Foreword

Education is not just knowledge transfer, but also a spark for curiosity and critical thinking. In line with NEP 2020, NCF 2023, and SCF–AP, this Teacher Handbook empowers teachers in this transformative journey. Teachers today are facilitators of learning, shaping future-ready students with values, skills and competencies. This hand book offers practical guidance for lesson planning, assessment, pedagogy and reflection.

It includes curricular goals, learning outcomes, and innovative teaching strategies. Resources like TLMs, Labs, Clubs and joyful learning techniques are featured. It aligns with the Academic Calendar for structured year-round teaching. This is your professional companion encouraging creativity, collaboration and growth. Let classrooms be inclusive, engaging and empowering learning spaces. This handbook is a valuable professional companion that empowers teachers to nurture lifelong learning and effective Classroom transformation.

The Department of School Education, Andhra Pradesh acknowledges the unwavering commitment of educators, academic experts and resource persons who contributed to the development of this Teacher Handbook

Together, let’s shape the future of education in Andhra Pradesh.

– Department of School Education, Andhra Pradesh

Government of Andhra Pradesh, Amaravati
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YEAR PLAN

S.No	Name of The Chapter	Month	No. Of Instructional Periods Allocated	No. Of Non-Instructional Periods Allocated	Total No Of Periods
1	Readiness	Jun			
2	Readiness	July			
3	Components of Food	Aug	6	3	**9**
4	Sorting Materials into Groups	Aug, Sep	4	1	**5**
5	Separation of Substances	Sep	6	3	**9**
6	Getting to Know Plants	Sep/ Oct	6	7	**13**
7	Body Movements	Oct	7	5	**12**
8	The Living Organisms Characteristics and Habitats	Nov	8	6	**14**
9	Motion and Measurement of Distances	Dec	7	7	**14**
10	Light, Shadows and Reflections	Dec	6	4	**10**
11	Electricity and Circuits	Jan	7	4	**11**
12	Fun With Magnets	Feb	7	5	**12**
13	Air Around Us	Mar	6	6	**12**

June 2025

M3C9S5
No bag
Day

V3N4U8
Cluster
Complex

L6Z5G9
Teacher
Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Sunday	2	3	4	5	6	7 Bakr Eid
8 Sunday	9	10	11	RP 12 Reopening day	RP	14 Second Saturday
15 Sunday	16 RP	17 RP	18 RP	19 RP	20 RP	21 International Yoga Day No Bag Day
22 Sunday	23 RP	24 RP	25 RP	26 RP	27 RP	No Bag Day 28 Mega PTM
Sunday 29 National Statistics Day	30 RP					

Week1:

Week 2:

Week 3: RP

Week 4: RP

Week 5: RP

TEACHER'S NOTES

July 2025

M3C9S5
No bag Day

V3N4U8
Cluster Complex

L6Z5G9
Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		RP 1	RP 2	RP 3	RP 4	No Bag Day 5
Sunday Muharram 6	RP	RP 8	RP	RP	RP 1	Second Saturday 12
Sunday 13	RP 4	RP 15	RP 6	RP 7	RP	No Bag Day Cluster meeting 19
Sunday 20	RP	RP 22	RP 23	RP 4	RP 24	No Bag Day SMC Meeting 26
Sunday 27	RP 8	RP 29	RP 0	RP 1		

Week1: RP

Week 2: RP

Week 3: RP

Week 4: RP

Week 5: RP

↓ TEACHER'S NOTES ↓

August 2025

M3C9S5
No bag Day

V3N4U8
Cluster Complex

L6Z5G9
Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 NI	2 No Bag Day
3 Sunday	4 FA - 1	5	6	7	8 Vara Lakshmi Vratham NI	9 Second Saturday
10 Sunday	11 1.1	12 1.2	13 1.3	14 1.4	15 Independence day	16 Sri Krishna Ashtami
17 Sunday	18 1.5	19 1.6	20 NI	21 NI	22 NI	23 No Bag Day Cluster meeting
24 Sunday	25 2.1	26 2.2	27 Sri Vinayaka Chavithi	28 2.3	29 National Sports day 2.4	30 No Bag Day
31 Sunday						

Week1: FA - 1

Week 2: 1.1 – 1.4

Week 3: 1.5 – 1.6

Week 4: 2.1 – 2.4

TEACHER'S NOTES

1 COMPONENTS OF FOOD

Learning Outcomes:

Students will be able to

- identify various components of food.
- conduct simple tests to know the various nutrients present in different food items.
- explain the importance of nutrients
- apply knowledge in selecting food items for a balanced diet discuss the importance of a balanced diet.

Y6A2Q9

Prior Concept/ Skills:

- Basic understanding of food and its sources.
- Ability to observe and record observations.

Teacher References:

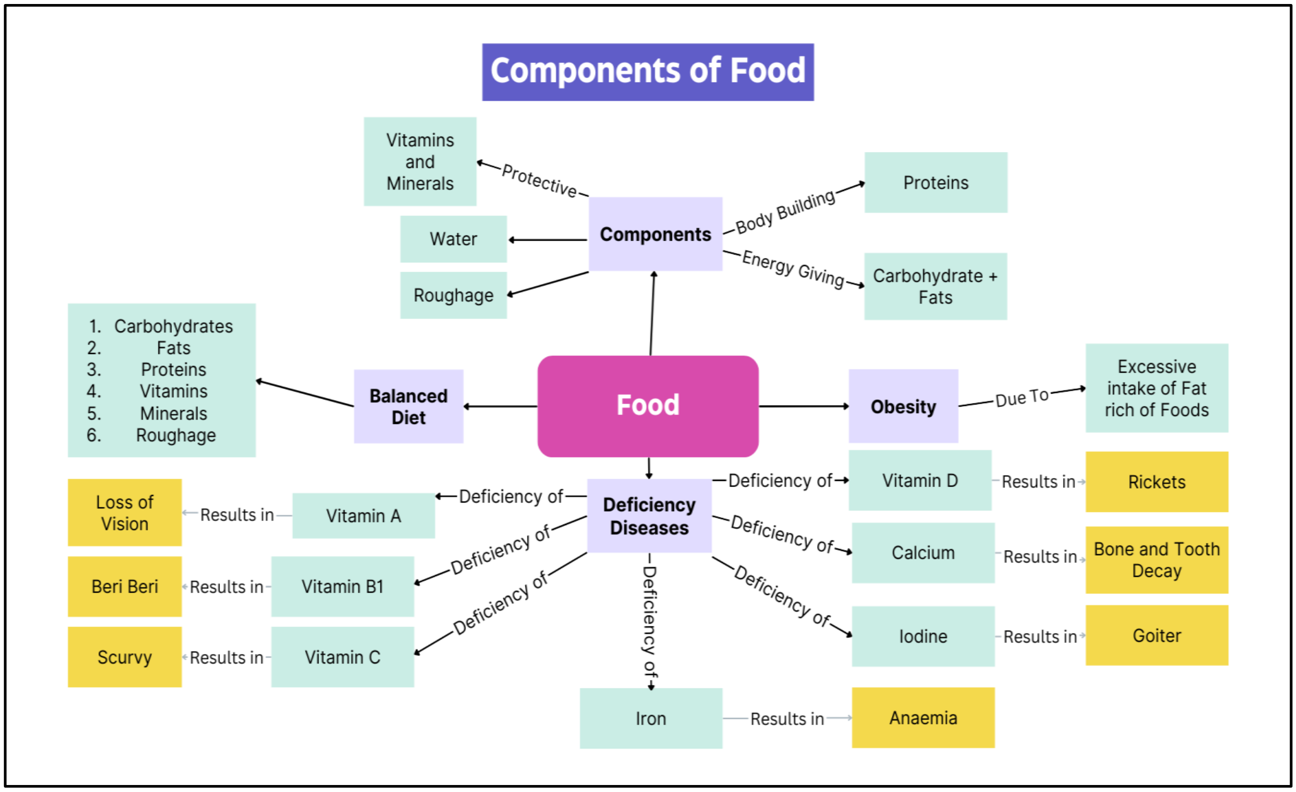
- SCERT Text Book

Teaching Learning Material (TLM):

- Food item chart
- Iodine solution
- Bread/rice or any starch rich food
- Empty packets of chips, biscuits, chocolates and other household items with nutrition table
- Copper sulphate from chemistry lab
- Sodium hydroxide from chemistry lab
- Food items with fat - namkeen, fried chips
- Butter paper - 8 to 10
- Chart paper and sketch pens
- Test for starch, protein and fats in food

  A menu card from local restaurant

CONCEPT MAP



SYNOPSIS

What are Nutrients?

- The food that we eat consists of different nutrients or components.
- The components of food which are needed by our body are known as nutrients.
- There are six main components present in food: Carbohydrates, fats, proteins, vitamins, minerals and fibres.
- Our body also needs water to carry out various functions like regulating body temperature, aiding digestion etc.
- Fiber/roughage is needed for digestive health, blood sugar control, weight management etc.

Carbohydrates

- Carbohydrates provide energy to our body, which keeps it going throughout the day.
- The sources of carbohydrates include cereals such as wheat, maize, rice, jawar, bajra, potatoes, bread etc.
- We can test the presence of carbohydrates by iodine test.

Proteins

- Protein is known as body-building food.
- Protein is a fundamental part of every cell in the body and is used to build and repair muscles, bones, hair, skin, eyes, and organs.
- The sources of proteins are: cheese, egg, soya bean, pulses, meat etc.

Fat

- Fat also provides energy to our body. Fat gives more energy as compared to carbohydrates.
- Some sources of fat are oil, ghee, egg yolk, milk, butter etc.

Vitamins

- Vitamins are a group of organic compounds which are essential in small amounts for maintaining normal health and development.
- Vitamins help in protecting our body against diseases. They help in keeping our eyes, bones, teeth and gums healthy.
- Vitamins are of different types: vitamin A, vitamin C, vitamin D, vitamin E, and vitamin K.
- There is also a group of vitamins called Vitamin B-complex.

Minerals

- Minerals help keep bones, muscles, heart, and brain working properly.

Roughage/Dietary Fibers

- Some sources of Roughage are fresh fruits, whole grains and pulses.

Balanced diet

- Our diet should have all the required nutrients in the right proportions and this should also contain some water and dietary fibers. This kind of diet is called a Balanced diet.
- Balanced diet is important for growth and maintenance of good health.
- It can be very harmful for us to eat too much of fat rich foods and we may end up suffering from a condition called obesity.

Deficiency Diseases

- Diseases that occur due to lack of nutrients over a long period are called deficiency diseases.
- Lack of iodine quantity in our body causes Goiter.
- Lack of calcium causes bone and tooth decay.
- Vitamin A deficiency causes loss of vision.
- Vitamin D deficiency causes Rickets.
- Lack of iron causes anaemia.

Period-wise Topics

Chapters and Concepts

Period number	Topic	Remarks
1.1	Introduction, Activity-1-1.1 What do different food items contain?	
1.2	Activity 2: Test for starch, test for proteins	
1.3	Test for fats: 1.2 what do various nutrients do for our body - Carbohydrates, Proteins, Fats	
1.4	What do various nutrients do for our body? - Vitamins, Minerals, Fibers and Water - Activity 3	
1.5	1.3 Balanced diet	
1.6	1.4 Deficiency diseases	

Period 1.1:.

Concepts Covered : Introduction, Activity-1-1.1 What do different food items contain?

Learning Objectives :

Students will be able to:

- identify and list different nutrients in our food.
- explain the functions of carbohydrate/starch in food

Prior Concept/ Skills: students had the knowledge of food and purpose of eating food.

TLM Required : Pictures, images of food items

Teacher Resources : Bilingual textbook

Igniting Activity:

Food Charades:

- Divide the class into two teams.
- Show a picture of a food item to a representative from each team.
- The representative must act out the food item without speaking.
- The first team to guess the food item correctly wins a point.

Let us divide in two groups. - One member comes from each team, and I will show them the food item. They will act out the food item and the team needs to guess the food item. If you act and talk then negative 3 points. For every right answer positive 5 points.

➢ Can someone repeat my instructions?

Are you ready?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teachers write all the nutrients on the board, along with examples of each nutrient. - Why do we need energy? Where do we get this energy from? - Just like our bodies need fuel to run, our cells need nutrients to function. The major nutrients are carbohydrates, proteins, fats, vitamins, and minerals. - Carbohydrates are our body's primary source of energy. They're like the fuel that keeps our bodies going. One type of carbohydrate is starch, which is found in many foods we eat. **CFU (Open ended and Factual):** - What is the role of carbohydrates in our body? - How can we test for the presence of starch in a food item? - Can you name some foods that are rich in starch? - Do we need carbohydrates in our food? Why?	● I have some empty packets of chips, biscuits and chocolates. In pairs you will have to identify the content of carbohydrates present in the food items. Once identified, arrange these packets in increasing order of carbohydrate content. The food item which contains the least amount of carbohydrate comes first.	1. Unscramble the following words related to components of food and write them in the space provided. (a) reinpot ___________ (b) menliars ___________ (c) tivanmi ___________ (d) bocatradhyer ___________ (e) nitesturn ___________ (f) tfa ___________ **Homework** 1. In your house, find the food items which consist of starch/carbohydrates. Make a list of these items.

Closing

Summary

Indian meals showcase diverse food combinations, typically including grains, dal, meat, or vegetables, often accompanied by curd, buttermilk, or pickles. These meal components provide essential nutrients like carbohydrates, proteins, vitamins, and minerals, fulfilling the body's energy and nutritional needs. While variety is common, practical constraints like travel may sometimes limit meal options.

Food contains essential nutrients such as carbohydrates, proteins, fats, vitamins, minerals, dietary fibers, and water, all vital for the body.

Let us revise what we have learnt today:

3 things that you have learnt today.

2 things that you found interesting

1 question that you have

Assessment

1. Why do Indian meals often include a combination of grains, dal, and vegetables?
2. Describe the typical components of a meal in different regions of India, citing two examples.
3. Why do Indian meals often include a combination of grains, dal, and vegetables?

Period 1.2:.

Concepts Covered : Activity 2: Test for starch, test for proteins

Learning Objectives:

Students will be able to conduct simple experiments to test starch and test proteins

Prior Concept/ Skills: our food contains various nutrients like carbohydrates, proteins and fats etc.

TLM Required : food items, iodine solution, dropper, copper sulphate, Caustic soda, test tubes.

Teacher Resources : **bilingual textbook**

Igniting Activity:

"Mystery Substance"

You are given an unknown substance. Can you design a simple experiment to test if it contains starch or protein? What clues will you look for?

Hook:

"What do bread, eggs, and potatoes have in common?"

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Let us first discuss the homework given yesterday. - What did you observe in the process of making rice at home? What happened to the water? The white cloudy structure on top of rice is due to starch. The starch is released when rice is boiled. This shows that the rice has starch (carbohydrate) in it. Today, we will learn how to execute an experiment to test for the presence of starch in various food items. Understanding starch is important because it is a major source of energy in our diet. Who can tell me some of the food items that contain starch? → rice, potatoes, and bread.	- Divide into groups of 4. Each group will receive a set of food items and iodine solution. Your task is to test each food item for starch and record your observations in a table. - Let's test a potato together. First, cut a small piece. Then, add a few drops of iodine solution. What do you observe? What colour can you see? **Student Exploration:** - Now, it's your turn to experiment with the other food items. Remember to be careful when handling the iodine solution. Now, let's work together to test some food items. I'll guide you through the steps.	1. Name the solution needed to test the presence of starch in a food item. __________ 2. Name the colour that tells us the presence of starch in food items after the addition of the above solution. _____________ 3. Name four food items that consist of starch or carbohydrate. ____________ 4. Name the solutions that are needed to test the presence of protein in a food item.

In case the items for the test are not present in the school lab, please show the following video from 1:08 sec to 2:16 secs.
Video Link: Test for starch protein and fats | Class 6 Chapter 2 Components of food | CBSE - LearnFatafat

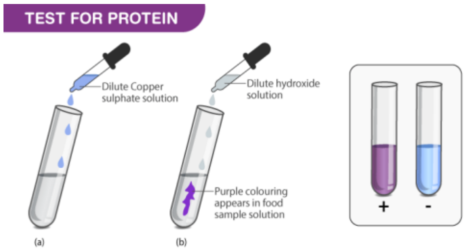
Demonstration of the Starch Test:

- Let's do a simple experiment to test for starch. I'll take a slice of bread, add a few drops of iodine solution, and observe the colour change."
- **Explanation:** "The blue-black colour indicates the presence of starch."

How can we test if the food item has protein or not? Can someone tell me why we need tests for protein?

In case the items for the test are not present in the school lab, please show the following video from 2:18 sec to 4:12 secs.
Video Link: Test for starch protein and fats | Class 6 Chapter 2 Components of food | CBSE - LearnFatafat

Let's explore how to test for proteins in food. We'll use a simple chemical test involving copper sulphate and sodium hydroxide. When these chemicals react with proteins, they produce a beautiful violet colour.



1. Take a small amount of the food item and grind it into a paste or powder.
2. Add a few drops of water to the food sample in a test tube. Then, add a few drops of copper sulphate solution followed by a few drops of sodium hydroxide solution.
3. Shake the test tube gently and observe the colour change. A violet colour indicates the presence of protein.

Let's test a few food items together: milk, lentils, and rice. We'll record our observations in a table.

S.No.	Food Item	Colour	Protein (Yes/No)

5. Write down steps of conducting the protein test experiment.
6. Name the food items that contain protein.

Name any two plant based proteins and two animal based proteins

Homework

7. Take some boiled rice, boiled potato and atta dough and put some more water in it. Now, feel the texture of the food.
8. What do you notice ? Is it the same as the white water produced during boiling rice?

Ask at your home about this and note down your observations in a notebook.

CFU (Open ended and Factual): ● Which solution do we use to test starch? ● What is the colour that confirms the presence of starch? ● Which solutions are used to test the presence of proteins? ● Why is it important to test starch in food?		

Closing

The lesson outlines two tests for identifying nutrients in food:

- **Starch Test**: Apply iodine solution to a food item. If the food turns blue-black, it contains starch.
- **Protein Test**: Grind the food into a paste, mix it with water, and add copper sulfate and caustic soda solutions. A violet color indicates the presence of protein.

These simple tests help detect key nutrients in food items systematically. Observations can be recorded for comparison.

Let us revise what we have learnt today:

- Three things that you have learnt today.
- Two things that you found interesting …..
- One question that you have…

Assessment

1. What colour indicates the presence of starch in a food item when iodine is added?
   a. Blue-black b. Violet c. Green d. Red
2. Which two chemicals are required for testing the presence of protein in food?
   a. Iodine and water b. Copper sulphate and caustic soda
   b. Vinegar and baking soda d. Hydrogen peroxide and ammonia

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3. Describe the steps to test for the presence of starch in a food item.
4. Why is it necessary to grind or mash a solid food item before testing for protein?
5. What observations would confirm the presence of protein during the test?

Period 1.3:.

Concepts Covered :

Test for fats: 1.2 what do various nutrients do for our body - Carbohydrates, Proteins, Fats

Learning Objectives:

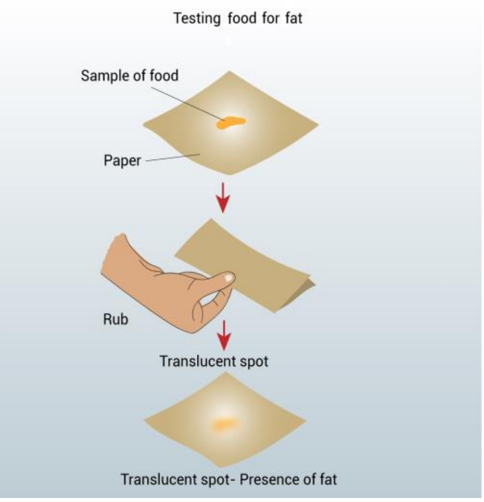
Students will be able to:

- conduct a simple experiment to test for the presence of fats in food items.

Prior Concept/ Skills: Learns to test carbohydrates, proteins

TLM Required : white paper, food items
Teacher Resources : Bilingual Text book (6th class), You tube videos
Igniting Activity :

1.

<table>
<tr><th>Explicit Teaching/Teacher Modelling *(I Do)*</th><th>Group Work *(We Do)*</th><th>Independent Work (You Do)</th></tr>
<tr>
<td>Imagine you are at a local market, and you see a vendor selling samosas. How do you know if they are healthy or too oily? Today, we will learn a simple test to find out!
We can test for fats in food using a simple method. We'll take a small piece of the food item, wrap it in paper, and crush it. If the paper has an oily patch, it means the food contains fat.
In case the items for the test are not present in the school lab, please show the following video from 2:20 sec to 5:48 secs.
Video Link: Test for starch protein and fats | Class 6 Chapter 2 Components of food | CBSE - LearnFatafat

 </td>
<td>Let's try this together. I'll take a piece of butter and wrap it in this paper. Now, I'll crush it gently. Can you see the oily patch?

Now, you'll work in pairs. You'll have a variety of food items, like nuts, cheese, and oil. Wrap each food item in paper, crush it, and observe for an oily patch. Record your observations in a table.

<table>
<tr><th>S.No.</th><th>Food Item</th><th>Colour</th><th>Fat (Yes/No)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
Get into groups of 4 and make a list of all the food items that contain proteins. Now classify them under plant-based protein and animal-based protein.
Now identify the common items that have both protein and carbohydrate.
Discuss with the person next to you, in breakfast, lunch and dinner which nutrient is dominant? Is it the same for you?
2 groups can share about what they discussed in their groups

We will divide ourselves in groups of 4 and I will give you some empty and filled packets of food items. These are taken from the local shop. Like our first class, we are today going to look at the amount of fat present in each of the food items.</td>
<td>1. How do we test for fats in food?
2. Name two food items that contain fat?
3. Test five food items at home for the presence of fats. Record your observations. Research the different types of fats (saturated and unsaturated) and their health implications. You can also look for saturated fats and unsaturated fat label in food packets at home . Create a list of 10 protein-rich foods.
2. Which of the following sources of protein is different from others?
(a) Peas (b) Gram (c) Soyabeans (d) Cottage cheese (paneer)
1. Name the following:</td>
</tr>
</table>

Today, we're going to study proteins. Imagine your body as a magnificent building. Proteins are the bricks and mortar that build and repair this structure. They're essential for growth, development, and overall health. Food items like eggs, chicken, soyabean etc. contain protein items. Can you guess some other food items that may have protein in them?

Proteins we get from plants and as well as animals.

Here are some examples of plant-based protein items and animal-based protein items.

Plant Source	**Animal Source**
Soyabean	Eggs
Nuts	Chicken
Seeds like Chia Seeds, pumpkins	Fish
Chickpeas	Milk

Fats are a source of energy, providing 9 kilocalories (kcal) per gram, which is more than carbohydrates and proteins. They help the body absorb fat-soluble vitamins, such as vitamins A, D, and E. Fats support cell function and are part of cell membranes, helping control what goes in and out of

CFU (Open ended and Factual):

- What are proteins?
- Why are proteins important for our bodies?
- Can you name some food items rich in protein?
- What are fats?
- Why are fats important for our

Once done, arrange the food item packets in increasing order of fat. Which of these food items do you often consume?

(a) The nutrients which mainly give energy to our body.

(b) The nutrients that are needed for the growth and maintenance of our body.

2. Name two foods each rich in:

   (a) Fats

   (b) Starch

   (d) Protein

bodies? Can you name some foods that are rich in fats? **CFU (Open ended and Factual):** How can we test for the presence of fats in food? Is it healthy to consume too much fat?		

Closing

Summary

To test for fats, wrap a food item in paper, crush it, and check for oily patches. If an oily patch appears, it indicates the presence of fat.

Carbohydrates and fats provide energy, with fats giving more energy than carbohydrates. Proteins support growth and repair of body tissues. Foods can be classified into energy-giving foods (carbohydrates and fats) and body-building foods (proteins).

Let is revise what we have learnt today:

- 3 things that you have learnt today.
- 2 things that you found interesting
- 1 question that you have

Assessment

1. How do you test the presence of fats in a food?
2. Name the energy giving nutrients.
3. What is the role of proteins in our body?

Period 1.4:.

Concepts Covered **:** What do various nutrients do for our body? - Vitamins, Minerals, Fibers and Water - Activity 3

Learning Objectives:

Students will be able to:

- Understand the roles of vitamins, minerals, fibre, and water in our diet.
- Identify food sources of vitamins, minerals, fibre, and water

Prior Concept/ Skills: our diet contains vitamins, minerals, fibre along with carbohydrates, proteins and fats.

TLM Required: Pictures of sources of vitamins, minerals, fibre

Teacher Resources: Bilingual textbook.

Igniting Activity:

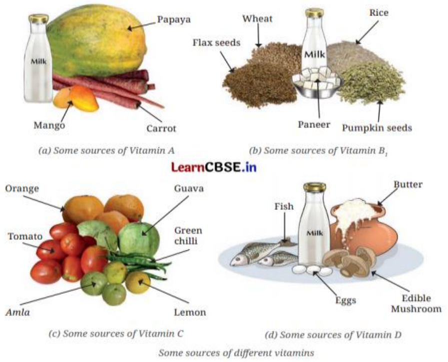
"Nutrient Detectives"

Imagine you're a detective trying to solve a mystery: "What nutrients are hiding in your favourite foods?" Grab a snack or meal and start investigating! What vitamins and minerals might be lurking in your food?

Hook:

"Did you know that your favourite foods might be hiding secret superpowers? Vitamins and minerals are the unsung heroes that keep your body strong and healthy!"

<table>
<tr>
<th>Explicit Teaching/Teacher Modelling <i>(I Do)</i></th>
<th>Group Work <i>(We Do)</i></th>
<th>Independent Work (You Do)</th>
</tr>
<tr>
<td>
<p>Imagine your body as a complex machine. It needs fuel to run, building blocks to repair itself, and lubricants to keep it smooth. These essential components are provided by the nutrients in our food</p>
<p>Today, we're going to explore the hidden heroes in our food: vitamins, minerals, fibre and water. Vitamins are like tiny superheroes, protecting us from diseases and keeping our eyes, bones, and teeth healthy.</p>
<p>Minerals are the body's building blocks, helping us grow strong and tall.</p>
<p>Fiber, or roughage, aids in digestion and keeps our digestive system healthy.</p>
<p>And water, the medicine of life, is essential for all bodily functions.</p>
</td>
<td>
<p>Now we will create groups of 4, and match the food items with the function that they serve. We can use the NCERT book to get help from.</p>
<p>(The teacher can move around the class to support students in matching the right function)</p>
<p>Make the following table on the board for the students to copy in their notebooks:</p>
<table>
<tr><th>Column A</th><th>Column B</th></tr>
<tr><td>Vitamin A</td><td>Essential for strong bones and teeth.</td></tr>
<tr><td>Vitamin B complex</td><td>Helps in calcium absorption for strong bones and teeth.</td></tr>
<tr><td>Vitamin C</td><td>Helps maintain good vision and healthy skin</td></tr>
<tr><td>Vitamin D</td><td>Boosts immunity and aids in iron absorption</td></tr>
<tr><td>Calcium</td><td>Helps in metabolism of the body</td></tr>
</table>
</td>
<td>
<p>1. Which one of the following food items does not provide dietary fibre?
(a) Whole grains
(b) Whole pulses
(c) Fruits and vegetables
(d) Milk</p>
<p>2. Which of the following food items does not provide any nutrients?
Milk, Orange Juice, Water, Tomato Soup</p>
</td>
</tr>
</table>

 Some sources of different vitamins → As you can see in the picture - Food items like Milk, mango, carrot, papaya are the sources of Vitamin A in our food. → Food items such as Paneer, wheat, flax seed, rice, milk and pumpkin seeds are rich in vitamin B1. → Food items such as orange, tomato, guava, green chilli, amla, and lemon are rich in vitamin C. → Fish, Milk, eggs, butter, mushrooms are some of the sources of Vitamin D. Which food item do you see here having most of the nutrients? - Milk Hence, it is very important to include milk in our diet. **CFU (Open ended and Factual):** ● What are the main functions of vitamins and minerals? ● Why is fibre important for our digestive health? ● How does water help our body? ● Can you name some food sources of calcium and iron?	**Answer:** ● Vitamin A: Helps maintain good vision and healthy skin. (Food sources: carrots, sweet potatoes, spinach) ● Vitamin C: Boosts immunity and aids in iron absorption. (Food sources: citrus fruits, berries, bell peppers) ● Vitamin D: Helps in calcium absorption for strong bones and teeth. (Food sources: sunlight, fortified milk, fatty fish) ● Calcium: Essential for strong bones and teeth. (Food sources: dairy products, leafy green vegetables) ● Vitamin B complex: B vitamins support the proper functioning of the brain and nervous system. (Food sources: meat, poultry, legumes, fortified cereals) Now, let's discuss the role of fibre. It's like a broom that sweeps out our digestive system, preventing constipation. Whole grains, fruits, and vegetables are excellent sources of fibre. Water helps our body to absorb nutrients from food. It also helps in throwing out some wastes from our body such as urine and sweat. We get water from drinking liquids and from the water content in fruits and vegetables.	**Homework** 1. Create a meal plan for a day, ensuring it includes a variety of nutrient-rich foods.

Closing

Summary

Vitamins and minerals are essential nutrients that help protect the body against diseases, maintain healthy skin, eyes, bones, teeth, and gums, and support overall growth and health. Different types of vitamins (A, C, D, E, K, and B-complex) and minerals are needed in small amounts, and can be found in various food sources. Additionally, dietary fibres (roughage) and water are crucial for digestive health and nutrient absorption.

Let is revise what we have learnt today:

- 3 things that you have learnt today.
- 2 things that you found interesting
- 1 question that you have

Assessment

1. What are the nutrients that help protect our body against diseases?
2. Name different types of vitamins and their sources.
3. What is the major function of dietary fibre?

Period 1.5:.

Concepts Covered : Balanced diet

Learning Objectives:

Students will be able to:

- identify the components of a balanced diet.
- explain the importance of balanced diet
- understand the consequences of not eating a balanced diet.
- create a balanced diet for themselves which is economical

Prior Concept/ Skills:

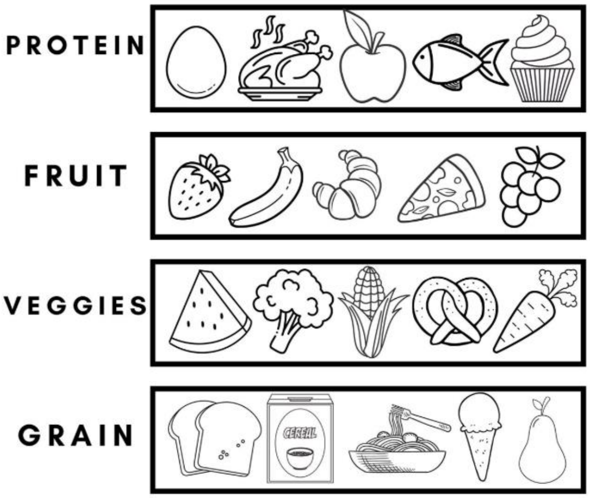
Our diet contains proteins, carbohydrates, fats, vitamins, minerals, fibre and water. We require them in definite quantities.

TLM Required : Pictures of different food items.

Teacher Resources : Bilingual textbook

Igniting Activity:

- Print pictures of various food items from various categories such as fruits vegetables, grains, fats and junk food.
- Take a full-size chart paper and divide it into sections representing nutrients, where the food item pictures need to be placed.
- Example chart (for teacher’s reference, the chart made by students will look different from this)



- Divide the class into teams of 4 students. The teams need to populate this chart with the right items as a relay race.
- In the process they will understand the concept that a healthy plate is one consisting of items from different nutrient groups.

This also helps them see that the junk food items do not fall under any of the categories.

Experience and Reflection:

- What did you enjoy most about today's activity?
- Did you learn anything new about nutrition?
- How can you apply what you learned to your own diet?
- What challenges did you face during the activities?

How did you overcome those challenges?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work *(We Do)***	**Independent Work** (You Do)
Good morning, class! Today, we're going to talk about something that's essential for our health: a balanced diet. Just like a car needs the right fuel to run smoothly, our bodies need the right nutrients to function optimally. **A balanced diet** is a diet that provides the body with the right amount of nutrients to function well. A balanced diet provides the body with the energy it needs, protects against nutritional deficiencies, and builds immunity.	Let's work together to create a balanced meal plan. We'll start by dividing the class into groups of four. Each group will be responsible for planning a meal for one day. Here are some guidelines to follow: ● Your meal plan should include breakfast, lunch, and dinner.	Read the items of food listed below. Classify them into carbohydrate rich, protein rich and fat rich foods and fill them in the given table. Moong dal, fish, mustard oil, sweet potato, milk, egg, beans, butter, buttermilk (chhachh), cottage cheese (paneer), peas, dal-rice, bread-omelette, idli-sambhar.

Now, let's think about the foods we eat. Let's look at some meals we commonly consume for breakfast/ lunch and try to identify whether these are balanced meals:
1. Idly-Sambhar
2. Curd Rice
3. Chicken/ Vegetable Biryani, etc.
4. Chapati and Vegetables

What nutrients are present in these meals? Which of the nutrients are absent and how can they be added?

CFU (Open ended and Factual):

- What is a balanced diet?
- Why is a balanced diet important?
- What are the different components of a balanced diet?
- Can you give examples of foods that are rich in carbohydrates, proteins, and fats?

How can you create a balanced meal plan?

- Make sure to include foods from all food groups: carbohydrates, proteins, fats, vitamins, and minerals.
- Consider the nutritional value of each food item.
- Remember to balance your meals. Don't overdo it on any one food group.

Once you've created your meal plan, we'll discuss it as a class and see if you've included all the essential nutrients.

Closing:

- Can someone tell me what are the components of a balanced diet?
- Why do we need to have a balanced diet?
- What is one thing that you found interesting in this lesson?

What is one question you have after going through this chapter?

Carbohydrate Rich Food Item (A)	**Protein Rich Food Item (B)**	**Fat Rich Food Item (C)**

Closing:

Let us take a minute to think about one change that you would like to make in your diet based on what you have learnt. Why would you make these changes in your diet? I would like to invite two volunteers in front of the class to answer these questions.

Homework

Tasty food is not always nutritious and nutritious food may not always be tasty to eat. Comment with examples.

Closing
Summary

A balanced diet includes all necessary nutrients in the right quantities, along with roughage and water, supporting growth and maintaining good health.
The dietary needs vary based on age and physical activity level.
Essential nutrients can be found in pulses, groundnuts, soybean, sprouted seeds, fermented foods, whole grains, fresh fruits, and vegetables.

However, improper cooking can lead to nutrient loss, so it's crucial to cook food properly.
To maintain a balanced diet, include a variety of foods, eat fruits and raw vegetables, and avoid excessive fat consumption to prevent obesity.
Let is revise what we have learnt today:
3 things that you have learnt today.
2 things that you found interesting
1 question that you have

Assessment
1. What is a balanced diet?
a) A diet with only carbohydrates
b) A diet with all necessary nutrients in right quantities
c) A diet with only fats
d) A diet with only proteins
2. Which of the following is a source of essential nutrients?
a) Only meat products
b) Only dairy products
c) Pulses, groundnuts, soybean, sprouted seeds, fermented foods, and whole grains
d) Only sugary snacks
3. What can lead to nutrient loss during cooking?
a) Proper cooking techniques
b) Excessive washing, heat, and water usage
c) Using only fresh ingredients
d) Cooking for a short time
4. What are the benefits of a balanced diet?
5. How can cooking affect nutrient retention?

Period 1.6 :.

Concepts Covered : 1.4 Deficiency diseases
Learning Objectives:
Students will be able to:
- Define deficiency diseases.
- Identify common deficiency diseases and their causes.
- Explain the importance of a balanced diet in preventing deficiency diseases.

Prior Concept/ Skills: Excessive cooking causes loss of some of the nutrients. This leads to diseases.
TLM Required : Pictures of healthy and unhealthy individuals for comparison
Teacher Resources : Bilingual textbook
Igniting Activity:

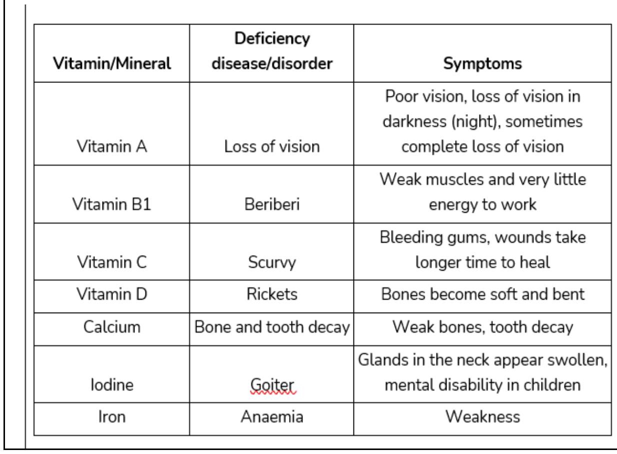
Show pictures of people suffering from malnutrition and ask students to observe the symptoms. "What do you think might be causing these health problems?"

Experience and Reflection:

What did you learn about deficiency diseases today?

How can we prevent deficiency diseases?

What are some common sources of vitamins and minerals in our diet?

<table>
<tr><th>Explicit Teaching/Teacher Modelling *(I Do)*</th><th>Group Work *(We Do)*</th><th>Independent Work
(You Do)</th></tr>
<tr><td>Imagine your body as a car. Just like a car needs fuel to run, your body needs nutrients to function properly. When you don't get enough of these essential nutrients, your body can start to malfunction. This can lead to a variety of health problems known as deficiency diseases.
One of the most common deficiency diseases is caused by a lack of iron. When your body doesn't have enough iron, it can't produce enough red blood cells to carry oxygen to your tissues. This can lead to fatigue, weakness, and shortness of breath.
Another important nutrient is vitamin C. It helps your body heal wounds, absorb iron, and boost your immune system. A deficiency in vitamin C can cause scurvy, a disease characterised by bleeding gums, loose teeth, and slow wound healing.
Let's explore some other common deficiency diseases and their causes. We'll use a table to organise the information.

<table>
<tr><th>Vitamin/Mineral</th><th>Deficiency disease/disorder</th><th>Symptoms</th></tr>
<tr><td>Vitamin A</td><td>Loss of vision</td><td>Poor vision, loss of vision in darkness (night), sometimes complete loss of vision</td></tr>
<tr><td>Vitamin B1</td><td>Beriberi</td><td>Weak muscles and very little energy to work</td></tr>
<tr><td>Vitamin C</td><td>Scurvy</td><td>Bleeding gums, wounds take longer time to heal</td></tr>
<tr><td>Vitamin D</td><td>Rickets</td><td>Bones become soft and bent</td></tr>
<tr><td>Calcium</td><td>Bone and tooth decay</td><td>Weak bones, tooth decay</td></tr>
<tr><td>Iodine</td><td>Goiter</td><td>Glands in the neck appear swollen, mental disability in children</td></tr>
<tr><td>Iron</td><td>Anaemia</td><td>Weakness</td></tr>
</table>
</td>
<td>Imagine that you are assisting a doctor for a day and you are a nutritionist. We will first divide the class into 3 groups, so there will be three groups of nutritionists. Now you three are presented with the patients of three different diseases and symptoms.
Create a diet plan for them that will assist their medication and improve their health condition. Do not forget to get it checked with your doctor (your teacher).
Patient 1: Rickets
Symptoms:
● Soft bones that can lead to bowed legs, knock-knees, or a pigeon-chest deformity
● Delayed growth
● Muscle weakness
● Pain in the bones
Dietary changes:
——————————————
-------------------</td>
<td>Fill in the blanks.
(a) _______________ is caused by deficiency of Vitamin D.
(b) Deficiency of _______________ causes a disease known as beri-beri.
(c) Deficiency of Vitamin C causes a disease known as _______________.
(d) Night blindness is caused due to deficiency of _____________ in our food.
Homework
For homework, you can visit 5 households near your home who have a family member with some ailments. Create a table with their name, symptoms that they are facing and possible diets that they can have. Do not prescribe any medicine or diet to them.

Create a small questionnaire before the visit. Think about the questions to ask them</td></tr>
</table>

Now, let's discuss the importance of a balanced diet in preventing deficiency diseases. A balanced diet provides all the essential nutrients our bodies need to function properly. By eating a variety of foods, we can ensure that we're getting the vitamins, minerals, and other nutrients we need to stay healthy. **CFU (Open ended and Factual):** ● What are deficiency diseases? ● What are some common deficiency diseases? ● What are the causes of deficiency diseases? ● How can a balanced diet help prevent deficiency diseases?	Patient 2: Beriberi Symptoms: ● Weakness and fatigue ● Loss of appetite ● Tingling or numbness in the hands and feet ● Muscle weakness ● Difficulty breathing Dietary changes: —------------------------- ------------------ Patient 3: Goitre Symptoms: ● Enlarged thyroid gland, which can cause a visible swelling in the neck ● Difficulty swallowing or breathing ● Fatigue ● Weight gain or loss ● Hoarseness Dietary changes: —------------------------- ------------------------- **Closing:** Can someone tell me what we learned today first? Let us do a quick revision using 3-2-1 method: - Mention 3 learnings you had from today's lesson - Mention 2 things that you found interesting - 1 question that you have after today's lesson	without making them feel uncomfortable, also take their permission before visiting them and using their names on the table. 

Name of the person	Symptoms they are facing	Possible DIET chart for them

Closing

Summary

Deficiency diseases occur when the body lacks essential nutrients over a prolonged period.

These diseases can be prevented by consuming a balanced diet.

Examples of deficiency diseases include protein deficiency (stunted growth, skin issues), vitamin deficiencies (loss of vision, beriberi, scurvy), and mineral deficiencies (rickets, goiter, anaemia).

Ensuring adequate nutrient intake is crucial for maintaining good health.

Let is revise what we have learnt today:

- 3 things that you have learnt today.
- 2 things that you found interesting
- 1 question that you have

Assessment

1. Paheli avoids eating vegetables but likes to eat biscuits, noodles and white bread. She frequently complains of stomach ache and constipation. What are the food items that she should include in her diet to get rid of the problem? Give reason for your answer.

(a) List all those components of food that provide nutrients.

(b) Mention two components of food that do not provide nutrients.

2. Boojho was having difficulty seeing things in dim light. The doctor tested his eyesight and prescribed a particular vitamin supplement. He also advised him to include a few food items in his diet.

(a) Which deficiency disease is he suffering from?

(b) Which food component may be lacking in his diet?

(c) Suggest some food items that he should include in his diet. (any four)

TEACHER'S DIARY

Name of the Teacher:				**Name of the Month:**	
Name of the Lesson:				Class:	
Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
1.1	Introduction, Activity-1:1.1 What do different food items contain?				
1.2	Activity 2: Test for starch, test for proteins				
1.3	Test for fats: 1.2 what do various nutrients do for our body - Carbohydrates, Proteins, Fats				
1.4	What do various nutrients do for our body? - Vitamins, Minerals, Fibers and Water - Activity 3				
1.5	1.3 Balanced diet				
1.6	1.4 Deficiency diseases				

1	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

2

SORTING MATERIALS INTO GROUPS

Learning Outcomes:

Student will be able to

Concept 1 - Object around us -Sorting of Objects

1. understand the importance of sorting of objects and its relevance in daily life.
2. explore different ways of sorting objects around them.

Concept 2 -Properties of materials, Appearance, and Hardness.

3. explore the properties of material that a given object is made up of.
4. identify the appearance and hardness of various materials.
5. classify objects on the basis of their hardness.

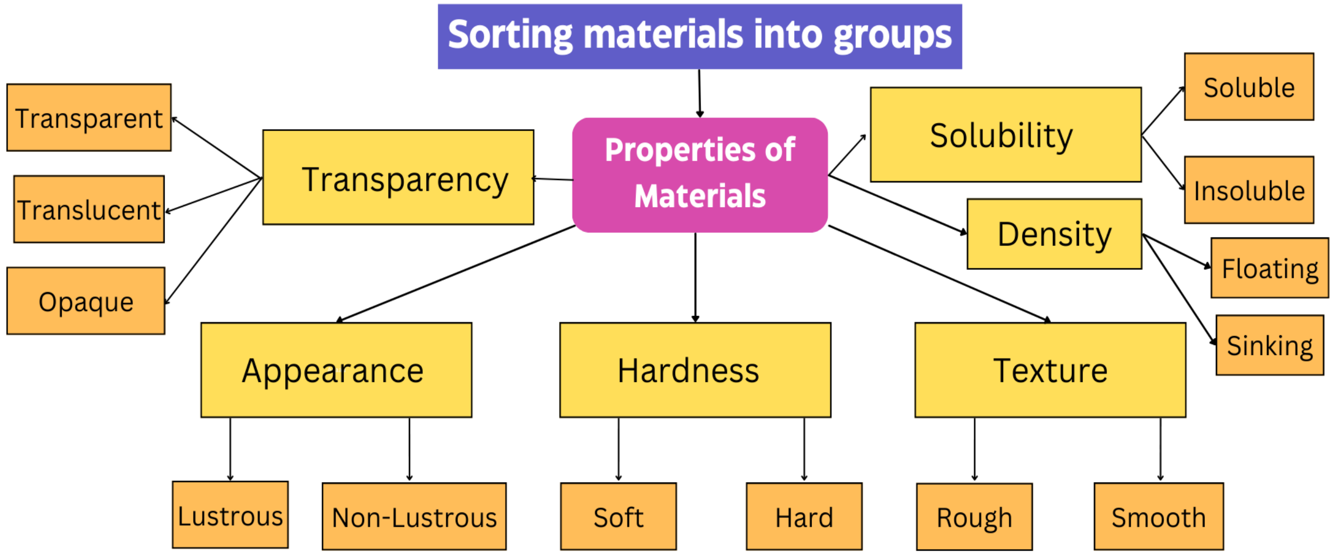
Concept 3 - Soluble and insoluble

6. classify objects on the basis of their solubility.
7. explore the solubility of gases and oil in water.

Concept 4- Objects may float or sink in water & transparency.

8. classify objects on the basis of their solubility.
9. classify objects on the basis of their density.
10. classify objects on the basis of their transparency

CONCEPT MAP



SYNOPSIS

Objects Around Us

- Objects are made up of one or more materials.
- One material can be used to make different types of objects.

Properties of materials

Appearance

- Lustrous (all metals are lustrous, some are more and some are less).
- Non-lustrous (wood, rubber and piece of rock)

Hardness (Hard and soft)

- Hard objects are table, board, wall, etc.
- Soft materials are petals, rubber balls, etc.

Visibility

- Transparent (Materials that allow the entire light to pass through it, like glass, water etc.)
- Translucent (Materials that allow some light to pass through it, like coloured glass, oiled paper.)
- Opaque (Materials that don't allow light to pass through them, like stone, wood etc.)

Materials may float or sink in water

- Materials that are denser than water sink in water.
- Materials that are less dense than water float on it’s surface.

Water Solubility

- The substances like salt and sugar which disappear when mixed in water are called soluble substances.
- The substances which don’t disappear when mixed in water, even after stirring for a long time are known as insoluble substances.

Advantages of classification

- Helps in identifications of objects.
- Helps in sorting of objects.
- Helps in locating things.
- Helps to understand similarities and dissimilarities among objects.

Learning Outcomes:

Student will be able to

1. Conduct activity to understand the objects around us.
2. Differentiate the properties of materials based on the appearances and hardness
3. Classify and sort the materials based on the similarities and the differences.
4. analyse the suitability of materials for specific purposes based on their properties.

Period-wise Topics

Chapters and Concepts

Period number	Topic	Remarks
2.1	Objects around us -Sorting of Objects	
2.2	Properties of materials, Appearance, and Hardness.	
2.3	Soluble or Insoluble?	
2.4	Objects may float or sink in water & Transparency	
2.5	Student Independent Practice	
2.6	Student Independent Practice	
2.7	Student Independent Practice	

Teacher References:

- NCERT Class 6 Textbook
- Bal Vaigyanik Class 6, Eklavya
- Video Link 1 - Concept 3 hook
- Video Link 2 - Period 7

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Ability to observe objects and note their characteristics such as size, shape, colour and texture.
- Ability to compare two or more objects based on their observable differences and similarities.
- Understanding of basic descriptive terms like “hard”, “soft”, "smooth", “transparent”, “float”.
- Understanding of heavy and light items around them.

Teaching Learning Material (TLM):

1. Chart for “Question corner”
2. Markers, pens
3. Chalk, duster, pins, rubber band, glass, pipe, ruler, eraser, sharpener, spoon, toys
4. Transparent glasses
5. Torch
6. Oil
7. Rough papers
8. Food colour
9. Lemon

10. Coconut oil
11. Kerosene
12. Dry leaf
13. Sugar
14. Salt
15. Milk
16. Sawdust
17. Flour
18. Cotton
19. Worksheets
20. Image chart
21. Chart paper

Concept 1: Objects Around Us -Sorting of Objects

Teaching Learning Process

Learning Objectives:

Student will be able to

1. understand the importance of sorting of objects and its relevance in daily life.
2. explore different ways of sorting objects around them.

Induction/Introduction:

In this section, students will learn about how they can sort objects around them using different criteria. They will understand the purpose behind sorting of objects.

Vocabulary:

Materials, Objects, Separation

Hook:

Step 1: Place several objects on the table and ask students to observe them for a few minutes. Cover the objects with a cloth or send the students to another room.

Step 2: Now, the students write the names of all the objects that they remember.

Step 3: Students tally with their partners - how many objects have they got correctly.

Step 4: Teacher asks the students to cut off the names of the objects made of wood, plastic, that are edible etc.

Experience and reflection:

- Have you wondered why one object is so different from another?
- Why do we store similar things together? For example clothes are always kept in the cupboard, and utensils in the kitchen, why?

Period 2.1: Sorting of objects
Student will be able to
1. understand the importance of sorting of objects and its relevance in daily life.
2. explore different ways of sorting objects around them.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)

Say: So we just did an activity where we had a lot of random things, and then we arranged them according to some criteria. We also see that in our school library books and notebooks are kept in a certain order. Similarly in shops things are arranged in a certain order. Why do you think we arrange things? *(Here take at least 2 to 3 responses to see what students say. Expected response, so that things look neat and tidy, so that the place is clean, or so that we can find things easily and faster etc.)*
Say: So yes, In everyday life, we often arrange objects for our convenience. At home, we usually store things in such a manner that similar objects are placed together. Such an arrangement helps us to locate them easily. (*Here we tried to build purpose in the students, to grasp better about what they are going to learn).*
Say: When we go to shops, we see that they have many types of candies, different shapes, sizes and flavours.
Even though we are wearing the same uniforms but at home we have so many clothes to wear.
	1. "Now let's work in our groups for the next activity."
	(Assuming that there are 6 groups of 5 students each, the following scenarios are given to each group to work on, for 5 minutes)
	Let us collect as many objects as possible from around us. Without disturbing any other classes, we will go to the ground and collect some objects that we see.
	Students work in groups, they go around the class and the ground and collect as many objects as possible.
	Now think of objects that you cannot bring to the class for example road, trees, tractor, a train!
	Step 1: In groups - Separate all the objects that are made of wood - Also consider the items that you cannot bring in the class.
	Step 2: In groups - Separate all the objects that are green in colour - Also consider the items that you cannot bring in the class.
	Step 3: In groups - Separate all the objects that are made of paper - Also consider the items that you cannot bring in the class.
	What just happened? What did we do?
	What is your observation?
	- S: We divided things as per your prompt.
	- T: Yes, but what was the outcome, when you did that?
	  - T: In every step you made two groups. One group had wood items, the other did not, similarly one group had items in green colour
	  - while the other did not and so on.
		★ 1. "Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own."
		The teacher writes down questions on the board and asks students to write their answers in the notebook.
		1. Name five objects which can be made from wood.
		2. Name five items that are yellow in colour.
		3. Name five food items that you can eat.
		4. Name three objects that glow.
		2. Which of the following is least likely to be made of wood?
		a. A cricket ball
		b. Dining Table
		c. A window frame
		d. Bookshelf
		★ 2. Match the objects given below with the materials from which they could be made. Remember, **an object could be made from more than one material and a given material could be used**

We also have so many items around us - board, chalk, pen, notebook, chair, table, phone, shoes and many other objects. How do you differentiate between these different objects?

Students: They look different.

Teacher: How do they look different?

Students: They have different colors.

Teacher: What else is different?

Students: Their size and shape.

Teacher: What else is different?

Students: Their uses are different… and so on…

Okay, let's do an activity: I will give you some prompts and you have to write it in your notebook:

Look around and list all items that are round in shape. You can include nearly round objects as well.

List all items that are made of plastics.

In the above examples we have grouped objects on the basis of their shape or the materials they are made of. All objects around us are made of one or more materials. These materials could be glass, metal, plastics, wood, cotton, paper, mud or soil.

. Let's begin by revising what we learned in the last class. Who can tell me what we learned in the last class?

- T: So can you tell me in what ways we classified the objects?
- What can be the benefits of classifying objects in this way?
- Who can think of one more way of classifying the objects collected by you? Remember that there can be multiple answers to this question and no answer is wrong.

★ Divide the classroom in groups of 4.

Instruction: In your groups discuss and write the names of these objects in the below table next to the names of the materials they are made up of. Add more materials to the list (if required).

Chair, table, plough, bullock cart, wheels, books, notebooks, newspapers, toys, calendars, sofas, TV unit, centre table, paintings, photographs, vases, bed, wardrobe, dressing table, bedside table, almirahs, drawers, taps, showers, toilets, toothbrush, toothpaste, soap, shampoo, comb, cars, bikes, scooters, rickshaws, bottles.

Material	**Objects**
a. Wood	
b. Metal	
c. Plastic	
d. Glass	
e. Rubber	
f. Oil	
g. Water	

Group Discussion:

What did you observe in this group activity?

What was easy for you and why?

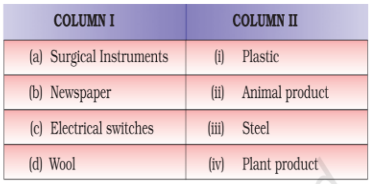
Where did you face the most challenge?

for making many objects.

Objects
Materials
Book
Glass
Tumbler
Wood
Chair
Paper
Toy
Leather
Shoes
Plastics

3. Match the objects given in Column I with the materials given in Column II.

(Tip for the teacher - Surgical instruments can be surgical scissor, knife or syringe and needle etc.)



COLUMN I	COLUMN II
(a) Surgical Instruments	(i) Plastic
(b) Newspaper	(ii) Animal product
(c) Electrical switches	(iii) Steel
(d) Wool	(iv) Plant product

Homework:

1. Observe the different items in your kitchen - Note down the names under two categories: items made of steel, and items made of plastic.
2. Talk to your parents about how they organise things in their cupboard or in the kitchen? How do they decide what items are to be kept together?

In the last class we saw how different objects can be grouped on the basis of material that they are made up of and also the number of materials used to make those objects. In today's class we will flip the concept learnt in the last class. Can someone guess what we are going to do today? Today we will try to see some common materials that we can see around us and then identify objects they are used to make. Let us look at some examples: Wood is used to make chairs, tables, plough, bullock carts and its wheels,.. Paper is used to make books, notebooks, newspapers, toys, calendars etc. Can you guess some common material that we can see around us? Wood, Paper, Leather, Plastics, Cotton, Glass, Steel, Iron, Rubber etc. **Checkingfor Understanding (CFU) Factual:** If you have to make a group of similar items, what are some of the criteria that you will choose? What are some items that are made up of wood? What are some common materials that you can see around you? **Open-Ended:** In what ways do different objects differ from the other? Name a household object made of more than one material and explain why each material was chosen to make this object?		3. Go to a local shop near your home and see how they arrange items in their shop? What criteria do they use to arrange them? Is it their shape, size, material they are made up of or anything else?

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

"Why do things look different from each other?"

"In how many ways can we group things?"

- Tell me 3 new things that you learned today.
- Tell me 2 new things that you found exciting.
- Tell me 1 question that you have from today.

"Are there any other questions that you are curious to know more about?"

Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment:

1. Name 5 items that are made of glass.
2. Name 3 things around you that give us light.
3. Why do we group things together? What are the advantages and disadvantages?
4. Which of the following statements is not true?
   (a) Materials are grouped for convenience.
   (b) Materials are grouped to study their properties.
   (c) Materials are grouped for fun.
   (d) Materials are grouped according to their uses.
5. 'Grouping of objects helps the shopkeeper.' Justify the statement.

Concept 2: Properties of Materials, Appearance, and Hardness.

Teaching Learning Process

Learning Outcomes:

Student will be able to

1. explore the properties of material that a given object is made up of.
2. identify the appearance and hardness of various materials.
3. classify objects on the basis of their hardness.
4. classify objects on the basis of their appearance.
5. analyse the suitability of materials for specific purposes based on their properties.

Induction/Introduction:

In this section students will learn that the objects are made of multiple materials and their properties. Students will be able to explain the properties of materials. They will also be able to understand that one type of material can be used to make multiple objects.

Vocabulary:

Properties, Luster, Grouping, soft and hard, appearance, hardness,

Hook:

Guess in 5 game:

Each team can be given a material each - the other team can ask up to 5 questions about the material which can be answered in Yes/ No, and try to guess what the material is.

For example, the materials can be a soft ball, a clip, a paper, an earbud, bottle cap etc.

Questions can be like -

Is the object round? Is it made of plastic? Is it used to play? Is it available in a sports shop? *(In this question series the answer is most probably a soft ball.)*

Note to teacher: Keeping the time in mind, play one round of it. If students find it fun, they can play more such games during break or recess time.

Experience and reflection:
Have you ever gone to a shop and forgotten the name of the thing that you want to buy but remember the way it looks? How do you describe the item to the shopkeeper in such a case?

Period 2.2: properties of material
Student will be able to

1. explore the properties of material that a given object is made up of.
2. identify the appearance and hardness of various materials.
3. classify objects on the basis of their hardness.
4. classify objects on the basis of their appearance.
5. analyse the suitability of materials for specific purposes based on their properties.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
1. Let us start the class with the second question of homework from last class. Can someone tell me what your parents tell you about how they organise things in their cupboard or kitchen? In the last class we saw how we can make groups of similar types of items based on their colour or size etc. Today we are going to focus on a particular property of an item, see which material they are made up of and how this will help us in sorting materials. I am going to write a few items on the board, you need to guess what material each one of it is made up of and properties of the material.	1. Now let us move around the school and try to find different items that are made up using only one material and items that are made using more than two materials. Divide the class into groups of 4 and every group gets a chart paper to move around the school to observe, inquire and put that into a list. Encourage students to take help from other teachers in the school in this inquiry.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." The teacher writes down questions on the board and asks students to write their answers in the notebook. Arrange the jumbled words to arrive at the appropriate names of materials and also write two uses of each. milaunuim tcaslpi

Plate - Steel → Is it always made of steel? What other material is it made up of? Plastic, glass, banana leaves.
Pen → Plastic, Metal
Mobile Phone → Plastic, metal, rubber
Shoes → leather, cloth, foam
Table → Wood, metal

Now we can make a list of items which are only made up of wood, similarly we can make a list of items which are made up of plastic and steel and so on. There are so many ways in which items are made of and we can classify all of them. observe the appearance and hardness of the materials.

2. T : Have you ever seen a glass made of cloth? Why not?
T : What can happen if I make a glass out of cloth?
S: The water will fall out of the cloth.
S: We will not be able to hold the cloth.
T: What happens if I use paper to make a cooking vessel?
S: The paper will not be able to hold the food for long.
S: The paper will burn as soon as we turn on the gas stove.

So, why is steel or plastics used in making most of the utensils?
It is because we choose a material to make an object depending on its properties, and the purpose for which the object is used.
Can you think of some properties of materials?
Hardness, Softness Appearance etc.
The first property that we are going to cover today is appearance.
Materials usually look different from each other.
Wood looks very different from iron.
Iron appears different from copper or aluminium.
At the same time, there may be some similarities between iron, copper and aluminium that are not

Objects made of 1 type of material	**Objects that are made up of more than 2 types of material**

Group Discussion:
What was difficult and what was easy in this activity?
What did you observe about the objects that are made up of more than one material?
Did you find more objects that are made up of one kind of material or otherwise? What could be the reason behind it?

2. Create groups of 5 students.
Collect small pieces of different materials – sandpaper, paper, cardboard, wood, copper wire, aluminium sheet, chalk, rubber pipe, some One Rupee coins.
Separate the shiny materials into one group.

Now take a sand paper and rub the material to see if you can see a new shine on some of the objects. Put them into the shiny material group as well.

Now in groups go around the school corridor, and make a list of items that appear shiny to you or might appear shiny after cutting them or rubbing their surface. Make sure that you do not touch any items which are sharp or have electricity in it.

Bring the list back to class.

soekrnee
gavnier

Which among the following correctly defines classification?
It is the process of mixing substances of different characteristics
It is the process of arranging substances into groups based on different characteristics
It is the process of arranging substances into groups based on common characteristics
Both b and c

Football, Tyres, Coins, Rings, The Earth
3. On what basis (property) can we classify the given items?
Shape
Colour
Size
Texture

Sunflower, Egg yolk, Mango, Cheese, Banana
4. What is the common property among the given objects?
Yellow in colour
Have same shape
All are fruits
All are vegetables

Select those objects from the following which shine:
Glass bowl, plastic toy, steel spoon, cotton shirt
Which of the following materials is not lustrous?
(a) Gold
(b) Silver
(c) Wood

there in wood. Such as wood can be cut or burnt easily whereas copper or aluminium may not be cut or burnt so easily. Lustre - Shiny material - Materials that have such lustre are usually metals. Iron, copper, aluminium and gold are examples of metals. T: Why do we not see shiny surfaces on old metal objects? S: Some metals lose their shine and appear dull, because of the action of air and moisture on them. We only notice the lustre, only on their freshly cut surface. 3. In the last class we saw one of the properties of objects that was lustre. What did you observe about the objects that have lustre? What purpose does this property serve? Which parts of a bicycle must have lustre and which should be non-lustrous? Why? In today's class we are going to look at a new property, which is hardness. Can someone tell me what the opposite of hard is? Yes, it is soft. *(Note: In this context the opposite of the word hard is soft. Students can also answer the opposite of hard is easy, which is also correct however in a different context.)* When you press different materials with your hands, some of them may be hard to compress while others can be easily compressed. Compress means to reduce the size of an object by applying pressure on it. For example a pillow is easy to compress hence it is soft. **Activity for the teacher to show**: Take a metal key and try to scratch with it, the surface of a piece of wood, aluminium, a piece of stone, a nail, candle, chalk, any other material or object. You can easily scratch some materials, while some cannot be scratched so easily.	**Group Discussion:** Name some places where shine in an object is important. For example, jewellery (made of gold), steel utensils, new motor bikes etc. Name some objects where shine is not so important - black board, cricket ball, cricket bat, our school uniform. Why do some materials shine while others do not? Can you think of situations where lustrous materials are not preferred? Why? (*Tip for teacher: Push students to think on the lines of things that have a smooth surface and the surface reflects light falling on it. Students might not use the word reflect and that is okay.* *If black boards or green boards are made of shiny materials we will have difficulty looking at it for a long period of time, similarly if a cricket ball is shiny the batter or the fielder might not be able to see the ball.)* *3.* Instruction to the teacher: Divide the classroom in groups of 5 and give them various materials which are hard and soft. Example list: rubber, a soft toy, a tennis ball, badminton ball, coin, plastic bottle etc. Give it to each group and give instructions to arrange these items in decreasing level of hardness. They keep the hardest item first, moving to the softest item.	(d) Diamond Why is gold, silver and diamonds often used to make jewellery? Can we make jewellery without them? Why do some metals lose their shine over a long period of use and time? If we need to improve the shine of an old metal object, how can we do that? Which among the following materials would you identify as soft materials and why? Ice, rubber band, leaf, eraser, pencil, pearl, a piece of wooden board, cooked rice, pulses and fresh chapati. Find the odd one out from the following: (a) Tawa (b) Spade (c) Pressure cooker (d) Eraser **Homework:** At your home make a list of at least 10 items that you can see and then make a list of all the materials you think that they are made up of. Collect and make a list of 5 items that shine in your home. What can you notice about them? In what ways does the property of lustre make them useful? *(Tip for Teacher: Push thinking of the students towards objects such as a mirror, since it shines we are able to use it. Similarly any new object or a toy which shines seems more valuable.)*

Materials which can be compressed or scratched easily are called soft while some other materials which are difficult to compress are called hard. For example, cotton or sponge is soft while iron is hard. **CFU (Open ended/ Factual)** **Factual:** How many materials are there in your pencil, pen and eraser? Can you name items which are made up of single material? (*Tip for teacher: Guide students here to push them to see that there are very few objects that are made up of single material, for example eraser, chalk, or scale. Try to push their thinking towards the reason why most objects are made up of more than one type of material)* What is lustre? How can we figure out if an object has lustre or not? What kind of material is generally used to make a hard object? What kind of material is generally used to make a soft object? **Open-Ended:** What properties of wood make it suitable for both furniture and pencil? On what basis do we choose a material while making an object? Why do you think we are asked to clean and polish our shoes everyday?	Let us now get into pairs, and I am sharing a worksheet with all of you. You can discuss with your partner to solve this worksheet. You need to identify the materials which are hard and soft, cut them and paste it in the respective boxes. Link to the worksheet : Link (Hard and soft materials) **Group Discussion:** Can one object be made using both soft and hard material? For example, a tennis ball is soft, whereas a cricket ball is hard. Similarly, inside the shoe is soft whereas the outside sole is hard. Why do you think it is this way?	Imagine that you are making a bicycle which parts should be lustrous and which parts shouldn't be? Why? Observe different body parts that humans have. Which body parts are hard and which of them are soft? Why? Go to the park/ground/forest near you - what are some things that you can find hard in nature and soft?*(The tree trunk is hard, whereas the leaves are soft. The coconut shell is hard, while inside it is soft. Apples and bananas are soft. Walnut is hard.)* Can you think about a bird or a cat and what are the parts of their body which are hard and soft? *(The beak of a bird or nail of an animal is hard, wings and body are soft- Wings help them fly, soft body helps them be flexible, nails and beak help them kill their prey or grab food items.)*

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

- Tell me 3 new things that you learned today.
- Tell me 2 new things that you found exciting.
- Tell me 1 question that you have from today.
- So in today's class we saw why certain materials are chosen to make certain objects.
- We also saw how we can group items based on their appearance. We saw two categories - shiny and non shiny materials. We also call them lustrous or non-lustrous materials.
- What did you find interesting in today's class?

- What are some questions you have? - Do write them down on the question corner chart.
- Tell me 3 new things that you learned today.
- Tell me 2 new things that you found exciting.
- Tell me 1 question that you have from today.

Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment on concept 2:

1. Answer the following in one word: What is common in the following?
   a. A ball, a globe, an orange and the earth ___________________
   b. A mug, a bucket, a dustbin and a toy ___________________
   c. Newspaper, notebook, magazine, calendars ___________________
   d. A nail, a wire, window grill and a gate ____________________

2. State whether the statements given below are True or False:
   a. Grouping is a useful process
   b. All objects are made up of the same kind of materials.
   c. Things can be grouped on the basis of their shape and size
   d. Different types of materials have different properties.

3. Which among the following correctly defines classification?
   a. It is the process of mixing substances of different characteristics
   b. It is the process of arranging substances into groups based on different characteristics
   c. It is the process of arranging substances into groups based on common characteristics
   d. Both b and c

4. Which of the following is least likely to be made using only plastic?
   a. Sandals
   b. A chair
   c. Pressure Cooker
   d. Water bottle

5. Find the odd one out from the following: **Nail, Utensils, Magnet, Beaker, Coin** Give reason for your choice.

(Note: The oddest choice among these is beaker. because the beaker is constructed of non-metal materials like plastic. However, other items like coins, utensils, nails, and magnets are made of metal. Additionally, the magnet can draw coins, utensils, and nails. But a beaker cannot be drawn to it. since it is not made of metal. Beaker is therefore the outlier among them.)

Concept 3 : Soluble or Insoluble?

Teaching Learning Process

Learning Objective/s:

Student will be able to

1. classify objects on the basis of their solubility.
2. explore the solubility of gases and oil in water.

Induction/Introduction:

In this section, students will learn about soluble and insoluble substances around them. They will learn that materials like salt,sugar are soluble in water and chalk powder insoluble in water . In addition this section also discusses solubility of oil and gas in water.

Vocabulary:

Soluble, Insoluble, stirring ,dissolve

Hook:

Magic Water" Experiment

Time: 5 minutes

Materials: Two transparent glasses of water, sugar, sand, spoons

Procedure:

1. Show the two glasses of water to the class.
2. Add sugar to the first glass and stir. Ask students, “Where did the sugar go?”
3. Then add sand to the second glass and stir. Ask, “Why is the sand still visible?”
4. Pose the question:

“Why does one disappear and the other doesn’t?”

“What do you think is happening here?”

Experience and Reflection

Experience: Students mixed different substances like salt, sugar, and sand in water to observe which dissolve and which do not.

Reflection: They realized that some substances are soluble while others remain undissolved, helping them understand real-life applications.

September 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 2.5	2 NI	3 NI	4 NI	5 Milad -Un -Nabi National Teacher's Day	6 No Bag Day
7 Sunday	8 International Literacy 3.1	9 3.2	10 3.3	11 3.4	12 NI	13 Second Saturday
14 Sunday Hindi Diwas	15 International Day of Democracy 3.5	16 3.6	17 NI	18 NI	19 NI	20 No Bag Day Cluster and SMC meeting
21 Sunday	22 NI	23 NI	24 Dussera Holiday	25	26	27
28 Sunday	29 Dussera Holiday	30 Durgaashtami				

M3C9S5
No bag Day

V3N4U8
Cluster Complex

L6Z5G9
Teacher Resources

Dasara Holidays 24.09.25 to 02.10.25

Dasara Holidays for Minority Institutions
27.09.25 to 02.10.25

Week1: **2.5 , NI**

Week 2: **3.1 – 3.4**

Week 3: **3.5 - NI**

Week 4: **NI**

Week 5:

TEACHER'S NOTES

Chapter 2 - Sorting of Materials into groups continued…

Period 2.3: Solubility of gases and oil in water

Learning Objectives:

Student will be able to

1. classify objects on the basis of their solubility.
2. explore the solubility of gases and oil in water.

<table>
<tr><th>Explicit Teaching/Teacher Modelling
(I Do)</th><th>Group Work *(We Do)*</th><th>Independent Work
(You Do)</th></tr>
<tr>
<td>1. What did you observe in nature and animals? What was soft and what was hard and why?
→ Take responses from 4 to 5 students
→ Enforce the reason behind why things are hard and soft in nature

In the last classes we have seen two properties so far. One is the hardness of an object and the other is the appearance of an object.
In today’s class we are going to look at a new property named - solubility.
How many of you know how to make tea or seen someone at home making a cup of tea?
What are the items you add?
- Milk, Water, Tea Leaves, Sugar, cardamom/ginger.
T: When the tea is ready, why do we filter it?
S: To filter out the tea leaves or residual cardamom/ginger
T: What happens to the sugar and the milk?
S: They all get mixed together.
Okay, in hot summer have you made lemonade? What are the items used to make lemonade?
- Water, lemon, sugar, salt, ice
T: After mixing everything together can you see lemon, water and sugar separately?
S: No, we cannot
T: However sometimes lemon seeds can be seen inside the glass. Isn’t it?</td>
<td>1. Divide the class into groups of 5 and give every group 5 glasses filled with water and some objects such as salt, sugar, sand, chalk, sawdust. (These items can be replaced on the basis of availability)

<table>
<tr><th>Substance</th><th>Disappear in water / does not disappear</th></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>

Now one by one mix these items, in water, stir the water using a spoon. And write down your observations in this table.
You will notice that some substances have completely disappeared or dissolved in water. We say that these substances are soluble in water. Other substances do not mix with water and do not disappear even after we stir for a long time. These substances are insoluble in water.</td>
<td>1. Pick one material from the following which is completely soluble in water.
(a) Chalk powder
(b) Tea leaves
(c) Glucose
(d) Saw dust
2. Which among the following dissolve in water?
a. Bread crumbs
b. Chopped onion
c. Salt
d. Sand
3. On the basis of solubility pick the odd one out:
a. Lemon juice
b. Milk
c. Flour
d. Vinegar
4. Identify the substance that is INSOLUBLE in water:
a. Lemon Juice
b. Milk
c. Sand
d. Sugar Syrup
State true or false -
1. Oxygen in water is important for the animals and plants living under the water.
2. Mustard oil is soluble in</td>
</tr>
</table>

S: Yes, that is why we need to remove the seeds before using the lemon. So there are a few items which get completely mixed with water and we cannot separate them, they are difficult to identify by just looking at them. These items which are completely dissolved in water are called soluble substances, whereas items which partially dissolve or do not dissolve at all are called insoluble substances. Let us do a group activity to find out soluble and insoluble substances. 2. In one of the classes we read about solubility. Who remembers the meaning of soluble and insoluble? Can you give me some examples of soluble and insoluble substances? Today we are going to do something amazing, we are going to see what happens when we mix water with other kinds of liquid. Such as different kinds of oil. We are also going to look at what happens when we mix gases such as oxygen and carbon dioxide with water. Let's watch this quick video: Link *Please do this activity live in the class if possible.* As we can see that when mixed with water, other liquids such as vinegar and lemon juice get easily mixed with water, whereas liquids such as mustard oil, kerosene and coconut oil do not mix with water, rather they form a layer over the water. Such liquids are called immiscible liquids, whereas vinegar and lemon juice are miscible liquids. Can you guess what will happen if you mix coconut oil and kerosene together, will they mix together or not? In case they do not mix, which liquid will form a layer on the top?	Water plays an important role in the functioning of our body because it can dissolve a large number of substances. **2. Group Discussion:** Which of the items are completely dissolved and which of them are not? Instruction to the teacher: Bring these items in the classroom with transparent glasses and water. Vinegar, lemon juice, hand sanitizer, food colouring, honey, vegetable oil, cooking oil, petrol (if available)/kerosene In groups of 5, conduct an experiment to test which of these liquids gets dissolved in water.. State reason for your answer. ● Vinegar ● Lemon juice ● Hand Sanitizer ● Food coloring ● Honey ● Vegetable oil ● Cooking oil ● Petrol So here we see that all the liquids which have similar density as of water get mixed together whereas liquids where there is a difference in density they do not get mixed together. For example oil is heavy as compared to water and hence it forms a layer on top surface of water, they do not get mixed. Whereas vinegar is very similar in weight as water and hence they get mixed together.	water. 3. Orange juice is immiscible in water. 4. Vinegar is miscible in water 5. Vinegar and lemon juice are immiscible. 6. If we add soap to a mixture of oil and water, the oil gets mixed with water and forms a white color solution. 7. Honey is immiscible in water. 8. Food colour is miscible in water. **Homework:** At home go to your kitchen with your parents and check with the following substances if they get dissolved or not: 1. Lemon 2. Tea leaves 3. Flour 4. Soap 5. Shampoo 6. Mustard oil 7. Coconut oil 8. Rice 9. At home try mixing water with cooking oil and some liquid soap to it and mix it together - observe what happens. Find out the reason behind it. You can look up on the internet as well to find the reasons.

Now, let us talk about gases. How do aquatic animals breathe underwater? Which oxygen do you think they breathe? → All living organisms need oxygen to breathe and gases like oxygen and carbon dioxide are present in water naturally. Water's chemical formula is H_2O → oxygen is present in water. In fact water is formed when hydrogen and oxygen are mixed together in appropriate amounts. **CFU (Open ended/ Factual)** **Factual:** - Why do we filter tea after preparing it? - What are the substances which are not visible after the tea is made? - What are the gases that can be found under water? - How do animals survive underwater? - Why vegetable oil doesn't dissolve in water? **Open-Ended:** - Where do we use the concept of solubility and insolubility in our daily lives? Give one example. - Why can't humans breathe underwater? When we cook food, do water and oil stay separated throughout the process of cooking?		

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

- Tell me 3 new things that you learned today.
- Tell me 2 new things that you found exciting.
- Tell me 1 question that you have from today.

Students are given time to write their questions on the "Question corner" chart in the classroom.

Concept 4: Objects may float or sink in water & Transparency

Teaching Learning Process

Learning Objective/s:

Student will be able to

1. classify objects on the basis of their density.
2. classify objects on the basis of their transparency.

Induction/Introduction:

In this class, we will discuss why some objects float and some sink in water, and understand the factors like shape, weight, and material that affect floating and sinking.we will also l learn about transparent, translucent, and opaque materials, and how they allow light to pass through them in different ways.

Vocabulary:

Float, sink, density, transparent, translucent and opaque.

Hook:

The teacher places different objects in water and asks students to guess which will float or sink.
This sparks curiosity as students observe surprising results.
The teacher shows a glass sheet, butter paper, and cardboard, asking, “Can you see through it?”
Students respond and begin to explore how light passes through materials.

Experience and reflection:

- Students test objects like wood, stone, and plastic in water.
- They realize floating or sinking depends on material, shape, and weight.
- Students group objects as transparent, translucent, or opaque.

They understand how light behaves with different materials in daily life.

Period: 2.4

Student will be able to

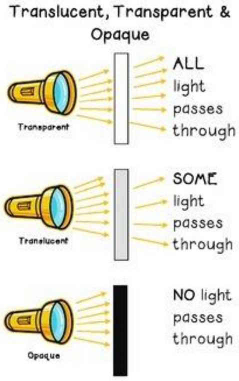
1. classify objects on the basis of their density.
2. classify objects on the basis of their transparency.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work *(We Do)***	**Independent Work** (You Do)
1. In today’s class we will look at a new property to differentiate between objects around us. T: Have you ever observed a plastic mug while taking a shower? What happens when you put it in a bucket full of water? T: Have you ever dropped a soap in a bucket full of water? What happens to the soap? T: When it rains near our school or home, you might have made paper boats to play? What happens to the boat?	1. Let us do a small activity first. Instructions for the teacher: **Materials:** A large clear container (e.g., a fishbowl or a large glass jar) Water	1. Which pair of substances among the following would float in a tumbler half filled with water? (a) Cotton thread, thermocol (b) Feather, plastic ball (c) Pin, oil drops (d) Rubber band,

T: What happens when you throw a stone in a pond or a bucket of water? Plastic mug, paper boat floats on the surface of water, whereas things such as soap and stone sinks down in the water. Can someone guess why some objects float while others sink in the water? Well it depends. It depends on whether the density of the object is lower or higher than the density of water. Explain here: Density tells us how tightly packed the material in an object is. For example, if you take a stone and a sponge of the same size, which will feel heavier? Stone feels heavier since matter is more tightly packed inside it, while the sponge has tiny holes filled with air. → If the density of the object is lower than the water then it floats on the surface of water. In simple words, when the object is light it floats. → If the density of the object is higher than the water then it sinks in the water. In simple words, when an object is heavy it sinks. Example: Float in water: Dry leaf, rubber band, etc Sink in water: Stone, metal pen, soap brick etc 2. In today's lesson we are going to look at an interesting topic which is transparency. Knowingly or unknowingly we all face this concept in our daily lives. T: While playing hide and seek where would you hide? S: behind the door, under the table, behind the wall T: Would you hide behind a glass door, through which we can see? S: No T: When you go to a shop, where are the candies kept? S: Inside a glass jar T: Why is it kept inside a glass jar?	Various household objects (e.g., a cork, a coin, a plastic toy, a wooden block, a rock) - Teachers can choose any household items to do this activity. **Procedure:** **Prediction:** Ask students to predict which objects will float and which will sink. Encourage them to discuss their reasoning based on their observations of the objects. **Experiment:** Fill the container with water. One by one, gently place each object into the water. Observe what happens to each object. Record the results in a table. Discuss the results and reinforce the concept of density Relate the results with practical concepts such as why boats float while submarines sink in the water. **In pairs try to solve this worksheet.** Worksheet Link Activity for 5 minutes: Divide the class in pairs and give each group a rough paper and some drops of oil. Instructions Take a sheet of paper and look through it towards a lighted bulb. Make a note of your observation. Now, put 2-3 drops of some oil and spread it on the sheet of paper. You can also take a food item that contains fat and rub it on the paper gently. Can someone tell why I am taking a food item with fats in it? Can someone give me an example of a food item with fats in it? *(Here we are checking if the students remember this concept from initial classes.)* Look again towards the lighted bulb through that portion of the paper on which the oil has been spread. Question - What is your observation?	coin 2. Give five examples of objects that float in water and five examples of objects that sink in water 3. Why do some objects float on water while some objects sink in water? 4. Which type of the following materials is used for making the front glass (wind screen) of a car? (a) Transparent (b) Translucent (c) Opaque (d) All the above 5. You are provided with the following materials: (i) Magnifying glass (ii) Mirror (iii) Stainless steel plate (iv) Glass tumbler Which of the above materials will you identify as transparent? (a) (i) and (ii) (b) (i) and (iii) (c) (i) and (iv) (d) (iii) and (iv) 6. Boojho found a bag containing the following materials (a) Mirror (b) Paper stained with oil (c) Magnet (d) Glass spectacles 7. While doing an

S: So that we can choose what we want to buy.
Explain: Those substances or materials, through which things can be seen, are called transparent.
Glass, water, air and some plastics are examples of transparent materials. Shopkeepers usually prefer to keep biscuits, sweets and other eatables in transparent containers of glass or plastic, so that buyers can easily see these items. On the other hand, there are some materials through which you are not able to see. These materials are called opaque. You cannot tell what is kept in a closed wooden box, a cardboard carton or a metal container. Wood, cardboard and metals, are examples of opaque materials.
Are there objects through which you can partially see?

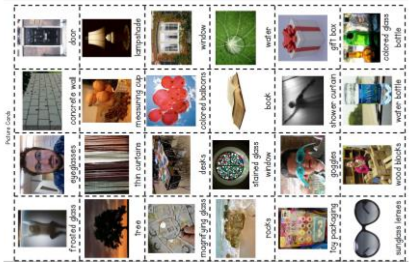
The materials through which objects can be seen, but not clearly, are known as translucent.
We will get a better idea about translucent objects in our group activity.

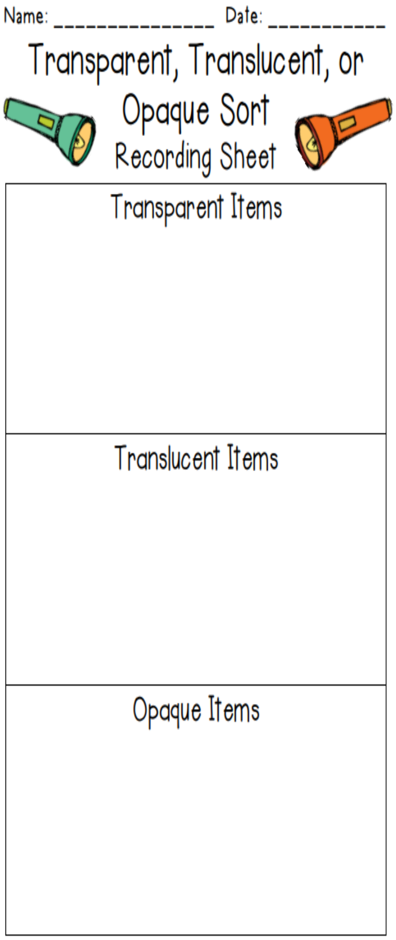


CFU (Open ended/ Factual)
Factual:
What kind of objects float in water? Why?

When can you see more light from the bulb? Do you see the bulb clearly?

Worksheet Instructions:
1. Each student needs a “Transparent, Translucent, or Opaque” sorting chart and a set of picture cards. 2.The student will decide if the item pictured on the card is transparent, translucent, or opaque.
3.The student will place/glue that card in the chart.




Name: _______________ Date: ___________

Transparent, Translucent, or Opaque Sort Recording Sheet

Transparent Items

Translucent Items

Opaque Items

activity in class, the teacher asked Paheli to hand over a translucent material. Which among the following materials will Paheli pick and give her teacher?
(a) Glass tumbler
(b) Mirror
(c) Muslin cloth
(d) Aluminium foil

8. On a bright sunny day, Shikha was playing hide and seek with her brother. She hid herself behind a glass door. Do you think her brother will be able to locate her? If yes, why? If no, why not?

Homework:
Take a small cotton ball and place it in a tumbler/bowl filled with water. Observe it for at least 10 minutes. Will it float or sink in water and why? Discuss with your siblings or parents at home.

What kind of objects sink in water? Why? What are opaque objects? Give some examples. What are translucent objects? Give some examples. **Open-Ended:** A paper boat sinks in water after a few minutes. Why? If a nail is made of wood instead of iron, will it float or sink? Why? Why do you think summer shades are mostly black in colour? If water is transparent why can't we see what is inside the pond or lake with our naked eyes?		Observe the items at your home. Make a table in your notebook and classify the items at home as opaque, transparent or translucent. You can take help of a torch if you want to do this activity.

Closing

So what did we learn today?

- We learned about the property density in objects.
- There are some objects that float on the surface of water whereas some others that sink.
- Objects having higher density than the water sink, while the objects having lower density than the water float
- You can now write your questions on the chart paper in the question corner.
- What are the three types of transparency?
- What is translucent, give an example.
- What is opaque? Give an example.
- What is translucent? Give an example.
- Please write down your questions on the chart paper on the question corner.

Assessment on Concepts 2,3, and 4

1. Select those objects from the following which shine:
   Glass bowl, plastic toy, steel spoon, cotton shirt
2. State whether the statements given below are True or False.
   (a) Stone is transparent, while glass is opaque.
   (b) A notebook has lustre while an eraser does not.
   (c)Chalk dissolves in water.
   (d) A piece of wood floats on water.
   (e) Sugar does not dissolve in water.
   (f) Oil mixes with water.
   (g) Sand settles down in water.
   (h) Vinegar dissolves in water.
   (i) A pillow is generally hard.

3. Given below are the names of some objects and materials:

   Water, basketball, orange, sugar, globe, apple and earthen pitcher

   Group them as:

   (a) Round shaped and other shapes (b) Eatables and non-eatables
4. List all items known to you that float on water. Check and see if they will float on an oil or kerosene.
5. Find the odd one out from the following:

   a) Chair, Bed, Table, Baby, Cupboard b) Rose, Jasmine, Boat, Marigold, Lotus

   c) Aluminium, Iron, Copper, Silver, Sand d) Sugar, Salt, Sand, Copper sulphate
6. Pick one material from the following which is completely soluble in water.

   (a) Chalk powder (b) Tea leaves

   (c) Glucose (d) Saw dust
7. You are provided with the following materials

   (i) Magnifying glass (ii) Mirror

   (iii) Stainless steel plate (iv) Glass tumbler

   Which of the above materials will you identify as transparent?

   (a) (i) and (ii) (b) (i) and (iii) (c) (i) and (iv) (d) (iii) and (iv)
8. Boojho found a bag containing the following materials

   (a) Mirror (b) Paper stained with oil

   (c) Magnet (d) Glass spectacles

   Help Boojho in finding out the material(s) which is/are opaque.

   (a) (i) only (b) (iv) only (c) (i) and (iii) (d) (ii) and (iv)
9. While doing an activity in class, the teacher asked Paheli to hand over a translucent material. Which among the following materials will Paheli pick and give her teacher?

   (a) Glass tumbler (b) Mirror (c) Muslin cloth (d) Aluminium foil
10. Which among the following dissolve in water?

    (a) Wood (b) Paper (c) Salt (d) Sand
11. Which among the following does not dissolve in water and forms a separate layer?

    (a) Cooking Oil (b) Milk (c) Lemon juice (d) Sugar
12. Which of the following is completely soluble in water?

    (a) Chalk powder (b) Tea Leaves (c) Glucose (d) Wood Sawdust
13. Which pair of substances among the following would float in a tumbler half filled with water?

    (a) Cotton thread, thermocol (b) Feather, plastic ball

    (c) Pin, oil drops (d) Rubber band, coin
14. Which of the following materials is not lustrous?

    (a) Gold (b) Silver (c) Wood (d) Diamond
15. Find the odd one out from the following:

    (a) Tawa (b) Spade (c) Pressure cooker (d) Eraser
16. Which type of the following materials is used for making the front glass (wind screen) of a car?

    (a) Transparent (b) Translucent (c) Opaque (d) All the above

Student Independent Practice: 1

Period: 2.5

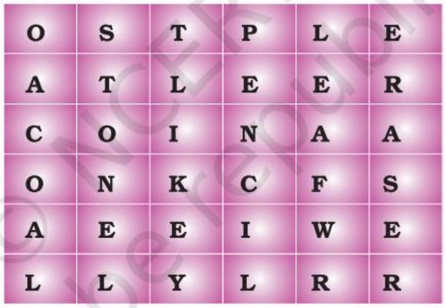
1. **Short Answer Questions:**

- Mixtures of red chilli powder in water, butter in water, petrol in water, and honey in water were given to Radha, Sudha, Sofia and Raveena, respectively. Whose mixture is in solution form?
- On a bright sunny day, Shikha was playing hide and seek with her brother. She hid herself behind a glass door. Do you think her brother will be able to locate her? If yes, why? If no, why not?
- Take a small cotton ball and place it in a tumbler/bowl filled with water. Observe it for at least 10 minutes. Will it float or sink in water and why?
- Which among the following materials would you identify as soft materials and why?
- Ice, rubber band, leaf, eraser, pencil, pearl, a piece of wooden board, cooked rice, pulses and fresh chapati.
- You are provided with the following materials— turmeric, honey, mustard oil, water, glucose, rice flour, groundnut oil. Make any three pairs of substances where one substance is soluble in the other and any three pairs of substances where one substance remains insoluble in the other substances.

2. During summer holidays, a group of children collected a lump of salt, green grass, broken glass piece, a small thermocol box, pen, iron nail, glass marbles, hair, naphthalene ball, a piece of sugar candy (mishri) and tried to group them on the basis of properties given in Table below. Help them in filling the Table.

Name of the material	**Appearance (Lustrous/Non-lustrous)**	**Transparency (Transparent/Translucent/Opaque)**	**Floats/Sinks in water**	**Soluble /Insoluble in water**

3. Pick five objects from the word box given as Fig. 4.1 which are opaque and would sink in water



O	S	T	P	L	E
A	T	L	E	E	R
C	O	I	N	A	A
O	N	K	C	F	S
A	E	E	I	W	E
L	L	Y	L	R	R

4. Chalk, iron nail, wood, aluminium, candle, cotton usually look different from each other. Give some properties by which we can prove that these materials are different. (Misc)

- Differentiate among opaque, translucent and transparent materials, giving one example of each.
- Sugar, salt, mustard oil, sand, sawdust, honey, chalk powder, petals of flower, soil, copper sulphate crystals, glucose, wheat flour are some substances given to Paheli. She wants to know whether these substances are soluble in water or not. Help her in identifying soluble and insoluble substances in water.

Student Independent Practice: 2

Period: 2.6

1. Which among the following dissolve in water?
   a. Wood b. Paper c. Salt d. Sand
2. Which among the following does not dissolve in water and forms a separate layer?
   a. Cooking Oil b. Milk c. Lemon juice d. Sugar
3. Which of the following is completely soluble in water?
   a. Chalk powder b. Tea Leaves c. Glucose d. Wood Sawdust
4. On the basis of solubility pick the odd one out:
   a. Lemon juice b. Milk c. Flour d. Vinegar
5. Identify the substance that is INSOLUBLE in water:
   a. Lemon Juice b. Milk c. Sand d. Sugar Syrup
6. Sort the following into soluble and insoluble substances:
   Salt, Talcum Powder, Pebbles, Mustard oil, Sugar crystals
7. Define –
   a. Classification b. Material
8. Name the two gases used by aquatic plants and animals, that are soluble in water.
9. What is the basis of grouping materials?
10. List five physical properties of materials.
11. Why wood floats on water?
12. Name the naturally occurring hardest substance known.
13. Why don’t we use papers to prepare tables and chairs?
14. Name any two-water soluble and water insoluble materials.
15. How is carbon dioxide gas dissolved in water helpful to the plants which live in water?

Student Independent Practice: 3

Period: 2.7

1. Select the correct option. Classification of objects into groups is important as it helps us in
   a. Finding an object from a large group,
   b. Understanding some basic properties of an object,
   c . Giving a clarity about similarities and differences amongst the various groups.
   d. All of the above

2. Which of the following is a matter?

   a. Air b. Steel c. Water d. All of these

3. Anything that has a mass and occupies space is called:

   a. Classification b. Volume c. Matter d. Air

4. A good example of grouping can be seen in a:

   a. Playground b. Supermarket c. Store room d. Hospital

5. Purpose of sorting materials into groups is:

   a. to study their properties b. convenience

   c. both (a) and (b) d. inconvenience

For question numbers 6 to 8, two statements are given - one labelled Assertion (A) and the other labelled Reason (R).

Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below - i) Both A and R are true and R is the correct explanation of the assertion. ii) Both A and R are true but R is not the correct explanation of the assertion. iii) A is true but R is false. iv) A is false but R is true

6. Assertion (A): Copper metal has lower density than water.

   Reason (R): The materials which sink in the water have higher density than water.

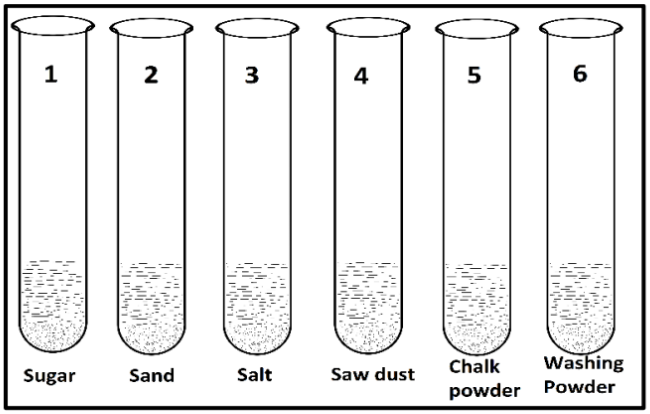
7. Assertion (A): Diamond is a hard material.

   Reason (R): The material which can be compressed or scratched easily are called hard materials.

8. Assertion (A): Shopkeepers usually keep biscuits, sweets etc. in transparent containers of glass or plastic.

   Reason (R): Buyers could see through the transparent containers.

9. Take 10ml of water in 6 test tubes each and add different samples of substances to each test tube as shown in the given figure. v



   Shake the test tubes vigorously for a couple of seconds and leave them undisturbed.

   In which of these test tubes, sample substances will remain insoluble in water?

   a. 1, 2 and 3 b. 2, 4 and 5 c. 2, 3 and 4 d. 4, 5 and 6 2.

10. Rahul found a bag containing the following materials.

    i) Mirror   ii) Paper stained with oil   iii) Magnet   iv) Glass spectacles

    Help Rahul in finding out material(s) which is/are opaque.

    a. (i) only   b. (iv) only   c. (ii) and (iv)   d. (i) and (iii)

11. While doing an activity in class, the teacher asked Paheli to hand over a translucent material. Which among the following materials will Paheli pick and give her teacher?

    a. Glass tumbler   b. Mirror   c. Muslin cloth   d. Aluminium foil

12. What are the similarities between iron, copper and aluminium?
13. Mustard oil and grease both are insoluble in water, but mustard oil floats whereas grease settles down, why?
14. Write any four properties of materials.
15. Why is a tumbler not made with a piece of cloth?
16. What do you mean by lustre of a substance?
17. Metals have lustre (shine). Give reason why some metal articles become dull and lose their shine.
18. Is grouping of materials necessary? Give one reason.
19. How is the density of an object related to its floating or sinking?
20. Why do you think oxygen dissolved in water is important for the survival of aquatic animals and plants?
21. Take a small cotton ball and place it in a tumbler/bowl filled with water. Observe it for at least 10 minutes. Will it float or sink in water and why?

Period 2.8: Remedial Teaching

TEACHER'S DIARY

Name of the Teacher:				**Name of the Month:**	
Name of the Lesson:				**Class: 6**	
Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	**Remarks**
2.1	Objects around us - Sorting of Objects				
2.2	Properties of materials, Appearance, and Hardness.				
2.3	Soluble or Insoluble?				
2.4	Objects may float or sink in water & Transparency				
2.5	Student Independent Practice - 1				
2.6	Student Independent Practice - 2				
2.7	Student Independent Practice - 3				
2.8	Remedial teaching				

1	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

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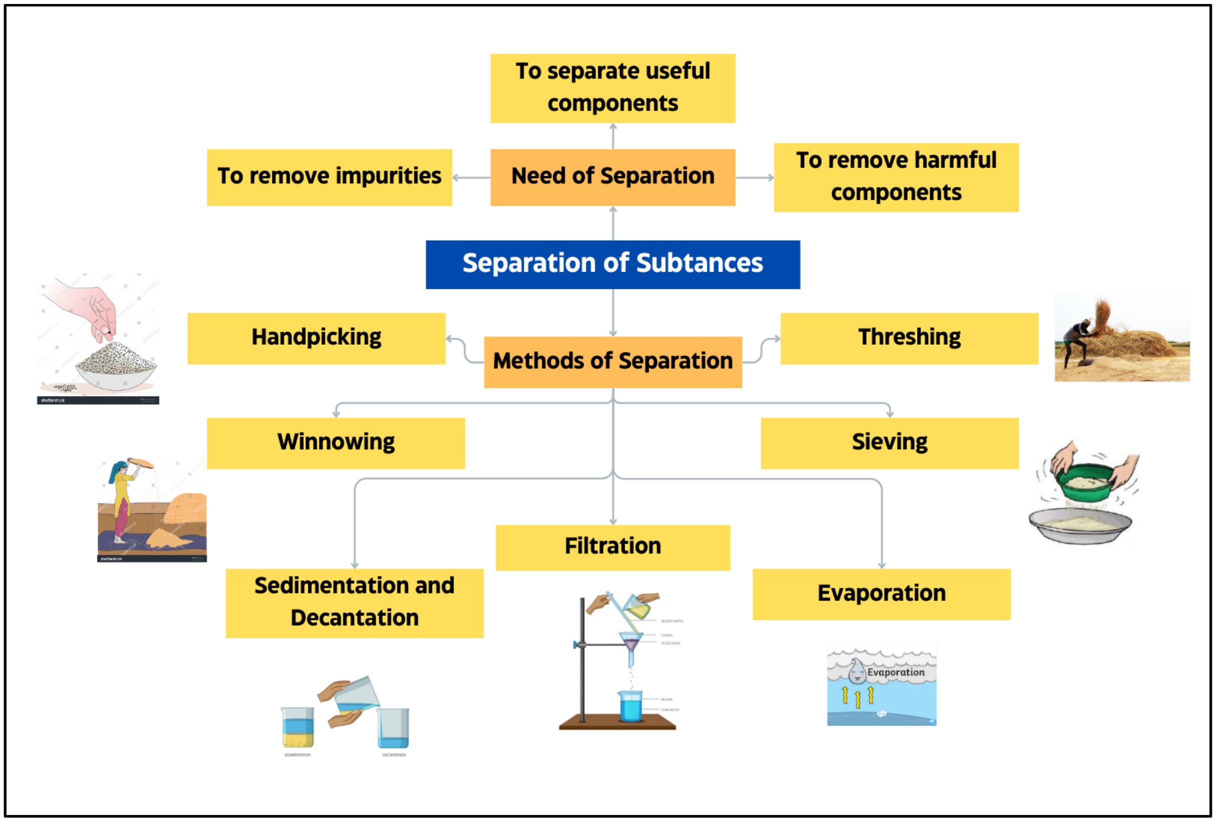
3 SEPARATION OF SUBSTANCES

Learning Outcomes:

Student will be able to

1. write the reasons for separation of substances
2. identify the separation method in their day to day life
3. understands the sedimentation and decantation methods
4. conducts activity to understand the Filtration and Evaporation methods
5. apply the knowledge of separation of methods in their domestic activity
6. prepares saturated solutions of salt and sugar

CONCEPT MAP



SYNOPSIS

Separation:

- The removal of substances from a mixture of two or more substances is known as separation.
- Some examples of separation are:
  → Separating stones from rice
  → Churning milk to obtain butter
  → Separation of tea leaves from tea
- Why do we need to separate substances?
  → To obtain two different components
  → To remove impurities or harmful components
  → To group substances of different sizes

Separation of substances

- **Pure substance:** The substance which contains only one type of particle.
  Examples: Water
- **Impure substance:** The substance which contains more than one kind of particle.
  Examples: A plate of rice is mixed with some stones.

Separation of components of mixtures

- **Mixture of solid with solid**

(i) Hand picking

→ The component of a solid-solid mixture can be separated by hand picking.
→ It is used for separating large size impurities like stones and husk.
→ For example: separating grass from mint leaves, separating pebbles from dal.

(ii) Threshing

→ The process in which the stalks are beaten to free the grain seeds.
→ Threshing is done with the help of bullocks. For large quantities of grains machines are used for threshing.
→ This method is used by the farmers to separate the grains from the stalks after harvesting.

(iii) Winnowing

→ It is a process which is used to separate heavier and lighter components of a mixture by wind or by blowing air.
→ This method is used by farmers to separate lighter husk particles from heavier seeds of grain.

(iv) Sieving

→ It is a process in which a component of a mixture with different sizes can be separated by a sieve.
→ The smaller particles move out through the pore of the sieve and the larger particles are left behind it.
→ This method is used to separate wheat bran (the bigger particles) from flour.

Mixtures of solids with liquids

(i) Evaporation

- → It is a process which is used when we want to get back a substance that has been dissolved. In this process liquid changes into gaseous form on heating.
- → Example: Getting salt out of salty water.

(ii) Condensation

- → It is a process by which a substance changes from the gas phase to liquid phase. Condensation is used to get back the water from the mixture during evaporation.

Separation of solids that do not dissolve in liquids

(i) **Sedimentation:** The process of separation of 2 components in such a way that the heavier substance settles down.

(ii) **Decantation:** separation of 2 components which do not mix together.
Example: Water and oil.

(iii) **Filtration:** The process in which separation of solid from liquid by the filter paper or strainer.
Example: separating mud from water by using filter paper.

- Saturated Solution: A saturated solution is one which cannot dissolve more of that substance. To dissolve more of a substance in a solution we have to heat it.

Period-wise Topics

Chapters and Concepts

Period No.	Topic	Remarks
3.1	Understanding Separation of Substances and its purpose	
3.2	Ways of separating solids from solids	
3.3	Ways of separating insoluble solids from liquids	
3.4	Ways of separating soluble solids from liquids	
3.5	Use of more than one method	
3.6	Saturated and unsaturated solutions (Can water dissolve any amount of a substance?)	
3.7	Students Independent Practice	
3.8	Students Independent Practice	
3.9	Students Independent Practice	
3.10	Remedial Teaching	
3.11	Remedial Teaching	

Learning Objectives:

Student will be able to

Concept 1 - Understanding Separation of Substances and its purpose

1. Explain the meaning and the purpose of separating substances.
2. Recognise the methods of separation in daily life like straining, churning etc.

Concept 2 - Ways of separating solids from solids

3. Explain the process of handpicking.
4. Observe the process of threshing.
5. Explain the process of winnowing
6. Explain the process of sieving

Concept 3 - Ways of separating solids which are not dissolved in water

7. Demonstrate the process of sedimentation, decantation and filtration.

Concept 4 - Ways of separating solids dissolved in water

8. Explain the process of evaporation and condensation
9. Apply more than one process of separation on a mixture of substances.

Concept 5 - Saturated and unsaturated solutions

10. Demonstrate the concept of saturated and unsaturated solutions.
11. Investigate the factors that affect the solubility of a substance in a solvent (e.g., temperature, type of solvent).

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Concept of mixtures and its types
- Concept of sorting objects into groups
- Properties of materials such as solubility, weight, size etc.

Teacher References:

Bilingual text-book AP - SCERT - General Science - Sem I
Teachers_Guide_Class6.pdf
08-Mixing+and+Separating_Textbook_Telugu.pdf
https://cbseacademic.nic.in/cbe/documents/SAS_Science-Class-6.pdf - Page 21-24
https://www.youtube.com/watch?v=s75GVbspr2E

Teaching Learning Material (TLM):

sand
salt
iron fillings
sugar
marbles
beads
Clear containers or Ziploc bags
Magnets
Sieves or filters
Tweezers or other tools for separating substances

Paper fans
Trays
Mixtures like Rice and chaff, sand and pebbles, water mixed with sand, wheat
very small black stones
Water
Oil
Filter Paper
https://www.youtube.com/watch?v=s75GVbspr2E
https://www.youtube.com/watch?v=WzfuoFZJ44c
Sieving | 6th Std | Science | CBSE Board | Home Revise
https://www.youtube.com/shorts/DUpse3NqC8Q
https://www.youtube.com/watch?v=1TqalwzfE3o

Concept 1: Understanding Separation of Substances and its purpose

Teaching Learning Process

Learning Objective/s:

Student will be able to

1. Explain the meaning of separating substances.
2. Discover the purpose behind separation of substances.
3. Recognise the methods of separation in daily life.

Induction/Introduction:

In this concept we will emphasise on the purpose of separation of substances and where it is used in our daily lives. Students will also be introduced to the formal definition of separating substances. The overall aim is to get students to think intuitively about the concept of separation.

Vocabulary: Churning, strainer, filtration, impurities

Hook:

- A variety of mixtures (e.g., sand and salt, iron filings and sugar, marbles and beads).
- Put them into clear containers or Ziplock bags.
- These Ziplock bags are handed over to each group.
- Challenge the students to share possible ways of separating the substances in the mixture.

Experience and Reflection:

- How can you separate the substances?
- What tools or methods will you use to separate the substances?
- What are some reasons why we might want to separate substances in real life?

Period 3.1:.

Student will be able to

1. explain the meaning of separating substances.
2. discover the purpose behind separation of substances.

3. discover the purpose behind separation of substances.
4. recognise the methods of separation in daily life.

Explicit Teaching/Teacher Modelling *(I Do)*

As we have seen in the activity just now, there are some substances which can be easily separated and there are a few which cannot be separated easily. But before we go further, let us understand what separation is and why we actually use it.

Let's take an example of tea - In our previous lessons we have covered this example many times. Who can tell me how we make tea?

Students: We take water, milk and boil it, then we add tea leaves, crushed ginger and sugar and boil it again for 5 minutes. The tea is ready.

T: Okay, what do you do after that?

S: We take a strainer and filter out the tea in a cup so that we can drink it.

T: Why do we need to filter it? Why can't we drink the tea as it is without filtering?

T: Because the tea leaves will spoil the taste of the tea, because they are very bitter. Hence, we do not need the tea leaves.

Perhaps you might have eaten peanuts, we remove the outer shell first and then we eat the peanut. Similarly, we remove the seeds before making lemon juice. If you found that there are seeds in the lime juice, you might have to remove the seeds first before consuming it. What will happen if you don't separate it?

Group Work ***(We Do)***

1. **T:** I am now going to divide our class into groups of 5. Each group will be given a task of separation. While you are separating, you have to push each other to think deeply and ask yourself

Q1. What is the separation process?

Q2. Purpose for which we do separation?

Q3. What do we do with the separated component?

Use the given table to structure your thoughts

While your friends are answering, we will carefully listen and ask questions to deepen our understanding and push each other's thinking.

In groups students will do the following:

In Column 1 of the table, are given a few processes of separation. The purpose of separation and the way separated components are used is mentioned in Column 2 and 3 respectively. However, the information given in Columns 2 and 3 is jumbled up. Can you match each process with its purpose and the way separated components are used?

Separation process	Purpose for which we do separation	What do we do with the separated component?
Separate stones from rice	-separate two different,but useful components.	-We throw away the solid component.
Churning milk to obtain butter	-To remove non-useful components.	-We throw away the impurities.
Separate tea leaves	- To remove impurities or harmful components	-We throw away both the components.

T: Based on the activity, what do you understand about separation?

S1: Separation happens between two different objects

Independent Work
(You Do)

T: In your notebooks and in your own words, write down your response to the following question

Q. What is meant by the process of separation?

Q. List 4 reasons why this process of separation is important in our daily lives.

Q. You are given a mixture A of salt and small stones and a mixture B of sand and water, how will you separate mixture A and B into its individual components?

Explain your answer with a diagram.

Hence if we have a mixture of substances and one kind of substance is separated out from the other in the given mixture, we call it separation of substances. Can you think of some more examples where we separate substances?

Now let us talk about different methods of separation around us. Can you name some of the separation processes that you see around you?

- Separating stones from Dal/Rice
- Separating iron nails from sand
- Separating impurities from drinking water etc.

The separating methods like picking out chillies with our hand, using a strainer, or churning milk can be divided into different categories such as:

- Separating solids from solids
- Separating undissolved solids from liquids
- Separating dissolved solids from liquids

We will study these concepts in detail in the upcoming classes.

CFU (Open ended/ Factual)

Factual:

- What do you mean by separation of substances? Give some examples.
- Why do we need to separate substances?
- Name two to three mixtures around you.
- What is the difference between mixing sugar in water v/s mixing sand in water?

Open-Ended:

- What happens when different types of clothes get mixed? Do you call it a mixture? Why or why not?

S2. Separation can happen between objects of any state (solid, liquid or gas)

S3: There can be many ways to separate objects,

T: Lovely, now using the definitions mentioned by each one of you, let’s combine and create one definition for the separation process.

Can we say, Separation is the process in which we separate two or more objects from each other? The objects could be of any physical state (solid, liquid or gas). The separated objects could be both harmful or useful objects.

2. Divide the class into groups of 5 students each. Give them the following table and ask them to go around the school and note down the observations.

(Tip for the teachers - The mixtures can be found in the school playground, school garden, classroom (chalk powder mixed with sand on classroom floor)

S. No.	What mixture did we observe?	What are the components of mixture	How do we separate the mixture?

Once they come back, ask them the following set of questions (take at least 1 response from each group):

1. What kind of mixtures looked easy to separate and why?
2. What kind of mixtures looked difficult to separate and why?

(*Focus on mixtures that may not be obvious - like playground sand, trash inside trashcan, chalk dust etc.)*

Q. Give 5 examples of separation of substances that you see around your home or school. In your own words explain which method of separation you find easy and why.

Home-Work

At your home make a list of 5 things that you have to mix in order to make it useful for work. For example, mixing milk with cornflakes, or mixing sugar in milk etc. Arrange them in increasing order of difficulty to separate them back. For example, it is easier to separate chilies from poha than to separate milk from cornflakes once mixed and so on.

- If we do not separate substances, what might it lead to?		Ask and observe your parents how they separate different substances at home. Create a list of items needed for separation of substances at your home. Which of these items are hand operated and which of them require special energy to operate them.

Closing

T: As we close this lesson today, would anyone like to recall 3 things we have learnt today, 2 things we found challenging and one thing that you will do at home today to practice what you have learnt in class today

So, who can tell me what all we have learnt today?

(Ask students to revise the lesson looking at their notes)

After factual recall. What are 3 new things you learnt today?

What are the 2 things you found interesting?

What is one question that you have?

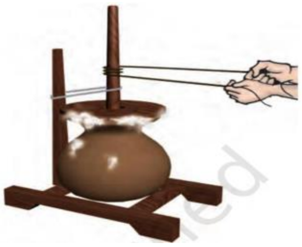
Assessment on Concept 1

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

Q1. Define separation of substances with examples.

Q2. Why do we need to separate substances, explain in your own words.

Q3. Explain the following method of separation shown in the diagram:



Q4. Why do we separate tea leaves from the tea before drinking it?

Q5. Give one example of when we throw the impurity after the separation of substances and when use both the substances after the separation.

Concept 2: Ways of separating solids from solids

Teaching Learning Process

Learning Objectives:

Student will be able to

1. explain the process of handpicking and identify its real-life application.
2. explain the process of threshing and identify its real-life application.
3. explain the process of winnowing and identify its real-life application.
4. explain the process of sieving and identify its real-life application.

Induction/Introduction:

In this section students will be introduced to the concept of ways of separating solids from solids. Under this concept there will be a lot of new vocabulary words and students will be introduced to the technical terms of the processes.

Vocabulary: Sieve, winnowing**,** threshing, handpicking, plucking, harvesting

Hook:

Note: Teacher to make the students experience an activity where they surface the realisation that the process of separation can be different based on the difference in the nature (size, shape, weight etc) of the solid substance.

Activity:

- Teacher shakes a mystery bag with mixed objects and asks:
- "Can I use just one method to separate everything inside?"
- Students share quick guesses.
- The teacher says: "Let’s find out by trying different methods at different stations!"

Station 1: Iron & Paper Clips

- Use: Magnet, sieve

Station 2: Wheat Flour & Small Black Stones

- Use: Sieve, fan

Station 3: Rice & Sawdust

- Use: Water, filter paper

Station 4: Sand & Salt

- Use: Water, filter, heat source (Teacher-led)

Instructions for the students:

1. Work in your assigned group at one station.
2. Use the given tools to separate the mixture.
3. Observe what works and what doesn't.
4. Write one key insight.

Experience and Reflection:

Q1. What were the different ways in which you could separate the objects from the mixture?

Q2. What made the separation of objects possible? Elaborate on the nature of the mixture and the solids in the mixture.

Period 3.2:.

Learning Objectives:

Students will be able to:

- explain the process of handpicking.
- explain the process of threshing and identify its real-life application.
- explain the process of sieving and identify its real-life application.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
T: Some of you mentioned that it was easier to separate iron filings and paper clips using our hands than using the mediums that were given to us. T: On further discussion, it was also possible because both the objects were big in size and the quantity of both these objects wasn't a lot. When we have to separate slightly larger sized impurities like the pieces of dirt, stone, and husk from wheat, rice or pulses, we generally prefer the process of handpicking. Hand picking simply means separating substances using our hands. This method doesn't require any other components or machines. T: In the last class we saw the process of hand picking. Can someone explain the process of hand picking and give examples? When do we prefer the process of handpicking the most? T: Let's also understand another process of separation, we haven't seen an example of this process. So, I will be showing a video of the same to all of you. Note down any thoughts or reflections that may arise for you from these videos.	T: We have seen the process of handpicking, and we have also seen some examples. Let's now make a list of real-life situations when you can use this method in your daily life. Activity: In your groups, make at least a list of 3 scenarios for handpicking. S: Students will make a list of situations where they can use handpicking. T: Teacher to encourage conversation among students, ask them to ask questions to each other and probe each other to think deeper by asking why Possible list of situations for handpicking **Separating stones from rice**: When rice is mixed with small stones, a student can pick out the stones by hand before cooking or processing the rice.	Q1. Define the hand-picking method of separation in your own words, give 3 examples of hand picking from your daily life. Q2. Which of the following statements is TRUE about the method of handpicking? a) Handpicking is used to separate grains from their husks b) Handpicking is done using a machine

https://www.youtube.com/watch?v=s75GVbspr2E - (Only to show till 2 mins 30 seconds) https://www.youtube.com/watch?v=WzfuoFZJ44c - Till 20 sec - Process of threshing by farmers Have you ever seen bundles of wheat or paddy stalks lying in fields after harvesting the crop? Stalks or bundles are dried in the sun before the grain is separated from them. Each stalk has many grain seeds attached to it. Imagine the number of grain seeds attached in hundreds of bundles of stalks lying in the fields. Hand plucking them like guavas and mangoes will not make sense as it will take a long time and it is not convenient as well. Hence to separate the grain seeds from the stalks they are beaten up against hard surfaces. **Definition of threshing:** Threshing is the process of separating grains (like rice, wheat, or barley) from their husks or stalks, typically by beating or loosening them. Sometimes, threshing is done with the help of bullocks. Machines are also used to thresh large quantities of grain. let's now start with a new method of separation today, but before we start, there is a small activity for all of you Activity Materials needed: 1. Paper fans 2. Trays 3. Mixtures like Rice and chaff, sand and pebbles, water mixed with sand, wheat and very small black stones Instructions 1. Teacher to use wind as a medium to separate the mixture. Ask students to share their observations The **winnowing process of separation** is a method used to separate lighter particles (such as husks, chaff, or dust) from heavier ones (like grains or seeds) by using air or wind. This technique takes advantage of differences in weight and size, where the wind blows away the lighter material, leaving the heavier particles behind. It is commonly used in agriculture to separate grains from their husks.	**Sorting beads in a craft project**: If beads of different colours or shapes are mixed together, handpicking can help separate them for use in making jewellery or decorations. **Removing pebbles from sand**: In a sandbox or playground, small pebbles can be removed by hand to make the sand smoother for playing. **Sorting vegetables**: If a mix of vegetables like potatoes, onions, and carrots are jumbled together, students can handpick and separate them for cooking or storage. **Picking out seeds from fruit**: When preparing fruits like watermelon or pomegranate, students can use handpicking to remove seeds from the pulp. **Separating damaged or unripe fruits from a batch**: In a basket of fruits, handpicking can be used to remove any spoiled or under-ripe fruits. **Picking out plastic pieces from a pile of mixed recyclables**: If plastic pieces are mixed with other recyclables like paper or glass, handpicking can be used to separate them. T: We have seen videos of threshing, and we have also understood the meaning of threshing and its purpose. Let's now make a list of real-life situations where you can use this method in your daily life. Activity: In your groups, make a list of at least 3 scenarios in which threshing can be used. S: Students will make a list of situations where they can use or have seen threshing.	c) Handpicking is a method used to separate large, easily visible objects, like stones or damaged grains, Q3. Define the process of winnowing. State at least 3 areas where winnowing is used in agriculture. Q4. State different ways in which winnowing can be done. **Q: Case Study:**

Now, we are going to learn about a very common method of separation called sieving. Let us watch these videos first. Note: The teacher can show any two videos, out of the given videos on sieving. Sieving | 6th Std | Science | CBSE Board | Home Revise https://www.youtube.com/shorts/DUpse3NqC8Q Rotary sieving machine/Sand screening machine/Powder vibro sifter As you can see, sieving is a common practice at our homes and as well as industries. As seen from the video, at homes, sieving allows the fine flour particles to pass through the holes of the sieve while the bigger impurities remain on the sieve. In industries, sieving is generally used post the threshing and winnowing. In a flour mill, impurities like husk and stones are removed from wheat before grinding it. Usually, a bagful of wheat is poured on a slanting sieve. The sieving removes pieces of stones, stalk and husk that may still remain with wheat after threshing and winnowing. **CFU (Open ended/ Factual)** **Factual:** **Q1.** Would we be able to hand pick and separate 100 bags of paper clip and nails mixture? S: No, it would take a lot of time for us to do that. T: The method of handpicking can be used for separating slightly larger sized impurities like pieces of stone, from wheat, rice or pulses. The quantity of such impurities is usually not very large. 1. What is threshing, and where is it used? Name some tools or methods used in threshing? 2. What is the main purpose of the winnowing process? 3. Which materials are typically separated using winnowing? 4. What is sieving used for? 5. What happens to the fine particles when sieving is done?	T: Teacher to encourage conversation among students, ask them to ask questions to each other and probe each other to think deeper by asking why. Possible list of situations for threshing: **Harvesting Wheat**: After harvesting wheat plants, threshing can be used to separate the wheat grains from the stalks or husks. Students can try this process on a small scale using a bunch of wheat and a stick or by hand. Students can try this practically in the classroom. **Separating Rice from Paddy**: After harvesting rice plants, threshing can help separate the rice grains from the stalks or husks. Students could simulate threshing by rubbing rice stalks together to loosen the grains. **Separating Barley Grains**: Similar to wheat or rice, barley grains can be separated from their stems or husks using the threshing method. A student could thresh barley using a small amount of barley plant stems. **Threshing Maize (Corn)**: After harvesting maize, threshing can be used to separate the corn kernels from the cob. A student could practice this process by manually removing the kernels from dried corn on the cob. **Threshing Beans from Pods**: If a mix of beans or peas is in their pods, threshing can help separate the beans from the outer pod. Students could use this technique with dried beans or peas, tapping or shaking the pods.	A farmer in a rural village has harvested a small field of wheat. After the wheat plants are cut, the farmer notices that some of the harvested wheat has small stones mixed in with the grains. In another part of the field, the wheat grains are still attached to the stalks, and the farmer needs to separate them. The farmer uses two different methods: one to remove the stones from the grains and another to separate the grains from the stalks. Question: Based on the farmer’s situation, which methods would the farmer most likely use for each task? a) Handpicking to separate the wheat grains from the stalks and threshing to remove the stones from the grains.

Open Ended: 1. Imagine you have a bowl of mixed beans and stones. How could you separate the beans from the stones using only your hands? Why might this method be useful? 2. Why do you think threshing is a better method for separating grains from stalks compared to handpicking? What might happen if threshing wasn’t used? 3. Why is wind or air an important factor in the winnowing process? 4. Imagine you're trying to winnow a mixture of seeds and leaves, but it's a very calm day with almost no wind. What could you do to help separate them? 5. What might happen if a material with impurities like stones or husks were not sieved before use in a process like grinding or cooking? 6. How does the size of the holes in a sieve affect what can be separated during the sieving process?	**Collecting Seeds from Sunflowers**: After sunflower seeds have matured, threshing can be used to separate the seeds from the flower head. Students could experiment with removing the seeds by gently beating or rubbing the flower head. T: Now that we know what winnowing is, let’s understand what are different ways in which we can practice winnowing. We know that we use wind to separate heavier objects from lighter ones. Now, you need to make a list of ways in which it can be done. While you make this, keep in mind the different ways in which we can create wind, and use that to separate the mixture. S: Students in their groups create a list of ways in which wind can be created Sample list would be: 1. Electric fan 2. Paper fan 3. Hand 4. Natural wind T: Teacher will discuss the list made by students and then using their list share the following ways in which winnowing can be done **1. Manual Fanning** **How it works**: A person uses a fan, or even a piece of cardboard, to blow air over the mixture of grains and husks. The lighter particles (chaff) are carried away by the wind, while the heavier rains fall down.	b) Handpicking to remove the stones from the grains and threshing to separate the wheat grains from the stalks. c) Threshing to separate the wheat grains from the stalks and Handpicking to separate the stones from the grains. d) Handpicking to separate the wheat grains from the stalks and Handpicking to remove the stones from the grains. Answer: b) Handpicking to remove the stones from the grains and threshing to separate the wheat grains from the stalks. Explanation: Handpicking is best for removing visible, large items like stones from a mixture of grains.

	Use: This method is commonly used in small-scale farming, especially in rural areas where traditional methods are still in practice. **2. Using a Traditional Winnowing Basket** **How it works**: A large, shallow basket (often called a **"chalani"**) is used to toss the mixture of grains and husks into the air. The basket is tilted slightly so that the lighter materials are blown away by the wind, and the heavier grains remain in the basket. **Use**: This method is widely used in India and other parts of South Asia, especially in small agricultural settings. **3. Mechanical Winnowers** **How it works**: These are machines designed to separate grains from chaff by using a combination of air currents and vibrating screens. The heavier grains fall through the screen, while the lighter materials are blown away by the air current. **Use**: Common in large-scale farming or commercial grain processing facilities, mechanical winnowers are efficient and save time. **4. Wind-Based Winnowing (Outdoor)**	Threshing is the process of separating grains (like wheat) from their stalks or husks, often done by beating or rubbing them together. 1. What is sieving, and how does it help in separating materials? 2. If you mix sand and pebbles, would sieving be effective in separating them? Why or why not? 3. After sieving a mixture of flour and powdered chalk, why might the two materials not separate completely? 4. In what other industries or processes would sieving be important, and why? **Home Work:**

	How it works: On a windy day, the grain mixture is spread out on a flat surface, such as a tarp or a large sheet. The wind naturally blows away the lighter husks and chaff while the heavier grains stay on the surface. **Use**: This method works well in open fields or when the natural wind conditions are favorable for separation. **5. Electric or Powered Fans** **How it works**: A fan (usually electric or powered by a motor) is directed over the mixture of grains and husks to blow away the lighter particles. The grains fall down while the husks are carried away by the force of the air. **Use**: This is a more modern technique, used in small-scale commercial or home-based grain processing where manual labor is reduced. T: Today, we are going to work in groups to explore how sieving can separate components of a mixture. We'll use flour and powdered chalk, and try to see if sieving can separate them. But first, let's remember that sieving works when the components of a mixture have different sizes. Our goal is to observe how this separation happens in real-life situations. T: I will divide you into groups of 4. Each group will receive a sieve, some flour, powdered chalk, and a bowl. You will mix the flour and powdered chalk to create a mixture. Then, you will sieve it and observe what happens.	At your home, make a list of 5 mixtures that require handpicking to be separated and 5 mixtures that cannot be separated using handpicking. Document at least 5 activities happening around you where people are using handpicking to separate objects. Ask them why they prefer to use handpicking for these scenarios to separate the objects. **T:** Now that we know the basic elements of what winnowing is, create a list of 5 Agriculture activities where winnowing is used along with their pictures. You may draw the pictures in your notebook. S: Students can make a list of the following activities and even more.

	● **Instructions for Groups**: 1. **Mix** a small quantity of flour and powdered chalk together in your bowl. Ensure the mixture is even. 2. **Sieve** the mixture through your sieve to try to separate the components. 3. **Observe** what happens to the flour and the powdered chalk after sieving. - **Group Work** "Now, you have 6 minutes to sieve the mixture and observe what happens. Be sure to record your observations in your notebooks." ● **Instructions for Students**: ○ Sieve the mixture slowly and carefully. ○ Observe how the flour passes through the sieve and what remains. ○ Check if any chalk powder is separated or if it stays with the flour. ○ Write down what you see. **Debrief:** "Now that you’ve completed the sieving process, let’s gather together and share what happened. Think about these questions as you discuss with your group." ● **Debrief Questions for Group Discussion**: 1. What did you notice after sieving the flour and chalk mixture? 2. Did the sieving process separate the chalk powder from the flour? Why or why not? 3. How would you explain the result based on the size of the particles in the mixture? 4. Do you think sieving is a good method to separate chalk powder from flour? Why or why not?	**Rice Processing**: After harvesting rice, winnowing is used to separate the rice grains from the husk and lighter debris, making the rice ready for consumption or further processing. **Wheat Harvesting**: During wheat harvesting, winnowing helps separate the wheat grains from the chaff and other lighter plant materials, ensuring only clean grains are collected. **Pulses and Legumes**: Winnowing is used to separate the edible seeds of pulses (such as lentils, chickpeas, and beans) from their outer husks or lighter plant matter after threshing.

	5. In what other situations would you use sieving to separate different components of a mixture? Great work, everyone! Sieving worked well to separate materials that have significantly different sizes. Since the chalk powder is very fine and the flour is a bit coarser, sieving couldn’t effectively separate them. This shows that sieving works best when the components in a mixture differ greatly in size.	**Mustard Seed Harvesting**: After harvesting mustard seeds, winnowing is used to separate the small, round mustard seeds from the chaff and other lighter particles, ensuring that only the clean seeds are collected. **Cereal Grains (Maize, Barley, etc.)**: Winnowing is used to separate the grains of cereals like maize, barley, and millet from the lighter husks and debris after threshing, making them suitable for storage and consumption. Find at least **two different mixtures** that you can sieve. Note down your observations in a notebook. Use a **sieve** or any similar tool you can find at home, ask your parents how they use these tools.

Closing

Note: Teacher to use the 3-2-1 method to revise handpicking.

- 3 things that you have learned about
- 2 interesting concepts
- 1 question that you have

So we have covered an interesting and new topic today. Let us revise what we learned today.

- So what is winnowing?
- What are the examples of winnowing?
- What did you find interesting in today's class?
- What is one question that you still might have?

I want you to close your eyes for a second and picture a sieve in your mind. Now, think about a big pile of flour mixed with chalk powder. How do you think sieving would help in this situation? (Pause for thoughts.) Would the fine flour separate from the chalk, or would it be more difficult because they are both fine? Exactly! Sieving works best when particles are of different sizes."

Let's see how well we understand sieving. I'll ask you a few questions and you can answer them out loud:

- What size of materials does a sieve help to separate?
- What are some everyday uses of a sieve that you can recall?

Why do you think sieving works better when materials have different sizes?

Assessment on Concept 2

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

1. Paheli bought some vegetables such as French beans, lady's finger, green chillies, brinjals and potatoes all mixed in a bag. Which of the following methods of separation would be most appropriate for her to separate them?
   (a) Winnowing (b) Sieving (c) Threshing (d) Hand picking
2. Boojho's grandmother is suffering from diabetes. Her doctor advised her to take 'Lassi' with less fat content. Which of the following methods would be most appropriate for Boojho to prepare it?
   (a) Filtration (b) Decantation (c) Churning (d) Winnowing
3. Which amongst the following methods would be most appropriate to separate grains from bundles of stalks?
   (a) Hand picking (b) Winnowing (c) Sieving (d) Threshing
4. Four mixtures are given below
   (i) Kidney beans and chick peas (ii) Pulses and rice
   (iii) Rice flakes and corn (iv) Potato wafers and biscuits
5. Which of these can be separated by the method of winnowing?
   (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (iii) and (iv)
6. While preparing chapatis, Paheli found that the flour to be used was mixed with wheat grains. Which out of the following is the most suitable method to separate the grains from the flour?
   (a) Threshing (b) Sieving (c) Winnowing (d) Filtration

7. Name and describe briefly a method which can be helpful in separating a mixture of husk from grains. What is the principle of this method?
8. Read the story titled “WISE FARMER” and tick the correct option to complete the story.

A farmer was **sad/happy** to see his healthy wheat crop ready for harvest. He harvested the crops and left it under the **sun/rain** to dry the stalks. To separate the seeds from the bundles of the stalk he **handpicked/threshed** them. After gathering the seed grains he wanted to separate the stones and husk from it. His wife **winnowed/threshed** them to separate the husk and later **sieved/hand picked** to remove stones from it. She ground the wheat grains and **sieved/ filtered** the flour. The wise farmer and his wife got a good price for the flour. Can you tell why?

Concept 3: Ways of separating insoluble solids from liquids

Teaching Learning Process

Learning Objectives:

Students will be able to

- demonstrate the process of sedimentation, decantation and filtration.

Induction/Introduction:

In this section students will be introduced to the concept of separation of solids that are undissolved in water. This section also consists of a lot of new words such as sedimentation, decantation, and filtration. .

Vocabulary: Solution, sedimentation, decantation, filtration, strainer,

Hook:

Today, we’re going to unlock the secrets behind how we can separate different materials from liquids. Imagine this: you’re in a place with no clean water. You only have muddy, dirty water in a bucket. You need to figure out how to get clean water quickly. What would you do?"

- **Teacher**: "Let me show you a scenario: I have a glass of **dirty water**. Look closely – it’s full of mud, leaves, and little pieces of dirt. Our goal is to **make it clean** so it’s safe to drink. Does anyone have an idea how we could do this?"
- (Pause for answers, students might mention boiling, using a cloth, etc.)
- **Teacher**: "Great suggestions! But today, we are going to do something amazing to clean this water using three special processes. "

Experience and Reflection:

- What methods have you seen your parents use at home to get clean water for drinking?
- Have you ever noticed that after a rain, the water in a pond or puddle may be cloudy at first, but then it becomes clearer? Why do you think that happens?

Period 3.3:

Learning Objective:

Students will be able to

- demonstrate the process of sedimentation, decantation and filtration.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
So far in previous lessons we have studied about hand picking, threshing, winnowing and sieving. Can someone tell me what is common among all these methods that we have learnt? Yes, you are right! In all these methods we are separating solid objects from solid objects. Sometimes, it may not be possible to separate components of a mixture by winnowing and handpicking. For example, there may be lighter impurities like dust or soil particles in rice or pulses. Let us watch this video - Method of Separation Sedimentation and Decantation In this video the clean water is taken out using decantation whereas the sediment which in this case is dust, settles down at the bottom of the container. Similarly, rice or pulses are usually washed before cooking. When you add water to these, the impurities like dust particles get separated. These impurities go into water. Now, the rice will sink at the bottom of the vessel and dust and impurities will float on the top of the water. When the heavier component in a mixture settles after water is added to it, the process is called sedimentation.	Today, we will work in groups to understand how sedimentation, decantation, and filtration work. Each group will have a set of materials to work with. ● **Instructions**: I will divide you into groups of 4. Each group will perform 3 activities, and you will need to record your observations. You'll get 3 minutes for each task. **Task 1: Sedimentation** ● **Activity Description**: 1. **Materials**: Water, sand or dirt. 2. **Objective**: To observe sedimentation in a mixture. ● **Instructions for Students**: 1. Fill your container with water, then add a small amount of sand or dirt. 2. Stir the mixture and let it sit undisturbed for a few minutes. 3. Observe what happens: What do you see settling at the bottom? This is sedimentation. 4. **Write your observations**: What is the process called? How does sedimentation work? Can you see the dirt or sand at the bottom? **Task 2: Decantation** ● **Activity Description**: 1. **Materials**: Water with sand or dirt (from Task 1). 2. **Objective**: To observe the process of decantation. ● **Instructions for Students**: 1. After observing sedimentation, carefully **pour the water** from the top of the container into another clean container. Be careful not to disturb the settled dirt or sand at the bottom. 2. This process is called **decantation**. 3. **Write your observations**: Did the water separate easily? Was the sand or dirt left behind in the first container? What is the purpose of decantation?	1. **Fill in the Blank**: The process by which heavier particles in a mixture settle at the bottom of a liquid is called __________. 2. **True or False**: Filtration is used to separate mixtures based on the difference in the size of the particles, where the smaller particles pass through a filter and the larger particles are left behind. (True / False) **3. Multiple Choice**: Which of the following methods is used to separate oil from water? a) Sedimentation b) Decantation c) Filtration d) Handpicking **4. Fill in the Blank**: The process of carefully pouring off the liquid from a container, leaving behind the solid particles, is called __________.

When the water (along with the dust) is removed, the process is called decantation. Let us find a few other mixtures that can be separated through sedimentation and decantation. We can use decantation to separate tea leaves from tea. It helps a little, but we still get a few leaves in our tea. Post this we need to pour the tea through a strainer - This process is called filtration. Nowadays, advanced water filters use the same process of sedimentation, decantation and filtration to give us clean drinking water. **CFU (Open ended/ Factual)** **Open-Ended:** 1. Can you think of any other situations where sedimentation and decantation would be useful, besides cleaning rice or pulses? Why do you think these methods are helpful in these situations? 2. Can filtration be used to separate salt from saltwater? If not, why? **Factual:** 1. What happens during sedimentation and decantation when water is added to rice or pulses? How do these processes help separate impurities from the food?	**Task 3: Filtration** ● **Activity Description**: 1. **Materials**: Water, mud, and a filter (cloth or coffee filter). 2. **Objective**: To demonstrate the filtration process to clean muddy water. ● **Instructions for Students**: 1. Add some mud/dust into a container of water. Stir it up to mix them. 2. Now, use the cloth filter or coffee filter to separate the mud from the water by slowly pouring the mixture through the filter into another container. 3. **Write your observations**: What happens as the dirty water passes through the filter? Which component gets filtered out, and which one passes through? How does filtration work? **Debrief and Group Discussion** ● **Teacher Script**: Now that you've completed all three tasks, let's come together and discuss what you observed. You've seen how sedimentation, decantation, and filtration can help separate different components in a mixture. ● **Debrief Questions for Group Discussion**: 1. In the sedimentation activity, what did you notice about the way sand or dirt settled? Why do you think sedimentation happens? 2. During decantation, how did we separate the clear water from the sediment? Was it easy to do? 3. What did you observe while filtering the oil and water? Why did we need to use filtration after decantation? 4. Name a few real-life situations where these processes might be used *(like cleaning water or separating materials in food production)* Great job, everyone! You've now seen how sedimentation, decantation, and filtration work to separate different materials.	3. **Multiple Choice**: Which of the following is NOT an example of when sedimentation and decantation can be used? a) Cleaning rice or pulses b) Separating sand from water c) Removing dust from air d) Separating tea leaves from tea **Home-Work:** Conduct an experiment to identify what factors might affect how quickly the sand settles in water? (e.g., amount of sand, size of sand particles, how much water is used). Record your observations

Closing:

To wrap up today's lesson on sedimentation, decantation, and filtration, let’s do a quick reflection using the **3-2-1 method**.

Take a moment to think about three key things you learned about the processes of sedimentation, decantation, and filtration. You can write them down or think about them in your mind.

(Pause for 30 seconds as students reflect.)

- *Take two to three responses from the students.*

Two things that were interesting or surprising

Now, think about two things that you found interesting or surprising during today’s lesson. What surprised you the most about these processes?

(Pause for 30 seconds as students reflect.)

- *Take two to three responses from the students.*

Finally, think about one question you still have about these processes. It could be something you're curious to learn more about or something you didn’t completely understand.

- *Take two to three responses from the students.*

Assessment on Concept 3

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

1. You might have observed the preparation of ghee from butter and cream at home. Which method(s) can be used to separate ghee from the residue?
   (i) Evaporation (ii) Decantation (iii) Filtration (iv) Churning
   Which of the following combinations is the correct answer?
   (a) (i) and (ii) (b) (ii) and (iii) (c) (ii) and (iv) (d) (iv) only
2. **True or False**
   Decantation is a method used to separate heavier insoluble solids from a liquid by allowing the solid to settle and then pouring the liquid off gently.
3. **Fill in the Blank**
   The process of separating a mixture of water and sand using a filter paper is called ___________.
4. **Multiple Choice Question**
   Which of the following methods is NOT used to separate insoluble solids from liquids?
   a) Filtration b) Decantation c) Sedimentation d) Evaporation

Concept 4: Ways of separating soluble solids from liquids

Learning Objectives:

Students will be able to

- explain the process of evaporation and condensation
- apply more than one process of separation on a mixture of substances.

Induction/Introduction:

This section of the lesson will introduce students to the concepts of evaporation and condensation. Along with this students will do activities to understand that sometimes more than one method of separation is needed.

Vocabulary: Evaporation, condensation,

Hook:

Imagine you're stranded on a deserted island. You have access to seawater. How could you obtain fresh drinking water from the saltwater?

Experience and Reflection:

1. What are some initial ideas you can think of?
2. What are the resources you would need to accomplish your task?
3. Who can help you?

Period 3.4:

Learning Objectives:

Students will be able to

- explain the process of evaporation and condensation
- apply more than one process of separation on a mixture of substances.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Material: 2 spoon table salt, 1 glass of water, test tube, fire Mix two tablespoons of salt in one test tube and boil away the water from the test tube. What is left in the tube is salt. A similar process is followed to extract salt from the sea water. Sea water is salty and it is stored in shallow pits. Under the heat of the sun, the water evaporates and what is left behind is salt. This process of conversion of water into its vapour form is called evaporation. The water gets evaporated either due to the heat of the sun or by the boiling of water. Often, one method is not sufficient to separate the different substances present in a mixture. In such a situation, we need to use more than one of these methods. Take a mixture of sand and salt. How will we separate these? - *Take two to three responses from the students.* We already saw that handpicking would not be a practical method for separating these.	**Materials for Each Group:** ● A mixture of sawdust, sugar, and water (or another combination like iron filings, salt, and water). ● Filter paper and funnel. ● Beakers and test tubes. ● A magnet (if using iron filings). ● Heating setup (Bunsen burner or hot plate). ● Kettle or any setup to collect condensed water using an ice plate. **Student Task:** ● Each group will receive a mixture of substances and the necessary materials.	**1.** Which of the following best describes the process of condensation? a) Water changing into vapor when heated b) Water vapor turning back into liquid on cooling c) Salt separating from water when boiled d) Sand settling at the bottom of a mixture **Short Answer Question:** **2.** Explain how evaporation is used to separate salt from water in a saltwater mixture. **3. Fill-in-the-Blank Question:** ● The process of water turning into vapor is called ____________. ● ____________ is the process of turning water vapor back into liquid form.  *Fig. 3.13* Evaporation and condensation

Keep this mixture in a beaker and add some water to it. Leave the beaker aside for some time. Do you see the sand settling down at the bottom? The sand can be separated by decantation or filtration. What does the decanted liquid contain? Do you think this water contains the salt which was there in the mixture at the beginning? Now, we need to separate salt and water from the decanted liquid. Transfer this liquid to a kettle and close its lid. Heat the kettle for some time. Do you notice steam coming out from the spout of the kettle? Take a metal plate with some ice on it. Hold the plate just above the spout of the kettle as shown in Fig. 3.13. What do you observe? Let all the water in the kettle boil off. When the steam comes in contact with the metal plate cooled with ice, it condenses and forms liquid water. The water drops that you observed falling from the plate were due to condensation of steam. The process of conversion of water vapour into its liquid form is called condensation.  **Fig. 3.13** Evaporation and condensation After all the water has evaporated, what is left behind in the kettle? S: We have salt left behind in the kettle. **We have thus, separated salt, sand and water using processes of decantation, filtration, evaporation and condensation.** **CFU (Open ended/ Factual)** **Factual**	● The task is to **observe the properties** of the substances (e.g., solubility, density, magnetic properties) and **design a procedure** to separate the components. ● Groups will perform the separation step-by-step based on their own strategies. ● They should record **observations**, **challenges faced**, and **solutions devised** during the process. **Teacher's Role:** ● Walk around the class, observing and **guiding** students through **probing questions** instead of giving direct instructions: ○ *What differences do you notice between the substances?* ○ *What property could help you separate this substance?* ○ *If you had to get back pure water, how would you do it?* ● Encourage groups to **think critically**, **test their hypotheses**, and **adjust their methods** based on their findings.	**4.** Look at the diagram showing a kettle producing steam and a metal plate with ice condensing water droplets. Answer the following: ● What process is shown in this diagram? ● Label where evaporation and condensation are occurring. **5.** You are given a mixture of sand, salt, and water. Write the steps you would take to separate all three substances. Mention which processes you would use and why. **Home-Work** You are given a mixture of **pepper**, **flour**, and **water**. ● Devise a method to separate these three substances completely. ● List the steps you would follow and explain the separation method used for each step.

- What is evaporation, and where have you seen it in your daily life? - Why do we need more than one method to separate sand, salt, and water? **Open-Ended** - Share some other applications of evaporation and condensation.	● Support students in **documenting their process** to reflect on their approach and learning. If the students are found to struggle, guide them rather than providing them with direct answers.	

Closing

3 Things: List three things you learned today about evaporation, condensation, or separating mixtures.

2 Questions: Write two questions you still have or two things you're curious about.

1 Connection: Share one real-life example or situation where you think evaporation, condensation, or a mixture separation process is used.

Assessment on Concept 4

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

1. During summer, Boojho carries water in a transparent plastic bottle to his school. One day he left his bottle in the school. The bottle still had some water left in it. The following day, he observed some water droplets on the inner surface of the empty portion of the bottle. These droplets of water were formed due to
   (a) boiling and condensation. (b) evaporation and saturation.
   (c) evaporation and condensation. (d) condensation and saturation.
2. Paheli asked for a glass of water from Boojho. He gave her a glass of ice cold water. Paheli observed some water droplets on the outer surface of the glass and asked Boojho how these droplets of water were formed? Which of the following should be Boojho's answer?
   (a) Evaporation of water from the glass. (b) Water that seeped out from the glass.
   (c) Evaporation of atmospheric water vapour. (d) Condensation of atmospheric water vapour.

The process of conversion of water into its vapour is called evaporation. The process of evaporation takes place continuously wherever water is present. Salt is obtained from seawater through the process of evaporation. Sea water contains many salts mixed in it. One of these salts is the common salt. When sea water is allowed to stand in shallow pits, water gets heated by sunlight and slowly turns into water vapour, through evaporation. In a few days, the water evaporates completely leaving behind the solid salts. Common salt is then obtained from this mixture of salts by further purification.

1. Name the process in which water is converted into its vapour on heating.

a. Condensation. b. Evaporation. c. Sedimentation. d. Decantation.

2. Name the process by which salt is obtained from seawater.

a. Condensation. b. Evaporation. c. Sedimentation. d. Decantation.

3. In the salt extraction process, the sea water is collected in.

a. Dark pits b. narrow pits c. deep pits d. shallow pits

4. Which of the following is obtained from the mixture of salts by the purification process?

a. Common Salt b. Chemicals c. Metal d. sand

Concept 5: Use of more than one method

Learning Objectives:

Students will be able to

- explain the process of evaporation and condensation
- apply more than one process of separation on a mixture of substances.

Induction/Introduction:

This section of the lesson will introduce students to the concepts of evaporation and condensation. Along with this students will do activities to understand that sometimes more than one method of separation is needed.

Vocabulary: Evaporation, condensation,

Hook:

Imagine you're stranded on a deserted island. You have access to seawater. How could you obtain fresh drinking water from the saltwater?

Experience and Reflection:

1. What are some initial ideas you can think of?
2. What are the resources you would need to accomplish your task?
3. Who can help you?

Period 3.5:

Learning Objectives:

Students will be able to

- explain the process of evaporation and condensation
- apply more than one process of separation on a mixture of substances.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Material: 2 spoon table salt, 1 glass of water, test tube, fire Mix two tablespoons of salt in one test tube and boil away the water from the test tube. What is left in the tube is salt. A similar process is followed to extract salt from the sea water. Sea water is salty and it is stored in shallow pits. Under the heat of the sun, the water evaporates and what is left behind is salt. This process of conversion of water into its vapour form is called evaporation. The water gets evaporated either due to the heat of the sun or by the boiling of water. Often, one method is not sufficient to separate the different substances present in a mixture. In such a situation, we need to use more than one of these methods. Take a mixture of sand and salt. How will we separate these? - *Take two to three responses from the students.* We already saw that handpicking would not be a practical method for separating these. Keep this mixture in a beaker and add some water to it. Leave the beaker aside for some time. Do you see the sand settling down at the bottom? The sand can be separated by decantation or filtration. What does the decanted liquid contain? Do you think this water contains the salt which was there in the mixture at the beginning? Now, we need to separate salt and water from the decanted liquid. Transfer this liquid to a kettle and close its lid. Heat the kettle for some time. Do you notice steam coming out from the spout of the kettle? Take a metal plate with some ice on it. Hold the plate just above the spout of the kettle as shown in Fig. 3.13. What do you observe? Let all the water in the kettle boil off. When the steam comes in contact with the metal plate cooled with ice, it condenses and forms	**Materials for Each Group:** ● A mixture of **sawdust, sugar, and water** (or another combination like **iron filings, salt, and water**). ● Filter paper and funnel. ● Beakers and test tubes. ● A magnet (if using iron filings). ● Heating setup (Bunsen burner or hot plate). ● Kettle or any setup to collect condensed water using an ice plate. **Student Task:** ● Each group will receive a mixture of substances and the necessary materials. ● The task is to **observe the properties** of the substances (e.g., solubility, density, magnetic properties) and **design a procedure** to separate the components.	**1.** Which of the following best describes the process of condensation? a) Water changing into vapor when heated b) Water vapor turning back into liquid on cooling c) Salt separating from water when boiled d) Sand settling at the bottom of a mixture **Short Answer Question:** **2.** Explain how evaporation is used to separate salt from water in a saltwater mixture. **3.** **Fill-in-the-Blank Question:** ● The process of water turning into vapor is called ___________. ● ___________ is the process of turning water  Fig. 3.13 Evaporation and condensation vapor back into liquid form. **4.** Look at the diagram showing a kettle producing steam and a metal plate with ice condensing water droplets. Answer the following: ● What process is shown in this diagram?

 **Fig. 3.13** Evaporation and condensation liquid water. The water drops that you observed falling from the plate were due to condensation of steam. The process of conversion of water vapour into its liquid form is called condensation. After all the water has evaporated, what is left behind in the kettle? S: We have salt left behind in the kettle. **We have thus, separated salt, sand and water using processes of decantation, filtration, evaporation and condensation.** **CFU (Open ended/ Factual)** **Factual** - What is evaporation, and where have you seen it in your daily life? - Why do we need more than one method to separate sand, salt, and water? **Open-Ended** - Share some other applications of evaporation and condensation.	● Groups will perform the separation step-by-step based on their own strategies. ● They should record **observations**, **challenges faced**, and **solutions devised** during the process. **Teacher's Role:** ● Walk around the class, observing and **guiding** students through **probing questions** instead of giving direct instructions: ○ *What differences do you notice between the substances?* ○ *What property could help you separate this substance?* ○ *If you had to get back pure water, how would you do it?* ● Encourage groups to **think critically**, **test their hypotheses**, and **adjust their methods** based on their findings.	● Label where evaporation and condensation are occurring. **5.** You are given a mixture of sand, salt, and water. Write the steps you would take to separate all three substances. Mention which processes you would use and why. **Home-Work** You are given a mixture of **pepper**, **flour**, and **water**. ● Devise a method to separate these three substances completely. ● List the steps you would follow and explain the separation method used for each step.

Closing

3 Things: List three things you learned today about evaporation, condensation, or separating mixtures.
2 Questions: Write two questions you still have or two things you're curious about.
1 Connection: Share one real-life example or situation where you think evaporation, condensation, or a mixture separation process is used.

Concept 6: Saturated and unsaturated solutions

Learning Objectives:

Student will be able to

1. demonstrate the concept of saturated and unsaturated solutions.
2. investigate the factors that affect the solubility of a substance in a solvent (e.g., temperature, type of solvent).

Induction/Introduction:

This section of the lesson introduces students to the concept of saturated and unsaturated solutions.

Vocabulary: Saturated solution, Unsaturated solution

Hook:

Divide the class into small groups and give each group the following:

- ○ A clear glass or beaker of water
- ○ A teaspoon
- ○ A container of salt
- ○ A timer (or use a central timer)
- ○ A recording sheet
- **Challenge:** "Your task is to dissolve as much salt as possible in your water in 2 minutes. Measure the amount of salt you add and record it."
- Groups can decide their strategy: whether to add salt slowly or all at once.
- Start the timer and let the groups work.
- Encourage observation: Some groups may notice that beyond a point, salt no longer dissolves.

Discussion

- Ask:
- ○ *How much salt did your group manage to dissolve?*
- ○ *Did all the salt dissolve? Why or why not?*

Experience and Reflection:

- Have you ever mixed something in water to find out that it is taking too much time to dissolve, or not dissolving at all?

Period 3.6:.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Let's talk about what happened during 'The Salt Challenge' earlier. You tried to dissolve as much salt as possible in water, and some of you realized that at a certain point, no matter how much you stirred, the salt wouldn't dissolve anymore. This is because the water had reached its limit—it couldn't hold any more salt. This is what we call a **saturated solution**." ○ "Before the water reached this point, when it could still dissolve more salt, we call it an **unsaturated solution**." ○ "Once the water couldn't dissolve any more salt, it became **saturated**." ○ *Ask:* "Can you think of other times in real life when you've tried to dissolve something and it wouldn't dissolve anymore?" ○ "If we had heated the water during the challenge, do you think it could have dissolved more salt?" *Pause and let students share their thoughts.* ○ *Prompt:* "Think about when you make lemonade with cold water vs. warm milk. Is it easier to dissolve sugar in cold water or warm milk? Why do you think that happens?" *Explanation Based on Students' Input:* ○ "Great observations! When you heat the water, its ability to dissolve substances increases. That's because heat gives the water molecules more energy, allowing them to interact with and break apart more of the salt or sugar molecules. So, heating can turn a saturated solution back into an unsaturated one."	**Materials needed:** ● 4 glasses of water ● Salt, sugar, and baking soda (or other soluble substances like powdered drink mix or citric acid) ● Spoons ● Recording sheets **Instructions:** - Divide the class into two teams: **Team A** and **Team B**. **Round 1: Predict and Test** ○ **Team A:** Predict how many teaspoons of a substance (e.g., salt) can dissolve in a glass of water before saturation. ○ **Team B:** Conduct the experiment: ■ Add one teaspoon of the substance to the water, stir, and observe. ■ Continue adding one teaspoon at a time until an undissolved substance appears. ■ Record the actual number of teaspoons dissolved. ○ Teams then compare Team A's prediction with Team B's results. **Switch Roles for Round 2:** ○ **Team B** predicts for a new substance (e.g., sugar), and **Team A** conducts the experiment. ○ Repeat the process with other substances like baking soda or powdered drink mix. **Guiding Questions:** ● "How do you know the solution is saturated?"	**1.** *What happens when you keep adding sugar to water and the solution becomes saturated?* a) The water turns into a solid. b) The sugar continues to dissolve indefinitely. c) The sugar begins to settle at the bottom. d) The water changes color. **2.** *Explain how heating a saturated solution can help dissolve more solute. What happens when it cools?* **3.** *When a solution has dissolved all the solute it can at a given temperature, it is called a* ___________ *solution.* **4.** *Water dissolves the same amount of sugar and salt before becoming saturated.* **5.** Match the terms to their correct definitions: ● Saturated solution ● Unsaturated solution ● Solubility ● Solvent **Definitions:** a) The ability of a substance to dissolve in a solvent. b) A solution that can still dissolve more solute. c) A liquid in which a solute dissolves. d) A solution that cannot dissolve any more solute **Home-Work:**

○ "Different substances dissolve in water in different amounts. For example, during the challenge, we used salt. Imagine if we had used sugar instead. Do you think the water could hold more teaspoons of sugar than salt before becoming saturated?" *Pause for responses and guide the discussion.* ○ "That's because every substance has a unique **solubility**—its ability to dissolve in a solvent like water. Factors like the type of solute (salt or sugar), the temperature, and even the solvent (water, milk, or oil) all affect how much of a substance can dissolve." **CFU (Open ended/ Factual)** **Open-Ended Questions:** 1. What is the difference between a saturated and an unsaturated solution? Can you give an example of each from everyday life? 2. Why does heating a saturated solution allow more solute to dissolve? What might happen when the solution cools again? **Factual:** 1. True or False: Water can dissolve the same amount of all substances, such as sugar and salt, before becoming saturated. 2. Which of the following will help dissolve more sugar in water? a) Cooling the water b) Heating the water c) Adding more water d) Both b and c	● "What differences do you notice in the number of teaspoons dissolved for different substances?" ● "Why do you think one substance dissolves more or less than another?"	- Take two glasses of water. Add a spoonful of **salt** to one glass and a spoonful of **baking soda** to the other. Stir both and observe: Which one dissolves faster, or does either remain undissolved? - Write one sentence about what you observed and why you think it happened.
Closing Let's wrap up what we learned today using the 3-2-1 framework. This will help us reflect and consolidate our understanding of saturated and unsaturated solutions, as well as solubility.		

Assessment on Concept 6

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

1. Sheela, Saima and Ravi have to dissolve the maximum amount of sugar in the same amount of milk so as to win in a game. Ravi took hot boiling milk while Saima took ice cold milk. Sheela managed to get milk at room temperature. Whom do you think would win the game and why?
2. Both Sarika and Mohan were asked to make salt solutions. Sarika was given a teaspoonful of salt and half a glass of water, whereas Mohan was given twenty teaspoons full of salt and half a glass of water.
   (a) How would they make salt solutions?
   (b) Who would be able to prepare a saturated solution?

You are asked to add two spoons of solid salt to some liquid water taken in a beaker. On stirring it you find that all of the salt has disappeared and only liquid can be seen in the beaker.

3. After stirring the salt completely disappears and you can see only liquid in the beaker. The liquid in beaker is
   (a) water (b) solution (c) solute (d) solvent
4. Which of the following processes will be useful to get salt from this solution?
   (a) Condensation (b) Evaporation (c) Filtration (d) Sedimentation
5. Which process can you use to get liquid water from the water vapours if you collect them in another container?
   (a) Sedimentation (b) Condensation (c) Evaporation (d) Filtration

Student Independent Practice:

Period 3.7:

Teaching Learning Process

1. **Define:**
   a) Mixture b) Molecule c) Element d) Pure Substance e) Distillation
2. **Fill in the blanks**
   a) Small pieces of stone can be removed from rice by ___________.
   b) Husk from wheat flour is generally removed by ________.
   c) _________ are obtained from stalks by threshing.
   d) The process of setting heavier particles is called ________.
   e) Filtration is helpful in separating an insoluble _________ from a ________.
3. **Very Short Question Answers:**
   a) Give one example of sieving used in everyday life.
   b) When is handpicking used?
   c) Which substance is used for loading?
   d) Which types of mixtures are separated by evaporation?
   e) What is decantation?
4. **Multiple choice questions:**

– Riya bought some vegetables such as French beans, lady's finger, green chillies, brinjals and potatoes all mixed in a bag. Which of the following methods of separation would be most appropriate for her to separate them?
  (a) Winnowing (b) Sieving (c) Threshing (d) Hand picking

– Akshay’s grandmother is suffering from diabetes. Her doctor advised her to take ‘Lassi’ with less fat content. Which of the following methods would be most appropriate for Akshay to prepare it?
  (a) Filtration (b) Decantation (c) Churning (d) Winnowing
– Which of the following mixtures would you be able to separate using the method of filtration?
  (a) Oil in water (b) Cornflakes in milk (c) Salt in water (d) Sugar in milk
– Which amongst the following methods would be most appropriate to separate grains from bundles of stalks?
  (a) Hand picking (b) Winnowing (c) Sieving (d) Threshing
– In an activity, a teacher dissolved a small amount of solid copper sulphate in a tumbler half filled with water. Which method would you use to get back solid copper sulphate from the solution?
  (a) Decantation (b) Evaporation (c) Sedimentation (d) Condensation
– Answer the following questions:
  a) You are provided with a mixture of salt, sand, oil and water. Write the steps involved for the separation of salt, sand and oil from the mixture by giving an activity along with the diagram.
  b) Name and describe briefly a method which can be helpful in separating a mixture of husk from grains. What is the principle of this method?

Student Independent Practice:

Period 3.8:

Teaching Learning Process

1. Fill in the blanks.
   a. Soft drinks and salt solution are examples of ————————- type of mixture.
   b. ————-is a method to separate light husk from heavier grains like wheat.
   c. At construction sites, sand is separated by ————- from gravel & ————-.
   d. Sand and camphor can get separated from each other by ——————-.
   e. ————- helps in loading by making light, suspended particles heavier.
2. Write True and False.
   a. Muslin cloth and charcoal can be used as filters. ——————.
   b. Sand and sugar can be separated by sublimation. ——————.
   c. Sawdust mixed in water cannot be separated by sublimation ——————.
   d. Muddy water can give clean water by the process of filtration. ——————.
   e. Mixtures with different compositions are called heterogeneous. ——————.

3. Answer the following in brief.

   a. How is common salt prepared on a commercial scale?

   b. List five methods of separating solid-solid mixtures.

   c. Suggest an easy way to separate a mixture of sand and salt.

   d. Why do we label air and soil a mixture?

   e. Explain adulteration and how it is a bad practice.

4. Answer the following.

A. Differentiate between

a) Homogeneous and Heterogeneous mixtures

b) Evaporation and filtration

B. Explain the process of sublimation with the help of an example.

C. Rain makes the air clear after a dust storm. Explain how.

D. How will you separate a mixture of common salt and iron nails?

5. Pick the correct option.

A. Naphthalene balls reduce in size due to

a. Filtration b. Sublimation c. Evaporation d. None of these

B. Sublimation can separate mixture of

a. Iodine & camphor b. Salt & water c. Peas & rice d. None

C. Oil and water can be separated by

a. Sedimentation b. Separating funnel c. Evaporation d. All of these

D. Which of these can be used as filters?

a. Muslin b. Filter paper c. Cotton wool d. All of above

E. Filtration can be used to separate insoluble solids from liquids like

a. Muddy water b. Tea leaves c. To make Tap water fit d. All of these

F. Salt from saturated solution can be separated by

a. Filtration b. Crystallisation c. Sedimentation d. None

G. Scrap iron is removed from the garbage heap by

a. Magnetic separation b. Filtration c. Centrifugation d. None

H. Which of these is not a pure substance?

a. Oxygen b. Hydrogen c. Air d. Helium

I. Sieving can be used to separate

a. Tea leaves b. Sand in gravel, pebbles c. Pearls of diff. sizes d. All of these

J. For separating pebbles from pulses and rice, we use

a. Sieving b. Hand picking c. Winnowing d. None

6. Observe the methods of separation used daily in our households like Winnowing, Hand-picking, sieving and evaporation and write your points of learning in the note-books.

Student Independent Practice:

Period 3.9:.

Teaching Learning Process

1. **FILL IN THE BLANKS**

a. Common salt can be separated from sea water by __________________

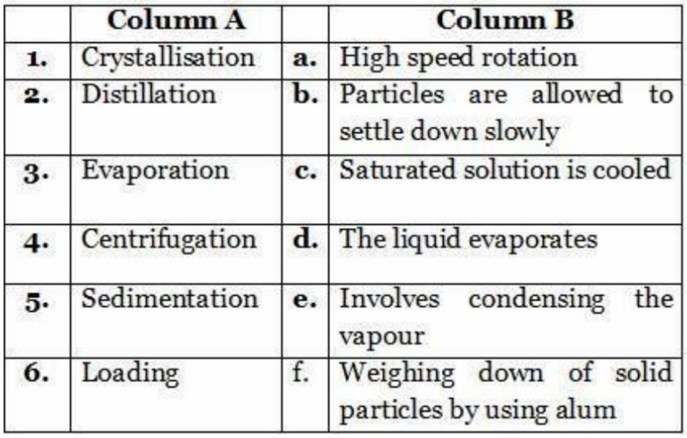
b. The process of pouring out the clear upper liquid without disturbing the sediments is called _________

c. The mixture of solute and solvent is called _____________

d. Insoluble impurities in water can be removed by ___________

e. The process of separating solid by hand is _____________

2. **Match the following:**



	Column A		Column B
1.	Crystallisation	a.	High speed rotation
2.	Distillation	b.	Particles are allowed to settle down slowly
3.	Evaporation	c.	Saturated solution is cooled
4.	Centrifugation	d.	The liquid evaporates
5.	Sedimentation	e.	Involves condensing the vapour
6.	Loading	f.	Weighing down of solid particles by using alum

3. **NAME THE FOLLOWING**

a. The process in which gas changes into liquid.

b. A solution which cannot dissolve any more solute at a given temperature.

c. A metal plate with holes, used for separating solid particles of different sizes.

d. The process of increasing the rate of sedimentation in a suspension by adding chemicals.

4. **ANSWER THE FOLLOWING QUESTIONS**

A. Take 3 glasses of water. Add two teaspoons of sugar in the first glass, four teaspoons of sugar in the second glass, six teaspoons of sugar in the third glass. Which one is most saturated:

a) First glass b) Second glass. c) Third glass

B. To separate dust and soil particles from rice, water is added. Then the vessel is tilted to pour out the dirty water. This is an example of _____________.

5. **Identify different methods of separation:**

.A.________________

B. ________________

.c.________________

6. A transparent bottle, half filled with water, is left outside in the sun for a few hours. After some time, some water droplets are observed on the inner upper surface of the bottle. Which process do you think is the cause of these droplets? Why?
7. Name and describe briefly a method which can help in separating a mixture of husk from grains. What is the principle of this method?
8. Soni accidentally mixed a few green gram seeds with rice flour and her brother helped her in separating the substances. Which method would they have used to separate substances and why?

Remedial Teaching:

Period 3.10:.

Remedial Teaching:

Period 3.11:.

TEACHER'S DIARY

Name of the Teacher:		**Name of the Month:**	
Name of the Lesson:		Class:	

Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
3.1	Understanding Separation of Substances and its purpose				
3.2	Ways of separating solids from solids				
3.3	Ways of separating insoluble solids from liquids				
3.4	Ways of separating soluble solids from liquids				
3.5	Use of more than one method				
3.6 **3.7** **3.8** **3.9** **3.10**	Saturated and unsaturated solutions (Can water dissolve any amount of a substance?) Students Independent Practice Students Independent Practice Students Independent Practice Remedial Teaching				
3.11	Remedial Teaching				

1	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher’s Signature Teacher’s Signature

Head Teacher’s Suggestions:

Teacher Notes:

October 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
M3C9S5 No bag Day	V3N4U8 Cluster Complex	L6Z5G9 Teacher Resources	1 Dussera Holiday	2 Mahatma Gandhi Jayanti Vijayadashami	3 NI	4 No Bag Day Sakunthala Devi Jayanti
5 Sunday International Teacher's Day	6 4.1	7 4.2	8 4.3	9 4.4	10 NI	11 Second Saturday
12 Sunday	13 FA - 2	14	15	16	17 NI	18 No Bag Day Cluster meeting
19 Sunday	20 Deepavali	21 4.5	22 4.6	23 NI	24 NI	25 No Bag Day SMC Meeting
26 Sunday	27 5.1	28 5.2	29 5.3	30 5.4	31 National Unity Day NI	

Week1 :

Week 2: **4.1 - 44**

Week 3: **FA 2**

Week 4 **4.5 – 4.6,NI**

Week 5 **5.1 – 5.4**

TEACHER'S NOTES

4

GETTING TO KNOW PLANTS

V8P5U6

Learning Outcomes:

Student will be able to

- Classify the plants as herbs, shrubs, trees, climbers and creepers.
- Explain the various parts of the plant and their functions.
- Conduct activities to understand the functions of plant parts.
- Draw a neat labelled diagram of parts of a Flower.
- distinguish between herbs, shrubs, and trees and they will be able to classify given plants (through pictures, descriptions, or real specimens) into the categories of herbs, shrubs, and trees.
- differentiate between climbers and creepers based on their growth habits and support structures.
- identify and label the main parts of a plant and classify them into the shoot system and root system.
- understand the functions of the stem, root, and leaf in a plant.
- identify and label the different parts of a leaf and a flower, and describe their characteristics.
- compare tap roots and fibrous roots based on their structure and function.

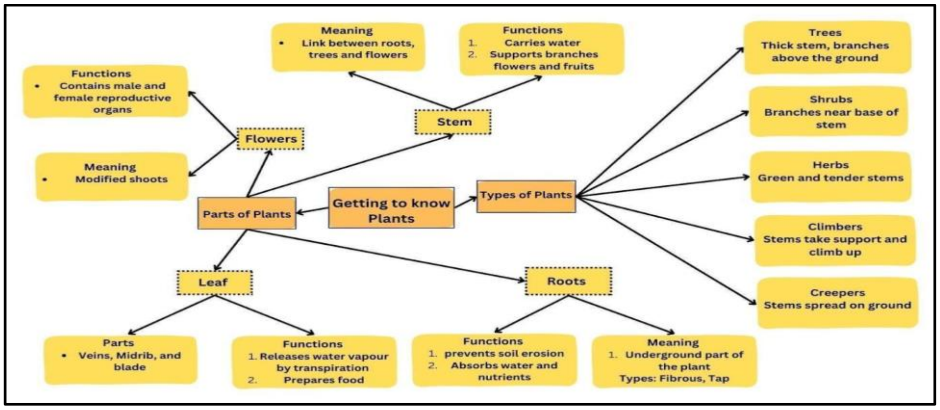
Prior Concept/ Skills:

- Living things grow, reproduce, and use energy.
- Plants are living organisms.
- Students should be able to observe and describe plants, noting their colors, shapes, sizes, and textures.
- Plants provide us with food, oxygen, and other essential resources.
- Plants need sunlight, water, and air to grow.

Teacher References:

- Bilingual text-book AP - SCERT - General Science - Sem I
- Teachers_Guide_Class6.pdf
- https://www.littlegreenthumbs.org/wp-content/uploads/2021/12/All-lessons-only.pdf
- https://cdn.agclassroom.org/ca/resources/lesson/what.pdf

CONCEPT MAP



Period-wise Topics

Chapters and Concepts

Period number	Topic	Remarks
4.1	Introduction 4.1 Herbs, Shrubs and Trees Activity 1	
4.2	4.2 Stem - Activity 2, 4.3 Leaf - Activity 3	
4.3	Leaf - Activity 4,5	
4.4	4.4 Root - Activity 6, 7	
4.5	Root - Activity 8,9	
4.6	4.5 Flower - Activity 10,11	

Period 4.1:.

Concept 1: Introduction
4.1 - Herbs, Shrubs and Trees
Activity 1

Learning Objective/s:

Students will be able to

- distinguish between herbs, shrubs, and trees based on their characteristic growth habits, including height, stem type, and branching patterns.
- classify given plants (through pictures, descriptions, or real specimens) into the categories of herbs, shrubs, and trees based on their observed characteristics.
- differentiate and classify between climbers and creepers based on their growth habits and support structures.

Prior concept and skill:

- Living things grow, reproduce, and use energy.
- Plants are living organisms.
- Students should be able to observe and describe plants, noting their colors, shapes, sizes, and textures

Teaching Learning Materials:

Rose: Rose Plant.jpg
Sunflower: sunforest-mix-sunflower-types-1586794598.jpg
Strawberry Plant: strawbrry.webp
Money Plant: MoneyPlantbig.webp
Coconut Plant: cloud-farm-hybrid-coconut-plant-200-mm-cf83-product-images-orvuxdynaxa-p602453269-0-202306150305.jpg

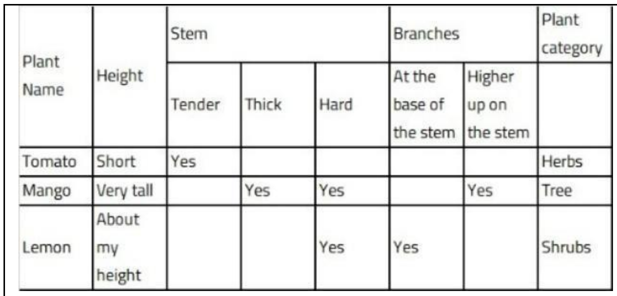
Video: Let's Learn About Trees | Caitie's Classroom Till 2:30 without audio

Igniting activity:

Showing the pictures of different plants and make the students to name the plants. And write them on the board.

Q1. What are two interesting things you noticed about each plant in the picture?
Q2. Are all plants of the same height? If not, why so?

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
Short video of a tree and plants pictures of herbs and shrubs Video: Let's Learn About Trees | Caitie's Classroom Till 2:30 without audio ● Here is a herb (e.g., mint/coriander). Image Link: mint.jpg ● Here is a shrub (e.g., hibiscus/rose). Image Link: nurserylive-g-hibiscus-gudhal-flower-red-plant-213118.webp ● In the video, you can see a tall tree. **T:** Let's start with the height of the plants. **T:** Let's start with the height of the plants. Finally, let's observe the **branches**. Look at the specimens and the tree in the video. **◈ Where do you see the branches growing? Are they close to the ground or higher up?**	**T:** "We are stepping outside to observe real plants. In your groups, use the graphic organizer to note down your observations. Pay close attention to: - The height of the plant. - The texture of the stem – is it soft or hard? - The position of the branches – are they close to the ground or higher up? - Based on these observations, you will classify each plant as an **herb, shrub, or tree** and write a sentence explaining your classification." **Instructions for Groups (Outdoor Exploration)**	1. State 2 features of herb, shrubs and trees 2. According to your observation, which category would these plants fall into A. Tulsi B. Mint C. Lavender D. Maple E. Jasmine F. Pine  Lavender Image  Maple Image  Jasmine



Plant Name	Height	Stem			Branches		Plant category
		Tender	Thick	Hard	At the base of the stem	Higher up on the stem	
Tomato	Short	Yes					Herbs
Mango	Very tall		Yes	Yes		Yes	Tree
Lemon	About my height			Yes	Yes		Shrubs

T: Let us now quickly revise what we discussed and by the end of the revision, we will define what herbs, shrubs and trees are.
S: Students to recall what the teacher did, step by step, share any additional observations that they had about the shrubs, trees and herbs
T:
Herbs: Plants with green and tender stems are called **herbs**. They are usually short and may not have many branches.
Shrubs: Some plants develop branches near the base of the stem. The stem is hard but not very thick. Such plants are called **shrubs**
Trees: Some plants are very tall and have hard and thick stems. The stems have branches in the upper part, much above the ground. Such plants are called **trees**

(Open ended/ Factual)

Factual:

- What are two ways that tree branches can differ from each other?
- Describe the difference between the stems of a tree and the stems of a herb?

Open-Ended:

- How might the height and branching pattern of a plant help it survive in its environment?

- Why are some stems hard while others are soft?

- **Each group** finds and observes at least **three different plants** in the school compound.
- They **discuss and fill in** the graphic organizer.
- They write one **concluding sentence** for each plant, justifying its classification.
  Example: *"The banyan tree is very tall, has a thick woody stem, and its branches grow high above the ground. It is a tree."*

Indoor Discussion & Sharing

Groups return to class and **quickly share** their findings.
The teacher facilitates discussion, asking:

◈ *How did you decide whether a plant was a herb, shrub, or tree?*

◈ *Did any plant surprise you? Why?*

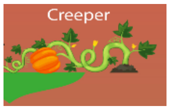
◈ *Did different groups classify the same plant differently?*

Let's discuss!

The class **compares observations** and refines their understanding.

Pine

3.Which of the following is the correct match between the



characteristics of stem and the category of plant?
(a) weak stem which cannot stand upright: Shrub
(b) green tender stem : Creeper (A creeper grows horizontally on the ground)
(c) thick, hard stem with branching near the base: Tree
(d) thick, hard stem with branches high on the plant : Herb

4. The tomato plant is a:
   (a) Herb
   (b) Shrub
   (c) Tree
   (d) None of the above

5. Mango tree is a:
   (a) Herb
   (b) Shrub
   (c) Tree
   (d) None of the above

Home Work

Go to a nearby park or garden, take a nature walk and identify at least 2 examples of each, herbs, shrubs and trees. While you do this, make sure to note your observation of their characteristics in

		a table. You can also draw their pictures in your notebook. *(If you're not sure about the name of the plant, ask an adult for help and record the name along with your observations.)*
Let us now look at the strawberry and a money plants again:  **(Strawberry Plan)**  **(Money Plant)** Would any of you like to state your observations of both of these plants? S: Students share their observations T: We do see that the Strawberry plant gives us a sweet fruit like strawberry, whereas money plant gives us heart shaped plants. In terms of height: I see that the strawberry plants grows horizontally, whereas the money plant grows vertically? T: Let's again put our observations in the form of a table like we did before. T: On the basis of all your observations, we have found 2 new categories of plants apart from herbs, shrubs, trees. That is **Climbers** are plants with long, weak stems that cannot stand upright on their own. To reach sunlight and grow vertically, they use special structures like tendrils or aerial roots to climb and attach themselves to surfaces such as trees, walls, or fences.	**TLMs (Teaching-Learning Materials):** Now, in your groups, we will explore five different plants and classify them as climbers or creepers. Remember to note your observations carefully. Think about how these plants grow and whether they need support or not." Divide the class into groups of three. Hand out the TLMs (pictures or plants, graphic organizer, and markers). **T:** "Once you classify the plants, write a concluding sentence for each, explaining why it is a climber or a creeper." Each group examines the pictures or plants and fills out the graphic organizer. **Example Observations:** Grapevine: "Grows upward using tendrils to climb walls or fences. **Climber.** "Watermelon: "Grows horizontally on the ground. **Creeper.**" The teacher clarifies misconceptions. Students justify classifications based on growth direction, support structures, and stem strength.	1. State the difference between climbers and creepers 2. Give at least 2 examples each of climbers and creepers 3. Why do creeper plants spread along the ground instead of growing upright? 4. A climber has a stronger __________ as compared to a creeper. **Home Work** Go to a nearby park or garden, take a nature walk and identify at least 2 examples of climbers and creepers. While you do this, make sure to note your observation of their characteristics in a table. You can also draw their pictures in your notebook

Creepers: Creepers are plants with weak stems that grow horizontally along the ground or a surface. They lack the strength to stand upright on their own **CFU (Open ended/ Factual)** **Factual:** - Name a few creepers and climbers that you have seen around you. - What is the difference between plant stem and branches? **Open-Ended:** - How do you think the water flows within the stems of a plant? (ESR: Roots drink water from the soil. The water travels up tiny tubes inside the stem. Leaves pull the water up as they lose water to the air.) - What happens if we put an obstruction on the path of a climber or a creeper?	Each group creates a mini-poster illustrating a climber and a creeper with drawings or fun facts. Groups present one plant and explain their classification.	

Closing

Let is revise what we have learnt today:

3 things that you have learnt today.

2 things that you found interesting

1 question that you have

Assessment Questions on Concept 1:

1. What are the different ways in which plants can be classified?
2. Name two plants that are herbs.
3. Give two examples of shrubs.
4. Give two examples of trees.
5. Which of the following is the correct match between the characteristics of stem and the category of plant?
   (a) weak stem which cannot stand upright: Creeper
   (b) green tender stem : Shrub
   (c) thick, hard stem with branching near: Tree the base
   (d) thick, hard stem with branches high: Herb on the plant
6. Classify the following into herbs, shrubs, and trees.
   Wheat, Henna, Coconut, Paddy, Bougainvillea, Carrot, Banyan, Lemon, Eucalyptus, Cabbage.
7. Classify the following into climbers and creepers.
   Strawberry, Bitter gourd, Grapevine, Money plant, Pea plant.

Period 4.2:.

Concept 2: 4.2 - Stem - Activity 2,
4.3Leaf - Activity 3

Learning Objective/s:

Students will be able to

- identify and label the main parts of a plant, including stem, leaves

Prior concept and skill:

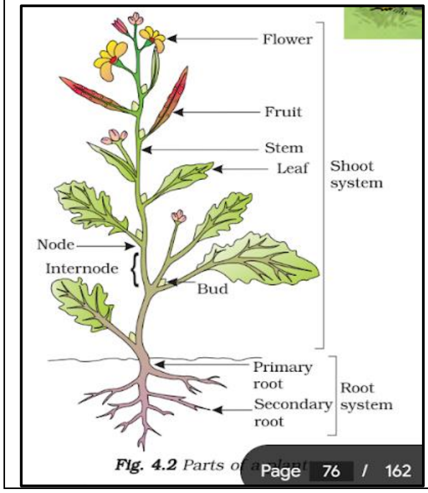
Students know the parts of plants like stem and leaf and their minimum characteristics.

Teaching Learning Materials:

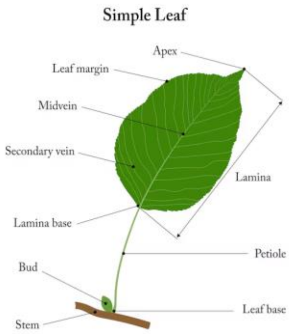
a glass, water, red/blue ink and a soft stem
paper, pencil and paper.

Igniting activity:

Showing the plant picture or specimen teacher should pose questions about stem and leaf.

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
In our previous activity we have explored different parts of a plant, now let's come together and give names to these parts of the plant, we will also try and guess what could possibly be the functions of these parts. We might not know for sure in this lesson but in the upcoming lessons we will dive deeper into the functions of each of the parts. Teacher to draw the following image on the blackboard without the labels at first.  ***Fig. 4.2*** *Parts of a plant*	The teacher briefly reviews the parts of a plant (roots, stem, leaves, flower, fruit/seeds) using the previously drawn diagram on the board. ○ Divide students into groups of 4-5. ○ Distribute the materials to each group. ○ Provide each group with a graphic organizer to plan their plant model, including: ■ Name of the plant. ■ A brief description of its function and appearance. ○ **Task:** Each group creates their plant using the materials provided. They must include all the following parts: ■ **Roots**: Use coffee grounds, brown paper, or string. ■ **Stem**: Use straws or pipe cleaners. ■ **Leaves**: Use green craft paper. ■ **Flower**: Use fake flowers or colored paper.	1. Classify the following parts of a plant into root system and shoot system A. Stem B. Secondary root C. Primary root D. Node E. Internode F. Leaf G. Fruit H. Flower 2. Define the root system and shoot system in your words. Q1. What is the main part of the leaf called? Q2. Imagine you are a tiny insect crawling on a leaf. Describe what you might see and feel as you explore its surface. Q3. ____ Connects the leaf to the stem **Homework**

And with the students one by one, on the basis of their labeling of their plant specimen, mark on the blackboard. Teacher to first ask students, What do you think could be the role of this part in the overall functioning of the plant and why? After taking responses to this question, the teacher then gives the part a name. Stem and its functions Teacher to bring a plant specimen to class. We at the start of this chapter, identified and labelled different parts of a plant Let us now deep dive into the shoot system. How many of you remember what is the shoot system in a plant? Student: Shoot is the upper part of the plant, whereas the root is the one underneath the soil. T: Yes, in the shoot system, today we will understand what a stem is and what its functions are. Teacher to bring a plant specimen along with its roots to the class. Add the specimen in a blue ink bowl. After some time, the students will notice that the colour of the plant turns blue. T: Why do you think the colour is turning blue? S: This happened because the roots absorb water from the soil. T: But how do you think it traveled up to the stem, what does this tell you about the stem? S: It could be because the stem takes the absorbed water and gives it to the leaves T: Yes, one major function of the stem is to conduct the water from the roots to the leaves. The water and minerals reach the leaves and other parts of a plant through the stem.	■ **Fruits/Seeds**: Use beads or seeds. ○ **Creative Twist:** Encourage groups to make their plants unique by adding special features (e.g., groups can be given some scenarios e.g. desert, place with low sunlight, etc. and they can pick 1 and show a possible plant adaptation). ○ Groups create a unique name for their plant and write a short explanation for the name. ○ Example: "Sun Chaser Plant – Named because it has tall stems and big leaves that turn toward the sunlight!" ○ Label the parts of the plant on their model using stickers or markers. ○ Each group presents their plant to the class, explaining: ■ Its name and why they chose it. ■ The function of each part in their model. ■ Any special features they added. ○ Classmates are encouraged to ask questions, such as: ■ "Why did you make the roots so long?" ■ "How does your plant survive in harsh conditions?" **TLMs (Teaching-Learning Materials):** 1. **Leaves:** A variety of leaves (e.g., banana, peepal, grass) with distinct venation patterns (reticulate and parallel). 2. **Tracing Paper:** One sheet per student. 3. **White Paper Sheets:** For creating impressions of the leaves. 4. **Pencils and Crayons:** For tracing and coloring the leaf impressions.	In your notebooks, go back to the previous examples of herbs, shrubs and trees. Take one example of each and draw them in your notebook Identify and label different parts of each of the plants (Herbs, Shrubs and trees) Reflect: Are the parts of the plant same or a little different between herbs, shrubs and trees?

As of now, we have labelled different parts of a plant, learnt about the stem and its functions. It's time for us to dive deep into understanding the functions of a leaf in a plant. Teacher will give one leaf to every child along with a tracing paper. Instructions for getting impression of the leaf - Put a leaf under a white sheet of paper - Hold the leaf in place - Put the pencil sideways on the paper and trace the leaf and get its impression on the paper Once every child has gotten an impression. Teacher to ask the children to look at her specimen  only.  - Can you guess what the veins are for? - Do you see a prominent middle line passing through the leaf, this is the midrib. - The part of the leaf by which it is attached to the stem is called petiole. - The broad green part of the leaf is called the lamina. **Veins:** Transport water, nutrients, and food throughout the leaf.	5. **Magnifying Glasses:** To observe small details (optional). 6. **Leaf Parts Chart:** A poster or digital slide showing labeled parts of a leaf (lamina, veins, midrib, petiole). 7.Worksheet Link for group-work 8.Observation template - Link ● Show a leaf diagram and briefly review its parts: lamina, veins, midrib, and petiole. ● **Instructions for Leaf Tracing:** ○ Place the leaf under the tracing paper. ○ Hold the leaf in place and rub the pencil sideways to get the leaf's impression. ○ Observe the veins, midrib, and edges in detail on your tracing. ○ Label the parts on the tracing paper. ● **Teacher's Role:** ○ Guide students as they trace their leaves. ○ Encourage them to notice the vein patterns and other details (e.g., serrated edges or smooth margins). ○ Ask questions like: ■ "What do you notice about the veins?" ■ "How does the midrib look compared to the other veins?" ● **Group Task:** ○ Group students in pairs or small teams and ask them to compare their tracings. ○ Provide prompts for discussion: ■ Is the venation parallel or reticulate? ■ How does the petiole connect the leaf to the stem? ■ What happens if the midrib is damaged? ○ Each group completes the observation worksheet together. ● **Teacher's Role:**	

Midrib: Provides support and structure to the leaf. **Petiole:** Attaches the leaf to the stem and helps in the transport of nutrients. **Lamina:** Captures sunlight for photosynthesis. Do you see that the veins in the leaf make a design? Where else have you seen veins? Do humans also have veins? What Do veins look like in the body of a human? If the veins are parallel to one another it is called parallel venation. If the veins are net like it is called reticulate venation. **CFU (Open ended/ Factual)** **Factual:** - What are the main functions of roots in a plant? - What role do leaves play in the process of photosynthesis? - What is the role of veins in a leaf? - Describe the difference between parallel venation and reticulate venation? **Open-Ended:** - What would happen to a plant if it didn't have roots? Explain your reasoning? - How do the leaves contribute to the health of a plant?	○ Rotate between groups to facilitate discussions and clarify concepts. ○ Highlight differences in leaves (e.g., “Look at how straight the veins are in the banana leaf compared to the peepal leaf”). ● **Group Presentations:** ○ Each group shares one interesting observation (e.g., "We found parallel venation in the grass leaf"). ● **T:** Use the leaf parts chart to recap and validate students’ findings	

Closing
Create a flow chart on different parts of a plant along with the students. *(A flow chart is a flow diagram to show the steps in a process.)*
Parts of a plant: Root system and shoot system
Shoot system: Stem, leaf

Assessment Questions on Concept 2:

1. Which part of the plant is strong and above the stem?
2. What are the functions of the stem?
3. What is venation?

Period 4.3

Concept 2: 4.3 Leaf - Activity 4, 5

Learning Objective/s: Students will be able to understand the functions of leaf.

Prior concept and skill:

Students will be able to

- gain the knowledge of structure of leaf and different parts.

Teaching Learning Materials:

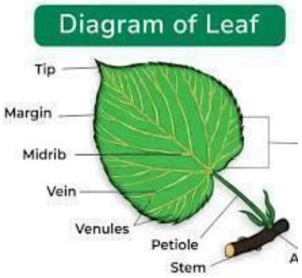
a herb, two transparent polythene bags and thread.

a leaf, spirit, a beaker, test tube, burner, water, a watch glass and iodine solution

Igniting activity:

Showing the plant picture of transpiration activity the teacher should pose questions to start the lesson.

Explicit teaching/Teacher Modelling (I Do)	Group Work *(We Do)*	You do (independent practice)
Plants have a special ability to make their own food through a process called **photosynthesis**. At the same time, they also release water vapor into the air through **transpiration**. These two processes are closely linked and happen in the leaves. **Photosynthesis: How Plants Make Food** Photosynthesis is the process by which **green plants** use sunlight, carbon dioxide, and water to make their own food. It happens mainly in the **chlorophyll** inside the leaves. **What do plants need for photosynthesis?** Sunlight – The energy source for the process Carbon dioxide – Taken in from the air through tiny openings called stomata Water – Absorbed by the roots and transported to the leaves through veins **Transpiration:** How Plants Lose Water	**ACTIVITY:** Divide the class into small groups (3-4 students per group). Assign each group a hypothesis or allow them to choose one from the following: *Does plant food contain starch?* *At what time of the day do plants release the most water vapour through transpiration?* Provide guiding questions to help them plan their experiment: *For starch test:* "How can we check for starch in leaves? Have you seen the experiment with iodine in Chapter 1?"	**Question:** Which part of the leaf is responsible for the majority of photosynthesis? a) Petiole b) Midrib c) Lamina d) Veins 2. Fill in the Blank: **Question:** The tiny pores on the underside of a leaf that allow for gas exchange are called __________. 3. Short Answer: **Question:** Explain the role of veins in a leaf. 4. Diagram Labelling:

While photosynthesis is happening, leaves also release water vapor into the air through a process called transpiration. This happens through the stomata (small openings on the leaf surface). **Why is transpiration important?** Cools the plant – Just like sweating cools our body Helps in water transport – Creates a pull that draws water from the roots to the leaves Maintains the flow of nutrients – Essential minerals travel with water to different parts of the plant **Questions:** Why do plants droop when they don’t get water? *(This is because excessive transpiration has made them lose too much water.)* Why do farmers often water their plants **early in the morning or late in the evening?** *(It is to reduce transpiration losses, as the heat of the day speeds up water evaporation.)* **CFU (Open ended/ Factual)** **Factual:** What is the primary role of the lamina, and why is it important for photosynthesis? What is the function of the petiole? **Open-Ended:** Why is photosynthesis important not only for plants but also for humans and animals? What do you think would happen to plants and other living things if there were no leaves?	*For transpiration test:* "How can we collect water vapour released by the plant? Will tying a plastic bag around the leaf help? What kind of bag should you use?" Students design their experiments on chart paper, listing materials needed, steps, and expected results. Each group presents their experiment design to the class. The teacher shows a video of the actual experiment or demonstrates it for verification and explanation of results. *acher’s Role:* Provide hints and guiding questions if students struggle. Facilitate discussion on how scientists use experiments to prove or disprove theories.	**Question:** Label the following parts of a leaf diagram: lamina, petiole, midrib, veins.  Leaf Diagram 5. Application: **Question:** How might a thick, waxy coating on a leaf help the plant survive in a hot, dry environment? **Homework** Research and Explain: Find a plant that is adapted to live in a dry environment. How does the structure of its leaves help it conserve water? Creative Writing: Imagine you are a water molecule. Describe your journey through a plant, starting from the roots and traveling to a leaf.

Closing

- Create 3 things that you have learnt in the lesson
- 2 things that you need to revise
- 1 questions you have

Assessment Questions on Concept 2:

1. What are the two major functions of the leaf?

2. What is transpiration?
3. What is photosynthesis?

Period 4.4

Concept 2: 4.4 - Root - Activity 6, 7

Learning Objective/s:

Students will be able to

- understand the functions of the root.

Prior concept and skill:

Students gained the knowledge of the structure of roots and their functions.

Teaching Learning Materials:

two pots, some soil, *khurpi* (for digging), blade or a pair of
seeds of gram and maize, cotton wool, *katori* (bowl) and some water.

Igniting activity:

Showing the plant picture the teacher should pose questions to start the lesson

Explicit teaching/Teacher Modelling (I Do)	Group Work *(We Do)*	You do (independent practice)
Teacher displays **two pictures** from the textbook: 1. A person watering plants **at the base (near the roots)**.  2. A person watering plants **only on the leaves**.	● **Teacher:** "Today, we'll discover the hidden world of roots! Have you ever wondered what roots really do for plants? Let's explore by observing roots firsthand." ● Briefly explain the safety rules: ○ Only pull out one plant per group. ○ Do not harm other plants. ○ Wear gloves while handling soil and plants. ● Divide the class into **groups of 4 students**. ● Assign roles to each group member: ○ **Plant Collector:** Pulls out one plant carefully. ○ **Observer 1:** Examines the root structure using a magnifying glass.	● State the 2 major functions of the roots of a plant ● How do plants stand firmly on the ground even in heavy rain and wind conditions? ● Can you think of a plant that stores food in its roots? **Homework** ● Find out which plant species have edible roots (e.g., carrots, sweet potatoes, radishes).

 - How do you usually water plants at home? - Which method do you think is more effective? Why? - Where do you think plants absorb water from? In our previous lessons, we have learnt about different parts of a plant. In this lesson we will dive deeper into one such part, that is the roots To understand the functions of roots in sustaining a plant, let’s do an activity. **Materials:** -We would require plants of gram (with roots) and (without root)gram plants. Teacher to bring the separated plants of gram to class. -A bowl of ink water. Teacher: I will dip the gram plant (with roots) and the gram plant (without roots) in the water. After Sometimes, students would notice that the gram plant starts to turn blue whereas the gram plant (without roots) didn’t. CFU: Why do you think this could be happening? S: Because one has roots and the other doesn’t. T: Would it be right to say that one of the functions of roots is to soak in water for the plant? **CFU (Open ended/ Factual)** **Factual:** - What role do roots play in the growth of a plant?	○ **Observer 2:** Measures and notes the length and texture of roots. ○ **Recorder:** Fills in the worksheet with group findings. ● Each group identifies a plant with roots and gently removes it from the soil using gloves. Water can be used to loosen the soil if needed. ● Groups place the plant on a tray or newspaper and examine the roots closely. ● Using the magnifying glasses and reference chart, students observe and record: ○ The type of root (taproot or fibrous root). ○ The size, shape, and color of the roots. ○ Any additional observations, such as soil ○ attached to the roots. ● Groups gather in a circle to share their findings. ● **Teacher prompts:** ○ “What did you notice about the roots? Were they long or short?” ○ “Did the roots have soil stuck to them? Why do you think that happens?” ○ “How do you think the roots help the plant stay healthy?”	● Have you ever noticed how soil washes away easily in areas with no plants, but in places with trees and grass, the soil stays in place? Why do you think this happens?

- What would happen to a plant if its roots were damaged or removed? **Open-Ended:** - Why do you think some plants have long, deep roots, while others have short, shallow roots? - Roots grow underground and are not visible like other parts of a plant. Why do you think their job is just as important as leaves or stems?		

Closing (4 Minutes)
With your partners, share something new you learnt about roots
And one thing you are curious to research about after today's lesson.

Assessment

1. What are the functions of root?
2. What happens if the root system is not developed in a plant?

Period 4.5:

Concept 2: Root - Activity 8,9

Learning Objective/s: Students will be able to understand the types and functions of roots.

Prior concept and skill:

Students gained the knowledge of the structure of roots and their functions.

Teaching Learning Materials:

1. **Specimens of plants:** Onion (fibrous root) and carrot (taproot), as well as additional plants like spinach, wheat (fibrous root), radish, and beetroot (taproot).
2. **Magnifying glasses:** For detailed observation of the root structure.
3. **Worksheets:** A chart for recording observations (root type, length, structure, and examples).
4. **Root identification chart:** Visual reference of taproots and fibrous roots.
5. **Plastic trays:** For placing plant specimens for observation.
6. **Water spray bottles:** To moisten roots for better observation without damaging the structure.

Igniting activity:

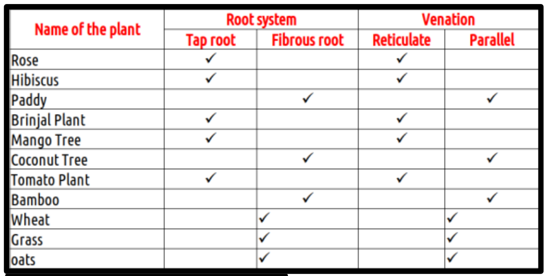
Showing the plant picture the teacher should pose questions to start the lesson

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
In our previous lesson, we spent some time trying to understand the functions of roots, let us now understand if all roots are similar or different? Do you think all roots would look the same?	● Divide the class into **groups of 4 students** and distribute materials.	Q1. Create a list of at least 3 of each fibrous root plants and taproot plants. Q2. Differentiate between fibrous root plants and taproot plants.

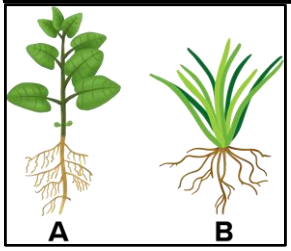
S: Students will share their responses to this
T: Teacher will probe for reasoning
Let's watch a video together
[Parts of a Plant - The Root | Environmental Studies Grade 3 | Periwinkle]
(This video should be played only from 0.29-2:11)

Definition:
Tap root: There are some plants that have one main root and many small roots that branch out from the main root. The main root is called the tap root. The many small roots are called lateral roots.

Fibrous root: Some plants do not have a single main root. Instead, they have many thin, thread-like roots that grow from the stem and spread out in all directions. These roots are called fibrous roots. Such roots are common in grasses and many flower plants.
Can you think of any examples of plants that have tap roots and fibrous roots?
Look at the leaves of different plants. What do you notice about the veins?



Name of the plant	Root system		Venation	
	Tap root	Fibrous root	Reticulate	Parallel
Rose	✓		✓	
Hibiscus	✓		✓	
Paddy		✓		✓
Brinjal Plant	✓		✓	
Mango Tree	✓		✓	
Coconut Tree		✓		✓
Tomato Plant	✓		✓	
Bamboo		✓		✓
Wheat		✓		✓
Grass		✓		✓
oats		✓		✓



- **Observation 1**: Plants with taproots often have reticulate venation in their leaves.
- **Observation 2**: Plants with fibrous roots often have parallel venation in their leaves.

Each group receives **specimens of plants** (onion, carrot, spinach, wheat, radish, beetroot) and a **worksheet** to fill out based on their observations.

Step-by-Step Process:

- ○ Students carefully place the plant specimens on a plastic tray and spray water if needed to loosen the soil and clean the roots for better observation.
- ○ Using a magnifying glass, students examine:
  - ■ The structure of roots (main root or multiple roots).
  - ■ The size, shape, and arrangement of roots.
- ○ Groups use the **root identification chart** to classify the plants as having either **taproots** or **fibrous roots**.
- ○ Example: Carrot → taproot, Onion → fibrous root.
- ○ Groups compare the appearance and function of the roots:
  - ■ Taproot: One main root with smaller lateral roots, ideal for deep water absorption.
  - ■ Fibrous root: Many roots of similar size, better for holding soil.
- ○ Students write their findings on the **worksheet** under columns like:
  - ■ Plant name
  - ■ Type of root (taproot/fibrous root)

Q3. Which type of root system would be better suited for the following environments, and why?

i) Dry Environment (e.g., desert or drought-prone areas)

ii) Area with High Rainfall (e.g., tropical rainforest or marshy land)

Homework: At your homes, soak, gram and maize seeds in a bowl. Place cotton underneath it and keep sprinkling water on it. After a week, share your observations about the roots of the both seeds with us in class.

Can you find some plants around you and check whether their leaves and roots follow this pattern? **CFU (Open ended/ Factual)** **Factual:** - What is the main structural difference between a tap root system and a fibrous root system? - Name two plants that have tap roots and two that have fibrous roots? What do they have in common? **Open-Ended:** - **Compare and contrast** how a plant with a taproot (like a carrot) and a plant with fibrous roots (like grass) might deal with a strong windstorm. Which plant do you think would be more likely to stay upright? - **Think about different types of soil.** Do you think plants with fibrous roots or taproots would grow better in loose, sandy soil? Why?	■ Characteristics (e.g., long, deep, shallow, spread out) ○ Groups can use **sticky notes** to label their plant specimens as “Taproot” or “Fibrous Root” and arrange them in two separate categories on a display tray. ● Groups gather and present their findings to the class, explaining: ○ The type of root their plants had. ○ How they identified it as a taproot or fibrous root. The importance of each root type for the plant's survival	

Closing

Teacher to create a mind map of the root system with the students on the black board. In the mind map, do include

- Types of roots
- Functions of roots along with a drawing of their picture

Assessment

1. How many types of root systems are there? What are they?
2. Give examples for plants with a tap root system and fibrous root system.

Period 4.6:

Concept 2: 4.5 - Flower - Activity 10,11

Learning Objective/s:

Students will be able to

- understand the structure of a flower.
- draw the diagram of flower.

Prior concept and skill:

Students gained the knowledge of structure of flower and its parts.

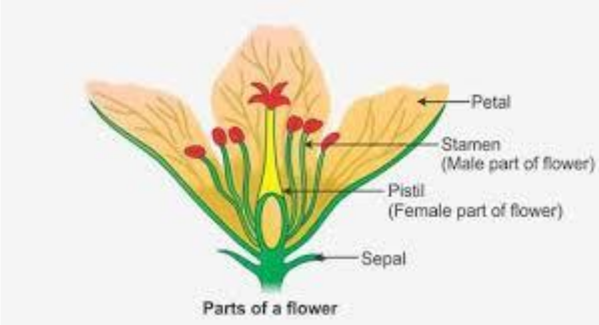
Teaching Learning Materials:

one bud and two fresh flowers each, a blade, a glass slide or a sheet of paper, a magnifying glass and water.

Igniting activity:

Showing the plant picture of flower or its specimen the teacher should pose questions to start the lesson

Explicit teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**You do (independent practice)**
Who can tell me which parts of a plant we have studied till now? S: Root system, shoot system, within shoot system, stem, roots, leaf. T: lovely, today we will learn more about flowers. T: How many of you love flowers? T: What flowers do you like? T: Teacher to show the following flowers on the screen to children and ask What all can you see in this flower  S: We see petals, we see stem like structures, etc T: Teacher to group students in groups of 4. Each group to have at least one hibiscus flower in their groups T: Teacher to have a hibiscus flower drawing on the board. Let's try to explore the parts of these flowers together. Today we will just start by naming these parts	● Divide students into **groups of 4**, ensuring each group has the necessary materials. 1. **Observation:** ○ Each group examines their flower using magnifying glasses and notes down visible features like petals, stem-like structures, and sepals. ○ Encourage students to touch and gently manipulate the flower to observe its texture and arrangement. 2. **Dissection:** ○ Using scissors and tweezers, students carefully dissect the flower to isolate its parts (petals, stamens, pistil, sepals). ○ Each part is placed on the **plastic tray** for clear observation. 3. **Naming the Parts:** ○ Groups use the **reference charts** to match the dissected parts to their names (e.g., petals, sepals, stamens, pistil). ● Each student individually draws their flower in their notebook.	1. Draw a picture of your favourite flower and label the different parts of it 2. Make a list of all the parts of a flower What is the main function of a flower? What are the four main parts of a flower? How do petals help in pollination? How do sepals protect the developing flower bud? What is the difference between the anther and the filament? **Homework** 1. If you were to give a name to the different parts of a flower, what would you name them as and why Think about these questions and write your answers to the same How do you think the shape and color of petals help a flower attract pollinators?

 Let's start with the lowermost part of the flower. As we label the plants, we will also think of what their possible role might look like, this might not be true, we will understand their role tomorrow. But for today we will guess according to our observation of the structure of the flower. T: Teacher to one by one name the different parts of the flower mentioned above and also write down students responses to the question What do you think would be the role of this part of the flower? **"Think of a flower as a tiny factory for making seeds."** Yesterday, we learned about the different parts of a flower and labeled them. Today, we'll explore how these parts work together to help plants reproduce. Imagine a flower as a factory, where each part has a special role: - **Sepals** – These are like the factory's security guards, protecting the flower bud before it blooms. - **Petals** – Acting as the marketing team, their bright colors and scents attract pollinators like bees and butterflies. - **Stamens (Male Reproductive Part)** – These are the pollen producers, similar to a warehouse making tiny pollen grains. Each stamen consists of: - **Filament** – A stalk that holds up the anther.	● They label the parts based on their group's observations and use **color pencils** to highlight: ○ **Petals:** Bright colors ○ **Stamens:** Yellow ○ **Pistil:** Green ○ **Sepals:** Dark green ● Students share their drawings with group members and compare their work. ● Groups discuss if anyone missed any part or misidentified a structure. Activity 2 ● Divide the class into **two teams**, ensuring an equal mix of active participants and guessers in each group. **Rules and Setup** 1. Each team takes turns. 2. A player from the acting team draws an **index card** with a description of a flower part's function. 3. The player must act out the function using **gestures, props, or miming**—no words or sounds are allowed.	What would happen if a flower did not have sepals? Why do you think the anther is located at the tip of the filament?

- **Anther** – The part that produces and releases pollen. - **Pistil (Female Reproductive Part)** – This serves as the receiving area of the factory where pollen arrives. It includes: - **Stigma** – A sticky surface that captures pollen. - **Style** – A tube that connects the stigma to the ovary. - **Ovary** – The part that contains the ovules, where seeds are formed after fertilization. Let's watch a short video that will bring this process to life. Pay close attention to how pollen moves from one flower to another and how seeds begin to form. Parts of a Flower and their Functions **CFU (Open ended/ Factual)** **Factual:** - Can you describe the location and appearance of the different parts of a flower, like the petals, stem-like structures, and the lowermost part ? - What are the reproductive parts of a flower? - What are the roles of the sepals and petals, and how do they protect and support the flower? - How does the sticky stigma help to ensure that pollen grains reach the ovary? **Open-Ended:** - Imagine you are an insect visiting a flower. What are some things about the flowers that would attract you to it? - Look at the petals of a flower. How might their bright colors and often fragrant scent help the flower? - What would happen if a plant had no flowers? How would it affect its ability to reproduce? *(Encourages students to think about the role of flowers in reproduction.)*	4. Their team has **30 seconds** to guess the function. 5. If the acting team fails to guess, the opposing team gets a chance to answer. ○ Players use creative gestures and props (e.g., using a scarf to mimic petals waving in the wind to attract pollinators). ○ Teams guess phrases like "protects the flower bud" (sepals) or "receives pollen" (stigma). ○ After a correct guess, the teacher asks a **follow-up question** to deepen understanding (e.g., “Why is it important for petals to attract pollinators?”). Correct answers earn an extra point. ● **Teacher:** “Fantastic teamwork and acting! Let’s recap what we learned about the roles of flower parts. Why do you think every part is essential for reproduction?” ● Students share key takeaways from the game.	

- Have you noticed that some flowers are bright and colorful while others are small and less noticeable? Why do you think flowers look so different?		

Closing:

- Three things you have learn today
- Two things you want to learn tomorrow
- One question that you have

Assessment

Fill in the blanks with appropriate words:

1. Water travels up the stem through …………. inside the stem.
2. The thick vein in the centre of the leaf is called ………….. .
3. The design made by ……………. in a leaf is called venation.
4. Leaves have ……………. shapes, sizes, edges, tips, etc.
5. Water comes out of leaves in the form of vapour by a process called ………………. .
6. Green leaves make food from ………………………, air and water by a process called photosynthesis.

Choose the correct option in the following questions:

i. Which of the following types of plants has thick, hard and woody stems?
(a) Tree (b) Shrub (c) Herb (d) All of these

ii. Which is not a part of a leaf?
(a) Petiole (b) Lamina (c) Veins (d) Nodes

iii. Parallel venation is not found in ………. .
(a) Sugarcane (b) peepal (c) maize (d) wheat

iv. Which one of the following is a function of leaves?
(a) Photosynthesis (b) Transpiration (c) Both (a) and (b) (d) To support fruit

TEACHER'S DIARY

Name of the Teacher:				**Name of the Month:**	
Name of the Lesson:				Class:	
Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
4.1	Introduction 4.1 Herbs, Shrubs and Trees Activity 1				
4.2	4.2 Stem - Activity 2, 4.3 Leaf - Activity 3				
4.3	Leaf - Activity 4,5				
4.4	4.4 Root - Activity 6, 7				
4.5	Root - Activity 8,9				
4.6	4.5 Flower – Activity 10,11				

1	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

5

BODY MOVEMENTS

T7Z5D9

Learning Outcomes:

By the end of this lesson, students will be able to:

1. Explain the importance of joints in the human body, identify different types of joints, give examples, and describe how each type allows movement.
2. Describe the role of the human skeleton in providing support and protection, identify different bones, and explain the function of cartilage.
3. Demonstrate how muscles work and explain their role in body movement.
4. Compare the movement patterns (gaits) of different animals and identify the body parts that help them move.
5. Analyse how joints, bones, and muscles work together to enable movement in humans and animals.

Learning Objectives

Concept 1: Joints - Types and examples

Students will be able to:

1. explain the importance of joints in the human body
2. name the types of joints in the human body.
3. give examples of each type of joint in the human body.
4. describe the extent of movement/motion for each type of joint.
5. construct models of various joints using materials from their surroundings and explain how they work.

Concept 2: Human Skeleton - Parts and Functions

Students will be able to:

6. describe the importance of the skeleton for the human body.
7. describe the role of X-rays in medicine.
8. identify bones in different parts of the human body.
9. give examples of cartilages in the human body.
10. explain the role of muscles in body movement.
11. demonstrate how muscles work by making a model.

Concept 3: Gaits of Animals

Students will be able to

12. compare the characteristic features of body movements of various organisms.

identify the body parts responsible for animals showing different gaits.

Prior Concept/ Skills:

- Knowledge of major organs in the human body and their functions.
- Observing things around them - the movement of different animals.
- Distinguishing between different characteristics like hard and soft.
- Data collection and recording for activities in the form of a table.

Teacher References:

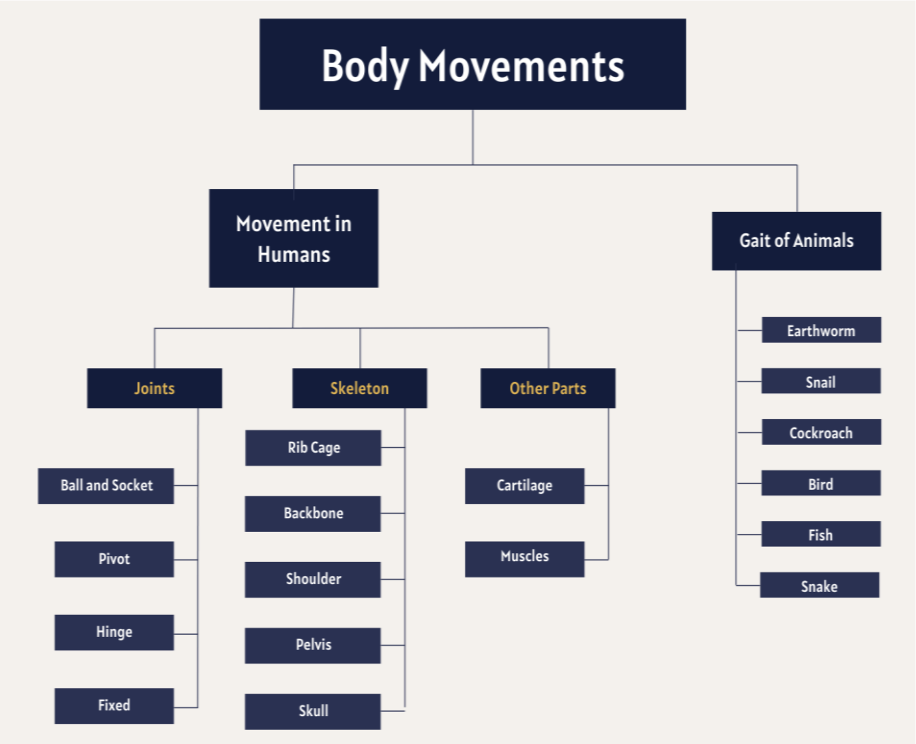
- NCERT Textbook

- Human Body System, Eklavya
- Concept 1 - Video
- Body Movements - Slide Show

Teaching Learning Material (TLM):

- 4 movement cards with different movements written on them
- Wooden ruler
- Rubber bands
- Print out of the human skeleton
- For making joint models - Clay, cardboard, scissors, wooden sticks/ice cream sticks/straws. glue, rubber bands, etc
- Joint model videos:
    - Pivot joint
    - Ball and socket joint
    - Hinge joint
- Mind map reference video (for teachers)
- Mind map sample
- XRays Group Work (Period 5)
- Model of skeleton
- Model of skull/ Image of skull
- Skeleton IP Practice sheet
- How muscles work together
- How muscles work - activity sheet.

CONCEPT MAP



SYNOPSIS

1. Movement in Humans

Different parts of the body are involved in helping humans to move. The main parts that are involved in movement in humans are:

Joints

- Joints are the points where two parts of the skeleton are fitted together to make movement possible.
- Examples are the hip joint, elbow joint, knee joint, etc
- Joints are of the following types:

  Ball and Socket Joint
  - Ball and socket joint, where the rounded end of one bone fits into the cavity of the other bone.
  - It brings movement in all directions.
  - It is seen in the hips and shoulders of the human body.

  Pivot Joint
  - A pivotal joint is where a cylindrical bone rotates in a ring.
  - It joins the neck to the head.
  - It allows us to bend the head forward and backwards and turn it to our left or right.

  Hinge Joints
  - Hinge joints bring about movement only in the back and forth direction.
  - The knees and elbows have hinge joints.

  Fixed Joints
  - Fixed joints are immovable joints because the bones are joined together.
  - Such joints are found in the skull.

2. Skeleton

- A skeleton is an internal structure in organisms that helps bring about movement.
- It forms a framework that gives the shape of the body and provides support to organisms.
- The skeleton is made up of bones.
- Different kinds of bones are joined to each other in a particular manner.
- These joints facilitate various types of movements.
- Various parts of the skeleton include:
  - ○ Rib Cage
  - ○ Backbone
  - ○ Pelvis
  - ○ Shoulder
  - ○ Skull

3. Muscles

- Muscles are parts of the body that help in bringing about movement.
- Muscles may be attached to bones (humans) or may work alone (earthworms).

4. Cartilage

- Part of the skeleton that is not as hard as bones and can be bent is cartilage.
- They are found in the upper part of the ear, the tip of the nose and at the tips of long bones.

5. Gaits of Animals

- The different patterns of movement of animals due to the differences in their skeletal structure are called gaits of animals.

6. Earthworm

- The earthworm does not have any internal skeleton.
- The body is made up of many rings joined end to end, and muscles attached to these rings help to extend and shorten the body.
- The skin of earthworms also has a large number of tiny bristles that help them get a good grip on the ground.
- Repeated extension and contraction of the body muscles enable the earthworm to move through the soil.

7. Snail

- Snails move with the help of their muscular, flat foot.
- They glide along a solid surface which is lubricated with mucus.
- This motion is powered by succeeding waves of muscular contractions of the foot.

8. Cockroach

- The body of a cockroach is covered with a hard outer skeleton that is made of different units joined together.
- It has three pairs of legs for walking and two pairs of wings attached to the breast for flying.
- It has distinct muscles that are used for movement.
- The muscles attached to the legs help in walking.
- The breast muscles attached to the wings help in flying, although they are not good flyers.

9. Birds

- Birds have special skeletal and muscular structures that help them to fly.
- The forelimbs are modified to become wings, and the bones inside are hollow to suit flying.
- The bones of the hind limbs are used for perching and walking.
- The shoulder bones and breast bones are strong and support muscles of flight, which move the wings up and down.

10. Fish

- Fishes have streamlined bodies that help them swim with the least resistance.
- They use their tail fin for small jerks through water, and other fins assist swimming.
- The tail fin is also used for changing directions.

11. Snakes

- Snakes do not have legs for movement but use their long backbone along with muscles for movement.
- Their bodies curve into many loops, which gives them a forward push by pressing against the ground.

Period-wise Topics

Chapters and Concepts

Period number	Topic	Remarks
5.1	Introduction 5.1 - Human Body and its movements - Activity 1	
5.2	Ball and socket joint - Activity 2, Pivotal joint, Hinge joints - Activity 3, Fixed joints	
5.3	Skeleton - Activity 4 (Rib cage, Backbone, Shoulder bone, Pelvic bone, Skull)	
5.4	Cartilage, Muscle, Muscle Contraction	
5.5	5.2 - Gait of Animals Earthworm - Activity 5 Snail - Activity 6 Cockroach - Activity 7	
5.6	Birds, Fish - Activity 8	
5.7	How do snakes move?	
5.8	Student Independent Practice	
5.9	Remedial teaching	

Concept 1: Human Joints - Types and Examples

Teaching Learning Process

Learning Objective/s:

Students will be able to:

1. Explain the importance of joints in the human body.
2. Name the types of joints in the human body.
3. Give examples of each type of joint in the human body.
4. Describe the extent of movement/motion for each type of joint.

Construct models using materials from their surroundings and explain how they work.

Introduction: In this part, students will learn about the importance of joints and the different types of joints in the human body. For each type of joint, they will learn about the movements allowed in that joint and the parts of the body where they can find that joint.

Vocabulary:

♦ **Joint:** A point in the human body where two bones are joined or connected. These are the parts of the body that allow movement.

♦ **Cavity:** A hollow space.

♦ **Ball and Socket**: A type of joint that allows free movement. One end of a bone fits into a cavity in another bone.

♦ **Pivot:** A point about which something turns. In human bodies, a type of joint.

♦ **Hinge:** The device that connects doors /windows to the walls. In human bodies, a type of joint.

Hook : Movement Charades game:

- Prepare four movement cards: Kicking a ball, Clapping your hands, Nodding your head, Writing.
- Divide the class into four groups.
- From each group, one student comes and picks a card. They act out the movement written on that card.
- Their team has to guess what movement they are trying to show.

Experience & Reflection:

1. Which part of the body was involved in the movement?

Can they bend or move the entire body part? Or is the movement only happening at a specific point?

Period 5.1:

1. Students will be able to explain the importance of joints in the human body

Explicit Teaching / Teacher Modeling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
“So, students, we have seen in this activity that some parts of the body can bend and move while other parts don’t move. So what do you think is making these parts special?” - Explain that the parts that we can bend have a connection of more than one bone in such a way that it allows movement. - Define “Joints” to the class. “Let’s take the example of our arms. Can you tell me which point of the arm we can bend?” [Allow students to answer. Some may say elbow. Others may be convinced we can move the arm as a whole.] “I will show you by demonstration that the elbow is the specific part that we can bend.	“But before we learn the details of the joints in our body, let us work in groups and try to learn a bit more about our bodies and their movements in this next activity.” - Divide the students into groups of 5 - 6 students. - Together, the students will complete the table given on **page 92** of the science textbook. “Try to move the different parts of your bodies given in the table and fill the boxes accordingly. While doing the	“Thank you, everyone, for engaging with the activity so far. I can see that we are already starting to discover a lot about the joints in our bodies. Write the answers to the next questions individually in your notebooks.” - Define joints. - Give any two examples of joints in our body. - Why are joints important to the human body? - What would happen if there were no joints in the human body?

Observe carefully." - **Demonstration:** Tie a wooden ruler to your arm, across your elbow, and show the students that this prevents you from bending the arm. - Explain how there are two different bones connected at the elbow. Draw a diagram on the board. T: "So, students, we have learnt so far that the parts of our bodies that allow movement and bending are joints. We have several joints in our bodies and they each allow some specific types of movements only. We will learn the details of each of them in the next classes." **Check For Understanding:** **Factual** - What is the function of a joint in the human body? - Name the specific joint in the arm that allows you to bend it? **Open Ended** - Why do you think some parts of the body, like the elbow, can move while others, like the skull, cannot? *(ESR: - Joints like the elbow have spaces where bones can move, but the skull bones are fused together.* *The elbow has a hinge joint that allows movement in one direction, but the skull has fixed joints that don't allow movement.)* Imagine if the elbow joint did not exist in our arms. How would this affect our daily activities and ability to move?	activity, we will think about one question - ***"Are the movements for your body the same as your friends?"*** *Please remember our class rules. You may move only your own body. Do not try to move your friend's body." - Go around the class listening to a discussion of the different groups. - Watch them perform the activity, but let them make their own choices. "Okay, students, now we will come back. We will quickly check your answers for two body parts. You can show a thumbs up if you answered yes, and a thumbs down if you answered no in your table." - Check the answers for two parts - neck and knee. - If some answers are different from others, ask them why they thought so. Invite students to share their answers to the discussion question. Take 3 - 4 responses.	

Closing

"Let's recap what we learned so far today. Take two minutes to note down any three things you learnt today and any two questions you have about joints that you want to explore in the next classes."

- Summarize the class by taking students' responses.
- Take two to three responses on what they are excited to explore in the upcoming classes.

Homework:

Google search: Find the number of joints in the human body.

Pick one activity from the following: Walking, jumping, or writing. Think of the following questions: Which joints are allowing you to do this activity?

How does that joint move while doing this activity?
Make a simple drawing to show the joints involved in this activity and their movements.

Period 5.2:
Students will be able to

1. name the types of joints in the human body.
2. give examples of each type of joint in the human body.
3. describe the extent of movement/motion for each type of joint.

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
Review the homework tasks given. Ask some students to share their homework drawings to start the class. Let all students pin their drawings on the display boards for all to see. "We will start this class by making a **KWL chart.**" Guide students to make a K (What I know), W (What I want to know), and L (What I have learned) chart. **They will fill the first two columns and leave the last column empty for now.** Give them 3 minutes to do this. Divide the board into two parts. One part will be used to draw the joint being discussed, and the other part will be used to write the main points for that joint. "Let's start exploring the different joints in our bodies. For each joint, we will learn three things - structure, movements allowed, and where it is found." [Write these labels on the board] Discuss **Ball and Socket joint - draw the structure on the board. Use a model of ball and socket joint to explain the structure and movements allowed in this joint to the students.** *(If a model is not available - attach a ball to a straw or stick and hold it in the palm of your hands to demonstrate the joint)* **Key points** - one bone has a socket (empty space). The end of the other bone (ball) fits into this socket. It allows full rotational movement in all directions. "Let's stand up in our places and try to move our	"Now, you will work in your groups to learn about the next type of joint - the Pivot Joint. Read from pg. 94 in your book, find the following information about the pivot joint - structure, movement and where it is found." "Afterwards, record your findings in your notebooks." Divide the class into their working groups. Give **8 minutes** for the groups to discuss and find the details for the pivot joint and write them in their notebooks. "Okay, now we can share our answers with the class. I will ask each group one by one. If your answer is the same as the other groups, you can give snaps to show them that you resonate with their answers." Fill in the details for the pivot joint from the answers of different groups. "Now, discuss the following questions with your groups" (5 minutes) How does the pivot joint's movement differ from the ball and socket joint?	"Now, we will individually answer these questions in our notebooks." The joint that allows full rotational movement is called ________________ Give two examples of ball and socket joints in our body Explain the movement of the pivot joint in our body with an example

arms where they join our shoulders. We can move them in a full rotation. This is an example of a ball and socket joint.” “Can you go through your tables yesterday and find any other part that you think can be ball and socket joints.” - Explain the movement of legs joining the hips. **CFU** **Factual** What does the structure of a ball and socket joint look like? Identify two locations in the human body where you can find ball and socket joints. **Open-Ended:** Why do you think the ball-and-socket joint allows movement in all directions, and how does this benefit our daily activities? **ESR:** The ball can rotate freely in the socket. Therefore it allows movements in all directions. This allows activities like rotating our hands in a full circle, or moving our legs in all directions. Compare the movement of your shoulder joint with your knee joint. How do the differences in structure affect the range of motion? **ESR:** Shoulder has ball and socket joint. It allows movement in all directions. Knee joint allows movement only in up - down direction. It is restricted in other directions.	Name some everyday objects that show movement that is similar to the pivot joint. ***ESR:*** *Some examples can be: Movement of a key inside a lock. Movement of a see-saw about its connection point. Students may come up with other examples, discuss them accordingly.* “Let's come back and share our discussions with the class.” Take responses from various groups.	

Closing

“Let’s go back to our KWL charts. We will fill the last column with the summary of what we learned in today’s class. We will also share what we had written in the W column and if any of those questions have been answered in this class.”

- Students will fill the “What I learned” column of the KWL chart.

Students will share any “What I want to know” questions that have been answered in the class.

Homework:

Draw diagrams of:

a. Ball and Socket joint
b. Pivot joint

Choose any 1 joint that you learned about in class today. Imagine if that joint got injured. Write a short paragraph on how your daily activities will get affected if you are not able to move this chosen joint.

Period 5.2:

Students will be able to

1. name the types of joints in the human body.
2. give examples of each type of joint in the human body.
3. describe the extent of movement/motion for each type of joint.

Explicit Teaching / Teacher Modeling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
“We have been learning about joints in the human body in the last two classes. Today, let’s start by observing the surroundings and see if we can find any joints around us. Take a minute to observe the classroom and note down any joints that you can see.” - Give students 1 minute to do the observation activity. “Can you see any joints that are similar to what we learned yesterday?” - Invite answers. “Both joints we learned yesterday allow a lot of free movement. Today, we will learn two more joints and try to see how they are different from the previous ones. I will show you the first type of joint we will learn in the very room itself.” - Show how any **HINGE** works in the classroom. “What are the movements we can observe in this hinge? This is exactly similar to the HINGE joint in our bodies.” - Demonstrate the movement of the elbow/fingers and show how similar they are to the hinge. - Divide the board into two parts. One part will be used to draw the joint being discussed, and the other will be used to write the main points for that joint. Write the three labels on the board: structure, movements, and where it is found. - Write the points for the HINGE	“We have studied the four primary types of joints in our bodies in the last two classes. Now, we will work in our groups to make a revision chart of the joints. We will then share our mind maps with our class. We will do this in two steps:” STEP #1 - Take 4 minutes with your group to write down the four types of joints and the information about them. STEP #2 - We will show this information as a mind map or chart. You can use different ways to show this information. Take 8 minutes to make this chart. - Guide the students through the process of making a mind map. Use this video as a reference for beginner mind map making process. You can show this sample mind map to students. This is a mind map on the topic “myself”. “Okay, students, you have all worked hard on your mind maps. Now, we will share the work. We will do this in the	“Now, we will individually answer these questions in our notebooks.” - The joint found in our fingers is called ________________ - Explain the movement of hinge joints in our body. Give two examples of fixed joints in our body.

joint on the board and draw a diagram on the other half of the board. “Interestingly, the last type of joint we will study allows no movement at all! This is called a FIXED joint.” - Write down the points for the FIXED joint on the board. - Give an example of the skull and jaw for fixed joints. **Show that only the lower jaw moves.** **Check For Understanding:** **Factual** - What is the structure of a hinge joint like, and how does its movement differ from a ball-and-socket joint? - Where in the human body can you find fixed joints, and what is their primary purpose? **Open Ended** - Why do you think the hinge joint allows movement only in one direction, and how is this useful for daily activities like walking or writing? - Compare the functions of hinge joints and fixed joints in the body. How does the lack of movement in fixed joints benefit specific body parts like the skull?	form of a **gallery walk.** While you are observing the other groups’ works, think of two questions - ” # Anything that they included in the chart that you forgot? # Did you find anything that was common in all the charts? - Each team will place their chart in their place. - The students will rotate from group to group, spending 1 minute looking at each group’s chart. - Give them 2 minutes to consolidate their observations. Ask for some responses.	

Closing

“Let us go back to the KWL charts made in the last class. We will now complete these charts. Fill everything you learned today in the L column.”

“If you have any unanswered questions in the W column, please write them in a note and post them on the question wall for everyone to look at and answer.”

- Pass sticky notes to students who want to write questions for the question wall.

Let them write and put their questions on the wall.

Homework:

Draw a diagram of the hinge joint.

Find two objects in your surroundings that show similar movements to each of the joints we studied in class.

Period 5.2:
Students will be able to

1. construct models of joints using materials from their surroundings and explain how they work.

Materials - Clay, cardboard, scissors, wooden sticks/ice cream sticks/straws. glue, rubber bands, etc

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
“Let’s quickly remind ourselves what we have studied so far. Name the four types of joints we have studied in class.” Take responses “Did you find real-life examples for these joints?” Review homework “Today’s class will be different. We will try to model the joints using various materials. This class will be all about your creativity and problem-solving.” “We can see these videos for ideas.” Show them these videos. Pivot joint Ball and socket joint Hinge joint “We will do the following steps to make the models: Step 1 - review the diagram of the joint you will make. Step 2 - ideate - ideate about how you will make that model. Step 3 - get any materials you need for it. Step 4 - make the models.” “Finally, don’t forget to check for the movement in your models. You can verify if they are correct from the revision maps you made in the last class.” **Check For Understanding:** **Factual:** What are the four types of joints we have studied, and what movements do they allow? List the steps involved in constructing a model of a joint.	Divide the class into six groups. Assign one joint to each group (two groups each will be making the same joints) Give the students 12-14 minutes to create the model for their joints Go around the groups and provide assistance if needed, but let students work without intervention as much as possible Arrange a “Gallery walk” procedure at the end for students to observe each other’s models.	“Well done, students. We showed a lot of creativity in our activity. As a final closing of this activity, we will individually answer some questions on the model we made.” What joint did you model? Where can you find this joint in the body? What movements are allowed by this joint? After observing the movement in your joint model, what challenges did you face while replicating the movement, and how did your team overcome them?

Open Ended: How can you use the materials provided to construct a model that accurately represents the movements of a hinge joint or a ball-and-socket joint? Explain your plan.		

Closing

“We will close the class by reflecting on today's activity! We will do this by writing “Fireworks and Feedbacks”.

Fireworks - any moment that was a joyful spark for you, where a concept you have learned became more clear?

Feedback - any feedback for your group or your teacher that you want to share?

Take 2 minutes to reflect on the class and share any such moment of firework or feedback.”

Take 3 - 4 responses to close the class

Homework:

With the help of your parents, create a short video (like an Instagram reel!) to demonstrate any joint that we have learned about in class.

If you don’t have access to a phone, you can draw a step-by-step comic strip or create a simple model to show the joint’s movement. Be creative!

Assessment on Concept 1

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

1. A joint that allows no movement is called:
a. Pivot joint
b. Fixed joint
c. Hinge joint
d. Ball and socket joint
2. Which of the following joints is immovable?
a. Shoulder and arm
b. Knee joint
c. Upper jaw and skull
d. Lower jaw and upper jaw
3. Which of the following parts of our body help us in movement?
   (i) Bones
   (ii) Skin
   (iii) Muscles
   (iv) Organs
a. (i) and (iii)
b. (ii) and (iv)
c. (i) and (iv)
d. (iii) and (ii)
4. Imagine that your body does not have any joints. What difficulties do you think this will create in your life?

5. Give one example of each of these types of joints in our body:
a. Hinge joint
b. Pivot joint
6. “The joint of the legs to the hips is called a ball and socket joint” - Is this name justified? Give reasons for your answer.
7. Which joint allows the most free movement in the human body?
8. What would have happened if our backbone was made of one single bone?
9. What type of joint is used for the following movement:
a. A girl moves her head in the left and right direction.
b. A cricket bowler bowls a ball
10. Fill in the blank spaces in the following table:

Type of Joint	Where is it found	Movements allowed
a.__________________	Knee & Elbow	b.__________________
Ball and Socket joint	c.__________________	d.__________________
e.__________________	f.__________________	Allows forward – backward and side to side movement of head

Concept 2: Human Skeleton - Parts and Functions

Teaching Learning Process

Learning Objective/s:
Students will be able to

1. describe the importance of the skeleton for the human body.
2. describe the role of X-rays in medicine.
3. identify bones in different parts of the human body.
4. give examples of cartilages in the human body.
5. demonstrate how muscles work by making a model.
6. explain the role of muscles in body movement.

Introduction: In this part, students will learn about the human skeleton. They will learn the different parts that make up the skeleton, as well the functions of the skeleton.

Vocabulary:
♦ **X Rays:** Images used to see the bones and internal structures of the body.
♦ **Contraction:** The process by which muscles become smaller in length to pull the bones closer.

Hook : The skeleton of a house!

- “We have all seen houses and buildings. We are sitting in one right now. But do we know the steps for its construction? I will write some steps for construction. Let's see if you can arrange them in the correct order”
- Write the following on the board with numbering :

1. Putting cement on the bricks
2. Placing bricks
3. Making the roof

4. Making the structure with iron rods
5. Putting doors and windows

- Can you put these steps in the right order?
- **Share the right order with them - 4, 2, 1, 5, 3**

Experience & Reflection:

- **“**How many got it right? Show of hands.”
- Show a picture of the internal structure of an under-construction house.
- **Discuss:** “Imagine if the framework of a house with iron rods wasn’t there—what would happen to the house? Could it stand tall? Could it stay safe?”

Reflect: “What do you think gives structure to our bodies?”

Period 5.3:
Students will be able to

1. describe the importance of the skeleton for the human body.
2. describe the role of X-rays in medicine.

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work *(We do)***	**Independent Work *(You do)***
“Just like we saw a framework for the house, our bodies also need a framework to give it structure. This framework for our bodies is called the skeleton.” Write the definition of the skeleton on the board. Show an image of the human skeleton to the class. “Let us try to understand why this is important.” Demonstrate the function of bones using two clay models. “I have here two models for an arm made from clay. One model has a pipe through it to resemble a bone. I will apply pressure to both structures. Observe what happens.” Apply pressure to both structures. The one without a pipe will bend or break. Ask the students to share their observations. “Thus, you can see, just like in the case of the building, our bones give our body structure and strength. This is the first important function of the skeleton.” “You already know the most vital parts of our bodies are our internal organs. They are essential to keep us alive. Can you name	**Teaching Learning Material -** ● Make **two simple models of arms using clay.** In one model, put a piece of wood or pipe in the middle to resemble a bone and give it strength. ● Take printouts of this file - XRays “But how do we study bones? Can we see them?” “Let us get into our groups and read about an interesting discovery that helps us do so.” - Divide students into groups. Give each group a printout of the reading in this file. - They will read the text and answer the following questions as a group: (Write the questions on the board) 1. Who discovered X-rays, and in which year were	“Now, we will work individually to answer some questions.” ● Define skeleton. ● What tool do we use to check the health of bones in our body? ● Write any 3 important functions of the skeleton. Imagine your bones were not hard. How would that affect your lives?

some such organs?” Take responses. “You will see that all these organs are also enclosed within the skeleton. Why do you think that is?” Take responses. Give the second function of the skeleton - “protecting internal organs” “You have also seen the parts of the body that allow movement. What are these parts called?” Expected answer - joints “These are also a part of the skeleton and made of bones, as we have already studied. Thus, the skeleton also helps us move our bodies.” **CFU** **Factual** What is the skeleton, and what are its three primary functions in the human body? Based on the demonstration, why does the clay model with a pipe not bend or break when pressure is applied? **CFU** **Open Ended** How does the skeleton protect vital organs in our body, and why is this function important for survival? Imagine our bodies did not have a skeleton. What challenges would we face?	they discovered? (Answer: Wilhelm Roentgen, 1895) 2. What are two uses of X-rays other than in medicine? (Answer: Checking luggage at airports and studying fossils or ancient artefacts) **Group discussion** - “In your groups, discuss on the following prompt for the next 5 minutes. Make sure everyone gets a chance to share their thoughts.” “What would life be like if X-rays were never discovered? What would have changed in their lives?” Give students 6 minutes to discuss and then take responses for 2 minutes.	

Closing

“Today, we began to study the framework of our body - the skeleton.”

“We will now summarize what we learned from today's class. Write down the following in your notebooks:

- 3 things you learned today,
- 2 things you want to know more about
- 1 doubt that you have in today’s lesson

Give students 3 minutes to reflect and then take responses from 4 - 5 students.

Homework:

Ask your parents about any incident where someone broke a bone. Do they have XRay plates in the house? Ask to see the plates and note what you can see. How was the broken bone treated? If you do not have XRay plates at home, you can search for images online and study them.

Period 5.4:
Students will be able to
1. identify bones in different parts of the human body.

Materials -

Teachers can use a **model of the skeleton** if it is available in their school labs.
Otherwise, they can take printouts of the skeleton used in the previous classroom.

<table>
<tr>
<th>Explicit Teaching / Teacher Modelling
(I Do)</th>
<th>Group Work (We do)</th>
<th>Independent Work
(You do)</th>
</tr>
<tr>
<td>“We have seen that the skeleton gives our bodies its structure. Further, it also protects our internal organs. Today, we will learn about major parts of our skeleton.”
“Who can tell me the name of the organ that controls all other parts of our body?”
Take responses
“Yes, it is our brain. So, this part needs to be specially protected. Can you point out which part of your body is protecting our brain?”
Students point to their heads.
“This part of our skeleton is called the SKULL.”
Show a picture of the skull/model of the skull.
Give details about the skull -cover these key points:
It is made of multiple bones joined together to form complete protection.
The joints in the skull are fixed joints. There is no movement possible.
The skull has openings - for eyes, ears and mouth.
“Although most parts of the skull are fixed joints, there is one movable joint in the skull. Can anyone guess? Which part of our heads can we move?”
Some students may answer the mouth or jaws.
“Interestingly, our jaw is made up of two parts - the upper and lower jaw. And actually, we can only move the lower jaw! While the upper jaw is fixed to the skull.”
Demonstrate the movement of the jaw. Show that if you put a hand firmly under your lower jaw, you cannot open your mouth.</td>
<td>“Okay, students, now we will work in our groups to make short notes on some of the different parts of the skeleton. Make this Graphic organiser in your notebooks to guide you.”
<table>
<tr><th>Part of skeleton</th><th>Where in the body</th><th>One bone / multiple bones?</th><th>Main function/s</th><th>Any special features</th></tr>
<tr><td>Skull</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Rib cage</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Backbone</td><td></td><td></td><td></td><td></td></tr>
</table>
“Now we will watch a video on the parts of the skeleton. In your groups, make notes while watching the video. Then, discuss with your group and fill in the graphic organiser for the 3 parts written above. We have already studied the skull. You may start by filling that up. If you need more information, you can also read your books from page 98.”

Play this video till 3:12 time in the video. [Play at 0.75x speed for better understanding for the students]
Students will discuss and fill in the GO for the 3 parts of the skeleton.
Give 8 minutes to fill the GO
Discuss the answers for 5 minutes</td>
<td>“We will now work independently and answer the following questions in our notebooks.”
The part of the skeleton that protects our heart and lungs is called _______________.
Which part of our skeleton helps us stand upright?
What is the type of joint present between the upper jaw and skull?
“We should wear helmets when riding bikes and motorcycles.” Why do you think we need to do this?</td>
</tr>
</table>

Ask students to perform this activity. Encourage them also to open their mouths and feel the joint of their jaws as they are doing this. **CFU** **Factual** What is the role of the skull in the human body, and how does its structure help it perform its function? Which part of the skull contains a movable joint? **CFU** **Open Ended** Why do you think there are not many movable joints in the skull? **ESR:** They can get injured. They will weaken the skull. How would the movement and function of the jaw be affected if both the upper and lower jaw were movable instead of just the lower jaw? **ESR:** The jaw would not remain attached to the skull. We would not be able to chew food - we chew food by crushing them with our teeth - we would not have the strength to do that.		

Closing

“We have learned about some parts of the skeleton in our class today. To close today’s class, we will do an activity called - “teach it to a first grader”. Imagine you have to teach this concept to a first-grade student. How would you explain to them? Turn to your partners and share this summary.”

- Give students 3 minutes to do this

Ask two students to share with the large group what their partner said.

Homework:

Draw a diagram of the rib cage in your notebooks

Search online for an image of the skeleton of any other animal that you have seen. Can you find the parts you have learned about so far in that skeleton? Share your observations with the class in the next period.

Period 5.4:

Students will be able to identify bones in different parts of the human body.

Explicit Teaching / Teacher Modeling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
- Review the homework - Revise the parts of the skeleton	“We have studied the different parts of the skeleton in the last	Students will solve this practice sheet.

covered so far - skull, rib cage and backbone.

"Today, we shall continue our learning of the skeleton and see its various other parts. Let us make another GO to take our notes."

Part of skeleton	Where in the body	One bone / multiple bones?	Main function/s	Any special features
Shoulder				
Pelvis				
Hands and Feet				

- Describe the different parts of the skeleton using models or by showing pictures.
- Guide students in filling out the LO for the different parts. Mention the key functions and structure of each part. Some key points should be:
  - Shoulder - the arms connect to the body by the shoulder. The bones can be felt on the upper back. It has a ball and socket joint.
  - Pelvis - protects our intestines and urinary systems. It also supports all the weight of our upper body and gives the body a rotating motion.
  - Hands and feet - made of many small bones. In hand - they are called carpels. Many joints allow more flexibility. Allows us to grip and hold things.

CFU
Factual

- What is the main function of the pelvis in the human skeleton, and how does it support the body?
- How does the ball and socket joint in the shoulder contribute to the movement of the arms?

CFU
Open Ended

- Compare the structure and function of

two classes. Now, we will work in our groups to make a revision chart for the parts of the skeleton. We will then share our mind maps with our class. We will do this in two steps:"

STEP #1 - Take 4 minutes with your group to write down the parts of the skeleton and the information about them.

STEP #2 - We will show this information as a mind map or chart. You can use different ways to show this information. Take 8 minutes to make this chart.

- Guide the students through the process of making a mind map or revision.

"Okay, students, you have all worked hard on your mind maps. Now, we will share the work. We will do this in the form of a **gallery walk.** While you are observing the other groups' works, think of two questions - **"**

Anything that they included in the chart that you forgot?

Did you find anything the same in all the charts?

- Each team will place their chart in their place.
- The students will rotate from group to group, spending 1 minute looking at each group's chart.
- Give them 2 minutes to consolidate their observations. Ask for some responses.

the shoulder and pelvis. How do their roles in the skeleton differ based on their location and design? Why do you think our hands and feet are made of many small bones? ESR: They help to grip and hold stuff. More joints allow greater flexibility of movement. This allows our hands and feet to be very versatile.		

Closing

"Let us consolidate our learnings about the skeleton in the form of a 3-2-1 reflection."

Summary: "What concept did we explore today?" -

- Tell me 3 new things that you learned today.
- Tell me 2 new things that you found exciting.
- Tell me 1 question that you have from today.

Students are given time to write their questions on the "Question Corner" chart in the classroom.

Homework

Draw the pelvic girdle. Show the location of the ball and socket joint in the picture.

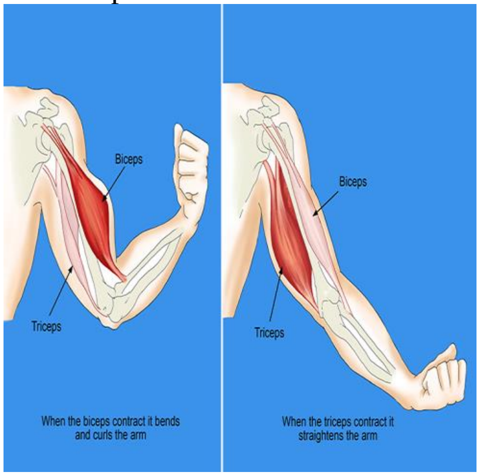
Imagine you have hurt your pelvic girdle. According to you, what activities in your daily lives would become difficult because of this?

Period 5.4:

Students will be able to

1. give examples of cartilages in the human body.
2. explain the role of muscles in body movement.
3. demonstrate how muscles work by making a model.

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
"So far, we have studied the bones in our skeleton. But some additional parts are equally important." "Touch your ears. Feel the structure of the ear. You will feel it's not as hard as bones, but it still has some structure. The part that is giving this structure is called **Cartilage**." - Define cartilage. "Can you think of any other part that has this kind of property?" - An example is the nose. Students can also be told that cartilage is present between bones in joints.	**Materials-** - Activity sheet printout - Long cardboard tube from a roll of wrapping paper (or card to make tubes), Sticky tape, Ruler or tape measure. Paper clip. Scissors. Two long balloons (For each group) - Ice Cream sticks - 2 - Rubber band - 3 to 4 - Board pins - 3 to 4	Draw a diagram of the arm muscles when flexed and relaxed, showing how the muscles work to move the arm.

Have you ever wondered why TV actors always have to curl their arms to show their strength? “But our bones alone cannot help us to move. They need some attachments to them that help to move them. Flex your arm, touching your shoulder with your fingers. What do you feel on your upper arms?” “This is **MUSCLE**. It is called **connective tissue,** and it helps to move the bones.” This image shows the location of biceps and triceps in our arms. When we curl our arm the biceps contract and it bends, whereas triceps (the lower muscle relaxes.). When we straighten our arm the triceps contract and biceps relax.  - Show this video to demonstrate how muscles work in pairs. Pause the video after 40 seconds and explain it to the students. - Define **contraction** of muscles. OR (if time permits, the following activity can be done as I do) Video of the activity Material Required: Ice Cream sticks - 2 Rubber band - 3 to 4 Board pins - 3 to 4 Match sticks (optional) Scissor (if using match sticks) - As the video suggests the ice cream sticks represent the arm, the pins represent the joints and the rubber bands represent the muscles.	- Match sticks (optional) - Scissor (if using match sticks) “We will create some models to demonstrate how the muscles work.” - Get students into groups of 5 - 6 students each. - Use this video for reference. - Provide the materials needed. You can change any material with locally available substitutes. “We will work in our groups for the next 10 minutes to make this model of the arm to study how muscles work in pairs to move our bones. Remember to include everyone in the activity and have a lot of fun while doing it!” We will now demonstrate the models we have made to the other groups. While we are looking at the presentations, we will discuss the following question in our groups - Do you see any difference in the other groups’ models than your groups?	

CFU **Factual** - What is cartilage, and how is it different from bones in terms of structure and function? - Explain how muscles work in pairs to help bones move. **CFU** **Open Ended** - Why do you think certain parts of the body, like the ears and nose, are made of cartilage instead of bones? Imagine your muscles stopped working in pairs. What challenges would your body face in performing movements? How might it impact daily activities?		

Closing

"We have spent the last several classes studying our skeletal system. We have seen in detail how different body parts help us move. As a class, we will create a list of all the main topics we have studied to close this part of our chapter. Each of us will add one topic to the list! Anyone can volunteer to begin, and then you can tag someone else to follow."

- Get a volunteer /cold call someone to start the timeline of topics
- Let the students tag each other
- Assign two students to write down the topics on the board as a timeline / flowchart

In the end, give time to put any burning questions on the Question Corner to end the topic.

Homework:

Ask your parents if there are any gyms or places where people go to exercise near your house. Ask them to take you there. Make a note of the different exercises people are doing and what muscles they are for. Share this as a small paragraph writing with the class with the title "A visit to a gym".

Assessment on Concept 2

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

Multiple Choice Questions (MCQs): *(Circle the correct answer)*

1. Which of the following is NOT a function of the skeleton?
   a. Protects internal organs b. Helps in movement
   c. Produces energy d. Gives shape to the body
2. Which part of the skeleton protects the brain?
   a. Spine b. Skull c. Ribs d. Femur
3. Give one word for the following:

   a. Bones that join with the chest bone at one end and backbone at the other end.
   b. Framework of bones that give support to the body.
   c. Bones which enclose the organs of our body that lie below the abdomen.

4. Give 3 examples of cartilage in the human body.
5. How can you differentiate between bones and cartilage?
6. Explain why the rib cage is important in the human body.
7. Describe how muscles and bones work together to move your arm.
8. Boojho fell off a tree and hurt his ankle. On examination the doctor confirmed that the ankle was fractured. How was it detected?
9. Bones are hard structures and cannot be bent. But, we can still bend our elbow, knee, etc. How is this possible?
10. **Matching Activity:** *(Match the items in Column A with their correct descriptions in Column B)*

1. Skull	A. Protects the heart and lungs
2. Ribs	B. Allows rotation of the head
3. Pivot Joint	C. Protects the brain
4. Cartilage	D. Soft and flexible tissue found in the ear and nose
5. Ball-and-Socket Joint	E. Allows movement in all directions (e.g., shoulder, hi

11. **Movements in a football match!" -** Imagine you are playing football in the park with your friends. Describe how your skeleton joints and muscles play a role in this activity. Name the parts that are involved and what roles they play in this activity.

Concept 3: Gaits of Animals

Teaching Learning Process

Learning Objective/s:

Students will be able to

1. compare the characteristic features of body movements of various organisms.
2. identify the body parts responsible for animals showing different gaits.

Introduction: In this part, students will learn about the movements of different types of animals. They will learn about the body parts of the animals that enable the particular type of movement. They will connect between the type of animals and their movements.

Vocabulary:

♦ **Streamlined:** The shape of anybody that makes it easier to move through fluids.

Hook : Riddles game:

- Ask students some riddles on animal movements. They will write their answers out in large letters on a piece of paper and hold them up.

- I move by slithering on the ground, without legs or feet to be found. Who am I?
  (Answer: Snake)
- I soar through the air, flapping as I go. Flying up high, I put on a show. Who am I?
  (Answer: Bird)
- I leap and hop from place to place; my jumps help me win any race. Who am I?
  (Answer: Frog)
- I glide through the water without making a sound. My tail and fins help me move around. Who am I?
  (Answer: Fish)
- I crawl along, carrying my house. My pace is slow—quieter than a mouse. Who am I?
  (Answer: Tortoise)

Experience & Reflection:

Discuss the following questions:

- How did you understand what animals were being talked about in the riddle? What clues did you use?
  Did any of the riddles have multiple possible answers for you? If so, which ones, and why were you unsure?

Period 5.5:

1. Students will be able to compare the characteristic features of body movements of various organisms.

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
"We will learn about different animals and their body movements in our next classes. We will see how their bodies are adapted for the various movements that they can do." "We have all seen various animals around us and how they move. We may have also seen some shows online about animals. Think of all you know about animals and their movements, and think of any ONE BURNING QUESTION you may have. It may be something that has always confused you or something you have wanted to learn more about! Note this burning question down in your notebooks." "Before we explore how animals move, let's first think about how we move. What are some movements we can do—like walking, running, or jumping? Let's list them and identify the body parts involved in each. This will help us understand the connection between movement and body parts."	"Now, we will work in groups to make a table of different organisms and what movements we see them doing. Make the following table in your notebooks."	"Humans were hunters and gatherers. They have slowly evolved to be agriculture and village-based." - How do you think human movements are suited for this? Write your thoughts on this subject in a small essay. Think about what we've studied in body movements so far. Consider what movements would have been essential for hunting and gathering and how our body suits them. Think about our modern lives and

Human movements	**Body parts involved**
Walking	Legs and feet
Running	Legs and feet
Swimming	Hands and legs
. . . etc.	

- **Discuss** - "Which are the movements that we perform most regularly? How are our bodies adapted for this movement?"

Now, let us try to list some movements we have seen animals doing. We can be as detailed as possible and include all examples here. Some easy ones are walking, swimming, running, flying (Ask students to add more to the list)

- **Discuss -** "Can all animals perform all movements?"

CFU
Factual

- What body parts are primarily involved in human walking and running?
- Name two movements that animals can do but humans cannot, and explain why humans cannot perform these movements.

CFU
Open Ended

- How do you think birds' or fish's body structures support movements such as flying or swimming?

If humans were adapted to fly like birds, what changes in our body structure do you think would be necessary? How would this affect our daily lives?

Organism	Walking / Running	Flying	Swimming	Jumping	(Add 2 more)
Fish	No	___ ___ _	Yes	____ ____	. . .
Cockroach					
Horse					
. . . Add 3 more					

"You will add two more movements and any three animals of your choice to this table. Let us take 10 minutes to finish this activity."

- Students will add 3 more animals and then fill up the respective movements
- After the activity, groups share their responses.

Discuss: "Do you disagree with any movement ticked by some other groups? Why?"

what movements are needed for that.

Closing

- Do a Think-Pair-Share activity. Students will summarise what they learnt and any questions/doubts from the lesson. The partner should add what points their partner missed and add their own questions to the discussion.
- Take some responses on what they heard from their partners.

Homework:

Take time to finish the essay and add more points to it. Present the final essays in the next class.

Period 5.6
Learning Objective/s:
Students will be able to:

1. compare the characteristic features of body movements of various organisms.
2. identify the body parts responsible for animals showing different gaits.

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
Review what was talked about in the last class. "Now we will learn about the gaits of a few different animals and see how their bodies are specially designed for supporting these movements." "The first animal we will study will be the earthworm!" "Firstly, let us think of the type of movement earthworm performs. Have you seen them moving?" - Take responses. "Let's see a video to understand their movement better." - Show this video (Till 2:10) - Explain on the board by drawing how the earthworm moves. **Discuss:** "What are the parts of the earthworm's body that are helping it move?" **CFU** **Factual** - What type of movement does an earthworm perform? - Which body parts of the earthworm help it to move effectively? **Open Ended** - Earthworms move without having bones or legs. Describe the challenges faced by earthworms while moving through soil. How do you think their body structure is adapted to help them move? **ESR:** If they had one long body, they would get buried in the soil and not move forward. Their body is divided into segments. This allows the body to contract and push them	"You will now work in pairs to study the movement of snails. You will watch a video, and you can also refer to the book on page 104." - Show this video - Think-Pair-Share with partners ● What are the movements a snail does? ● What body parts help enable the snail to move this way? ● How do you think the snail's unique movements help them survive? Share some answers with the large group	Answer the following questions in your notebooks: ● Show the different steps in the movement of an earthworm with a diagram. "A snail can move on all surfaces, but an earthworm cannot move on smooth surfaces." Give reasons for this.

forward. Compare the movement of earthworms with that of humans. What are the key differences, and what makes these movements suitable for their respective environments? **ESR:** Humans walk on legs. This allows them to cover large distances and move fast. They can hunt and do complex tasks. Earthworms crawl in soil. They have limited movement as compared to humans but this allows a simplified body structure.		

Closing

"Let us consolidate our learnings about the movements of earthworms and snails in the form of a 3-2-1 reflection."

Summary: "What concept did we explore today?" -

- Tell me 3 new things that you learned today.
- Tell me 2 new things that you found exciting.
- Tell me 1 question that you have from today.

Students are given time to write their questions on the "Question Corner" chart in the classroom.

Homework

Try to find snails or earthworms around your houses / in gardens / in fields. Make a small video of their movements. Share this in the class group, explaining the movement that you are seeing in the video.

If you do not have access to a mobile phone or the internet, you can instead observe the movement of any other animal or creature around you. Draw a simple sketch showing the body parts that help them move and write a short description of their gait.

Period 5.6:

Learning Objective/s:

Students will be able to

1. compare the characteristic features of body movements of various organisms.
2. identify the body parts responsible for animals showing different gaits.

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
"So far, we have seen the movements of earthworms and snails. Today, we shall study the movements of cockroaches and birds. Can you spot what is common in the movement of these two animals?" - They can both fly Let's see how a cockroach moves and which body parts help its movement.	"You will now work in pairs to study the movement of birds. You will watch a video, and you can also refer to the book on page 106." - Show this video	Write the answers to the following questions in your notebooks: ● List the movements

Play only the first 40 secs of this video without audio - Ask students: “ What do you observe about the movement of cockroaches?” - Show this video. (this is an explanatory video - play the full video) - Draw a diagram/picture showing the different body parts of the cockroach on the blackboard - Make notes of the movement and its associated body parts. **CFU** **Factual** - What are the main body parts of a cockroach that help it move? - Which type of movement, besides walking, can cockroaches perform? **CFU** **Open Ended** - How are the body parts of a cockroach adapted to help it perform different movements like walking, climbing, and flying? Provide examples from what you observed in the video. Compare the movement of a cockroach with that of a bird. How do their body parts differ in supporting their specific ways of moving?	- Think-Pair-Share with partners ● In what ways does a bird move? ● What are the special features of a bird that enable this movement? ● Show these special features through a picture/drawing of a bird. - Share some answers with the large group.	of a cockroach and the related body parts ● What are 3 adaptations in a bird that help it to fly? How is the flight of a cockroach different from the flight of a bird?

Closing

“Let us consolidate our learnings about the movements of cockroaches and birds in the form of a 3-2-1 reflection.”

Summary: “What concept did we explore today?” -

- Tell me 3 new things that you learned today.
- Tell me 2 new things that you found exciting.
- Tell me 1 question that you have from today.

Students are given time to write their questions on the “Question Corner” chart in the classroom.

Homework

Find out about “flightless birds”. Why are they not able to fly?

Period 5.6:

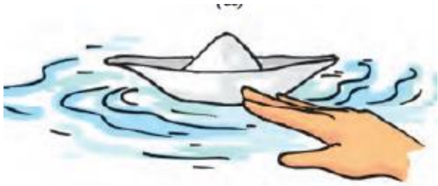
Learning Objective/s:

Students will be able to

1. compare the characteristic features of body movements of various organisms.
2. identify the body parts responsible for animals showing different gaits.

Materials - modelling clay

Explicit Teaching / Teacher Modeling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
“Today, we will study the movements of fishes. Tell me one difference between a	“Let us get into groups and do a really fun activity now. You can	**“We often learn from nature to create new**

fish and the other animals we have studied so far”: - They live in water Therefore, the body of a fish is specially adapted for movement in water. Let's see how a fish moves and which body parts enable this movement. Let’s do a paper boat experiment: Make a paper boat. Put it in water and push it with one narrow end pointing forward . Observe: Did it go into the water easily? Now hold the boat sideways and push it into the water from the broad side.  Observe: Are you able to make the boat move in water when you push it from this side?   - Explain the term “Streamlined” body. - Show on a diagram/picture the different body parts of the fish. - Make notes on the blackboard of the movement and its associated body parts. - The teacher can show this video to visualise the actual process. **CFU** **Factual** What is the term used to describe the shape of a fish’s body that helps it move easily in water? Which body parts of a fish are primarily responsible for its movement in water? **Open Ended** How does the streamlined body of a fish helps it move efficiently in water? Use	show a lot of creativity and teamwork in the next activity. - **Activity: Clay modelling of fishes -** Students will work in groups of 5 - 6 to create clay models of fishes. - They will present their models to the class and show the features of fish's bodies that help them move in the water. **Discussion prompts -** In their groups, they will discuss the following: Do fishes' movement and body structures depend on size? Or do fish of all sizes have the same features?	**inventions.”** - Can you think of two examples where the movement of animals has inspired a modern-day invention? Think of the animals we have learned about, and write two examples in your notebooks.

examples from the video to explain. Compare the movement of a fish with that of a cockroach or bird. How do their body parts differ in adapting to their respective environments?		

Closing

"Let's do a quick revision of the animals we have studied so far, their movements and the special features of their bodies. Each of us will add one topic to the revision chart! Anyone can volunteer to begin, and then you can tag someone else to follow."

- Get a volunteer /cold call someone to start the revision chart of topics
- Let the students tag each other

Assign two students to write down the topics on the board as bullet points.

Homework

Draw a diagram of a fish's body and explain the features that help its movement.

"Design a quiz" - Imagine you are the teacher, and you have to design a 10-mark quiz on the topic "Movements of animals." What are the questions you would give in the quiz? Create a quiz, and your friends will solve it in the next class. You can be creative and ask different types of questions than the ones we normally do in class.

Period 5.7

Students will be able to

1. compare the characteristic features of body movements of various organisms.
2. identify the body parts responsible for animals showing different gaits.

Explicit Teaching / Teacher Modelling *(I Do)*	**Group Work** *(We do)*	**Independent Work** *(You do)*
Review homework. Students will exchange the quizzes they have made with their partners and try to solve each other's quizzes. (4 minutes) "Today we are going to close our study of the movements of different animals. The last animal whose movements we will study today is a snake." "Have any of you seen a snake moving? Can you describe it?" **"**Let's see how a snake's body is designed to help it move in this way." - Watch this video **Discuss:** How is the body structure of the snake different from the body structure of the earthworm?	"We have learned the gaits of so many different animals in the last few classes. Working in groups, we will make revision charts for them so that we can remember all the details better." "Remember to mention all the movements that that animal can do. And mark the body parts that help to do that movement." - Divide class into 6 groups - Assign one animal to each group - Give 10 minutes to make a revision chart of their	Write a short paragraph on : "**If you could give yourself any one of these superpowers** - you can fly, you can swim underwater or you can climb on surfaces, which superpower would you want? What changes would your body need to have so that this is possible?"

- Describe how a snake forms loops and pushes its body forward by making diagrams on the board. - Explain the connection between the unique movement of the snake to its body structure for the students. **CFU** **Factual** - What type of movement does a snake use to push its body forward? - How does the structure of a snake's body contribute to its ability to move in loops? **Open Ended** - How does the movement of a snake differ from the movement of an earthworm? Use specific details of their body structures to explain Why do you think the snake's ability to form loops is an advantage for its survival in its environment?	movement and association "Now we will present our charts to the other groups. Please appreciate everyone's work. If you think they missed something or you want to ask questions, you can raise silent hands." Give each team 1 minute to present.	

Closing

"We will close this chapter today. Reflect on all you have learned in the last few classes. Let us summarise our learnings and find any unanswered questions. Add them to the question corner. "

"Before we close, let's give gratitude to our friends. On a sticky note, write a message for any one classmate who has helped you during this chapter and pass them the note of gratitude."

Homework: Complete the table by writing names of any 5 animals that we have not studied in class.

Animal's name	**Movement 1**	**Body part**	**Movement 2**	**Body Part**	**Movement 3**	**Body Part**

Assessment on Concept 3 (Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment

Multiple Choice Questions (MCQs): ***(Circle the correct answer)***

1. Which animal uses its fins and tail to move in water?
   a. Frog b. Fish c. Bird d. Snake
2. The correct body structure of a cockroach is:
   a. Two pairs of legs Three pairs of wings b. Two pairs of legs Two pairs of wings

c. Three pairs of legs Two pairs of wings d. Three pairs of legs Three pairs of wings

3. Which of the following organisms does not have both muscles and skeleton for movement?

   a. dog b. snail c. earthworm d. human being

4. Which animal uses scales and muscles to move?

   a. Fish b. Snake c. Frog d. Bird

5. Define a streamlined body.

6. “Earthworms are known as farmer’s friends” - Why?

7. Explain the movement of birds. What features of their bodies help them to fly?

Animal	How They Move	Reason for Movement
Snake	Swim	Muscular foot
Snail	Fly	No legs, uses muscles
Fish	Slither	Strong legs for running
Horse	Gallop	Fins and streamlined body
Bird	Crawl	Wings and lightweight bones

8. Matching Activity: *(Match animals to their unique gaits)*

9. What is unique about the way snakes move on the ground?

10. How is the movement of a bird flying different from a fish swimming? How are the two animals similar?

11. Imagine an animal that moves in three ways (e.g., walking, swimming, and flying). What might its body look like? Write a short paragraph.

Period 5.8: Student Independent Practice Questions

TEACHING LEARNING PROCESS

True or False

Q1. All joints in the human body allow movement.

Q2. The skeleton system provides shape and support to the body.

Fill in the Blanks

Q3. ___________ joints allow movement in one direction, like the knees and elbows.

Q4. The ___________ protects the lungs and the heart.

Multiple Choice Questions

Q5. Which type of joint allows rotation?

a) Hinge joint b) Pivot joint c) Ball-and-socket joint d) Fixed joint

Q6. What structure in fish helps them maintain balance while swimming?

a) Backbone b) Gills c) Fins d) Tail

Short Answer Type

Q7. Describe the function of cartilage in joints.

Q8. How do birds' wings enable them to fly?

Assertion and Reason

Q9. Assertion (A): Snakes move by forming loops of their body.
Reason (R): Snakes have a flexible backbone and strong muscles.

- Options:
  a) Both A and R are true, and R is the correct explanation of A.
  b) Both A and R are true, but R is not the correct explanation of A.
  c) A is true, but R is false.
  d) A is false, but R is true.

Q10. Assertion (A): Earthworms move by expanding and contracting their body segments.
Reason (R): Earthworms use fins to propel themselves forward.

- Options:
  a) Both A and R are true, and R is the correct explanation of A.
  b) Both A and R are true, but R is not the correct explanation of A.
  c) A is true, but R is false.
  d) A is false, but R is true.

Case Study

Q11. A student observed that a tortoise can retract its limbs into its shell for protection. The teacher explained that the shell is a modified ribcage, and the limbs are attached to a unique skeletal structure.

- What is the role of the rib cage in the tortoise's movement?
- Why might this adaptation be beneficial for survival?

Long Answer Type

Q12. Explain how joints and muscles work together to enable movement. Include examples of hinge, ball-and-socket, and pivot joints.

Q13. Which of the following parts of our body help us in movement?

(i) Bones (ii) Skin (iii) Muscles (iv) Organs

Choose the correct answer from the option below.

(a) (i) and (iii) (b) (ii) and (iv) (c) (i) and (iv) (d) (iii) and (ii)

Q14. Underwater divers wear fin-like flippers on their feet to

(a) swim easily in water. (b) look like a fish.
(c) walk on water surface. (d) walk over the bottom of the sea (sea bed).

Q15. Name the type of joint of your hand which helps you to grasp a badminton racquet.

Q16. Provide one word answers to the statements given below.

a. Framework of bones which gives shape to our body.
b. Bones which enclose the organs of our body that lie below the abdomen.
c. Joint where our neck joins the head.
d. Part of the skeleton that forms the earlobe.

Q17. Boojho fell off a tree and hurt his ankle. On examination the doctor confirmed that the ankle was fractured. How do you think it was detected?

Q18. Bones are hard structures and cannot be bent. But, we can still bend our elbow, knee, etc. How is this possible?

Period 5.8: Student Independent Practice Questions

TEACHING LEARNING PROCESS

True or False

Q1. The skull is made up of movable bones.

Q2. A cockroach has a backbone.

Fill in the Blanks

Q3. ___________ is the structure in birds that supports flight.

Q4. The ___________ joint is found in the shoulder and allows rotation in all directions.

Multiple Choice Questions

Q5. Which part of the skeleton protects the spinal cord?

a) Ribs b) Skull c) Backbone d) Pelvis

Q6. Which animal uses its muscular foot to move?

a) Earthworm b) Snail c) Fish d) Bird

Short Answer Type

Q7. What is the function of the ribcage?

Q8. How do fish use their fins and tail for movement?

Assertion and Reason

Q9. Assertion (A): Birds have hollow bones.
Reason (R): Hollow bones make the skeleton lighter, aiding flight.

- Options:
  a) Both A and R are true, and R is the correct explanation of A.
  b) Both A and R are true, but R is not the correct explanation of A.
  c) A is true, but R is false.
  d) A is false, but R is true.

Q10. Assertion (A): Fixed joints do not allow movement.
Reason (R): Fixed joints are found in the skull.

- Options:
  a) Both A and R are true, and R is the correct explanation of A.
  b) Both A and R are true, but R is not the correct explanation of A.
  c) A is true, but R is false.
  d) A is false, but R is true.

Case Study

Q11. A gardener observed that a tree bends slightly when strong winds blow, but it does not fall.

- What are some possible reasons why the tree doesn't fall over in the strong wind?
- How do the tree's roots and trunk play a role in keeping it upright?
- How might the shape and size of the tree's branches affect its ability to withstand strong winds?

Long Answer Type

Q12. Compare and contrast the movement of a fish, a bird, and a snake. Explain how their body structures are adapted to their respective environments.

Q13. Which of the following joints is immovable?
(a) Shoulder and arm (b) Knee and joint
(c) Upper jaw and skull (d) Lower jaw and upper jaw

Q14. Snail moves with the help of its
(a) shell (b) bone (c) muscular foot (d) whole body

Q 15. What would have happened if our backbone was made of one single bone?

Q 16. Provide one word answers to the statements given below.
a. Joint which allows movement in all directions.
b. Hard structure that forms the skeleton.

Q17. Which type of movement would have been possible if
(a) our elbow had a fixed joint.
(b) we were to have a ball and socket joint between our neck and head.

Q18. Earthworms are known as ‘farmer’s friends’. Why?

Period 5.8: Student Independent Practice Questions

TEACHING LEARNING PROCESS

True or False

Q1. The backbone is made up of a single bone.

Q2. Ball-and-socket joints allow movement in one direction only.

Fill in the Blanks

Q3. The __________ protects the brain.

Q4. __________ are the points where two bones meet.

Multiple Choice Questions

Q5. Which type of joint allows movement in one direction only?
a) Ball-and-socket joint b) Hinge joint
c) Pivot joint d) Fixed joint

Q6. Which animal moves by producing loops in its body?
a) Earthworm b) Snake c) Bird d) Fish

Short Answer Type

Q7. How do muscles and bones work together to create movement?

Q8. What is the difference between a hinge joint and a ball-and-socket joint?

Assertion and Reason

Q9. Assertion (A): Earthworms use bristles on their body to grip the ground while moving.
Reason (R): Earthworms have a backbone.

- Options:
  a) Both A and R are true, and R is the correct explanation of A.
  b) Both A and R are true, but R is not the correct explanation of A.
  c) A is true, but R is false.
  d) A is false, but R is true.

Q10. Assertion (A): Fish have streamlined bodies to reduce water resistance while swimming.
Reason (R): Streamlined bodies help fish move faster in water.

- Options:
  a) Both A and R are true, and R is the correct explanation of A.
  b) Both A and R are true, but R is not the correct explanation of A.
  c) A is true, but R is false.
  d) A is false, but R is true.

Case Study

Q11. A group of students observed the movement of a snail in their school garden. They noticed that the snail leaves a slimy trail as it moves slowly.

- Why does the snail produce slime during movement?
- How does the muscular foot help the snail move?

Long Answer Type

Q12. Explain the importance of joints in the human body. Discuss the different types of joints with examples of where they are found.

Q13. Which of the following organisms does not have both muscles and skeleton for movement?
(a) dog (b) snail (c) earthworm (d) human being

Q14. Underwater divers wear fin-like flippers on their feet to
(a) swim easily in water. (b) look like a fish.
(c) walk on water surface. (d) walk over the bottom of the sea (sea bed).

Q15. Provide one word answers to the statements given below.
a. Part of the body with a fixed joint.
b. Help in the movement of the body by contraction and relaxation.
c. Bones that join with chest bone at one end and to the backbone at the other end.

Q16. Write the type of joint which is used for each of the following movements:
(a) A cricket bowler bowls the ball.
(b) A girl moves her head in the right and left direction.
(c) A person lifts weights to build up his biceps.

Q 17. (a) Unscramble the jumbled words and write them in the blank spaces provided.
(i) neosb .... (v) arctigeal .... (ii) tnemevom .... (vi) epahs .... (iii) iontcaronct .... (vii) sangro inerlan .... (iv) lsecsum .... (viii) laxaeriont ....

(b) Read the following paragraph and fill in the blanks using the words you unscrambled.
______(a)______ and ______(b)______ form the skeleton of the human body. They provide the framework, give ______(c)______ to the body and help in ______(d)______ They protect the ______(e)______ The bones are moved by alternate ______(f)______ and ______(g)______ of two sets of ______(h)______ attached to them.

Period 5.9 Remedial teaching

TEACHER’S DIARY

Name of the Teacher:				**Name of the Month:**	
Name of the Lesson:				Class:	
Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
5.1	Introduction 5.1 - Human Body and its movements - Activity 1				
5.2	Ball and socket joint - Activity 2, Pivotal joint, Hinge joints - Activity 3, Fixed joints				
5.3	Skeleton - Activity 4 (Rib cage, Backbone, Shoulder bone, Pelvic bone, Skull)				
5.4	Cartilage, Muscle, Muscle Contraction				
5.5	5.2 - Gait of Animals Earthworm - Activity 5 Snail - Activity 6 Cockroach - Activity 7				
5.6	Birds, Fish - Activity 8				
5.7	How do snakes move?				
5.8	Student Independent Practice				
5.9	Remedial teaching				

1	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

November 2025

C2M1S3
No bag Day

F1S8Y2
Cluster Complex

E5F4M6
Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 No Bag Day Andhra Pradesh Avatarana
2 Sunday	3 NI	4 NI	5 NI	6 NI	7 NI	8 Second Saturday
9 Sunday	10 NI	11 Nationa Education Day SA - 1	12	13	14 Children’s Day	15 No Bag Day
16 Sunday	17 6.1	18 6.2	19 6.3	20 6.3	21 NI	22 No Bag Day Cluster meeting Fibonacci Day
23 Sunday	24 6.4	25 6.4	26 National Constituti c India 6.4	27 Sanjeevaraya S J 6.4	28 NI	29 No Bag Day SMC Meeting
30 Sunday						

14 - 20 National Library Week

Week1:	**NI**
Week 2:	**SA-1**
Week 3:	**6.1 -6.3**
Week 4:	**6.4**

↓ TEACHER’S NOTES ↓

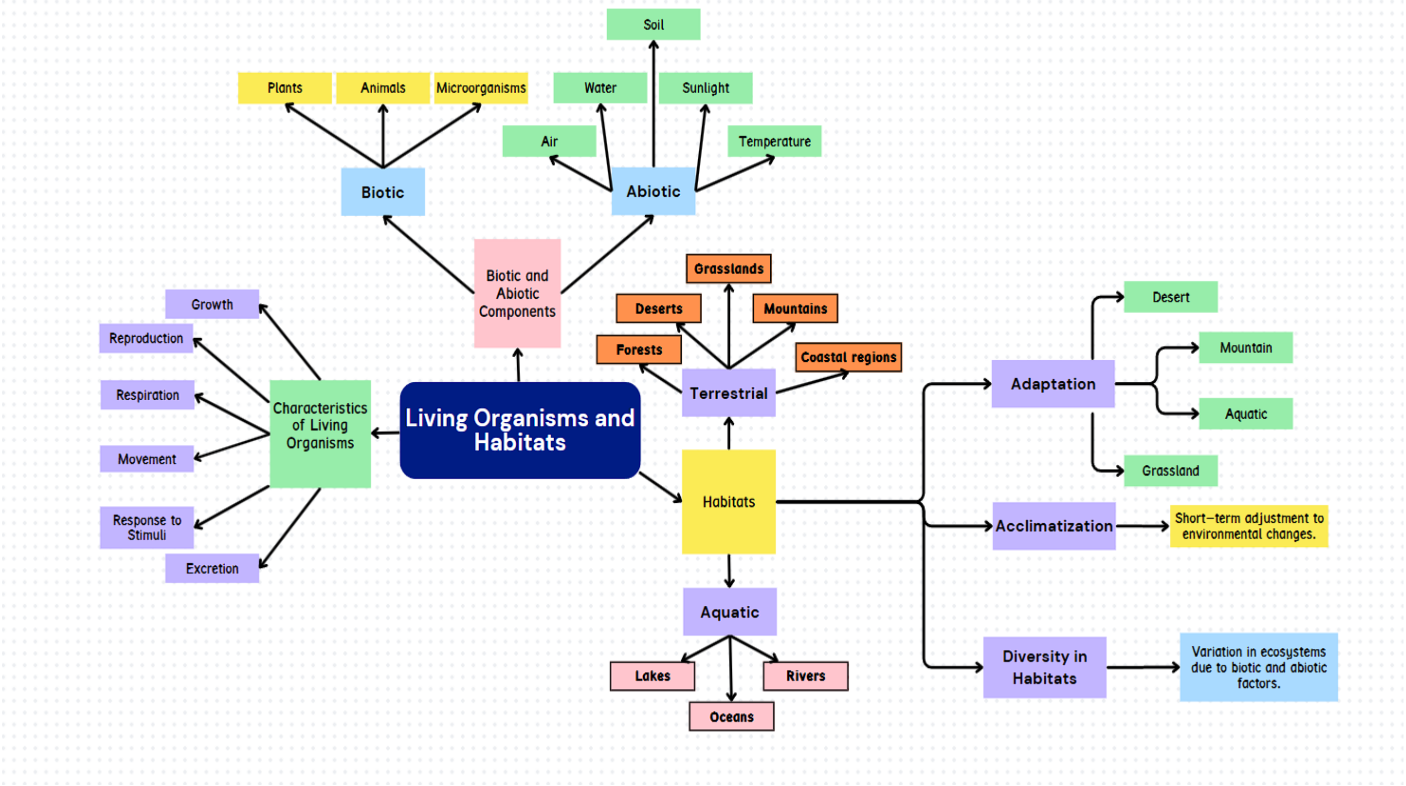
6

THE LIVING ORGANISMS – CHARACTERISTICS AND HABITATS

Learning Outcomes: Students will be able to:

1. Understand the characteristics of living organisms
2. classify different types of habitats as biotic and abiotic.
3. explain biotic and abiotic components of ecosystems.
4. analyze adaptations of organisms to their environments
5. understand acclimatization and ecosystem diversity.

CONCEPT MAP



Period-wise Topics

Chapters and Concepts

Period. No	Topic	Remarks
6.1	Introduction Organisms and the surroundings where the live - Activity 1	
6.2	Habitat and adaptation	
6.3	Activity 2 A Journey through different habitats : Some Terrestrial Habitats Deserts - Activity 3, Mountain Regions, Grasslands	
6.4	Some Aquatic habitats: Oceans, Pond & Lakes	
6.5	Characteristics of Organisms: Food, Growth, Respiration,	
6.6	Do all organisms Response to stimili - activity 4 Living organisms & excretion	
6.7	Reproduction - Activity 5	
6.8	Movement & Life	
6.9	Student Independent Practice	
6.10	Student Independent Practice	
6.11	Student Independent Practice	
6.12	Remedial teaching	
6.13	Remedial teaching	

SYNOPSIS

The Teacher can revise following concept (Synopsis)

1. Characteristics of Living Organisms

- Living organisms differ from non-living things in several ways:
- Growth: Organisms grow by increasing in size or number of cells.
- Reproduction: The ability to produce offspring, either sexually or asexually
- Respiration: Organisms use oxygen to release energy from food.
- Movement: Plants show movement through growth, while animals move actively.
- Response to Stimuli: Living beings respond to changes in their environment, such as light, heat, or touch.
- Excretion: Organisms eliminate waste products produced during metabolic activities.
- Dependence on Food and Water: All living organisms require food for energy and water for survival.

2. Habitats

- A habitat is the natural environment where an organism lives and gets its basic needs like food, water, and shelter.
- Types of Habitats:
- Terrestrial Habitats: Found on land, such as:
- Forests: Dense tree cover supporting diverse plant and animal species.
- Deserts: Hot, dry areas with sparse vegetation and organisms like camels and cacti.
- Grasslands: Open areas with grasses, home to animals like lions and deer.
- Mountains: Cold, windy regions with animals like snow leopards and yaks.
- Coastal Regions: Areas by the sea, with specialized plants like mangroves.
- Aquatic Habitats: Found in water, such as:
- Lakes and rivers: Freshwater ecosystems.
- Oceans: Saline water ecosystems with diverse marine life.

3. Biotic and Abiotic Components

Biotic Components: The living organisms in a habitat, such as plants, animals, and microorganisms.

Abiotic Components: Non-living elements like sunlight, air, water, soil, and temperature.

These components influence the survival and reproduction of organisms.

4. Adaptation

- Adaptation refers to the traits or behaviours that help an organism survive in its specific habitat.
- Examples of Adaptations:
- Desert Adaptations:
- Camels: Store water, excrete concentrated urine, have long legs to keep bodies above hot sand.
- Cacti: Have spines instead of leaves to reduce water loss, thick waxy stems for water storage, and deep roots to absorb water.
- **Mountain Adaptations:**

Yaks: Have thick fur for insulation.

- Mountain goats: Strong hooves for climbing rocky slopes.
- Snow leopards: Thick fur and padded feet to move in snow.
- **Aquatic Adaptations:**

  Fish: Streamlined bodies for efficient movement, gills to extract oxygen from water, and fins for balance.
- **Grassland Adaptations:**
- Lions: Light brown color for camouflage, eyes in front for targeting prey, and strong claws for hunting.
- Deer: Eyes on the sides to detect predators, long legs for running, and strong teeth for chewing hard stems.

5. Acclimatization

- Acclimatization refers to temporary changes in an organism's body to adjust to environmental changes.
- Example: Humans may experience difficulty breathing at high altitudes but adapt over time by breathing faster and increasing oxygen intake.
- Difference from Adaptation: Acclimatization occurs in an organism's lifetime, while adaptation develops over generations.

6. Diversity in Habitats

- The variation in abiotic and biotic components across habitats leads to a wide diversity of life forms.
- **Deserts:**
- Sparse rainfall and extreme temperatures.
- Common organisms: Cactus plants, camels, burrowing snakes, and rats.
- Mountains:
- Cold, windy conditions with snowfall.
- Common organisms: Coniferous trees, yaks, snow leopards, and mountain goats.
- Grasslands:
- Open areas with grasses.
- Common organisms: Lions, deer, and herbivorous animals.
- Aquatic Habitats:
- Organisms adapted to water environments, such as fish, crabs, and aquatic plants.

Prior Concept/ Skills:

- Difference Between Living and Non-Living Things
- Basic Life Processes
- Types of Landforms
- Introduction to Ecosystems
- Basic Concept of Adaptation

Teacher References:

- https://byjus.com/ncert-solutions-class-6-science/chapter-9-the-living-organisms-their-surroundings/

- https://allen.in/cbse-notes/class-6-science-notes-chapter-6-the-living-organisms-characterstics-and-habitats
- https://youtu.be/6e9M8VOBSqE?si=r43MFwCRr-d3CweC
- https://youtu.be/BMUyxcM4ymU?feature=shared
- https://youtu.be/T9kx2VifFiE?feature=shared

Teaching Learning Material (TLM):

The TLMs that are required are as follows;

- Flash Cards (Group activities).
- Chart Paper (To make flashcards).
- Pictures as required for the activity.
- A4 sheet papers.
- Flash card: Link
- Image Cut Out Link.
- Diagrams of different ecosystems, such as a forest, pond, and desert. Worksheet Link
- Close-up images of different animals - link to all the images
- Link to the video (play without audio) till 2:20 Sec – Link

Grade: 6

Subject: Science

Period:1 (Model)

Chapter: Living Organisms –Characteristics And Habitats

Concept: 6.1 Characteristics of Living Organisms

Learning Objective/s:

Students will be able to

- Identify key characteristics that define living organisms (respiration, growth, reproduction, movement, response to stimuli, excretion)
- Compare and contrast the ways in which different organisms carry out these life processes

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Difference Between Living and Non-Living Things
- Basic Life Processes

TLM Required: Balloons, Toy Cars, Flash Cards, Text Book images, Activity Cards

Induction/Introduction

In this concept we are focussing on the key characteristics that help us distinguish a living organism from a non-living thing.. Students will be introduced to how living organisms grow, reproduce, breathe, move, respond and release waste.

Period 6.1:

Vocabulary:

Characteristics, organisms, respiration, stimuli, reproduction and excretion.

Teaching Learning Process

Hook: Paste the following pictures on the blackboard.

- Ask students to write down two things that are similar among the pictures and two things that are different among the pictures.
- Take the response of one student on what are the things that they found similar and what they found different. Ask other students if they also get the same answer and if any of them have any different answers.

Experience and Reflection:

- What are the reasons that make the camel and the fish similar when compared with the cupboard and chair?
- What are the main differences between the camel and the fish?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
T: What makes a living organism? What makes us differ different from a chair? ESR: We have life and a chair does not have life. T: Yes, so what are certain actions that we do that proves that we are alive? Give me four responses. (Take one re response from one student) ESR: We breathe, we eat, we grow and reproduce. . T: These are some actions that we do that make us different from a chair or a table. In today's class we will lo look at three of these characteristics—respiration, gro growth and reproduction.	**Activity:** Sorting Game Provide groups of students with a <u>mix of flash cards</u> showing objects (e.g., a dog, a rock, a car, a tree, a fish etc). **Task:** 1. Print and cut out the provided flashcards for students. 2. Divide students into small groups and provide each group with a set of flashcards. 3. Have students analyze each object based on three characteristics: **Growth, Reproduction, and Respiration**. 4. Students will mark checkboxes in the grid to determine whether each object is living or non-living. 5. Once all objects are categorized, discuss the tricky cases (e.g., seed, cloud, feather) and clarify misconceptions.	**Fill in the blanks.** **1.** Living organisms grow by increasing in size or _____. (Answer: complexity) 2. Respiration releases _____, which is needed for all activities. (Answer: energy) **Multiple Choice Questions:** 3. Which of the following is an example of Reproduction? a) A tree producing seeds

Now the teacher has to explain what these

Characteristics:

- Respiration: is the process by which living organisms convert food into energy.
- Growth: When a living organism increases in size (becomes taller and increases in weight) as the time goes by.

Reproduction: is the process by which living organisms give birth to their own kind.

Open ended/ Factual)

Factual:

- What is respiration?
- How do hens reproduce?

Open-Ended:

- Why is growth important among living organisms?
- How do you think reproduction helps animals survive over time?

Ask the students to make a table like this;

Object	Grows (Yes/No)	Reproduces (Yes/No)	Respires (Yes/No)	Living / Non-Living
Dog				
Rock				
Tree				
Car				
Fish				
Cloud				
Seed				
Feather				
Human				
Mushroom				

After sorting, ask groups to share their reasoning in the table format. Ask one of the students to repeat the instructions.

Discussion:

ighlight key observations from the activity, cting misconceptions (e.g., "A car moves but sn't grow or reproduce, so it's non-living").

b) A Car moving on a road

c) A rock changing shape

d) Water freezing into ice *(Correct Answer: a)*

4. What is the primary purpose of respiration in living organisms?

a) To Release waste products

b) To Obtain energy from food

c) To Grow larger

d) To reproduce *(Correct Answer: b)*

5. Which of the following shows growth in a living organ

a) A balloon expanding

b) A child becoming taller

c) Water turning to ice

d) A car moving forward *(Correct Answer:b bb)*

Closing

- Recap the three key characteristics of living organisms: respiration, growth, and reproduction.
- Ask students to write a sentence explaining which characteristic they find most important and why. (Exit Ticket)

Home Work:

1. Go for a walk in your home or neighborhood and observe the things around you.
2. Make a list of 5 living things and 5 non-living things.
3. For each living thing, write down one characteristic that makes it "living" (e.g., "My cat grows bigger as it ages").
4. Draw a simple picture of one living and one non-living thing from your list.

Period 6.2:
Students can be able to describe the processes of movement, response to stimuli, and excretion in living organisms.

I Do	We Do	You Do
Teacher: In the last lesson we learnt about three characteristics of living organisms. Could somebody remind me what those were? Today we are going to learn about some more characteristics that define living organisms. Living organisms are constantly interacting with their environment. They move, react to stimuli (like light or temperature), and excrete waste. Today, we will look at how these processes work in living organisms. Here the teacher will explain the remaining characteristics; **Movement**: ● Living organisms show movement either visibly (e.g., animals walking) or internally (e.g., blood flow in humans). ● Plants also move, such as bending toward light or roots growing downward. **Response to Stimuli**: ● Organisms react to changes in their environment, such as light, heat, or touch. ● Example: Touching a hot object causes you to pull your hand away; a sunflower turns toward sunlight. **Excretion**: ● The process of removing waste products from the body to maintain health. ● Examples: Humans sweat and excrete urine; plants release oxygen during photosynthesis. **Visual Aid:** Movement in Plants: Video (Play without audio and explain while the video is being played) , Response to stimuli like sunlight, touch, etc. : Video (Play without audio and explain while the video is being played) (The students might have trouble understanding the word stimuli, including daily life example would be good, such as if your hand goes near a flame how will your body react) **CFU (Open ended/ Factual)** **Factual** ● What is one way that animals move? ● What is excretion in plants? How do they release waste? **Open Ended** ● Why do you think living organisms need to respond to changes in their environment? How do you think excretion helps living organisms stay healthy?	● Show images of animals moving, plants bending toward light, or sweating humans. ● Image Cut Out Link. ● In groups, students are asked to identify which process is being shown (movement, response to stimuli, or excretion). ● Discuss as a class why each example fits the category.	1. Excretion helps remove ____, which can harm the body if not eliminated. (Answer: waste) 2. Animals respond to ____, such as heat, light, or touch, to protect themselves. (Answer: stimuli) 3. Which of the following is an example of response to stimuli? a) A tree growing taller b) A human pulling their hand away from a hot object c) A bird flying in the sky d) A fish excreting waste (Correct Answer: b) 4. What is the primary purpose of excretion? a) To help organisms grow b) To release waste products c) To move the body d) To absorb nutrients (Correct Answer: b) 5. Which of these shows movement in a plant? a) Roots growing downward b) A leaf changing color c) A rock rolling down a hill d) A flower being picked (Correct Answer: a)

Closing

- Recap the three processes: movement, response to stimuli, and excretion, with a quick review of examples.
- Ask students to write one way they have observed these processes in their own life. As an exit ticket.

Home Work

Living organisms carry out several essential processes to survive. Choose two life processes from the seven you have learned and explain how they help an organism survive. Provide an example for each process based on real-life observations.

Example:

When I accidentally touched a hot pan, I quickly pulled my hand away. This is a response to stimuli, which helps protect my body from harm. Similarly, plants grow towards sunlight to maximize their ability to make food through photosynthesis. This process, known as nutrition, is essential for their survival.

Now, choose two life processes and write 2-3 sentences explaining how they help an organism survive!

Assessment

1. Which of the following processes is necessary for the survival of an individual but not for the survival of the species?

   a) Respiration b) Reproduction c) Growth d) Excretion

   Plants respond to __________ by bending towards a light source.
2. How does excretion occur in plants?
3. Compare the movement of a fish and a snake.
4. A scientist finds an unknown object in a forest. What characteristics would help determine if it is a living organism?
5. If an organism cannot excrete waste, what problems might it face?
6. Explain how respiration in plants differs from respiration in animals.
7. Why do desert plants have adaptations like spines instead of leaves?
8. Some plants reproduce through seeds, while others reproduce through stems or leaves. Give one example of each method and explain why these methods are important.
9. Why do different animals living in different habitats have special adaptations? Give two examples.

Concept 2: Habitats

Learning Objective/s:

- Students can be able to define habitat and explain its significance for living organisms and key characteristics of different terrestrial habitats.
- Student can be able to Identify and describe key characteristics of different terrestrial and aquatic habitats and the organisms that inhabit these

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Types of landforms.

Period 6.3

Teaching Learning Process

Hook:

- Bring a mystery box (or bag) containing items that represent different habitats (e.g., a seashell for the ocean, a pinecone for a forest, sand for a desert, etc.).
- Pass the box around, letting students feel an item inside (without looking) and guess what kind of habitat it might belong to.
- After a few guesses, reveal the item and ask:
- "What kind of organisms might live in this habitat? Why?"

Experience and Reflection:

- What do all living things need from their habitat?
- How do different habitats provide these needs in unique ways?
- What would happen if an animal was moved to a habitat it doesn't belong in?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
The teacher starts by sharing a story about a recent trip to different places that they have been to. The pictures should include images of various geographical places. T: "Last summer, I traveled to two very different places! First, I visited a vast, hot desert where the ground was covered in sand, and the sun was blazing. Guess what I saw there?" (Show an image/video of a desert.) ESR: "A camel!" T: "Yes! And later, I traveled to a place where water was everywhere. I saw creatures swimming around—some had fins, some had shells! Can you guess what I saw?" (Show an image/video of an ocean or river.) ESR: "Fish!" T: "C T: Camels and fish live in very different places. places. Where are camels usually found?" ESR: " ESR: Deserts!" T: "An T: And where do fish live?" ESR: " ESR: “Water bodies!" T: Now, think about your own home. What makes it a good place to live?" (Pair s Students and let them discuss for a minute, then share then share their answers.) ESR: “Our home has shelter, food, and water." T: Great! Just like we need a place that provides food, water, and shelter, animals and plants also need a suitable place to live. This special place where they find everything they need to survive is called a habitat."	**The objective of the Activity:** This activity aims to help students actively identify and connect each terrestrial habitat to its unique features, plants, and animals through an engaging matching task. **Steps to Conduct the Activity:** **Preparation:** Create two sets of cards: **Set A:** Cards with pictures or names of terrestrial habitats (e.g., Forest, Desert, Grassland, Mountain, Coastal Region). **Set B:** Cards with descriptions or examples (e.g., "Home to camels," "Dense trees and a variety of birds," "Mangroves and saltwater-adapted shrubs"). Shuffle the cards and distribute them among student groups. **Instructions to Students:** Each group receives a mix of cards from both sets.	1. Forests are dense areas filled with many _____. (Answer: trees) 2. Deserts are known for having very little _____. (Answer: rainfall) **Multiple Choice Questions:** 3. Which habitat is home to animals like lions and zebras? a. Mountains b. Grassland c. Coastal regions d. Forests *(Correct Answer: b)* 4. Which of these plants is commonly coastal regions? a. Cactus b. Mangroves c. Pine trees d. Grass *(Correct Answer: b* 5 Which habitat has the coldest climate? a. Forests b. Grasslands

T: "A Habitat is the natural home of a living organism. Just like we live in cities or villages, different animals have different habitats. Can a camel live in a forest?" ESR: “No!" T: “Why not?" ESR: " ESR: “Because it is adapted for the desert!" T: “Exactly! Each organism is suited for its habitat. Now, let’s explore different terrestrial habitats—the places where land animals and plants live!" **Deserts:** ● **Plants:** Cacti, thorny bushes. ● **Animals:** Camels, lizards, snakes. ● Dry areas with little rainfall. ● **Survival:** Plants store water in stems, animals like camels store fat in humps and can survive without water for long periods. **Grasslands:** ● **Plants:** Grasses and small shrubs. ● **Animals:** Lions, zebras, giraffes, and deer. ● Open areas covered mainly with grasses. ● **Survival:** Herbivores graze on grasses, and predators like lions rely on speed and stealth to hunt. **Mountains:** ● **Plants:** Coniferous trees, mosses, and lichens. ● **Animals:** Snow leopards, yaks, mountain goats. ● Cold and windy regions with rocky terrain. ● **Survival:** Thick fur protects animals from cold, and hooves help them climb rocky terrain. **CFU (Open ended/ Factual)** **Factual** ● What kind of plants grow in the desert? ● Name a primary feature of the desert? **Open Ended** ● How do animals protect themselves from the cold in the cold mountains? ● Why do you think forests have more animals than desert regions?	**Task:** Students work collaboratively to match the habitat name or picture (Set A) with its correct description or example (Set B). **During the Activity:** Encourage discussions within groups to justify their matches. Move around the classroom to guide groups, clarify doubts, and ensure everyone participates. **Post-Activity Discussion:** Groups share their matches with the class and explain their reasoning for at least one or two pairs. Use this opportunity to address any misconceptions and reinforce key characteristics of each habitat. **Example Matches:** ● **Desert:** "Home to camels and plants like cacti." ● **Grassland:** "Open spaces with grasses, lions, and zebras." ● **Mountains:** "Cold regions with coniferous trees and snow leopards."	c. Mountains d. Deserts *(Correct Answer: c)*

Closing

- Recap: Summarize the five terrestrial habitats and highlight how they differ in climate, plants, and animals.
- Exit Ticket: Ask students to write the name of their favorite habitat and one reason why they find it interesting.

Home Work

- Choose one organism from any of the terrestrial habitats and describe one adaptation that helps it survive.
- Example: *A camel has long eyelashes to protect its eyes from desert sandstorms.*
- Then draw a simple sketch of your chosen habitat, showing at least one plant and one animal that lives there.

Period 6.4

- Students are able to identify and describe aquatic habitats such as lakes, rivers, and oceans, and the organisms that live in each.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
In the last class we looked at living organisms in the land. Could someone tell me what type of habitat it is called? ESR: Terrestrial Habitat. T: Yes, there are different types of terrestrial habitats Could you tell me which they are? ESR: ESR: Deserts, Grasslands and Mountains T: Excellent. Today we are going to look at another form of habitat. Could you tell me apart from land, where else we might find a vast population of living organisms. ESR: Sea. T: Today we are going to learn about living organisms that have water bodies as their habitat. These habitats are known as Aquatic Habitats. Here the teacher has to explain about the different types of aquatic habitats that are there. **Lakes:** **Description:** Still or slow-moving freshwater bodies. **Organisms:** Fish (e.g., trout), frogs, turtles, algae, water lilies.	**Preparation:** ● Gather images or flashcards of the three aquatic habitats: lakes, rivers, and oceans. Each card should include clear visuals (e.g., a calm lake, a flowing river, and an expansive ocean). ● Create additional flashcards with pictures or names of aquatic organisms (e.g., trout, jellyfish, seaweed, reeds, sharks, frogs, etc.). ● Ensure there are at least three organisms for each habitat **Instructions to Students:** ● Divide the class into pairs or small groups and distribute the habitat and organism cards. ● Explain the **task**: Each group must match each organism card with its correct aquatic habitat (lake, river, or ocean). Students should discuss as a team why they believe an organism belongs to a particular habitat. ● Example Matches: ○ **Lake:** Trout, frogs, water lilies. ○ **River:** Salmon, reeds, otters. ○ **Ocean:** Sharks, jellyfish, coral reefs. **During the Activity:** ● Walk around the room, observe the groups, and ask guiding questions:	3. Which organism is most likely to live in a lake? a) Shark b) Trout c) Crocodile d) Whale *(Correct Answer: b)* 4. What is a key feature of plants that grow in lakes? a) They have roots deep in the soil. b) Their leaves float on the surface. c) They grow on rocks. d) They need saltwater to survive. *(Correct Answer: b)* 5. Which aquatic habitat is home to animals like whales and jellyfish? a) Rivers b) Lakes c) Oceans d) Ponds *(Correct Answer: c)*

Adaptations: Fish have gills to breathe underwater; plants like water lilies have broad leaves that float to absorb sunlight. **Rivers:** **Description:** Flowing freshwater bodies that move from mountains seas. **Organisms:** Fish (e.g., salmon), crocodiles, otters, aquatic plants like reeds. **Adaptations:** Fish like salmon swim against currents, and reeds grow along riverbanks to stay rooted. **Oceans:** **Description:** Vast saltwater bodies covering most of Earth’s surface. **Organisms:** Whales, sharks, jellyfish, coral reefs, seaweed. **Adaptations:** Marine animals like whales hold their breath for long dives, and coral reefs provide shelter for many species. To explain this content images could be used, especially for aquatic plants such as coral reefs and sea weed. **CFU (Open ended/ Factual)** **Factual** ● What type of water is found in lakes and rivers? ● Name one plant that grows in oceans. **Open Ended** ● How do fish survive in rivers with strong currents? ● Why do you think oceans have more types of organisms than lakes?	○ *"Why do you think trout live in lakes but not in oceans?"* ○ *"What features help jellyfish survive in the ocean?"* ● Encourage groups to think about water type (freshwater or saltwater), movement (still or flowing), and other habitat conditions **Wrap Up Discussion:** ● After groups finish matching, go through the matches as a class. ● For each match, ask a group to explain their reasoning. For example: ○ *"Why do you think reeds grow in rivers?"* ○ *"Why would coral reefs not survive in a lake?"* Highlight key adaptations of organisms that make them thrive in their respective habitats (e.g., floating leaves in lakes, streamlined bodies in rivers, salt tolerance in oceans).	

Closing

- Recap: Summarize the three aquatic habitats and highlight their differences in water type, organisms, and adaptations.
- Exit Ticket: Ask students to write one new fact they learned about aquatic habitats today.

Home Work

- Pick one organism plant or animal from the aquatic habitat and describe one way it has adapted to its environment.
- Example: *Fish have gills to breathe underwater.*

Assessment

1. Which of the following is an example of a terrestrial habitat?
   a) Ocean b) Pond c) Grassland d) River
2. Which factor is NOT essential for an organism's survival in its habitat?
   a) Food b) Water c) Mobile phone d) Shelter
3. The habitat that provides food, water, and shelter to an organism is called its __________.
4. Fish have __________ to help them breathe underwater, while terrestrial animals use lungs.
5. Define **habitat** and explain why it is important for living organisms.
6. How is a desert habitat different from a rainforest habitat?
7. Imagine a polar bear is placed in a desert. What challenges would it face, and why would it struggle to survive?
8. A scientist discovers a new animal with webbed feet, sharp claws, and thick fur. Based on these features, predict what kind of habitat it might live in and why.

Concept 3: Biotic and Abiotic Components

Teaching Learning Process

Learning Objective/s:

Students will be able to

- define ecosystems and differentiate between biotic components (plants, animals, microorganisms) in an ecosystem.
- define and describe abiotic components (air, water, soil, sunlight, temperature) in an ecosystem and explain their role in supporting life.

Prior Concept/ Skills:

- Living organisms and nonliving things

Induction/Introduction:

In this concept we are focussing on the concept of an ecosystem and its components. We will focus on understanding what an ecosystem is and differentiating between its biotic components (plants, animals, and microorganisms) and abiotic components (air, water, soil, sunlight, and temperature). Additionally, We will examine the role of abiotic components in supporting life within an ecosystem.

Teaching Learning Process

Hook: Step 1: Quick Brainstorm (1 min)

- T: "Imagine a forest with tall trees, birds chirping, and a river flowing. Now, what would happen if we remove all the water?" (Pause for responses—students may say plants will die, animals will leave, etc.)

Step 2: Think-Pair-Share (2 mins)

- T: "Turn to your partner and discuss: What other non-living things are essential for life in a forest?" After 1 minute, pairs share their answers (e.g., air, sunlight, soil, temperature).

Step 3: Connect to the Lesson (1 min)

T: "Everything in an ecosystem—living things like plants, animals, and microorganisms, and non-living things like air, water, and soil—must work together. Today, we'll explore how these biotic and abiotic components interact to support life!"

Experience and Reflection:

- Have you ever seen a dried-up pond, lake, or river? What happened to the plants and animals around it?
- Think about a garden or park near your home. What do you notice about the plants and animals there? How do they depend on water, sunlight, and soil?
- Imagine if there was no air or sunlight for a whole day. How would that affect your daily life and the environment around you?

Period 6.5:

Students will be able to define ecosystems and differentiate between biotic components (plants, animals, microorganisms) in an ecosystem.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
In the last class we looked at aquatic habitats. T: Take a look around you, are there only living organisms around you? ESR: No, there are books, benches, light etc. T: Yes, there are other things around us that make our life more comfortable to live in. We make use of these objects around us for our daily life. We use the air around us to breathe, we use the water around us to drink and grow plants from which we get food. (Here the teacher will introduce the ecosystem). An ecosystem is a community of living organisms and their physical environment that interact with each other. The living organisms in the ecosystem are known as biotic components and the physical environment around us like water, rock, soil, air etc. are known as abiotic components. Today we will be looking at biotic components in our ecosystem**.** **Ecosystems:** ● Definition: An ecosystem is a community of living organisms (biotic components) interacting with each other and their non-living environment (abiotic components). ● Examples: Forests, ponds, deserts, grasslands.	**Ecosystem Diagram Matching** **Preparation:** ● Prepare printed or digital diagrams of different ecosystems, such as a forest, pond, and desert. Worksheet Link ● Each diagram should include visible plants, animals, and possible representations of microorganisms (e.g., mushrooms or bacteria icons near decomposing matter). ● Include unlabeled placeholders for the students to fill in. **Instructions to Students:** ● Divide students into pairs or small groups and provide each group with one ecosystem diagram. ● Task: Students will: ● Identify and label the biotic components in the ecosystem (e.g., trees, deer, fungi in a forest). ● Categorize each biotic component as a producer, consumer, or decomposer directly on the diagram**.** **During the Activity:** ● Encourage students to discuss and justify their labels as a team. ● Walk around to guide	1. Plants are called ____, as they produce food through photosynthesis. (Answer: producers) 2. Bacteria and fungi are examples of ____, as they break down dead matter. (Answer: decomposers) 3. Which of these is a biotic component of an ecosystem? a) Water b) Grass c) Sunlight d) Soil *(Correct Answer: b)* 4. What is the main role of decomposers in an ecosystem? a) To provide oxygen b) To break down dead plants and animals c) To eat other animals d) To absorb sunlight *(Correct Answer: b)* 5. Which of these organisms is a consumer? a) Algae b) Lion c) Mushroom d) Tree *(Correct Answer: b*

Biotic Components: ● Definition: The living parts of an ecosystem. ● Categories: Plants (Producers): Provide food for other organisms through photosynthesis (e.g., grass, trees, algae). Animals (Consumers): Eat plants or other animals for energy (e.g., herbivores like deer, carnivores like lions, omnivores like humans). Microorganisms (Decomposers): Break down dead plants and animals, returning nutrients to the soil (e.g., bacteria,) **(CFU (Open-ended/ Factual)** **Factual** ● What is an ecosystem? ● Name one example of a decomposer**.** **Open Ended** ● How do biotic and abiotic components interact with each other in an ecosystem? Why are decomposers important for maintaining balance in an ecosystem?	discussions and ask probing questions such as: ● *"Why do you think this organism is a consumer and not a producer?"* ● *"What role does this microorganism play in the ecosystem?"* **Wrap-Up Discussion:** ● Once all groups finish labeling their diagrams, have a class-wide discussion. ● Display one diagram from each group and ask them to explain their labeling and categorization of the biotic components. ● Highlight correct answers and clarify any misconceptions**.** **Example Diagram and Labeling:** **Forest Ecosystem:** ● Producers: Trees, shrubs, grass. ● Consumers: Deer, tigers, birds. ● Decomposers: Mushrooms, bacteria near dead plants. **Pond Ecosystem:** ● Producers: Algae, water plants. ● Consumers: Fish, frogs, ducks. ● Decomposers: Bacteria in the water.	

Closing:

- Recap: Summarize the definition of an ecosystem and the three biotic components: plants (producers), animals (consumers), and microorganisms (decomposers).
- Exit Ticket: Ask students to write down one example of a producer, a consumer, and a decomposer from their surroundings.

Home Work

Task:

Observe any area near, such as a park, garden, pond, or any natural area. Observe and list at least three living (biotic) components you see (e.g., trees, birds, insects) and classify them into Producers (plants), Consumers (animals, insects), and Decomposers (fungi, bacteria, worms if visible)**.**

Draw a simple diagram of your ecosystem, labeling at least three biotic components. Finally, explain in 2-3 sentences why all three types of biotic components are necessary for maintaining a balanced ecosystem.

Period 6.5:

- Students will be able to define and describe abiotic components (air, water, soil, sunlight, temperature) in an ecosystem and explain their role in supporting life.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** *(We Do)*	**Independent Work** (You Do)
In the last class we learnt about the biotic components and ecosystem. Today we are going to understand about the abiotic components that are around us. T: Could someone explain what biotic components are? ESR: Biotic components are the living organisms that are present in an ecosystem. T: Good, abiotic components are the opposite of biotic components, they are the non-living parts of an ecosystem that support and influence living organisms. Here the teacher will explain the different abiotic components. 1. **Abiotic Components:** ● Definition: Non-living parts of an ecosystem that support and influence living organisms. ● Examples: Air, water, soil, sunlight, temperature**.** **2. Roles of Abiotic Components:** ● Air: Provides oxygen for animals and carbon dioxide for plants during photosynthesis. ● Water: Essential for drinking, growth, and transportation of nutrients in plants and animals. ● Soil: Provides nutrients and support for plants, which	**Preparation:** ● Prepare cards or written prompts describing hypothetical scenarios where an abiotic component is missing or altered. Examples include: ○ *"What happens if there's no sunlight in a forest?"* ○ *"What if water in a pond becomes polluted?* ○ *"How would a desert ecosystem change if the temperature dropped significantly?"* **Instructions to Students:** ● Divide the class into small groups of 3–4 students. ● Assign one scenario to each group. ● Task: Groups will discuss how the absence or change in the abiotic component affects the ecosystem. They should consider: ○ The impact on plants, animals, and microorganisms. ○ How the food chain might be disrupted. ○ Possible solutions or adaptations by organisms. **During the Activity:** ● Allow groups 5–7 minutes to discuss and jot down their thoughts. ● Encourage them to think critically by asking guiding questions like: ○ *"If there's no sunlight, how will*	1. Plants use ____, water, and sunlight to make their food. (Answer: carbon dioxide) 2. Soil provides ____, which are essential for plant growth. (Answer: nutrients) 3. Which abiotic component is necessary for photosynthesis? a) Soil b) Oxygen c) Sunlight d) Water (Correct Answer: c) 4. What role does temperature play in an ecosystem? a) Provides nutrients to plants b) Affects the types of organisms that can live in the region c) Powers photosynthesis d) Supplies oxygen to animals (Correct Answer: b) 5. Which abiotic component do fish need to survive in water? a) Soil b) Sunlight c) Oxygen d) Carbon dioxide (Correct Answer: c)

form the base of the food chain. ● Sunlight: Powers photosynthesis, warms the Earth, and helps regulate climate. ● Temperature: Affects the type of organisms that can live in a region (e.g., polar bears in cold climates). **CFU (Open ended/ Factual)** **Factual** ● What is an abiotic component? ● Give an example of an abiotic component needed for photosynthesis. **Open Ended** ● How do abiotic components like water and soil work together to support plant life in an ecosystem? ● If the temperature in a desert ecosystem suddenly became much colder, how would this change affect the living organisms there?	*plants make food?"* ○ *"How does polluted water affect the animals that drink it or live in it?"* **Presentation and Class Discussion:** ● Each group presents their scenario and findings to the class in 1–2 minutes. ● Facilitate a class-wide discussion after each presentation: ○ Highlight the role of the affected abiotic component. ○ Discuss real-life examples (e.g., oil spills in oceans, droughts in deserts).	

Closing

- Recap: Summarize the five abiotic components and their roles in supporting life in an ecosystem.
- Exit Ticket: Ask students to write down one abiotic component and explain its importance in one sentence.

Home Work

- Step outside your home or look around your surroundings and identify at least three abiotic components (air, water, soil, sunlight, temperature).
- Write one sentence about how each abiotic component supports life**.**
- Example**:** *Sunlight helps plants grow by providing energy for photosynthesis.*
- Now imagine if one of these abiotic components disappeared, how would it affect the plants and animals in that environment?

- Write 2-3 sentences explaining your thoughts.

Assessment

1. Which of the following is an **abiotic** component of an ecosystem?
   a) Trees b) Sunlight c) Fish d) Insects
2. Which of the following is NOT a biotic component of an ecosystem?
   a) Bacteria b) Air c) Plants d) Animals
3. The living components of an ecosystem, such as plants, animals, and microorganisms, are called __________ components.
4. __________ is an abiotic factor that provides energy for plants to make food through photosynthesis.
5. Define an ecosystem and give one example.
6. Differentiate between biotic and abiotic components with one example for each.
7. Imagine a pond ecosystem. What might happen if all the **fish** were removed? How would it affect the other components of the ecosystem?
8. A plant is placed in a completely dark room with enough water and soil. Predict what will happen to the plant over time and explain why.
9. How do abiotic components like air, water, and soil support life in an ecosystem? Explain with examples.
10. Why do microorganisms play an important role in ecosystems? Give two examples of their functions in nature.

Concept 4: Adaptation

Learning Objective/s:

Students will be able to

- explain adaptation and identify specific adaptations of organisms to deserts.
- identify specific adaptations of organisms to grasslands, mountain, and aquatic environments.

Induction/Introduction

- In this concept, we are going to focus on how living organisms adapt to their surroundings. The students will learn about how different organisms adapt to different habitats.

Teaching Learning Process

Hook: Show close-up images of different animals (e.g., camel's hump, penguin's flipper, shark's fin, snow leopard's fur). Here is a link to all the images.

Ask: "Where do you think this animal lives? What features help you guess?"

Let students share their thoughts before revealing the full images.

Show the full images and ask: "Did your guesses match? What features helped you the most?"

Briefly explain how each animal's body is adapted to its environment.

"Just like these animals have special features to survive in different places, all living things adapt to their surroundings. Today, we'll explore how animals and plants adjust to different environments!"

Experience and Reflection:

- Have you ever noticed animals around you that look or behave differently depending on the weather or season? What did you observe?

- Think about your pets (or animals you see often). How do they stay cool in summer or warm in winter?

Period 6.6:

Students will be able to explain adaptation and identify specific adaptations of organisms to desert

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** *(We Do)*	**Independent Work** (You Do)
The teacher plays a short, engaging video showing camels in the desert, highlighting their features and how they move in their habitat. After the video, the teacher asks: Link to the video (play without audio) till 2:20 Sec - Link "What did you notice about the camel? How is it able to survive in such a dry and hot place?" (*Students share their observations.*) The teacher guides the discussion using targeted questions: T: "Why do you think the camel has long eyelashes?" ESR: "To protect its eyes from sand and dust." T: "Why do you think the camel has a hump? What purpose might it serve?" ESR: "It stores fat, which helps the camel survive without food and water for long periods." T: "Why do camels have broad, padded feet?" ESR: "So they don't sink into the soft desert sand." T: "Great observations! Camels have special body features to help them survive in the desert. But what about the humans who live there?" Students discuss how desert communities (e.g., Bedouins, Rajasthan people) adapt their clothing, food, and lifestyle to the environment. T: "So, both camels and humans change their ways of living to survive in the desert. This process of adjusting to an environment is called adaptation." T writes the definition on the board: "Adaptation is a special feature or behavior	**Desert Simulation Challenge Preparation:** ● Divide students into groups of 3–4. ● Provide pictures and descriptions of different desert animals and plants that were not discussed in the I Do section (e.g., fennec fox, thorny devil lizard, saguaro cactus, desert beetles).' **Instructions to Students:** 1. Each group picks a desert organism and studies its physical and behavioral adaptations. 2. They discuss and deduce how these adaptations help the organism survive. 3. Groups present their findings in a quick 1–2 minute discussion. **Guiding Questions:** ● "Why does the fennec fox have such large ears?" ● "How does a cactus survive with very	1. Camels store _____, which they use for energy. (Answer: fat) 2. Cacti have ____, which help them reduce water loss. (Answer: spines 3. Why do desert foxes have large ears? a) To help them hear predators b) To release body heat c) To store water d) To dig for food *(Correct Answer: b)* 4. What adaptation allows cacti to survive long dry periods? a) Shallow roots b) Thin stems c) Deep roots and water storage in stems d) Broad leaves *(Correct Answer: c)* 5. Which of these is NOT an adaptation of desert organisms? a) Light-colored fur b) Storing water in leaves c) Hibernating in winter d) Thick, waxy stems *(Correct Answer: c)*

that helps a living organism survive in its habitat." **What is Adaptation?** ● **Definition:** Adaptation is a special feature or behavior that helps an organism survive in its environment. ○ **Example:** Animals in cold regions grow thick fur to stay warm. **Adaptations of Desert Organisms:** ○ **Camels:** ■ Store fat in their humps to use as energy. ■ Long eyelashes and nostrils that close to keep out sand. ■ Can survive without water for long periods. ○ **Cacti:** ■ Spines instead of leaves to reduce water loss. ■ Thick, waxy stems to store water. ■ Deep roots to absorb water from the soil. **CFU (Open ended/ Factual)** **Factual** ● What do camels store in their humps? ● Why do cacti have spines instead of leaves? **Open Ended** ● How do the adaptations of camels help them survive in desert conditions? ● Humans also live in deserts. What are some ways they have adapted to survive in such harsh environments?	little water?" ● "Why does the desert beetle collect fog droplets on its back?" **Wrap-Up Discussion:** ● Compare these adaptations to the camel’s adaptations. ● Highlight diversity in desert survival strategies (not all desert animals store water like a camel).	

Closing

- Recap: Summarize what adaptations are and highlight the specific adaptations of camels, cacti, and desert foxes.
- Exit Ticket: Ask students to write down one adaptation of a desert organism and explain how it helps it survive.

Home Work

Task: Imagine you are lost in the desert! What one adaptation would you want to have to survive? Explain in 2-3 sentences.

Period 6.6:

Students will be able to identify specific adaptations of organisms to grasslands, mountain, and aquatic environments.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** *(We Do)*	**Independent Work** (You Do)
In the last lesson we learnt about how living organisms adapt to their environment for survival and we looked in depth on desert habitat. In this lesson we will learn about how living organisms live in other habitats. T: Where do we find fishes in? ESR: In water, sea, lakes. T: Yes, but how do they breathe underwater? Here the teacher will introduce how different organisms adapt to their habitat. **1. Aquatic Environments:** ○ **Organisms:** Fish, dolphins, seaweed, water lilies. **Adaptations:** ● Fish have streamlined bodies and gills to breathe underwater. ● Dolphins use echolocation to navigate and find prey. ● Seaweed anchors to the ocean floor to avoid being washed away. ● Water lilies have broad, floating leaves to absorb sunlight. **2. Grasslands:** ○ **Organisms:** Lions, zebras, giraffes, grass. **Adaptations:** ● Lions have light-coloured fur for camouflage and sharp claws for hunting. ● Zebras and giraffes have long legs to run from predators and reach tall grasses. ● Grass grows quickly to recover from grazing.	Adaptation Design Challenge 1.Preparation: o Divide students into small groups of 3–4. o Provide materials like blank paper, coloured pencils, and a worksheet template (optional) with questions about the organism's adaptations. o Assign each group one habitat (grassland, mountain, or aquatic). 2.Instructions to Students: o Explain the scenario: "Imagine you are scientists discovering a new organism perfectly adapted to survive in your assigned habitat." o Task: Each group will: ● Decide the physical and behavioural features of their organism (e.g., how it moves, eats, and protects itself). ● Sketch and label their organism, highlighting its adaptations. ● Answer key questions such as: o How does your organism stay safe from predators? o How does it find and store food or water? o How does it adapt to the unique climate of its habitat? 3.During the Activity: ● Give groups 7–10 minutes to brainstorm, sketch, and discuss. ● Circulate around the classroom, asking guiding questions like:	1. Lions have _____, which help them blend into the grasslands. (Answer: light-coloured fur) 2. Fish have _____, which allow them to breathe underwater. (Answer: gills) **Multiple Choice Questions:** 3. Which adaptation helps snow leopards stay warm in cold climates? a) Long tails b) Thick fur c) Sharp claws d) Light-coloured fur *(Correct Answer: b)* 4. What helps water lilies float on the surface of the water? a) Strong roots b) Needle-like leaves c) Broad leaves d) Thick stems *(Correct Answer: c)* 5. Which of these adaptations is common in mountain plants? a) Large leaves b) Needle-like leaves c) Floating roots d) Light-coloured bark *(Correct Answer: b)*

3. **Mountains:** ○ **Organisms:** Mountain goats, snow leopards, conifers. **Adaptations:** ● Mountain goats have strong hooves for climbing rocky terrain. ● Snow leopards have thick fur for insulation and long tails for balance. ● Conifers have needle-like leaves to reduce water loss in cold climates. **CFU (Open ended/ Factual)** **Factual** ● What helps mountain goats climb rocky terrain? ● Why do fish have gills? **Open Ended** ● How do different animals in grasslands protect themselves from predators? ● Why do plants and animals in aquatic environments have different adaptations compared to those in deserts or mountains?	o "What makes your organism suitable for this habitat?" o "How does it handle extreme conditions like heat, cold, or water currents?" ● Encourage groups to collaborate and think about real-world examples. 4.Presentation and Class Discussion: ● Each group presents their organism in 1–2 minutes. ● As they present, ask clarifying or challenging questions, such as: o "How does this adaptation help it compete with other organisms in the habitat?" o "What would happen if this organism lived in a different environment?" ● Summarize and reinforce the importance of specific adaptations for survival in each habitat.	

Closing

- Recap: Summarize the specific adaptations of organisms in grasslands, mountains, and aquatic habitats, emphasizing how they help organisms survive.
- Exit Ticket: Ask students to write one adaptation they learned today and why it is important.

Home Work:

Imagine you are a scientist tasked with preparing humans for life on a distant planet. This planet has very different conditions from Earth.

Choose ONE of the following planetary conditions:

- Extremely high temperatures
- Very low gravity
- A planet with very little water
- A planet with a toxic atmosphere

Describe at least **THREE** physical or behavioural adaptations that humans would need to develop to survive in this environment. Use your understanding of adaptation from class to justify your answers.

Assessment

1. Which of the following is an adaptation of camels to survive in the desert?
   a) Thick fur to trap heat
   b) Long, broad feet to walk on sand
   c) Short ears to reduce water loss
   d) Sharp claws for climbing trees
2. Which adaptation helps aquatic animals like fish breathe underwater?
   a) Lungs
   b) Gills
   c) Trachea
   d) Spiracles
3. Animals living in __________ regions have thick fur and a layer of fat under their skin to protect against the cold.
4. In grasslands, animals such as deer have __________ legs to run fast and escape predators.
5. Define adaptation and give one example of an organism with its adaptation.
6. How are mountain animals like the snow leopard adapted to their cold environment?
7. How are plants in deserts adapted to survive in extreme conditions? Give two adaptations with explanations.
8. Compare the adaptations of a penguin in the polar region and a camel in the desert. How are these adaptations suited to their respective habitats?

Concept 5: Acclimatization and Diversity in Ecosystems

Learning Objective/s:

Students will be able to

- define acclimatization and explain how organisms adjust to short-term changes in their environment.
- discuss the diversity of ecosystems and how variations in biotic and abiotic factors lead to different habitats and organisms.

Induction/Introduction

- In this concept we are focussing on how living organisms acclimatize to their surroundings and how different abiotic and biotic components interact with each other to influence habitats.

Teaching Learning Process

Hook: Ask students to rub their hands together quickly for 30 seconds. Then, have them place one hand in cold water and the other in room-temperature water. Ask: "How do your hands feel? Did your body react to the change in temperature?". Explain: "This is a small example of acclimatization—our bodies adjust to short-term changes, just like animals do in nature!"

Experience and Reflection:

- Have you ever stepped into a cold pool or shower on a hot day? How did your body react?
- **Experience and Reflection:**
  Have you ever stepped into a cold pool or shower on a hot day? How did your body react?

Period 6.7:

Students will be able to

- define acclimatization and explain how organisms adjust to short-term changes in their environment.

Explicit Teaching/Teacher Modelling (I Do)	**Group Work *(We Do)***	**Independent Work (You Do)**
In the last class we learned about how different organisms adapt to the environment that they live in. Could anyone tell me an example? ESR: Fish have gills that help them breathe under water. T: Yes, now imagine you got a new job that is in Himachal Pradesh. What do you think is the temperature there? ESR: Very cold. T: It will be very cold, completely different from where we live right now. But do you think you will be able to live there? ESR: Yes, we will have to wear warm clothes, sweaters etc. T: Yes, by wearing sweaters we will be able to fight the cold. But Himachal Pradesh is situated among the mountains. As we go up the amount of oxygen goes down, so our body starts breathing faster to adjust to the low amount of oxygen. This is a process our bodies undergo to survive changes in our environment. Every living organism goes through this process. It is called Acclimatization. Here the teacher will explain acclimatization. **Define Acclimatization**: "Acclimatization is the process where an organism adjusts to a new environment or condition over time. This adjustment helps the organism survive temporary changes in its surroundings." **Example**: "When humans travel to higher altitudes, they start breathing faster to adjust to lower oxygen levels. This is a form of acclimatization." **Modelling (6 mins)**: ● **Example of Acclimatization in Animals**: "A camel's body adjusts to the heat of the desert by storing water and reducing sweat. This allows it to survive extreme temperatures." ● **Example of Acclimatization in Humans**: "When people move from low altitudes to high altitudes, their bodies produce more red blood cells to capture more oxygen."	**Acclimatization Scenarios** Divide students into small groups and give each group a scenario card that describes a situation where an organism must adjust to a temporary environmental change (e.g., a deer getting used to colder weather, a fish adjusting to a sudden temperature change in water). Ask each group to discuss how the organism would acclimatize and share their thoughts with the class. **Class Discussion:** ● After the group activity, invite each group to present their scenario and explain how acclimatization would occur in their organism. ● Discuss the different ways organisms in each scenario might acclimatize (e.g., increasing fur thickness, adjusting breathing	**1.** Acclimatization is the process where an organism adjusts to a _____________ environmental change over a short period. 2. When humans move to high altitudes, their bodies produce more ____________ to help capture more oxygen. 3. ___________ is an example of an animal that acclimatizes by storing water and reducing sweat in hot desert environments. 4. Which of the following is an example of acclimatization? a) A camel storing water in its body during a hot summer. b) dog growing a thicker coat in winter. c) plant developing deep roots to find water during a drought. d) All of the above. 5. Which of the following is NOT

- **Discuss how acclimatization differs from adaptation**: "Acclimatization happens over a short period, while adaptation takes place over many generations." **CFU (Open ended/ Factual)** **Factual** - What is acclimatization? Can you give an example? - Why do humans breathe faster when they move to high altitudes? **Open Ended** - Why do you think animals and plants need to acclimatize to changes in their environment? Can you think of other situations where acclimatization might happen in living organisms?	patterns, or altering body temperature). **Sample Questions for the Class**: - "How does a polar bear acclimatize to warmer temperatures?" - "How might a tree acclimatize to less rainfall during summer?"	an example of acclimatization? A) A plant bending toward light. B) A bird developing a larger beak over many generations. C) A person sweating more when it is hot outside. D) A fish adjusting its behaviour in response to changes in water temperature.

Closing

Recap:

- Ask students to share one example of acclimatization they learned today. Write a few examples on the board.

Exit Ticket:

- Have students write one sentence on an index card or whiteboard answering: "Why do organisms need to acclimatize when faced with changes in their environment?"

Home Work

- Choose one of the following scenarios and research how the human body adjusts to the change in environment. Write 2-3 sentences describing what happens and how the body acclimatizes.
- When people travel to different parts of India, their bodies adjust to the new environment. Below are some examples of what happens when you visit different places. Can you guess why?
- **While visiting Araku Valley or Ananthagiri Hills (Cooler, Higher Altitude Places near Hyderabad):** You may start breathing faster than usual. Why do you think this happens? *(ESR: The air has less oxygen at higher altitudes, so the body increases breathing rate to take in more oxygen.)*
- **While traveling to Ramagundam or Nizamabad in Peak Summer (Very Hot and Dry Places in Telangana):** Your body starts sweating a lot more. How does this help you?

(ESR: Sweating helps cool down the body and prevents overheating in extreme heat.)

Period 6.8:

Students will be able to

- analyze how variations in biotic and abiotic factors shape diverse ecosystems and support the evolution of specialized organisms.

Explicit Teaching/Teacher Modeling *(I Do)*	Group Work *(We Do)*	Independent Work (You Do)
In this chapter, we have looked at what defines living organisms, their habitats and how they adapt and acclimatise, ecosystem and what are its components. In today's class, we are going to look at how different biotic and abiotic factors influence ecosystems. T: In a desert, abiotic factors like high temperature and low water availability affect the types of organisms that can survive, such as cacti, camels, and desert foxes. It is because of these factors that cactus and camels have certain abilities that help them survive. Can a banana plant survive in the desert? ESR: No, it will be too hot and not enough water. T: So different abiotic components influence the biotic components which leads to different types of ecosystems and habitats. The teacher will explain in detail about how these factors create diversity in ecosystems. **Define Ecosystems**: "An ecosystem is a community of living organisms and their interactions with the environment in a specific area. Ecosystems can be small, like a pond, or large, like a forest or ocean." **Introduce Biotic and Abiotic Factors**: o **Biotic Factors**: Living components like plants, animals, and microorganisms. o **Abiotic Factors**: Non-living components like air, water, temperature, sunlight, and soil. **Explain how these factors create different habitats**: "Different ecosystems have different biotic and abiotic factors, which lead to variations in habitats and organisms." **Use Examples**: **Desert Ecosystem**: "In a desert, abiotic factors like high temperature and low water	**Comparing Ecosystems** o Divide students into small groups and provide each group with a description of a different ecosystem (e.g., ocean, desert, forest, grassland). o Ask each group to identify: 1. Biotic factors in the ecosystem (e.g., plants, animals). 2. Abiotic factors in the ecosystem (e.g., temperature, sunlight, water). 3. How do these factors influence the types of organisms that live there? o Have each group present their ecosystem to the class, focusing on the biotic and abiotic factors and the organisms that depend on them. **Guiding Questions:**: "What biotic factors would you find in a forest ecosystem?" "How does the amount of sunlight affect the organisms in a rainforest?" "Why do you think deserts have fewer types of organisms compared to rainforests?" "How might an ecosystem change if its abiotic factors,	**Fill in the blanks with the following clues**. (plants, animals, microorganisms, air, water, sunlight) 1. Biotic factors in an ecosystem include ________, __________, and __________. 2. Abiotic factors such as _______, __________, and __________ influence the survival of organisms in a habitat. 3. Which of the following is a biotic factor in an ecosystem? a) Sunlight b) Temperature c) Plants d) Soil 4. What is the primary abiotic factor that affects a desert ecosystem? a) High humidity b) High temperature and low water availability c) Fertile soil d) Heavy rainfall 5. Which ecosystem is characterized by high rainfall and a wide variety of plants and animals? a) Grassland b) Desert c) Rainforest d) Tundra

availability affect the types of organisms that can survive, such as cacti, camels, and desert foxes." **Rainforest Ecosystem**: "In a rainforest, high humidity, frequent rainfall, and warm temperatures support a wide variety of organisms, such as monkeys, parrots, and tall trees." **Illustrate the Relationship**: Show how biotic and abiotic factors interact. "In the desert, the lack of water (abiotic) means only plants and animals that can store water, like cacti and camels, can survive." **CFU (Open ended/ Factual)** **Factual** ● What are biotic factors? Can you give an example? ● What are abiotic factors? Can you give an example? **Open Ended** ● How do abiotic factors like temperature affect the types of organisms that can live in an ecosystem? Why do you think different ecosystems have such different types of organisms?	like temperature or water, changed dramatically?" **Class Discussion:** o After the group presentations, lead a class discussion on the diversity of ecosystems. o Ask questions like: o "What patterns did you notice in how different ecosystems support different types of organisms?" o "How does the amount of water in an ecosystem impact the types of plants and animals that live there?" o Discuss how changes in abiotic factors (like climate change, droughts, or pollution) can impact ecosystems and the organisms that depend on them.	

Closing

Recap:

- Ask students to share one thing they learned about biotic and abiotic factors and how they shape ecosystems.
- Write their answers on the board, highlighting the connection between biotic and abiotic factors and the organisms that thrive in specific ecosystems.

Exit Ticket:

- Have each student write one sentence on an index card or whiteboard answering: "How do biotic and
- abiotic factors work together to create different types of habitats?"

Home Work

Scenario: A new factory is built near a river that flows through a forest ecosystem. Over time, some trees start to wither, and the number of fish in the river decreases.

Question: Identify two possible abiotic changes caused by the factory that could be affecting the ecosystem. Explain how these changes impact both biotic and abiotic components of the ecosystem. (Write 3-4 sentences.)

Student Independent Practice:

Period 6.9

Multiple Choice Questions

1. Which of the following cannot be called a habitat?
   a) A desert with camels b) A pond with fishes.
   c) A jungle with wild animals. d) Cultivated land with grazing cattle.
2. Following are some features of plants
   (i) They lose a lot of water through transpiration.
   (ii) Their leaves are always broad and flat.
   (iii) They lose very little water through transpiration.
   (iv) Their roots grow very deep into the soil.
   Which of the combination of above features are typical of desert plants?
   (a) (i) and (ii) (b) (ii) and (iv) (c) (ii) and (iii) (d) (iii) and (iv)
3. Boojho comes across an animal having a stream-lined and slippery body. What is the habitat of the animal?
   (a) Water (b) Desert (c) Grassland (d) Mountain
4. Which of the following cannot be called a habitat?
   (a) A desert with camels (b) A pond with fishes
   (c) A jungle with wild animals (d) Cultivated land with grazing cattle
5. Choose the set that represents only the biotic components of a habitat:
   (a) Tiger, Deer, Grass, Soil (b) Rocks, Soil, Plants, Air
   (c) Sand, Turtle, Crab, Rocks (d) Aquatic plant, Fish, Frog, Insect

Short Answer Questions

1. Using the following words, write the habitat of each animal given

Grassland, Mountain, Desert, Pond, River


(a)


(b)


(c)


(d)

2. Why is reproduction important for organisms?
3. Some desert plants have very small leaves whereas some others have only spines. How does this benefit the plants?
4. Unscramble the following word: RETECOXNI (Hint: Waste products are removed by this process).
5. Name the places of living of following plants:
   a) Cactus b) Lotus

Long Answer Questions

1. Like many animals, although a car also moves it is not considered as a living organism. Give 2-3 reasons
2. What are the main differences between biotic and abiotic components? Give examples.

Period 6.10

Student Independent Practice

Fill in the blanks

1. Saline water, hot air and sand are .... components of a habitat.
2. Plants and animals that live on land are said to live in .... habitats.

Multiple Choice Questions

1. What are the characteristics of living beings?
   (a) Respiration, Reproduction, Adaptation
   (b) Respiration, Reproduction, Excretion
   (c) Respiration, Reproduction, Adaptation, Excretion
   (d) Reproduction, Adaptation, Excretion
2. Which of the following is correct for respiration in plants?
   (a) Respiration takes place only during the day
   (b) Respiration takes place only during the night
   (c) Respiration takes place both during the day and night
   (d) Respiration takes place only when plants are not making food
3. Which of the following is not an example of response to stimulus?
   (a) Watering in the mouth when we see delicious food items
   (b) Closing of leaves of a mimosa plant when touched
   (c) Shutting our eyes when an object is suddenly thrown in our direction
   (d) A chick hatching out of an egg

Short Answer Questions

1. Classify the following habitats into terrestrial and aquatic types: desert, pond, forest, ocean, mountain. Give one living organism for each.
2. Mention one adaptation present in the following animals:
   (a) In camels to keep their bodies away from the heat of sand.
   (b) In frogs to enable them to swim.
   (c) In dolphins and whales to breathe in air when they swim near the surface of water.
3. What is adaptation?
4. Define ecosystem.
5. Why does a fish have slippery scales on its body?

Long Answer Questions

1. A desert has extreme temperatures and scarce water. Discuss two plant and two animal adaptations that help them survive in this environment.
2. A pond has a variety of plants and animals. Identify and classify five biotic and abiotic components of this habitat, explaining their roles.

Period 6.11
Student Independent Practice:

1. Animals that live in water are said to live in _____________ habitats.
2. _____________ enable a plant or an animal to live in its surroundings.
3. _____________ is the process of getting rid of waste products in living organisms.

Multiple Choice Questions

1. Which of the following is an incorrect statement about excretion?
   (a) Excretion takes place in plants
   (b) Excretion takes place both in plants and animals
   (c) Excretion is the process of getting rid of excess water only
   (d) Secretion is one method of excretion
2. Which one of the following is not associated with reproduction?
   (a) A new leaf coming out of a tree branch. (b) A dog giving birth to a puppy.
   (c) A seed growing into a plant. (d) Chick hatching from an egg

Short Answer Questions

1. Unscramble the following word ROUCDPRENTOI (Hint: Because of this we find organisms of the same kind)
2. How do the skins of animals living in cold places protect them from cold conditions?
3. What adaptation of desert animals protects themselves from deficiency of water?
4. Explain abiotic components.
5. What is habitat?

Long Answer Questions

1. A snow leopard lives in the cold, rocky terrain of the Himalayan mountains. It has thick fur, a long tail, and sharp claws. The plants in its habitat are mostly conifers with needle-like leaves, which can survive extreme cold.

   Question:

   a. How do the adaptations of the snow leopard help it survive in its habitat?
   b. Why are conifers better suited for the mountain climate compared to plants with broad leaves?

2. In the African savanna, lions, zebras, and giraffes coexist. Lions rely on stealth and camouflage to hunt. Zebras use their speed to escape predators, and their stripes make it difficult for lions to single them out in a herd. Giraffes use their long necks to eat leaves from tall trees, while grass grows back quickly after being grazed.

   Question:

   a. How do the adaptations of lions and zebras show the relationship between predator and prey?
   b. Why do giraffes and grass have adaptations that allow them to survive together in the same ecosystem?

Period 6.12 : Remedial teaching

Period 6.13 : Remedial teaching

TEACHER’S DIARY

Name of the Teacher:				**Name of the Month:**	
Name of the Lesson:				Class:	
Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
6.1	Introduction Organisms and the surroundings where the live - Activity 1				
6.2	Habitat and adaptation				
6.3	Activity 2 A Journey through different habitats: Some Terrestrial Habitats Deserts - Activity 3, Mountain Regions, Grasslands				
6.4	Some Aquatic habitats: Oceans, Pond & Lakes				
6.5	Characteristics of Organisms: Food, Growth, Respiration,				
6.6	Do all organisms Response to stimuli - activity 4 Living organisms & excretion				
6.7	Reproduction - Activity 5				
6.8	Movement & Life				
6.9	Student Independent Practice				
6.10	Student Independent Practice				
6.11	Student Independent Practice				
6.12	Remedial teaching				
6.13	Remedial teaching				

1.	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature

Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

December 2025

C2M1S3
No bag Day

F1S8Y2
Cluster Complex

E5F4M6
Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 World AIDS 7.1,7.2	2 7.3	3 7.4,7.5	4 7.6	5 NI	6 No Bag Day Mega PTM/SMC
7 Sunday	8 7.7	9 7.8	10 Human 7.8	11 NI	12 NI	13 Second Saturday
14 Sunday	15 8.1	16 8.2	17 8.3	18 8.3	19 NI	20 No Bag Day Cluster Meeting
21 Sunday	22 Mathematics Day Christmas Holiday	23	24 National	25 Christmas	26	27 No Bag
28 Sunday	29 8.4	30 8.4	31 NI			

Christmas Holidays for Christian Minority Institutions 21.12.25 to 28.12.25

Week1: **7.1 – 7.6**

Week 2: **7.7 – 7.8**

Week 3: **8.1– 8.3**

Week 4: **NA**

Week 5: **8.4**

TEACHER'S NOTES

7

MOTION AND MEASUREMENT OF DISTANCES

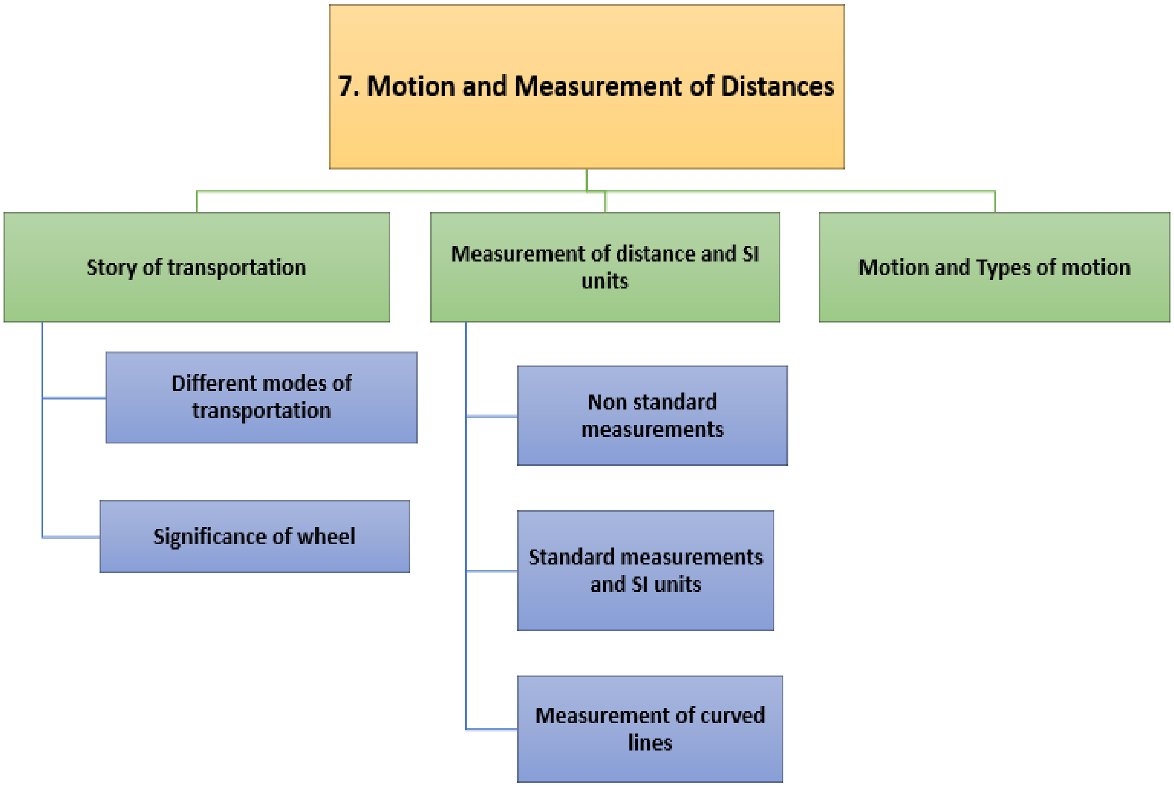
E6H5F4

Learning Outcomes:

Students will be able to

1. Identify the means of Transport in day to day life
2. Measure the length of objects with appropriate tool
3. Apply the knowledge of standard units of accuracy, consistency, and comparison
4. Conducts the activity and measures the length of the curved line
5. Differentiate between rectilinear, circular and oscillatory motion
6. Differentiate between rectilinear, circular and oscillatory motion
7. Differentiate between rectilinear, circular and oscillatory motion

CONCEPT MAP



SYNOPSIS

Evolution of Transport:

- Humans initially travelled on foot, carrying goods on their backs.
- The domestication of animals enabled the use of animals for transportation. Early water travel involved simple log boats, evolving into more advanced designs over time.
- Around 3500 BC, the wheel was invented, leading to the development of carts pulled by animals, significantly enhancing land transport efficiency.
- In the 19th century, steam engines powered trains, automobiles, and motorized ships, revolutionizing long-distance travel and commerce.
- The early 1900s saw the introduction of aeroplanes, electric trains, and spacecraft, further transforming global transportation networks

Introduction to Measurement and Distance, Importance of Standard Units:

- Early measurements were based on body parts or everyday items, like the "foot" or "hand span.”
- Personal or non-standard units, like foot lengths or hand spans, can cause problems because they vary from person to person. This inconsistency can lead to confusion and mistakes, especially in fields like trade, construction, and science.
- Standardized systems, like the International System of Units (SI), ensure consistency and accuracy, using units like the meter (m) for length.

Measurement Activities:

- A metre scale for accurate measurements.
- The measuring devices are suited for specific tasks (like a tape for large objects or a metre scale for small ones).
- Use a thread to measure curved lines, with examples like the length of a curved path.

Motion and Types of Motion:

- Rectilinear Motion: Motion along a straight line.
  - Example: A car driving along a straight road.
- Circular Motion: Motion along a circular path.
  - Example: The motion of the blades of a windmill.
- Periodic Motion: Motion that repeats itself after regular intervals of time.
  - Example: The swinging of a pendulum in a clock.
- Some more examples of motion in everyday life are a moving train, the blades of a fan, or a clock’s hands.

Period-wise Topics

Chapters and Concepts

Periodic No.	Topic	Remarks
7.1	The story of transportation	
7.2	Non-standard and standard methods of measurement	
7.3	Standard units of measurement & correct measurement of length	
7.4	Measuring the length of a curved line	
7.5	Moving things around us	
7.6	Types of Motion	
7.7	Revision: Practice of measuring lengths and types of motion	
7.8	Student Independent Practice	
7.9	Student Independent Practice	
7.10	Student Independent Practice	
7.11	Remedial teaching	
7.12	Remedial Teaching	
7.13	Remedial Teaching	

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Recognize that length measures how long something is, and distance measures how far apart things are.
- Knowledge of standard units, like meters for length, are used worldwide to keep measurements consistent.
- Understand how to use tools like rulers or measuring tapes to measure length accurately.
- Know that motion means an object is changing its position over time.

Teacher References: *(Any external links that would help teachers create activities on their own. This includes NCERT Material, OERs, Digital links, etc.)*

- NCERT Class 6 Textbook 6_General Science_SEM-2_Textbook.pdf

- Bal Vaigyanik Class 6, Eklavya
- Motion and Measurement of Distances Class 6 Science in One Shot (Chapter 10) | BYJU'S - Class 6
- Motion And Measurement Of Distances | Part 1/2 | English | Class 6
- Grade 6 | Science | Motion and Measurement of Distances | Free Tutorial | CBSE | ICSE | State Board
- Measuring Length Using Non-Standard Units

Teaching Learning Material (TLM):

Period 1: Invention of Wheels - History of Wheels - How did the Wheel Come into Existence? Learning Junction

Large sheets of paper, markers, coloured pencils, or crayons for each group. Pictures (or printouts) of various transportation modes (walking, animal-drawn carts, boats, steam engines, railroads, automobiles, aeroplanes, spacecraft)**.**

Large sheets of paper, markers, coloured pencils, or crayons for each group. Pictures (or printouts) of various transportation modes (walking, animal-drawn carts, boats, steam engines, railroads, automobiles, aeroplanes, spacecraft)**.**

Period 2: A ruler or scale (for comparison), String (about 30 cm long), Gilli and Danda (or substitutes), Classroom objects (e.g., desks, books, tables), Chalkboard or whiteboard, Paper and pencils for recording.

Period 8: Metre sticks, 15 cm rulers, String, Measuring tapes, Various classroom objects of different sizes (desks, books, chairs, etc.), Large chart paper/whiteboard, Markers or pens.

Period 9: White paper sheets, Sugar (for attracting ants), Pencil, Ruler (optional), A list of common objects (for class discussion), Chalkboard or whiteboard.

Period 10: A stone, string, and a stopwatch (for Activity 7), A clock, an electric fan, and a sewing machine (for observation), Chart paper and markers for group work, A ruler or measuring tape (optional).

Concept 1: Story of transport

Teaching Learning Process

Learning Objectives:

Student will be able to

1. Describe the different modes of transportation from ancient times to the modern era, including the invention of the wheel, the steam engine, automobiles, and spacecraft.

Induction/Introduction

In this concept, students will learn about the evolution of transportation—from walking and animal-drawn carts to modern transportation like cars, aeroplanes, and spacecraft.

Vocabulary:

Evolution:

Meaning: The gradual development or change of something over time, especially from a simpler to a more complex form.

Invention:

Meaning: A new device, method, or process that has been created.

Streamlined:

Meaning: Designed or constructed to offer minimal resistance to movement, often used in the context of shapes or vehicles.

Period 7.1:

Learning Objectives:

Students will be able to

- Describe the different modes of transportation from ancient times to the modern era, including the invention of the wheel, the steam engine, automobiles, and spacecraft.

Hook:

Imagine if you had to travel from one city to another(Visakhapatnam to Hyderabad), but you couldn't use any bikes, cars, buses, or trains. How would you get there? What do you think your journey would be like? (Take student responses)

Experience and reflection:

- How did you travel last time? What types of transportation did you use? (Take student responses)

Which means of transportation do you like most and why? (Take student responses)

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
The teacher reads the passage "There was a general ………. Of the 20th century." on pages 2, 3, and 4 of the textbook aloud to the class about transportation in ancient times. The teacher can also show the video Invention of Wheels - History of Wheels - How did the Wheel Come into Existence? Learning Junction about the invention of the wheel, highlighting the revolutionary impact it had on transportation. **Key Discussion Points**: Ancient transport: walking, animal-drawn carts, boats. • The invention of the wheel and its impact on transport. • The development of steam engines, railroads, automobiles, aeroplanes, and modern spacecraft. **CFU (open-ended/ Factual)** **Factual** 1. What did people use for transportation before animals? 2. What do you think of the wheel's improved transport? **Open-ended**	"Now let's work in our groups for the next activity." **Timeline Creation:** Divide the students into small groups of 3-4. Each group will create a timeline of transportation, arranging events in order using picture 7.1 on page 2 of the textbook. Ask them to include simple illustrations or pictures next to each event on the timeline.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." The teacher writes down questions on the board and asks students to write their answers in their notebooks. 1. What modes of transportation from ancient times are still used today? 2. Which inventions had the most significant impact on how people travel? 3. How have technological advancements made travel faster and more efficient? **Homework:** Write a short paragraph (3-4 sentences) about how transportation in your local area has changed over the years (e.g., from bicycles to cars, or horses to motorised vehicles).

3. If you could travel anywhere in the world, which mode of transportation would you choose and why? In the future, what kind of transport do you think people might use?		

Closing
The teacher briefly recaps the main points of the lesson, emphasising how transportation evolved from simple walking and boats to complex modern systems like aeroplanes and spacecraft.

Assessment of Concept 1:
A. Answer the following questions.

1. The invention of the _________ was a major breakthrough in transportation, making it possible for carts to move efficiently.
2. Before the development of trains and automobiles, people primarily used _________ and boats for long-distance travel.
3. The _________ engine played a significant role in the development of railroads, revolutionizing land transportation.
4. Explain why the invention of the wheel was important for transportation
5. What do you think is the most significant transportation invention in history, and why?

B. Match the transportation mode with its description. (LO 1)

COLUMN - A	**COLUMN - B**
1. Animal-drawn carts	A. A machine used to power locomotives and ships, making transportation faster.
2. Aeroplanes	B. A modern form of transport that flies through the air.
3. Steam engine	C. A traditional mode of transport used to carry goods and people, pulled by animals.

Concept 2: Non-standard and standard methods of measurement

Teaching Learning Process

Learning Objective/s:
Students will be able to

1. Use non-standard units (foot, handspan, string) to measure the length of classroom objects.
2. Identify and explain the use of standard measurement units (metre, centimetre, kilometre) in daily life situations.
3. Accurately measure an object using a standard metric scale (metre and centimetre).
4. Convert and compare lengths in different units, such as metres, centimetres, millimetres, and kilometres, and apply these conversions to real-life situations.
5. Apply accurate measurement techniques for irregular shapes, e.g. curved lines.
6. Apply the concept of measurement by using both non-standard (foot, handspan, string) and standard units (metres, centimetres) to measure classroom objects.

Induction/Introduction

In this concept, students will be able to use non-standard units, such as foot, handspan, and string, to measure the length of various classroom objects, understand the importance of measuring with non-standard units, and relate the use of these methods to real-world situations.

Vocabulary:

Foot: Foot: This unit was based on the length of a human foot.

Handspan: This is the distance from the tip of the thumb to the tip of the little finger when the hand is fully extended.

Period 7.2:

Learning Objectives:

Students will be able to

- use non-standard units (foot, handspan, string) to measure the length of classroom objects.

use standard units(centimetre, metre, kilometre,) to measure the length of classroom objects.

Hook:

If you don't have a ruler or tape measure and need to measure the length of the desk, how would you go about it? Let’s try it and share your methods. (Take student responses)

Experience and reflection:

Have you ever used your hand or foot to measure something? What method did you use, and how accurate do you think it was? (Take student responses)

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Based on the student's responses to the hook question, the teacher demonstrates one of the methods to measure the table, such as using a small stick or pencil, or gillii and danda. The teacher then demonstrates how to measure the length of the desk using string and asks students to follow the steps shown in Figure 7.4 of the textbook. A discussion is facilitated on how to measure distances shorter than the length of the string. Students are instructed to fold the string and mark it into 1/2, 1/4, and 1/8 lengths of the string. The teacher now asks the students to compare the distances measured by the pencil and stick with the string, and share their observations.	“Now let’s work in our groups to measure different things or places.” Divide the students into small groups of 3-4. Each group will choose a classroom object (e.g., desk, chair, or book) to measure using any object and a piece of string. Ask them to compare the methods and share their findings with the class. 1. Which method provided the most accurate measurement? 2. Which method was the easiest to use? 3. Are these methods consistent and useful? 4. Are there other methods that might be more accurate than these? Provide examples. “Now, let’s practice in your groups! “	**1. Activity:** Provide each student with a piece of string and ask them to measure the length of their textbook. **Instructions:** ● Lay the string along the edge of the textbook. ● Mark the endpoint on the string. ● Fold the string into halves, quarters, or eighths to measure shorter sections if needed. ● Estimate the length based on the string's measurements.

The teacher shares that the pencil and stick measurements vary slightly, while the string method offers more flexibility and accuracy, especially for shorter distances. The string also requires careful folding to measure accurately.

Till now, we have used some non-standard methods to measure things. How do you think we could measure larger spaces like the classroom? Do you think it will be accurate enough? (Take student responses)

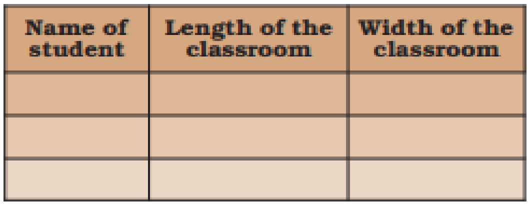
Let's find out together!

Activity 1: Measuring the Length and Breadth of the Classroom

Activity 2: Measuring the width of a table *(Teacher Demo)*

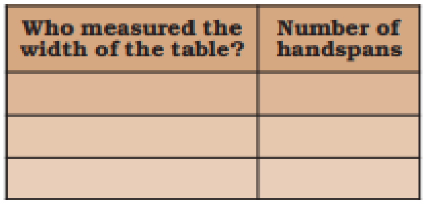
The teacher will demonstrate the following activity (Pages 7-9 in the textbook) with the help of a few students. The teacher will measure the length of the classroom using a non-standard method, such as using foot measurements, and will note the findings in the table.

Table 7.1 Measuring length and breadth of classroom



Name of student	Length of the classroom	Width of the classroom

Table 7.2 Measuring width of a table



Who measured the width of the table?	Number of handspans

CFU (Open-ended/ Factual)

Factual

1. When they used a string for measurement, did Paheli and Boojho get the same result when measuring the desk after a few days? Why or why not?

Divide the class into groups of 5-6 students and ask them to choose the tallest person in the group. The remaining members will then use their hand spans and finger widths (complete hand spans and the remainder in finger widths) to measure the height of the tallest person. Afterwards, discuss the following questions with the class.

S.No	Name of the Student	Hand Spans	Finger Width

Discussion Questions:

1. Are all the measurements alike?
2. Why are all the measurements not the same?
3. Is your hand span equal to your friend's hand span?

If everyone were to use their hand spans and finger widths to measure lengths, what problems would it create?

- Compare your estimation with the actual measurement using a standard ruler

2. Activity: Ask students to individually measure the length of their desk or a small classroom object using their **foot** or **handspan** and compare the results with the person sitting next to them.

Reflection Questions:

- Which method provided the most accurate measurement?
- Which method was the easiest to use?
- Do you think non-standard units would work for measuring larger spaces? Why or why not?
- Can you think of any creative ways we could improve the accuracy of non-standard units for practical use?

Home Work

- Measure the length of something at home (e.g., the width of a door, the length of a table) without using a scale or measuring tape. Write about the method you used and the length you got.

2. What are some situations where we might need to measure lengths, as discussed in today's lesson? 3. What is a non-standard unit of measurement? 4. What is an example of a non-standard unit you used today in the lesson? **Open-ended** 5. What are the advantages and limitations of using string to measure length? 6. In what other real-life situations could you use the string measurement method? Why is it important to use the same unit when measuring objects?		Measure the length and width of a table at home using your foot or handspan. Compare your results with someone else in your home.

Closing

Well done, everyone! Today, we learned how to use non-standard units like gilli, danda and string to measure things around us. We saw that while a string can be more flexible and accurate for shorter distances, other methods, like using a pencil or stick, might not be as precise.

The teacher concludes that the hand & span, foot sizes and strides of different people are not the same. They vary from person to person. Hence, we can use them only to estimate distances, not to measure distances accurately

Assessment of Concept 2:

Answer the following questions:

1. Which is more accurate for measuring the length of an object: using a non-standard unit (like a handspan) or a standard unit (like centimetres)? Explain why.
2. Explain the importance of using standard units of measurement in everyday life.
3. If a classroom object is measured as 50 cm, how would you express that measurement in metres and millimetres?
4. What challenges might you face when measuring irregular shapes, and how can you overcome them?

Use a non-standard unit (like your foot or handspan) to measure the length of a classroom desk. Then, convert the measurement into centimetres and metres.

Concept 3: Standard units of measurement & correct measurement of length

Teaching Learning Process

Learning Objectives:

Students will able to

- Accurately measure an object using a standard metric scale (metre and centimetre).
- Convert and compare lengths in different units, such as metres, centimetres, millimetres, and kilometres, and apply these conversions to real-life situations.
- Apply accurate measurement techniques for irregular shapes, e.g. curved lines.

- Apply the concept of measurement by using standard units (metres, centimetres) to measure classroom objects.
- identify and explain the use of standard measurement units (metre, centimetre, kilometre) in daily life situations.
- convert and compare lengths in different units, such as metres, centimetres, millimetres, and kilometres, and apply these conversions to real-life situations.

Induction/Introduction

In this concept, students will be able to use standard units, such as a meter scale and measuring tape, to measure the length of various classroom objects, understand the importance of measuring with standard units, and relate the use of these methods to real-world situations.

Vocabulary:

- **Metre (m)**: The base unit of length.
- **Centimetre (cm)**: 1 metre = 100 centimetres.
- **Millimetre (mm)**: 1 centimetre = 10 millimetres.
- **Kilometre (km)**: 1 kilometre = 1000 metres.

Period 7.3:

Learning Objectives:

Students will be able to

- ○ Accurately measure an object using a standard metric scale (metre and centimetre).
- ○ Convert and compare lengths in different units, such as metres, centimetres, millimetres, and kilometres, and apply these conversions to real-life situations.
- ○ Apply accurate measurement techniques for irregular shapes, e.g. curved lines.
- ○ Apply the concept of measurement by using standard units (metres, centimetres) to measure classroom objects.
- ○ identify and explain the use of standard measurement units (metre, centimetre, kilometre) in daily life situations.
- ○ convert and compare lengths in different units, such as metres, centimetres, millimetres, and kilometres, and apply these conversions to real-life situations.

Hook:

Imagine if you wanted to buy a rope, and the shopkeeper measured it using their arm. But when you got home, you measured using your own arm—and it turned out shorter!

Would that be fair? Why or why not?

Experience and reflection:

Have you observed how tailors take measurements for the clothes they stitch? How do we commonly express the distance between two cities?

<table>
<tr><th>Explicit Teaching/Teacher Modelling (I Do)</th><th>Group Work (We Do)</th><th>Independent Work (You Do)</th></tr>
<tr>
<td>
<p>1. In previous classes, we explored how people used body parts (such as feet, fingers, and steps) to measure in ancient times. We learned that using body parts for measurement can lead to inconsistencies.</p>
<p>Now, think about how we moved from these ancient methods to the measurements we use today. (Take student responses)
The teacher discusses the evolution of measurement systems from body parts to standardised units using the video Metric System - explained simply.
Introduce the metric system, focusing on the metric units used today:</p>

Metre (m): The base unit of length.
Centimetre (cm): 1 metre = 100 centimetres.
Millimetre (mm): 1 centimetre = 10 millimetres.
Kilometre (km): 1 kilometre = 1000 metres.

<p>Teacher Demonstration:</p>

The teacher shows the metre scale and the 15 cm scale from the geometry box.
Demonstrate how to measure an object(e.g. notebook) using the metre scale and explain the units of measurement.

<p>We have learned about units of measurement and practised measuring using a 15 cm scale.
The teacher facilitates a discussion on accurate measurement using the following questions: (Take student responses)</p>

If two people take the same measurement but one person’s eye is not directly in front of the scale, how do you think their measurements will differ?
What might happen if the measurement tool is not aligned properly with the object you're measuring?

<p>The teacher demonstrates the correct use of a metre scale:</p>

Positioning the scale: Ensure the scale is in contact with the object along its length (Fig. 7.7).

</td>
<td>
<p>1. Measuring Classroom Objects:</p>

Measure the length and breadth of a desk or chair using the metre stick or the 15 cm scale.
You should record their measurements in both metres and centimetres.
Finally, compare the standard measurements with one non-standard method.

<table>
<tr><th>o</th><th>Name of the Student</th><th>Standard Method</th><th>Non-Standar Metho</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
<p>2. Measuring Classmate's Height and Correct Positioning:
Divide the class into groups of 5-6 students and ask them to measure the height of one classmate using their hand span and then with a metre scale. The student should stand against a wall, and a mark should be made above their head. Measure the distance from the floor to the mark using hand spans, and then measure it with the metre scale. Record all measurements in Table 7.3.
Discussion Questions:</p>
</td>
<td>
<p>1. Answer the following questions:</p>

1 metre = ___________ centimetres.
1000 metres = ___________ kilometres.
What challenges did you face when using non-standard methods for measurement? How did the results compare to standard methods?
Why may the measurements have varied using different methods or tools?

<p>2. Ask students to measure the length of an object of their choice (e.g., a pencil, a book) using a metre scale and answer the questions.</p>

Was it easy to get an accurate reading?
How did you ensure that the scale was aligned correctly?
What are some things you need to keep in mind to make sure you are taking accurate measurements?

<p>Answer the following questions.</p>
</td>
</tr>
</table>

2. **Handling broken scales**: Explain that if the zero mark is not clearly visible (Fig. 7.8), use a full mark (e.g., 1.0 cm) and subtract this value from the reading at the other end to get the correct length (e.g., 14.3 cm - 1.0 cm = 13.3 cm). 3. **Correct eye position**: Demonstrate how the eye must be directly in front of the measurement point to avoid errors (Fig. 7.9). The teacher explains that measurements can vary depending on the positioning of the measurement tool and eye level. It's important to take measurements carefully and accurately, as even small errors can lead to discrepancies. 2. We have learned about SI units for measuring length with a scale. Today, we'll practice measuring lengths using these units in real-life situations. 1 metre = _______________. 1 centimetre = ____________. 1 kilometre = _____________. The teacher will demonstrate conversion with examples, such as how to convert metres to centimetres, centimetres to millimetres, kilometres to metres, and so on. For example, if the distance between two cities is 15,000 meters, you would convert it to kilometers (15,000 meters = 15 kilometers) for easier understanding and communication.	1. Why did different students get different measurements with hand spans? 2. Were the metre scale measurements more consistent between students? Why or why not? 3. How did your eye position affect the accuracy of your measurements? 4. What happened when your eyes were not aligned directly with the measurement point? **Measuring distances:** Divide the class into groups of 3-4 students and ask them to measure the length of various classroom objects (such as books, blackboard, desks, length of the window/door, textbook and chairs) in metres, centimetres, and millimetres. Then, have them convert these measurements into different units. For example, if a book is 30 cm long, ask them to convert it into metres and millimetres: 30 cm = 0.30 metres (since 1 metre = 100 centimetres) 30 cm = 300 millimetres (since 1 centimetre = 10 millimetres)	1. Convert 5 metres into centimetres. Answer: __________________ 2. Convert 300 millimetres into metres. Answer: __________________ 3. A runner participates in a 5-kilometre race. How far did they run in metres? Answer: __________________ 4. Your height is 1.75 metres. How tall are you in centimetres and millimetres? Answer: Centimetres: __________________ Millimetres: __________________ 5. A football field is 120 metres long. Express this distance in kilometres. Answer: __________________ 6. The distance from your home to the nearest store is 800 metres. Convert this distance into centimetres. Answer: __________________ **Home Work** Measure a few objects at home (e.g., a table, door, or bed) using standard units

1. Convert 5 metres to centimetres. 1 metre = 100 centimetres 5 metres = 5 × 100 = **500 centimetres** **2. Convert 250 centimetres to metres.** 1 metre = 100 centimetres 250 centimetres = 250 ÷ 100 = **2.5 metres** **3. Convert 3 kilometres to metres.** 1 kilometre = 1,000 metres 3 kilometres = 3 × 1,000 = **3,000 metres** **4. Convert 1,500 millimetres to centimetres.** 1 centimetre = 10 millimetres 1,500 millimetres = 1,500 ÷ 10 = **150 centimetres** **5. Convert 2.5 kilometres to metres.** 1 kilometre = 1,000 metres 2.5 kilometres = 2.5 × 1,000 = **2,500 metres** **6. Convert 800 centimetres to millimetres.** 1 centimetre = 10 millimetres 800 centimetres = 800 × 10 = **8,000 millimetres** **CFU (Open-ended/ Factual)** **Factual** 1. What was the standard unit of length introduced by the French in 1790? 2. In the International System of Units (SI), what is the relationship between metres and centimetres? 3. Why is it important to position the measurement tool correctly when taking a measurement? 4. What is the relationship between metres and kilometres? 5. How do you convert centimetres to millimetres? **Open-ended** 6. How did the standard units help you measure more accurately compared to using feet or handspan? 7. Write situations where using standardized measurements might be important in your daily life. 8. Can you think of any situations in real life where small measurement errors could lead to big problems? 9. When taking measurements, what can you do to make sure you avoid small errors due to misalignment? Can you think of a real-life example where you would need to convert metres to kilometres?	If a group has extra time, they can also try measuring the height of one person in the group and convert the measurements to different units.	(metres, centimetres). They should write down their measurements and convert them between different units (e.g., metres to centimetres) Measure the length of two objects at home (e.g., a book and a piece of paper) using a metre scale and then compare their results with a family member's measurements. **Reflection**: "How did the results compare? Did you notice any errors in the way the measurement was taken?" 1. Measure the distance between two points between any two corners in your home and convert it into various units. **2.** Calculate the total distance you walk in a day if you walk to school (1.2 kilometres) and back home (1.2 kilometres). Express this total distance in kilometres and metres.

Closing

Summarize the importance of standardised units of measurement and their application in everyday life.

- Recap the historical context of measurement.
- Emphasise the importance of standardized units (SI units) for uniformity in science, trade, and daily activities.
- Highlight how units like metres, centimetres, millimetres, and kilometres make measurements consistent and reliable across the world.

- Choosing the right measurement tool for the job is essential.
- Accurate measurements depend on careful positioning and proper eye alignment.
- Small errors can happen, but understanding how to reduce these errors is important for precise results.

The teacher recaps the different units and conversions with the class. Ask for a few volunteers to share their answers and explain their reasoning.
Key Points:

- 1 metre = 100 centimetres,
- 1 centimetre = 10 millimetres,

1 kilometre = 1000 metres

Concept 4: Measuring the Length of a Curved Line

Teaching Learning Process

Learning Objectives:

Students will able to

1. Students will be able to accurately measure an object using a standard metric scale (metre and centimetre).
2. Apply accurate measurement techniques for irregular shapes, e.g. curved lines.
3. Students will be able to apply accurate measurement techniques for irregular shapes, e.g. curved lines.

Introduction:

In this concept, students will learn the method used to measure curved lines accurately and express the result in metric scale.

Vocabulary:

- **Metre (m)**: The base unit of length.
- **Centimetre (cm)**: 1 metre = 100 centimetres.
- **Millimetre (mm)**: 1 centimetre = 10 millimetres.
- **Kilometre (km)**: 1 kilometre = 1000 metres

Period 7.4:
Learning Objectives
Students will be able to
accurately measure an object using a standard metric scale (metre and centimetre).

Hook:

(Can be done as outdoor or indoor activity):

The teacher marks two tracks on the floor - one straight and one curved with the same starting and end points. She calls a few students to volunteer to walk on both the paths and say which is longer and why.

After the activity, the teacher says, “Today we will learn how to measure the length of a curved line and express it in standard units.”

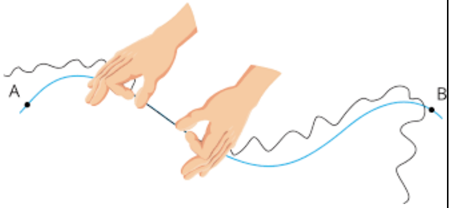
Experience and reflection:

Have you ever walked or ridden a bike on a curvy path, around your neighbourhood? Did it feel longer than taking a straight route—even if both started and ended at the same place?

<table>
<tr><th>Explicit Teaching/Teacher Modelling <i>(I Do)</i></th><th>Group Work <i>(We Do)</i></th><th>Independent Work
(You Do)</th></tr>
<tr>
<td>
In the previous class, we learned how to measure different lengths using standard units with suitable tools e.g. straight lines using a metre scale. Now, think about whether we can measure a curved line with a ruler. How do you think we might do that? <i>(Take student responses)</i>

The teacher facilitates a discussion with students using the following questions:

Can we use a metre scale to measure a curved line? Why or why not?
If a metre scale can’t measure a curved line, what kind of tool do you think could be used instead?
How do you think we can use a flexible tool like a thread to measure the length of a curved line?
What happens if we place the thread along the curved line? How will we measure the length of the thread?



The teacher demonstrates how to measure a curved line using thread:

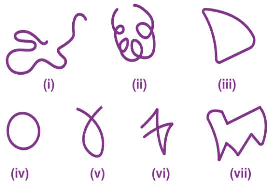
Show the class how to use the thread to measure a curved line.
Take a piece of thread and tie a knot at one end.

</td>
<td>
Measuring the Curved Line:
Divide the class into groups of 3-4 and give each group a piece of thread and a curved object to measure. Ask them to record their measurements.
Objects: Bangle, water bottle cap, tiffin box cap, plate, spoon, circular lid.
Follow the same steps:

Tie a knot at one end.
Use the thread to trace along the curve, making marks at the end of the curve.
Measure the length of the thread with the metre scale.

<table>
<tr><td>Student Name</td><td>Length of the given curved object</td></tr>
<tr><td></td><td></td></tr>
</table>
</td>
<td>

Students now measure additional curved lines either on paper or in the classroom.

Link for Curved lines


Record your results and compare them with a classmate’s measurements to see if there are any differences.
Explain how you will measure the length of a curved line.

Home Work
</td>
</tr>
</table>

● Place the knot at one end of the curved line (Point A). ● Slowly stretch the thread along the curved line, keeping it taut between your fingers. ● Mark the point where the thread reaches the other end of the line (Point B). ● Stretch the thread along the metre scale and measure the length from the knot to the marked end. **CFU (Open-ended/ Factual)** **Factual** 1. Why is it important to use a thread instead of a scale when measuring curves? **Open-ended** 2. Share 2-3 real-world examples where measuring a curved line might be necessary. Do you think the thread method gives a more accurate result for curved lines compared to just using a metre scale? Why or why not?	**Discussion Questions:** ● Why do we need to keep the thread tight while measuring the curved line? ● Did all students get the same measurement? Why or why not? ● What might cause differences in measurements between students? ● How does this method compare to using a straight ruler?	Measure a curved object at home (e.g., the outline of a bowl or a curved garden path) using the thread method. Record your measurements and compare them with a classmate's measurements in the next class.

Closing
Recap the key learning points:

- We use thread to measure curved lines because it can bend and follow the shape of the curve.
- The importance of using a standard unit (metre scale) after measuring with the thread is to get an accurate reading.

Accuracy in measuring requires patience and care in following the line with the thread.

Concept 5: Moving things around us

Teaching Learning Process

Learning Objectives:

Students will be able to

- Identify and differentiate between objects in motion and at rest.

Induction/Introduction

In this concept, students will learn about what motion is using the things around us and the types of motion.

Vocabulary:

- **Motion:** Objects that change position over time (e.g., a bird flying, a car moving).

Rest: Objects that do not change position (e.g., a chair, a table)

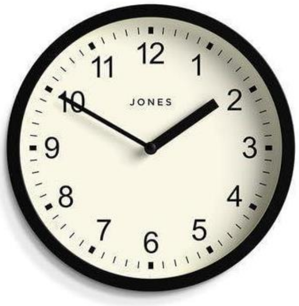
Period 7.5:
Learning Objectives:
Students will be able to
Identify and differentiate between objects in motion and at rest.

Hook:

The teacher shows students a series of short video clips or images (these can be displayed using a projector or on the board). Each clip should feature something either in motion or at rest.
Example clips: A moving car, a spinning top, a cat lying on a chair, a person running, a clock with moving hands, a stationary book.







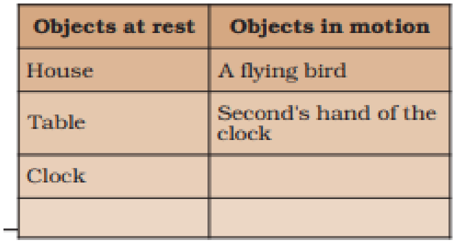
As each clip or image is shown, pause briefly and ask, "Is this object in motion or at rest?" (Take student responses)
After showing 3-4 examples, ask, "Have you ever wondered why something like a car moves but a table doesn't? What makes the difference?" (Take student responses)

Experience and Reflection:
Think about the last time you saw something move. What did you notice about its movement? Was it fast or slow? (Take student responses)

<table>
<tr><th>Explicit Teaching/Teacher Modelling
(I Do)</th><th>Group Work (We Do)</th><th>Independent Work
(You Do)</th></tr>
<tr>
<td>(**NOTE:** The teacher can also show this video REST AND MOTION | PHYSICS | SCIENCE with examples of rest and motion.)

The teacher **demonstrates** how to complete Table 7.4 on page 16 of the textbook with a few examples by facilitating students with the questions below: (Take student responses)
● Share some objects you've seen recently in daily life (Write some examples on the board).
● What makes an object in motion or at rest?
For example: A bird flying vs. a table—which is in motion? How do you know? Yes, the bird is in motion because it changes its position over time, whereas the table stays in the same place.
Definition of Motion and Rest:

Motion: Objects that change position over time (e.g., a bird flying, a car moving).
Rest: Objects that do not change position (e.g., a chair, a table)

CFU (Open-ended/ Factual)
Factual
1. What kind of objects were easy to identify as being in motion? Why?
2. Write 2 examples of objects that are in motion and at rest in the classroom.
Open-ended
When you see a person walking across the room, how do you know they are moving?</td>
<td>**Differentiate Moving vs. Rest:** Divide the class into groups of 3-4 students and ask them to work together to list more objects they see around them, categorizing them as either in motion or at rest. They should fill out Table 7.4.
(**Note:** Give students time to go out and observe, such as walking past people, moving bicycles, and stationary furniture.)
Table 7. 4 Objects at rest and in motion

<table><tr><th>Objects at rest</th><th>Objects in motion</th></tr><tr><td>House</td><td>A flying bird</td></tr><tr><td>Table</td><td>Second's hand of the clock</td></tr><tr><td>Clock</td><td></td></tr><tr><td></td><td></td></tr></table>After completing the table, ask each team to share an example and explain how they decided whether an object is in motion or at rest.</td>
<td>**Answer the following questions:**
1. How would you define motion based on the idea that it involves a change in an object's position over time?
2. Can you think of an example where you can observe motion?
3. What role does time play in deciding if something is in motion?

Home Work
Do Activity 6 and answer the following questions:
● How are the ants moving?
● Is their movement similar to the movement of a fan or a train?</td>
</tr>
</table>

Closing

The teacher summarizes the lesson by reinforcing the concept that motion involves a change in position with time, and objects at rest do not change their position.

Concept 6: Types of Motions

Teaching Learning Process

Learning Objectives:

Students will be able to

- Analyze the differences between rectilinear motion, circular motion, and periodic motion, and identify examples of each in daily life.

Induction/Introduction

In this concept, students will learn about what motion is using the things around us and the types of motion.

Vocabulary:

- **Rectilinear Motion:** Movement in a straight line, like a car on a road or a sprinter on a track.
- **Circular Motion:** Movement in a circle, like the hands of a clock or a rotating fan.

Periodic Motion: Motion that repeats at regular intervals, like a swinging pendulum or a sewing machine needle

Period 7.6:
Learning Objectives:
Students will be able to analyse the differences between rectilinear motion, circular motion, and periodic motion, and identify examples of each in daily life.

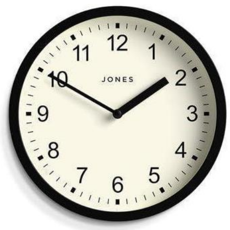
Hook:

The teacher shows students a series of short video clips or images (these can be displayed using a projector or on the board). Each clip should feature various types of motions.

Example clips: A moving car, a spinning top, a sewing machine a boy running, a clock with moving hands, a moving pendulum in clock.







As each clip or image is shown, pause briefly and ask, "What type of motion is this?" (Take student responses)

Experience and Reflection:

Think about the last time you saw something move. What did you notice about its movement? Was it fast or slow

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work *(We Do)***	**Independent Work** (You Do)
Show the students a clock, a sewing machine, and an electric fan.    Ask: “Where did you place these objects in your grouping of objects? (Take student responses) Are they moving from one place to another? Do you notice movement in any of their parts? **Introduce Rectilinear Motion**: (**NOTE:** The teacher can also show this video [Motion and its Types - Part 1 | Don't Memorise]()) ● The teacher can take a toy car and move it along the table to demonstrate the rectilinear motion of the toy car. ● Explain that rectilinear motion refers to movement in a straight line. Objects like vehicles on a straight path, soldiers marching, and sprinters in a race exhibit rectilinear motion. **Introduce Circular Motion**: (**NOTE:** The teacher can also show this video [Motion and its Types - Part 2 | Don't Memorise]()) ● The teacher can tie a thread to a stone and rotate it to demonstrate the circular motion.	**Identifying Types of Motion:** Divide the class into groups of 3-4 and assign a list of various objects. Ask each group to classify these objects according to the types of motion (rectilinear, circular, periodic). Afterwards, have the groups discuss why they categorized each object in a specific way by providing 1-2 examples of each type of motion from their surroundings. **List of objects:** 1. Car 2. Bicycle 3. Clock's hands 4. Fan blades 5. The ball is rolling on the ground 6. Pendulum 7. Helicopter 8. Washing machine drum 9. Merry-Go-Round 10. Swing	Individually, write down three examples of objects or events from your everyday life that demonstrate each type of motion (rectilinear, circular, and periodic). For each example, provide a brief explanation of why it fits that particular type of motion. **Home Work** Observe different types of motion in their home or surroundings and write a short paragraph describing at least three objects or activities that involve rectilinear, circular, or periodic motion.

- Emphasize that while these objects don't move from one place to another, their parts (like the clock hands or fan blades) follow circular paths. Their distance from the centre remains the same.

Introduce Periodic Motion:
(**NOTE:** The teacher can also show this video, Periodic Motion)

- Discuss the concept of periodic motion. The teacher can use the string tied to the stone to show how a periodic motion is identified.
- Explain that periodic motion is a type of motion that repeats at regular intervals, such as the motion of a pendulum or the needle of a sewing machine.

Concept Explanation:
Rectilinear Motion: Objects move in a straight line (e.g., sprinter, vehicle on a straight path).
Circular Motion: Objects move in a circular path while staying at a fixed distance from a point (e.g., fan blades, clock hands).
Periodic Motion: Objects or parts of objects repeat their motion at regular intervals (e.g., pendulum, swing, sewing machine needle).

CFU (Open-ended/ Factual)
Factual
1. How can you tell the difference between circular and periodic motion?
2. Give an example of rectilinear motion.

Open-ended
3. Can you think of any examples of objects that are in motion but not changing location, like a fan or a clock?
4. How does understanding the different types of motion help you understand the movement of objects around you?

Can you think of any examples where objects experience a combination of different types of motion? (For example, a ball rolling on the ground experiences both rectilinear and rotational motion)

Closing

Today, we learned about three types of motion: rectilinear (straight line), circular (circular path), and periodic (repeated at regular intervals). We explored real-life examples, such as a car for rectilinear motion, a clock for circular motion, and a pendulum for periodic motion. Understanding these motions helps us better observe and explain how objects move in our everyday lives.

Assessment of Concepts:

1. Look around the classroom and list two objects that are in motion and two that are at rest. What makes each of them fall into their respective category?
2. Describe the difference between rectilinear motion, circular motion, and periodic motion. Provide one example of each from your daily life.
3. How can you tell if an object is in motion or at rest?
4. A fan's blades rotate in a circle, while the clock hands also move in a circular motion. How are these similar, and how are they different?

Period 7.7: Revision

Learning Objective:

Students will be able to apply the concept of measurement by using both non-standard (foot, handspan, string) and standard units (metres, centimetres) to measure classroom objects.

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
The teacher leads a discussion with the students, using questions to help summarize the concept of measuring distance. (Take student responses) 1. How do you know how far you've travelled? 2. What factors determine whether you walk or use another mode of transportation? 3. Why do you think it's important to have a consistent measurement system? 4. Why do we need standard units of measurement? 5. How does using standardized measurements help us communicate better? **The teacher concludes that** ● The need for standard units of measurement to ensure consistency and accuracy. ● Different measurement tools are used for different tasks (e.g., measuring tape for a tailor, metre scale for school measurements).	● Divide the class into **groups** of 3-4 students per group. ● Assign each group the task of measuring a different classroom object (e.g., a desk, chair, window, or bookshelf) using **both** non-standard (foot length, handspan) and **standard units** (metres, centimetres). ● Ask them to record their findings on a **chart paper** or in their notebooks, noting: ○ Object name ○ Non-standard measurement results (e.g., total number of foot lengths or handspans) ○ Standard measurement results (e.g., metres or centimetres) ○ Any challenges faced during measurement (e.g., varying foot lengths, inaccuracies in handspan). **Assignments:** ○ Group 1: Measure the length of a desk using foot length and metres. ○ Group 2: Measure the width of a chair using a handspan and centimetres.	**Answer the following questions:** What were the advantages of using non-standard units? When might these units be useful? ○ What were the disadvantages of using non-standard units? ○ Why is it important to use standardised units in formal settings like science, construction, or trade? ○ Can non-standard units ever be used in these settings? If so, in what contexts?

● Understanding that using inconsistent or non-standard measurement methods leads to confusion (using foot and handspan, etc.) **CFU (Open-ended/ Factual)** **Factual** 1. What is the SI unit of length? 2. What units of measurement are used to measure large distances, such as between two cities? **Open-ended** 3. Can we trust measurements based on body parts for scientific purposes? Why or why not? What are some examples of different measurement tools used for different tasks?	○ Group 3: Measure the height of a window using foot length and metres. ○ Group 4: Measure the length of a shelf using a handspan and centimetres. **Discussion Questions:** After completing the measurements, students will have to **analyse** their data and **discuss** the following: 1. Which method provided the most accurate result? 2. Were there any differences in measurements between group members? Why or why not? 3. Which method was more practical or flexible?	**Home Work** Choose any small household item (e.g., a pencil, book, or spoon) and measure its length using both a standard and non-standard method. Then, compare the results and write your thoughts on it.

Closing

The teacher concludes by highlighting the importance of standard units in ensuring accuracy and consistency in measurements. The teacher emphasizes that while non-standard units (such as foot or handspan) may be convenient in everyday life, they can cause confusion and inconsistency. This is why standardized units (like metres and centimetres) are essential for scientific, academic, and industrial purposes.

Periods 7.8, 7.9, 7.10:

Student Independent Practice:

Students work on completing the worksheets below.

Worksheet 7.1, and Worksheet 7.2

Periods 7.11 : Remedial Teaching

Periods 7.12 : Remedial Teaching

Periods 7.13 : Remedial Teaching

TEACHER'S DIARY

Name of the Teacher:				**Name of the Month:**	
Name of the Lesson:				Class:	
Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
7.1	The story of transportation				
7.2	Non-standard and standard methods of measurement				
7.3	Standard units of measurement & correct measurement of length				
7.4	Measuring the length of a curved line				
7.5	Moving things around us				
7.6	Types of Motion				
7.7	Revision: Practice of measuring lengths and types of motion				
7.8	Student Independent Practice				
7.9	Student Independent Practice				
7.10	Student Independent Practice				
7.11	Remedial teaching				
7.12	Remedial Teaching				
7.13	Remedial Teaching				

1.	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

8

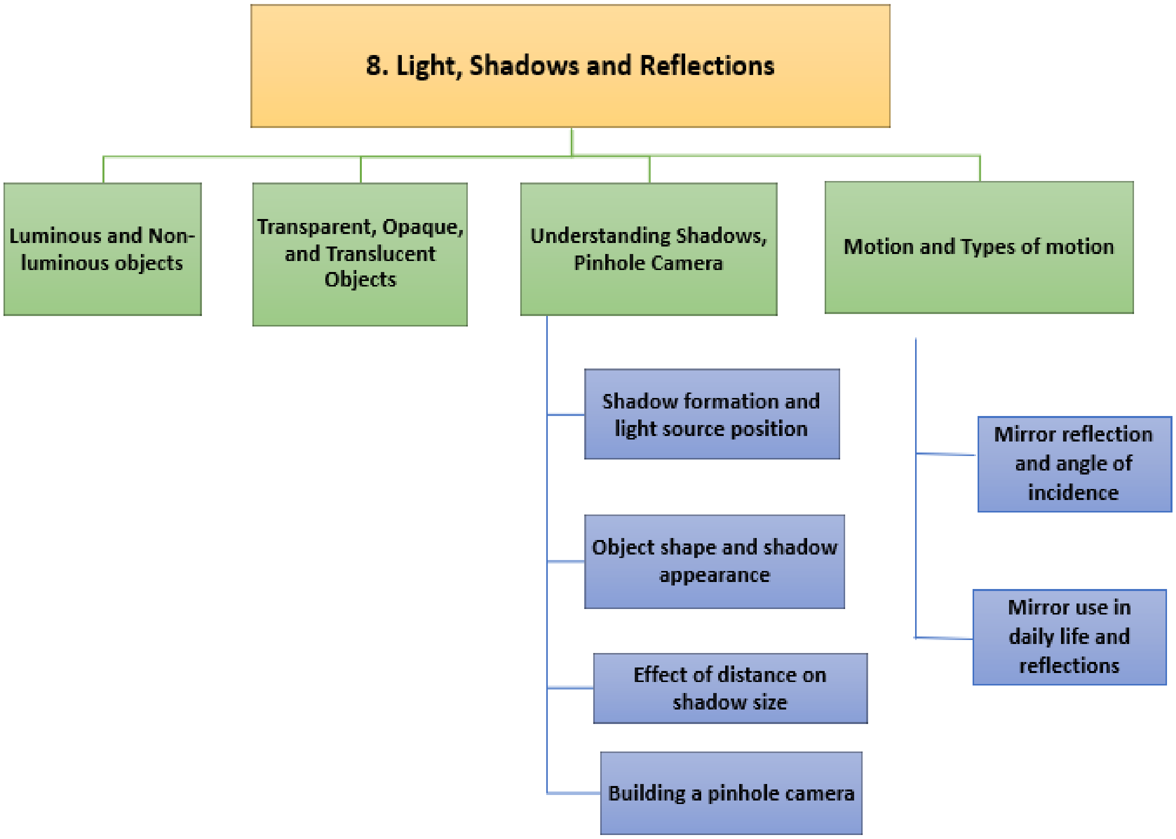
LIGHT, SHADOWS AND REFLECTIONS

Learning Outcomes:

Student will be able to

1. Identify the transparent, Opaque, and translucent objects
2. Explain the formation of shadows
3. Construct the Pinhole camera
4. Understands that Light travels in straight lines
5. Conduct an experiment to verify the characteristics of the image formed by the mirrors
6. Conducts the activity to explain the concept of reflection

CONCEPT MAP



SYNOPSIS

Understanding Light and Objects:

- Light is essential to see objects. Without light, objects remain invisible.
- Light sources (e.g., candle, torch) allow us to see in the dark.
- *Luminous Objects*: Objects that emit their own light, such as the Sun and a torch.
- *Non-Luminous Objects*: Objects like chairs or paintings that do not emit light, but are visible when illuminated by light from luminous sources.
- **Types of Objects Based on Light Transmission**:
    - *Opaque Objects*: Do not allow any light to pass through; cannot be seen through.
    - *Transparent Objects*: Allow light to pass through completely; clear visibility through them.
    - *Translucent Objects*: Allow some light to pass through but block clear visibility.

Exploring Shadows:

- Shadows form when light is blocked by an opaque object.
- Shadows provide information about the shape of objects, but can sometimes be misleading.
- Shadows are visible only when cast onto a screen (e.g., the ground, cardboard).
- The shape, size, and color of shadows change based on the object's position relative to the light source.

Factors Affecting Shadows:

- The shape of the shadow changes when the object is rotated (e.g., a chair's shadow).
- Different colored objects create different shadows, though the shadow itself is always black or gray.
- The size of the shadow changes depending on the position of the object relative to the light source (e.g., a long box casts a shorter shadow when the short side faces the Sun).

A Pinhole Camera:

- A pinhole camera creates images on a translucent screen, which are different from shadows.
- The images produced in the pinhole camera are inverted (upside down).
- The pinhole camera can be used to observe the Sun, including during a solar eclipse, without directly looking at the Sun.
- Natural pinhole images form when sunlight passes through gaps in tree leaves, creating small circular images on the ground.

Investigating Mirrors and Reflections:

- Mirrors reflect images of objects in front of them.
- Light striking a mirror changes direction, showing how mirrors redirect light.
- When light passes through objects like a comb and reflects off a mirror, it demonstrates how light travels in straight lines and reflects off surfaces.
- Light plays a crucial role in visibility, shadow formation, and reflection.

Period-wise Topics

Chapters and Concepts

Period No.	Topic	Remarks
8.1	Introduction, Luminous and Non-luminous Objects	
8.2	Transparent, Opaque, and Translucent Objects	
8.3	Understanding Shadows	
8.4	Pinhole Camera	
8.5	Mirrors and reflections	
8.6	Student Independent Practice	
8.7	Student Independent Practice	
8.8	Student Independent Practice	
8.9	Student Independent Practice	
8.10	Remedial teaching	
8.11	Remedial teaching	

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- **Understanding of light:** We see objects when light falls on them.
- **Basic Properties of Mirrors**: Familiarity with the concept of mirrors reflecting light.
- **Angles**: A basic understanding of angles and reflections.
- **Observation Skills**: The ability to observe and describe physical phenomena, including how light interacts with different surfaces.

Teacher References: *(Any external links that would help teachers create activities on their own. This includes NCERT Material, OERs, Digital links, etc.)*

- NCERT Class 6 Textbook 6_General Science_SEM-2_Textbook.pdf
- Bal Vaigyanik Class 6, Eklavya

Teaching Learning Material (TLM):

Period 8.1: Flashlight, objects (pen, glass, paper, etc.), candle, small LED lights, candle, pen, torchlight, book. Luminous and Non-Luminous Objects | Light Energy | Reflection of Light | Science

Period 8.2: Objects like erasers, plastic scales, pens, pencils, notebooks, sheets of paper, tracing paper and cloth, a clear plastic sheet, a wooden box, and a piece of tissue paper.

Period 8.3: Small opaque objects (e.g., toy, pencil), light source (flashlight or candle), clear surface (wall or floor), objects (e.g., toy, book, pencil), a flashlight, sheet of white paper.

Period 8.4: Light source (flashlight or candle), Pinhole camera, cardboard, translucent paper usage, tape, etc…

Period 8.5: A chair, a thin notebook, a rectangular box, flowers (e.g., red rose, yellow rose, or other colorful objects), long box, sunny outdoor space (school ground or a clear area outside), notebook or worksheet for recording observations, measuring tape (optional).

Learning Objectives:

Students will be able to:

1. Explain how light is necessary for us to see objects.
2. Identify and classify objects as luminous or non-luminous based on their ability to emit or reflect light.
3. Categorize materials as transparent, translucent, or opaque based on how they allow light to pass through.
4. Identify and describe how opaque objects form shadows and recognize objects based on their shadow outline.
5. Observe and record how the shape of an object influences the appearance of its shadow (e.g., objects at different angles).
6. Experiment with different objects and light sources to observe how the distance between the light source and object affects the shadow's size.
7. Build a pinhole camera and explain how it creates an inverted image, demonstrating the principle that light travels in straight lines.
8. Describe how a mirror changes the direction of light and demonstrate the use of mirrors in daily life.

Concept 1: Introduction, Luminous and Non-luminous objects.

Teaching Learning Process

Learning Objectives:

Students will be able to

1. Explain how light is necessary for us to see objects.
2. Identify and classify objects as luminous or non-luminous based on their ability to emit or reflect light.

3. Students will be able to identify and classify objects as luminous or non-luminous based on their ability to emit or reflect light.

Induction/Introduction

In this concept, students will be introduced to the terms luminous and non-luminous objects. They will learn to classify objects into luminous and non-luminous.

Vocabulary:

Luminous: An object that produces and emits its own light. Example: The Sun, a light bulb.

Non-luminous: An object that does not produce its own light but can reflect light from other sources. Example: The Moon, a book.

Period 8.1:

Learning Objectives:

Students will be able to

- explain how light is necessary for us to see objects.
- identify and classify objects as luminous or non-luminous based on their ability to emit or reflect light.

Hook: The Darkness Challenge:

Start by dimming the lights or turning them off completely (ensure it's safe to do so) and ask students to imagine walking around a dark room. Then, ask them to describe what they can see.

Ask: "Can you see anything?"

Next, turn on a flashlight or your phone's light and ask, "Now, can you see the room? What changed?"

Experience and Reflection:

Have you ever tried to find something in the dark, like your books or keys? How did it feel? What if you had a light to help you?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher Demonstration: **Setup:** Begin by dimming or turning off the classroom lights to simulate darkness. If possible, use a dark corner of the room to enhance the effect, but make sure the students can still see you and are comfortable. (**Note:** Ensure the students feel safe and can still observe the demonstration.) ● Hold up a small object, such as a toy or a pen, and ask the students, “Can you see this object clearly?” ● Turn on the flashlight or torch and shine it directly on the object you are holding.	Divide the class into groups of 3-4 students. Provide each group with a flashlight and various objects. Ask them to experiment with the light by testing whether they can see the objects when the light is off and then when it's on. Students should document their	Write a brief explanation of how light helps us see objects. Ask them to include one example from their experiment with the flashlight.

- Then ask the students, “Can you see the object now? What changed?”

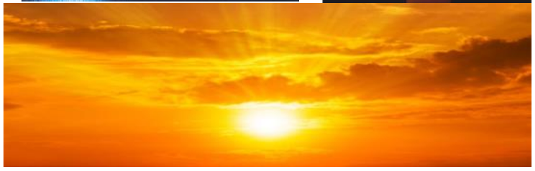
The teacher facilitates a discussion using the following questions:

- Why was the object invisible in the dark?
- What made the object visible once you turned on the light?

The teacher can also show the video How do we see things?

The teacher shows pictures of objects such as a flashlight, sun, candle, etc., and asks:





- How are we able to see these objects?
- What do these objects have in common? (They all produce their own light)

The teacher explains that objects that produce their own light are called "luminous objects."

Next, the teacher shows pictures of objects such as a book, a tree, a mirror, etc., and asks:

- Can these objects light up on their own? (No)
- How can we see these objects?

The teacher explains that objects that cannot produce their own light are called "non-luminous objects.

Teacher Demonstration:

Turn off the classroom lights and shine the flashlight on the book.

observations in the following table:

Object	Can You See It Without Light?	Can You See It With Light?	What Changed?
Ex: Pen 1. 2. 3.	Yes/No	Yes/No	What happened when the light was turned on?

Discussion Questions:

1. How does the presence or absence of light affect your ability to see the objects?
2. What did you notice about the objects when the light was turned off compared to when it was turned on?
3. How does an object appear in bright light compared to dim light?

Divide the class into groups of 3-4 students. Provide each group with images of objects (some luminous, some non-luminous) and a flashlight. Ask each group to sort the images of objects into two categories: luminous and non-luminous.

Now that we have explored luminous and non-luminous objects together, it's time for you to work in groups and apply what you have learned.

Objects: Small LED light, candle, pen, torchlight, book, chair, lamp, sun, moon, shoe, table, star.

(**Note:** The teacher can also provide some physical objects like small LED lights, a candle, a pen, a torchlight, a book, etc.)

Guided Questions for Group Discussion:

- How did you decide if an object was luminous or non-luminous?

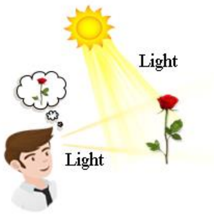
List at least 5 examples of luminous objects and 5 examples of non-luminous objects in the table below, either from the class discussion or from your own experiences.

Luminous Object	Non Luminous
1.	
2.	

Homework:

Write your experience about what happens when you switch off the light in a room. (Compare what you are able to see immediately to what your are able to see after a few minutes)

Find 3 luminous objects and 3 non-luminous objects in your house. Draw/write the objects' names and write a short paragraph explaining how you identified each object.

Ask: Why can you see the book now, even though it doesn't have its own light? (Because the flashlight light is reflecting off the book) **Explain:** Non-luminous objects are only visible when light from a luminous source reflects off of them and reaches our eyes.  The teacher can also use this video Luminous and Non-Luminous Objects | Light Energy | Reflection of Light | Science for the demonstration. **CFU (Open ended and Factual):** **Factual** 1. What happens when there is no light in the room? 2. What do we need to see? 3. What are luminous and non-luminous objects? 4. What is the difference between luminous and non-luminous objects? **Open-ended** 5. Why can't we see anything when it's dark? 6. Imagine you're outside on a cloudy day and the sun suddenly disappears behind the clouds. How does the change in light affect what you can see around you? 7. Do you think the moon is luminous or non-luminous? Why or why not? 8. How would our environment look if there were no luminous objects around us?	How does the flashlight help you see non-luminous objects?	

Closing

Summarize the lesson by revisiting the key idea: "Light is necessary to see objects." Ask a few students to share their understanding of why light is important for seeing things around us.

Recap the key points: Luminous objects emit their own light (e.g., Sun, stars, flashlight), and non-luminous objects reflect light (e.g., book, chair, moon). Remind them that light allows us to see these objects.

Assessment on Concept 1

(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment)

1. Why can we see objects during the day but not at night without any light? Explain how light helps us see non-luminous objects.
2. What is the difference between luminous and non-luminous objects? Provide two examples of each.
3. Classify the following objects as luminous or non-luminous: the Sun, a lamp, a chair, and a book. Justify your classification.

Concept 2: Transparent, Opaque, and Translucent Objects

Teaching Learning Process

Learning Objective/s:

Students will be able to

Categorise materials as transparent, translucent, or opaque based on how they allow light to pass through.

Induction/Introduction:

In this concept, students will learn about the properties of transparent, translucent and opaque objects. They will learn to categorize objects as transparent, translucent or opaque.

Vocabulary:

Transparent: A material that allows light to pass through it completely, so you can see clearly through it. Example: Clear glass or water.

Opaque: A material that does not allow any light to pass through it. You cannot see through it at all. Example: Wood or metal.

Translucent: A material that allows some light to pass through, but not enough to see clearly through it. It may appear blurry or frosted. Example: Tissue paper or wax paper.

Period 8.2:

Learning Objectives:

Students will be able to categorize materials as transparent, translucent, or opaque based on how they allow light to pass through.

Hook: Mystery Box Challenge:

Prepare a box with three different materials hidden inside (e.g., a clear plastic sheet, a wooden box and a piece of Tissue paper).

- Tell the students, "I have a mystery box here with three objects inside. I'll shine a flashlight through each material one at a time. I want you to guess what the materials are based on how the light behaves. We'll see if the light passes through completely, if it's blocked, or if it's scattered."
- One by one, shine the flashlight through each object, and ask the students to observe carefully and share their guesses.

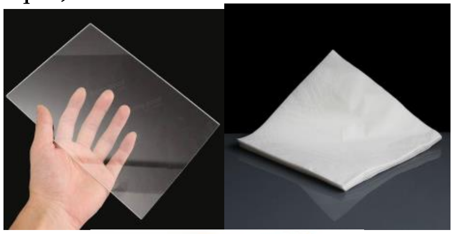
Experience and Reflection:

Have you ever tried looking through a foggy window or a clean glass window? How does the light pass through them, and how does it affect what you can see?

Explicit Teaching/Teacher Modelling *(I Do)*

The teacher explains the key terms and definitions of transparent, opaque, and translucent using the objects used in the hook(Mystery box challenge) activity.

On the board, draw a table with three columns: **Transparent**, **Opaque**, and **Translucent**. While discussing in front of the class, begin filling in examples of objects that fit each category (e.g., **transparent** – glass, **opaque** – wooden box, **translucent** – tissue paper). Ask students to call out their examples of objects from around the room and categorize them into transparent, opaque, or translucent.



Hold up a clear plastic sheet and explain that it allows light to pass through completely. Objects like this are called **transparent**.

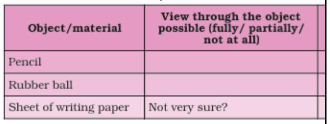
- Hold up a wooden box and explain that it does not allow light to pass through at all. Objects like this are called **opaque**.
- Hold up a tissue paper and explain that it allows some light to pass through but scatters it, making objects behind it blurry. Objects like this are called **translucent**.

Can you think of any real-life examples of objects that are transparent, translucent, or opaque?

Group Work ***(We Do)***

Divide the class into groups of 3-4 students. Distribute various objects to the groups (erasers, plastic scales, pens, pencils, notebooks, sheets of paper, tracing paper, and cloth).

Ask students to look at a distant object through each item and observe whether the object is visible clearly, partially, or not at all. Ask students to collect more objects from around the classroom and outside and classify them. Then record their observations in a table (similar to Table 8.1 in the textbook).



Object/material	View through the object possible (fully/ partially/ not at all)
Pencil	
Rubber ball	
Sheet of writing paper	Not very sure?

Guiding Questions:

1. What did you notice when the light passed through this object?
2. Why do you think this material is opaque?

Independent Work (You Do)

Categorize the given objects into three groups: transparent, opaque, and translucent. Write a short explanation for each classification in the table.

Objects: Wooden door, Tissue paper, Clear glass, Book cover, Tracing paper, Cloth (thick), Water (clear), Sunglasses lens, Aluminum foil, Mirror.

Object	**Category**	**Explanation**
E.g. Plastic sheet	Transparent	Light passes through it clearly, allowing us to see through it.

Home Work

Choose five objects from your home or school and classify them as transparent, opaque, or translucent. Write a brief explanation for each.

For example: ● **Transparent** materials are used in windows, eyeglasses, and clear containers. ● **Opaque** materials are used for walls, doors, and solid barriers. ● **Translucent** materials are used in lampshades, shower doors, and privacy glass. **CFU (Open-ended/ Factual)** **Factual** 1. Which of these materials allows us to see objects clearly: transparent, opaque, or translucent? 2. What type of object doesn't allow light to pass through it completely? **Open-ended** 3. What would happen if you used an opaque material in a place where you wanted light to pass through? 4. If you were designing a room that needed both privacy and light, which material would you use for the windows and why?		

Closing

Quick recap of transparent, opaque, and translucent objects and the main differences between them. Ask the class, "Can someone give me an example of an object that is transparent? Opaque? Translucent?"

Concept 3: Understanding Shadows

Teaching Learning Process

Introduction:

In this concept, students will observe how opaque objects form shadows and how shadows are influenced by various factors like size of the object, distance between the object and the light source, shape of the object etc.

Vocabulary:

Transparent: A material that allows light to pass through it completely, so you can see clearly through it. Example: Clear glass or water.

Opaque: A material that does not allow any light to pass through it. You cannot see through it at all. Example: Wood or metal.

Translucent: A material that allows some light to pass through, but not enough to see clearly through it. It may appear blurry or frosted. Example: Tissue paper or wax paper.

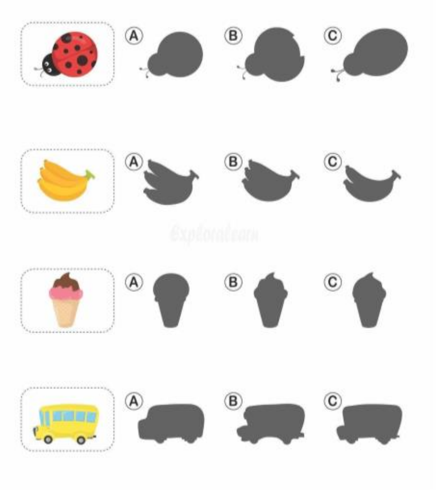
Period 8.3 :

Learning Objectives:

- Students will be able to identify and describe how opaque objects form shadows and recognize objects based on their shadow outline.
- Students will be able to observe and record how the shape of an object influences the appearance of its shadow (e.g., objects at different angles).
- Conduct experiments with various objects and light sources to observe how different factors influence the size, shape, and intensity of shadows.

Hook: When you stand in the sunlight, you can see a shadow of yourself.
Where do you see? Is it exactly like you? What is causing that shadow?

Experience and Reflection:
Have you observed how your shadow changes in the morning, afternoon and evening?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
The teacher models Activity 2 with 1-2 objects on page 28 of the textbook. **Alternative activity to do in the classroom:** **Setup:** - Dim the lights in the classroom or use a dark corner. - Have a flashlight or candle as the light source. **Demonstration:** - Hold a small opaque object (e.g., a toy or a pencil) in front of the light source. - Show how a shadow forms on the surface (wall or floor). - Move the object closer or farther from the light to change the size of the shadow. **Questions:** (Take student responses)	Shadow Formation Activity: Divide the class into groups of 3-4 students. Provide each group a few opaque objects (e.g., a toy, a book, a pencil), a flashlight, sheet of white paper. Asks students to take turns holding an opaque object in the sunlight or using a flashlight to create a shadow on the paper. As the object is held at different distances from the observer, students will observe and draw the outline of the shadow. After the activity, come together as a class and discuss the differences in shadows. **Discussion Questions:** 1. Were the shadows similar or different for different objects? Why do you think that is? 2. How does the size and shape of the shadow change based on the distance of the light source?	**Shadow Identification:** - Match the images or outlines of various shadows given in the pictures. - Students will write a brief explanation of how they determined the shadow. 

1. What happens to the shadow when the object is moved closer or farther from the light?
2. Does the shadow always look the same as the object?

After demonstrating activity, the teacher explains that the shape and size of the shadow depend on the position of the object and the light source.

Let us discuss how shadows are formed and how factors like the light source, object shape, and position influence the shadow's appearance.

Teacher Demonstration:

- Show an example by holding a flashlight at different angles to a simple object (e.g., a hand or a small toy figurine).
- Place a screen (e.g., white cardboard) to clearly show the shadow.
- Ask students to observe how the shadow changes when you:
    - Move the flashlight at different angles to the object
- Asks the following questions:
    1. How does the shadow change when the object is moved?
    2. How does the angle of the light source affect the shadow's appearance?

Divide the class into groups of 3-4 students. Give each group a flashlight, several opaque objects (e.g., figurines, cardboard cut-outs), and a white sheet or cardboard to use as a screen. Assign students to experiment with different object positions and light angles. Encourage them to notice the changes in shadow size, clarity, and shape.

Students will observe how the shape and size of the shadow change based on:

- The position of the object (close vs. far from the light).
- The angle of the light source.
- The shape and size of the object being used.

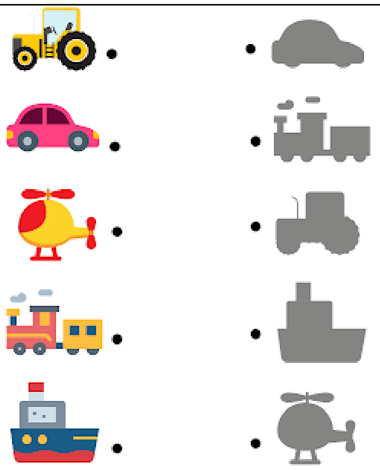
Discussion Questions:

1. How did the light source affect the size and shape of the shadow?
2. Why is a screen important for viewing shadows clearly?
3. How did the shape of the object influence the shadow?

Divide the class into 4-6 groups of 3-4 students. Assign each group to a different situation from the following to observe, note and share their findings with their classmates.

1. Toy car and Shadow

- Place a toy car on the ground in a sunny spot and observe the shape of the shadow.
- Record whether the shadow accurately represents the shape of the toy car.



- Create shadow art by positioning their hands or objects in creative ways to make interesting shapes or animals.

Answer the following questions.

1. How does the position of the light source affect the size and shape of an object's shadow?
2. Why do different objects create different shadow shapes and sizes?
3. How do you think the time of day of the sun might influence the shadow?

Home Work

- Observe the shadows at home during the day. Choose one object (like a tree, car, or person) and draw the shadow, noting how the shape and size of the shadow change based on the time of day.
- Take a photo of a shadow you see at home or outdoors. Write a description of how the object, light source, and screen (if present) affected the shadow's shape and size.

Observe the shadow of an object at home (e.g., a toy, a chair, or a plant). Draw the shape of the shadow. Describe how the shadow

3. What role does the screen play in viewing the shadow? **Recap:** The teacher asks the following questions: 1. How do shadows change? 2. What factors influence their size and shape? The teacher says that today we will observe shadows formed by different objects, and will explore how the angle of the sun, the shape of the object, and the color affect the shadow. **Teacher Demonstration:** The teacher takes the students outside to a sunny spot with an unobstructed view of the ground. **Chair and Shadow:** ● Place a chair on the ground in a sunny spot and observe the shape of the shadow. ● Ask students to record whether the shadow accurately represents the shape of the chair. ● Turn the chair around a little and observe how the shadow changes. Students should note how the angle of the chair affects the shadow. **CFU (Open-ended/ Factual)** **Factual** 1. What happens when light hits an opaque object? 2. Do all objects form shadows? Why or why not?	● Turn the toy car around a little and observe how the shadow changes. Students should note how the angle of the scale affects the shadow. **2. Comparing Shadows of Different Objects** ● Place a thin notebook on the ground and observe its shadow. ● Then, place a rectangular box beside the notebook and observe its shadow. ● Students should compare the shapes of the shadows and record their findings, noting whether the shadows look similar or different. **3. Shadow Colour Comparison** ● Take a red rose and a yellow rose (or other colourful flowers) and observe their shadows. ● Ask students to note if the shadows of the two flowers look different in colour. Do the shadows match the colour of the flowers? Students should record their observations. **4. Shadow Size and Angle** ● Take a long box and place it on the ground in the sunlight. Move the box around and observe how the size of the shadow changes. ● Ask students to observe when the shadow of the box is the shortest: when the long side or the short side of the box is facing the sun. ● Students should record how the angle of the object affects the shadow's size. ● Bring the students back together to discuss their observations.	changes when you move the object closer or farther from a light source.

3. What is the importance of a screen in observing shadows? 4. What shape is the shadow of the chair? **Open-ended** 5. When can we identify the object based on its shadow? 6. Why do shadows change shape when an object is moved closer or further from the light? 7. What did you observe when the light source was moved or the object was angled differently? 8. How does the position of the object influence the shadow's shape? 9. How does the shadow change when the chair is turned around?	**Discussion Questions:** ● How did turning the toy car change the shape of its shadow? ● Did the shapes of the notebook and rectangular box shadows look the same? Why or why not? ● How did the colour of the flowers influence the colour of their shadows? ● When was the shadow of the box shortest? How did the angle of the box affect the shadow’s size?	

Closing

Summarize the key points:

- Shadows are formed when an opaque object blocks light.
- The size and shape of the shadow depend on the object and the position of the light source.
- Shadows are formed when light is blocked by an opaque object.
- The shape and position of an object affect the appearance of its shadow.
- A screen is needed to view the shadow clearly.
- Shadows change in size and shape depending on the angle and position of the light source.
- The shape and size of the object also influence the shadow.
- Shadows can look different based on the colour of the object.
- The screen (such as the ground) helps us view the shadow clearly.

Concept 4: Pinhole Camera

Teaching Learning Process

Introduction:

In this concept, students will build their own pinhole camera and understand the principle behind its working. They will learn how light travels in straight lines.

Vocabulary:

Transparent: A material that allows light to pass through it completely, so you can see clearly through it. Example: Clear glass or water.

Opaque: A material that does not allow any light to pass through it. You cannot see through it at all. Example: Wood or metal.

Translucent: A material that allows some light to pass through, but not enough to see clearly through it. It may appear blurry or frosted. Example: Tissue paper or wax paper.

Period 8.4 :

Learning Objectives:

Student will be able to

- build a pinhole camera and explain how it creates an inverted image, demonstrating the principle that light travels in straight lines.

observed how your shadow changes in the morning, afternoon and evening?

Explicit Teaching/Teacher Modelling *(I Do)*	Group Work *(We Do)*	Independent Work (You Do)
(NOTE: Set up a space where students can conduct the activity under bright sunlight or a similar light source.) **Introduction:** ● Ask the students what they think is necessary to make a camera. What is a camera used for? *(Take student responses)* ● Explain that a pinhole camera is a simple device that allows us to see images formed by light entering through a tiny hole. ● Today, we will create a pinhole camera, observe how it works, and learn about the science behind it. **Activity: Making the Pinhole Camera :** The teacher can show this videoPinhole camera | DIY | School project | science project | STEM activity | NCERT or demonstrate using the following steps. **Steps to Build the Pinhole Camera:** ● **Step 1**: Show students how to prepare the two cardboard boxes by cutting one side of each, creating a hole in the larger box, and cutting a small square in the smaller box. ● **Step 2**: Have students cover the open square in the smaller box with tracing paper and tape it securely.	**Exploring the Pinhole Camera:** Divide the class into groups of 3-4 and have them follow the same process to build their pinhole cameras. Allow 10 minutes for this. Once the cameras are built, ask students to follow the steps below and record their observations: **Step 1**: Guide students to look through the open face of the smaller box (the side without the tracing paper). Encourage them to use a piece of black cloth to cover their head and the camera, ensuring no light enters except through the pinhole. **Step 2**: Have students aim the camera at distant objects, such as a tree or a building. Ask them to adjust the position of the smaller box forward or backward to focus the image on the tracing paper.	**Homework:** Make your own pinhole camera with objects you find at home.

● **Step 3**: Instruct students to slide the smaller box inside the larger one, making sure the tracing paper side is facing inward. ● **Step 4**: Explain how the pinhole camera is assembled and how it works. ○ The hole in the larger box allows light to enter and project an image on the tracing paper inside the smaller box. ● **Step 5:** Demonstrate how to use the pinhole camera to observe the Sun using a large piece of cardboard with a small hole in the middle. **(open-ended/ Factual)** **Factual** 1. How do the images formed by the pinhole camera compare to the shadows of objects? 2. What did you notice about the images of the objects? Were they upside down or right side up? **Open-ended** 3. Why are the images upside down? What role does light play in forming both shadows and images?	**Step 3**: Answer the following questions ○ What do they observe on the tracing paper? ○ Are the images erect or upside down? ○ Do the images show the colours of the objects they are looking at? **Step 4**: Repeat the process while observing moving vehicles or people, and have students note any changes in the images. After the activity, the teacher brings the class together and discusses their observations.	

Closing:
Recap the main concepts learned during the lesson: how light creates images through a small hole, and how this forms the basis of the pinhole camera.
What did you find most interesting about the pinhole camera experiment?

Concept 5: Mirrors and Reflections

Teaching Learning Process

Learning Objectives:

Students will be able to

Explain how a mirror alters the direction of light and provide examples of how mirrors are used in everyday life.

Introduction

In this concept, students will observe how mirrors reflect light and change the direction of light. They will also learn about mirrors in everyday life.

Vocabulary

Mirror: A mirror is a smooth surface that reflects light to form a clear image of whatever is in front of it.

Reflection: Reflection is the bouncing back of light from a surface, such as a mirror, creating an image.

Period 8.5: Learning Objective:
Student will be able to
describe how a mirror changes the direction of light.

Hook: Let's play a quick game!

- Hold up a mirror and ask the students, "What do you think would happen if I shine a flashlight at the mirror? Where do you think the light will go?"
- Shine the flashlight at the mirror and point out how the light changes direction and moves onto the wall.
- Then ask, "Why do you think the light doesn't go straight through the mirror?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher Demonstration: **Activity 8:** • Begin by explaining the concept of reflection. Show the class a mirror and a light source (e.g., a flashlight). • Demonstrate how the light reflects off the mirror at different angles by shining a flashlight onto the mirror and pointing out the reflection on the wall. • Emphasize that light travels in straight lines and that a mirror changes its direction when the light hits it. **CFU (Open-ended/ Factual)** **Factual** 1. What happens to light when it hits the mirror? **Open-ended** How can the reflection of light be used in everyday life?	**(Activity 7 in the textbook)** • Divide the class into groups of 3-4 students. • Give each group a mirror, a flashlight, and a piece of paper to observe the reflection. • Ask the students to work together to shine the flashlight onto the mirror and observe where the reflected light goes. • Have them discuss their findings. **Discussion Questions:** • How does the mirror change the direction of light? • What other objects or places can we find examples of reflections in our everyday life?	**Independent Work (You Do)** Choose an object and draw the path of light before and after it reflects off a mirror, and answer the following questions: 1. How does the mirror change the light's path? 2. What happens if you move the mirror? 3. Why can't light go through the mirror? 4. How does the angle of the light affect the reflection? **Home Work** Find and describe three examples of reflections you encounter at home or in the environment. Write a brief paragraph about how the reflection works in each example.

Closing
Review the main concept of the lesson: mirrors reflect light, changing its direction.
Share one real-life example of reflection.

Periods 8.6 - 8.9:

Student Independent Practice: Students work on completing the worksheets below.
Worksheet 8.1and Worksheet 8.2

Periods 8.10 and 8.11: Remedial Teaching

TEACHER’S DIARY

Name of the Teacher:

Name of the Month:

Name of the Lesson:

Class:

Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
8.1	Introduction, Luminous and Non-luminous Objects				
8.2	Transparent, Opaque, and Translucent Objects				
8.3	Understanding Shadows				
8.4	Pinhole Camera				
8.5	Mirrors and reflections				
8.6	Student Independent Practice				
8.7	Student Independent Practice				
8.8	Student Independent Practice				
8.9	Student Independent Practice				
8.10	Remedial teaching				
8.11	Remedial teaching				

1.	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature   Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

January 2026

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
M3C9S5 No bag Day	V3N4U8 Cluster Complex	L6Z5G9 Additional Resources		1 New year 8.1	2 8.2	3 No Bag Day
4 Sunday	5 FA - 3	6	7	8	9 8.3	10 Second Saturday
11 Sunday National Youth Day	12 Pongal Holidays	13	14	15	16	17 No Bag Day
18 Sunday D.R.Kaprekar Jayamti	19 8.4	20 8.5	21 NI	22 NI	23 NI	24 No Bag Day Cluster,PTM, SMCmeeting
25 Sunday Republic day	26 9.1	27 9.2 Annual Day	28 9.3	29 9.4	30 NI Gandhi Vardhanti	31

Pongal Holidays 10-01-2026 TO 18-01-2026,
Pongal Holidays for Christian Minority Schools 10-01-2026 TO 15-01-2026

Week1: **8.1 – 8.2**
Week 2: **8.3**
Week 3:
Week 4: **8.4 – 8.5**
Week 5: **9.1 – 9.4**

TEACHER'S NOTES

9

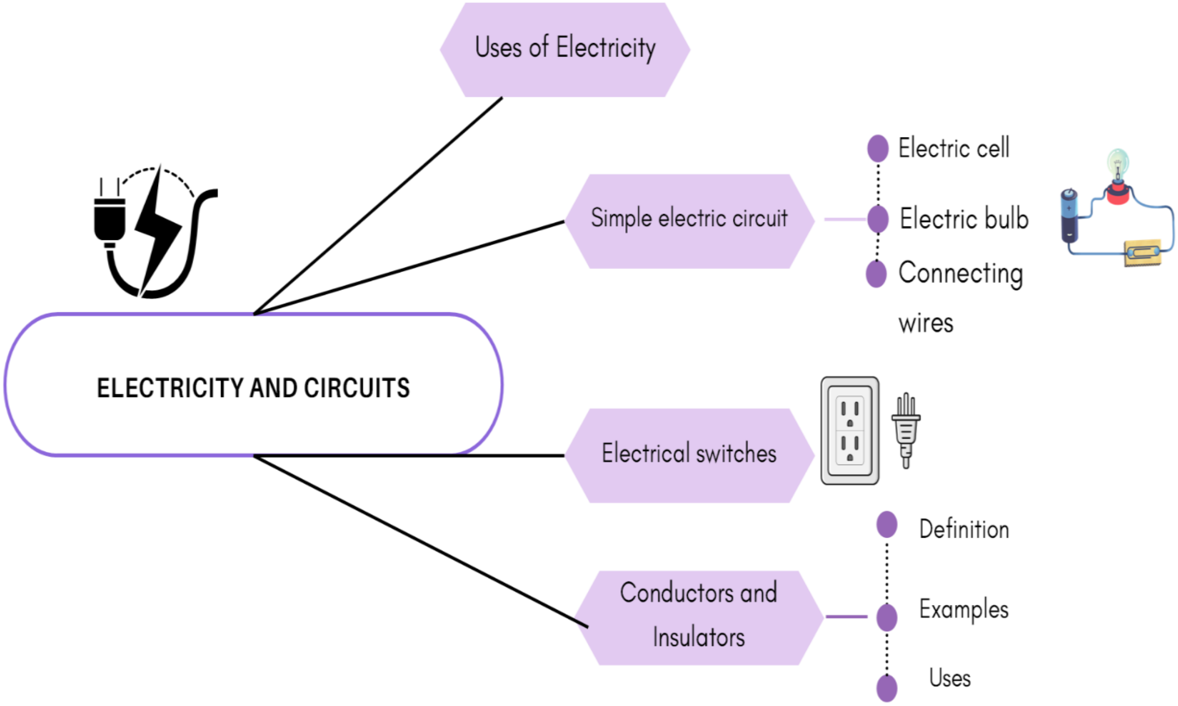
ELECTRICITY & CIRCUITS

Learning Outcomes:

Student will be able to

1. Understands the construction of an electric cell
2. Observes the construction of a bulb
3. Construct and draw the open and closed circuits
4. Identify the operatus like electrical cell: bulb and switch
5. Conduct activities using electric cell, Bulb, switch and wires
6. List out the conductors
7. List out the Insulators

CONCEPT MAP



SYNOPSIS

Electricity:

- Electricity is a form of energy.
- Electricity has many uses in our daily life including lighting up our homes and roads after sunset.
- We also use electrical appliances like fans, lights, televisions, iron boxes and electrical devices like phones and laptops.

Electric cell:

- An electric cell can be used to produce electricity.
- Electric cells have 2 terminals, positive and negative.

Electric bulb:

- An electric bulb is made up of 2 terminals, a filament and an outer covering.
- When electricity passes through the filament of the bulb, it lights up.

Electric circuits

- An electric circuit is the complete path for electricity to flow.
- A simple electric circuit can be made from a battery, wires and a light bulb or motor.
- Electric circuits can be open or closed circuits.
- Closed circuits are complete. The electric current flows from one terminal of the battery to the other terminal.
- Open circuits are incomplete. If there is a break in the circuit, the current cannot flow from one terminal of the battery to another.

Electric switch:

- An electric switch is used to control the flow of electricity in a circuit.
- There are different types of switches.
- A switch can be made by adding a conducting material like a safety pin or iron nail to a simple electric circuit.

Electric conductors and insulators:

- Materials that allow current to pass through them are called conductors. Examples include iron keys, steel spoon, pins, tap water etc.
- Materials that do not allow current to pass through them are called insulators. Examples include plastic scale, eraser, dry air etc.
- Conductors and insulators are used in switches, electric wires and other electric appliances.
- We must use electricity safely and responsibly.

Period-wise Topics

Chapters and Concepts

Periodic No.	Topic	Remarks
9.1	Introduction to electricity and electric cell	
9.2	Electric bulb	
9.3	A Bulb connected to an electric cell	
9.4	Simple electric circuit	
9.5	Electric switch	
9.6	Electric conductors & Insulators-1	
9.7	Electric conductors & Insulators-2	
9.8	Summary and extended activities (like discussing Science concept cartoons on electricity, discussing and researching student questions on electricity)	
9.9	Student Independent Practice	
9.10	Student Independent Practice	
9.11	Student Independent Practice	
9.12	Student Independent Practice	
9.13	Remedial teaching	
9.14	Remedial teaching	

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Electricity powers some appliances in our daily life.
- Switches in our house control the electrical supply.
- Electrical appliances need either a battery or need to be plugged into a socket to work.
- Electric current is a form of energy.

Teacher References:

- NCERT Class 6 Textbook
- Bal Vaigyanik Class 6, Eklavya
- Let’s experiment with electricity book
- How we found out about electricity - Isaac Asimov - Telugu book
- ‘I have discovered electricity’- Activity book
- What is electricity video (for children)
- What is electricity? (Only for teacher reference, not for students)
- Electricity activities with everyday materials - Arvind Gupta

Teaching Learning Material (TLM):

1. Chart for “Question corner”
2. Balloon and pieces of paper for Activity 1, Period 1
3. Worksheets for Assessment and Independent Practice
4. Different types of batteries- AA, AAA, button cell
5. Electric torch
6. Electric bulbs (filament bulbs not LED)
7. Small LED light, battery, 2 connecting wires (per group)for constructing simple electric circuit for Activity 4
8. Small LED light, battery, safety pin, piece of cardboard, 3 connecting wires (per group)for constructing simple electric circuit for Activity 8
9. Small LED light, 2 batteries, 2 safety pins, piece of cardboard, 5 connecting wires (per group)for constructing simple electric circuit for Activity 9
10. Small LED light, battery, safety pin, piece of cardboard, 3 connecting wires (per group)for constructing simple electric circuit for Activity 10
11. Small LED light, battery, piece of cardboard, beaker filled with water, 3 connecting wires (per group)for constructing simple electric circuit for Activity 12
12. Different type of materials like iron nail, chalk piece, old tin cans, paper, thermocol sheet, eraser, matchstick, glass bangle, stainless steel spoon, plastic scale etc for test on conductors or insulators

Concept 1: Electricity and electric cell

Teaching Learning Process

Learning Objective/s:

Students will be able to

- *list* uses of electricity in daily life
- *define and sketch* an electric cell
- *examine and identify* the terminals of an electric cell

Induction/Introduction:

- In this section, students will be learning about the uses of electricity in daily life. They will do a simple experiment to understand the concept of charge. They will also learn about electric cells and their types. They will learn to draw an electric cell and identify its terminals.

Vocabulary:

- Electricity, energy, electrical devices

Hook:

- Teacher starts the class with a small game.
- "I am going to tell you about an object we use and you have to guess what it is. Remember, raise a silent hand if you know the answer."
- "This object helps you talk to your friends when they are not near you. You can also watch videos or play games on it. You can carry it in your pocket." (Phone)
- "This object helps to keep your ice-cream cold. We can also store vegetables and food items in it. What is it?" (Fridge)
- "This is a noisy object that helps to make things into fine powders or paste. It is found in kitchens. What is it?" (Grinder)
- "This object can be found in railway stations and some buildings. If there are people who cannot climb the stairs, they can use it. What is it?" (Lift or escalator)
- What is common to all these objects?
- They need electricity to keep functioning.

Experience and reflection:

- Have you ever wondered how life would have been different today if electricity was not discovered? How would it be if you woke up one day and all electrical devices disappeared?

Period 9.1
Students will be able to

- *list* uses of electricity in daily life
- *define and sketch* an electric cell
- *examine and identify* the terminals of an electric cell

<table>
<tr><th>Explicit Teaching/Teacher Modelling <i>(I Do)</i></th><th>Group Work <i>(We Do)</i></th><th>Independent Work (You Do)</th></tr>
<tr>
<td>1. The teacher switches off the fans and lights for 2 seconds and turns them on again. "What happened when I turned off the switches?"
Students responded that it became dark and the fan stopped running.

"So we know that electricity is required to run the fan and light."
"Let us look at each example more closely. What happens when I turn on the light switch?"<br>"Light energy is produced. Where is it produced from?" -From electricity.
"Can you tell me what happens when I turn on the fan?"</td>
<td>1. "Now let's work in our groups for the next activity."

Before we start exploring, can you work in your groups to fill in the table below?
<table>
<tr><td>What I know about Electricity</td><td>What I want to know about Electricity</td></tr>
<tr><td></td><td></td></tr>
</table>
(Assuming that there are 6 groups of 5 students each, following scenarios are given to each to group to work on, for 5 minutes)

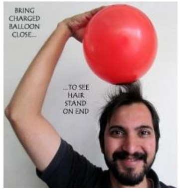
Group 1: World without electricity
Group 2: Uses of electricity at home
Group 3: Uses of electricity at schools</td>
<td>"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own."

Teacher writes down questions on the board and asks students to write their answers in the notebook.
1. What is electricity?</td>
</tr>
</table>

"The movement of the fan is caused by electricity. The movement of the fan is nothing but kinetic energy, it is produced from electricity."
So we know that electricity is a form of energy.

"We have seen several uses of electricity in our homes and offices etc. Some devices like phones and laptops need to be charged to work. Let's do a simple experiment to understand what it means to be charged?"

Activity 1: Static electricity
Teacher calls a volunteer to demonstrate the experiment. Teacher asks the student to rub the balloon on his/her head several times back and forth.
Now bring the balloon close to the student's hair. We see that the hair stands up.
We can also try this with small bits of paper. We will see that the papers stick to the balloon.



When we rub the balloon on our hair again and again, 'charge' builds up in it. That charge attracts your hair and bits of paper. We will study in detail about charge in higher classes.
This is similar to what happens in our electronic devices, when they are plugged in they get charged and electrical energy is stored in them.

2. Teacher recalls the concepts taught in the previous class.

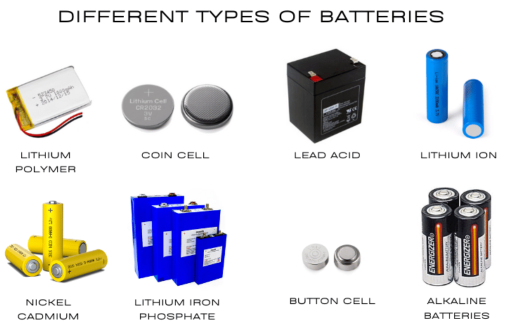
Group 4: Uses of electricity in public places
Group 5 and 6: Uses of electricity in the future world

Each group works on their scenario. The teacher lets students work creatively, they can draw or write about their scenario.

Teacher brings the class together and allows time for each group to present their work.

2. We saw in the video that a battery has a positive and a negative end. What are some other kinds of electric cells that you have seen?
Can you work in your groups and discuss these electric cells and where you have seen them being used?

The teacher presents students with a picture of various kinds of batteries.



Students discuss in their groups about these electric cells and the uses of these from their daily life.

Teacher brings the class together and allows time for each group to present their work.
Teacher discusses the types of electric cells and their uses.

2. Can you draw and explain an experiment to demonstrate how things get charged?
3. Name any 5 objects that need electricity to run.
4. Define an electric cell
5. What is meant by terminals of an electric cell?
6. How does an electric cell produce electricity?
7. What are the different types of electric cells?
8. Which do you think are better, costly batteries that can be recharged and used multiple times or less expensive one-time use batteries? Why?

Teacher assigns Homework:
What are some of the uses of electricity in your home and in the classroom?

Teacher shows this video: What is electricity video and discusses electric cells. (It is also important for the teacher to note that some of the concepts in the video may not be familiar to the students, like electrons and SI units of current and voltage. If students have questions regarding the same, the teacher can explain as much as required and tell students that they will be learning in greater detail in higher classes.) Teacher defines an electric cell as –"an object that produces electricity from the chemicals stored inside it." The two ends of the electric cell are called terminals. A battery has a positive terminal and a negative terminal. When you observe closely, you will see that the batteries have the terminals indicated on them.There is a symbol (+) for the positive and (-) for the negative terminal. **CFU (Open ended/ Factual)** 1. True or False: Electricity is a form of energy. 2. Name any 2 devices that need electricity to function. 3. What is an electric cell? 4. What are terminals of an electric cell? 5. How does an electric cell produce electricity? 6. Name some devices that use electric cells.		Teacher recalls the concepts taught: Observe the different kinds of electric cells used at your home. Draw the cell and mention the appliance it is used for.

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

"What is electricity?"

"What are some uses of electricity?"

"Are there any other questions about electricity that you are curious to know more about?"

Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment of concept 1 :

1. What is electricity?

2. Can you draw and explain an experiment to demonstrate how things get charged?
3. Name any 5 objects that need electricity to run.
4. Define an electric cell
5. What is meant by terminals of an electric cell?
6. How does an electric cell produce electricity?
7. What are the different types of electric cells?
8. Which do you think are better, costly batteries that can be recharged and used multiple times or less expensive one-time use batteries? Why?

Concept 2: Electric Bulb

Teaching Learning Process

Learning Objective/s:

Student will be able to

- explain the construction of a bulb
- draw and explain the parts of an electric bulb
- explain various types electric bulbs

Induction/Introduction:

In this section, students will be learning about the uses of electricity in daily life. They will do a simple experiment to understand the concept of charge. They will also learn about electric cells and their types. They will learn to draw an electric cell and identify its terminals.

Vocabulary:

Electricity, energy, electric bulb, filament, nitrogen gas, positive terminal, negative terminal

Hook:

Materials:

A small cardboard box or envelope containing representations of various bulb parts (wire, filament, glass bulb, base, etc.)

The teacher places the sealed box on the desk and asks:

“I have a mystery box here. Inside are the parts of something that helps us see at night. What do you think is inside the box? How do you think the parts come together to make light?”

Let students guess what’s inside the box. Then, open it and show them the parts of the bulb (either as a model or diagram).

“Today we will learn about electric bulbs.”

Experience and reflection:

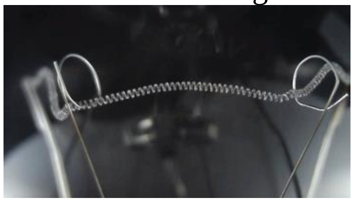
Have you ever wondered how life would have been different today if the electric bulb was not discovered? How would it be if all electric bulbs disappeared?

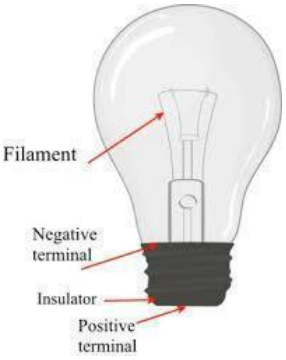
Period 9.2

Learning Objectives:

Student will be able to

- explain the construction of a bulb
- draw and explain the parts of an electric bulb
- explain various types electric bulbs

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. **Activity 3:** Let us look into a torch. What is inside a torch? The teacher opens the torch and shows that there are batteries inside it. In the previous class we learnt about terminals of a battery. Do you think the torch will work whichever way we place the battery inside it? The teacher tries both ways and shows that the torch works only when the battery is placed in a certain direction. As we learnt in the previous classes, the battery has two terminals, the negative and positive. Electricity flows from the positive terminal of the battery to the negative terminal. We learnt how to identify in the previous class. Now let us do an interesting activity.  What do you see in this picture? Can you guess what it is? Let us zoom out a little and see.  Now can you guess what it is?	**Activity 4:** We will be watching a video on the story of the light bulb. After that we are going to work in groups and discuss and answer a few questions. Invention of the light bulb video If there are any questions about the content in the video, the teacher can help students understand the video. Teacher then divides students into groups and asks them to sit in their groups (mixed ability groups). Now it's Quiz time ! I am going to ask you a few questions and I will give you time to discuss with your group. Once you know the answer, raise a silent hand. I will call the student to answer the question. Q1. Who invented the light bulb? Ans. Thomas Alva Edison Q.2. What are the parts of a light bulb? Ans. Filament, terminals, glass covering	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. Draw an electric bulb and its parts. 2. Meera's father was upset. His torch was not working. Meera removed the battery and fit it in her TV remote. She found that the battery was working. What do you think Meera should do to make the torch work?

Ok. Let's see the final picture.  As you guessed, it is a light bulb. What we saw in the first picture, was a close-up image of a part of the bulb called the filament. We can see that the bulb also has two terminals and a filament inside the glass. Teacher draws the bulb on the board and explains the parts.  Just like the battery has two terminals, the bulb also has two terminals - the positive and the negative terminal. Electricity flows from one terminal of the bulb to the other. We will do some activities in the next few classes where you will learn how to connect a battery to a bulb and what happens if we connect both ends of the battery to the same terminal of the bulb. Can you guess what happens to a light bulb when the filament inside is broken? Yes, the bulb stops working. We will learn the reason when we do some more activities in the class. **CFU (Open ended/ Factual)** 1. How does the torch get power to light up? 2. What are the parts of an electric bulb? What do you think is filled inside the bulb?	Q3. What were some ways to light up our houses when there were no light bulbs? Ans. Candles or lamps Q4. Why is the use of candles dangerous? Ans. Not safe to use, because there is a possibility of things catching fire. Q5. What were some problems encountered by Edison while he tried to invent his light bulb? Ans. He couldn't find the right material to use for the filament of the bulb. Q6. When Edison finally made a successful light bulb, how many hours did it glow? Ans. 13 and a half hours. Thank you for participating. Teacher brings the class together and discusses the activity and clears any doubts that students had.	**Teacher assigns Homework**: 1. Mini project : Find the story of how the first electric bulb was discovered and by whom. Share it in a few lines. You can draw, make a comic or write in simple words

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

"What is inside an electric bulb?"

"What are some different kinds of electric bulbs you have seen?"

Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment of concept 2:

Define an electric bulb.

1. Draw and explain the parts of an electric bulb.
2. Draw and illustrate the parts of an electric cell.
3. You are provided with a bulb, connecting wires and a battery. Draw the diagram and explain how you will make the bulb glow.

Concept 3: A Bulb connected to an electric cell

Teaching Learning Process

Learning Objective/s:

Student will be able to

- *examine and identify* the terminals of an electric bulb
- *Analyse the effect of connecting the cell to a bulb in different ways*
- *explain* the working of the electric bulb

Induction/Introduction

In this section, students will learn to draw and explain the parts of an electric bulb. They will learn to construct simple electric circuits using a bulb, a battery and wires. They will learn to define electric circuits - open and closed circuits. They will learn about the direction of flow of electric current.

Vocabulary:

Electric cell, terminals, electric bulb, filament, simple circuit,

Hook:

Teacher shows the below picture and asks students what they observe.

We see that it is dark and the room is lit by candles. This was 200 years ago.

Do we still light up our houses with candles? (Students respond.)

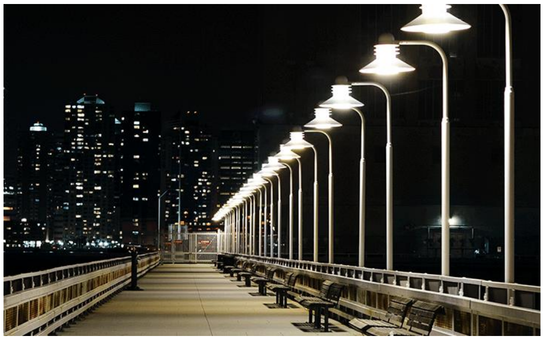
Yes, we have light bulbs now.

Let's learn a little about light bulbs. What are some places where you have seen lights being used- at home?

Teacher takes students' responses

What are some places where you have seen lights being used outside your home?

Teacher can show some pictures to help students think.



What is needed to make the lights glow?

Electricity.

Experience and reflection:

Have you ever wondered what is inside the light bulb? When the light bulb glows does the whole bulb glow or only a part of it glows?

Period 9.3

Learning Objectives

Student will be able to

- *examine and identify* the terminals of an electric bulb
- *Analyse the effect of connecting the cell to a bulb in different ways*
- *explain* the working of the electric bulb

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. Teacher shows this video on how the light bulb works. Look inside a light bulb video Teacher discusses the parts of the light bulb. Here I have a small LED light. But it is not glowing. How do I make it glow? (Students respond.) Yes, I can connect it to a battery. I am going to use some wires. These are called connecting wires. The teacher lights up the bulb (teacher need not explain in detail how she did it, because in the next part of the class, the children will be trying it out themselves.).	**Activity 4:** We are going to do this activity in groups. Each of you also has a battery, electric wires, LED (if available, the teacher can use small bulbs with bulb holders, but these are not easily available currently). You can also see that each of the connecting wires has a plastic covering in red or black, but the ends are exposed. While doing the activity, you must be careful not to touch the exposed ends of the electric wire when the circuit is completely connected. Each group has a worksheet (Worksheet 9.1).	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. Using a battery and wires, how can you make a light bulb glow? Draw and explain

Can you tell me why the bulb lit up when I connected it to the battery? Yes, electricity from the battery reaches the bulb through the wires. I am going to call 3 students to act as battery, wires and bulb. Teacher makes the students stand in front of the class. They are connected, so children can hold hands. Can you tell me how the electricity passes between them? Teacher takes a paper ball. Let us assume that this ball represents electricity. Whom should I give it to first? Yes, to the battery, then it is passed on to the student acting as the wires and finally to the student acting as a light bulb. **CFU (Open ended/ Factual)** 1. What are the parts of a light bulb? What is needed to light up an LED light?	Before you start the activities, spend time observing the following: ● Identify the terminals of the battery. Do you see the positive (+) and negative (-) signs? ● Examine the bulb/LED light. What are its components? Now you are ready to try the various connections as suggested in the worksheet. Try each of the connections and see when the light goes on. Can you also discuss in your groups why certain connections worked and others didn’t? Students discuss in their groups about these electric cells and the uses of these from their daily life. Teacher brings the class together and discusses the activity.	2. Why do we need connecting wires? What will happen if we connect the LED lights directly to the battery?

Closing

Teacher recalls the concepts taught:

Summary:

“What concept did we explore today?”

“What is inside an electric bulb?”

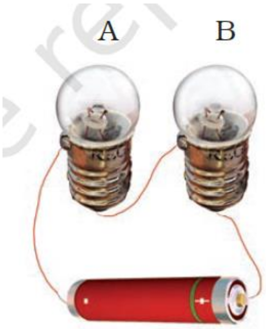
“Given a battery, wired and LED lights, can you find a way to light the LEDs? “

“Are there any other questions about today’s lesson that you are curious to know more about?”

Students are given time to write their questions on the “Question corner” chart in the classroom.

Assessment of concept 3:

1. Sahana made the following electric circuit. She saw that the filament in bulb B is broken. Will the bulb glow? Why or why not?



Concept 4: Simple electric circuit

Teaching Learning Process

Learning Objective/s:

Student will be able to

- *define* an electric circuit
- *construct* a simple electric circuit
- *explain* the flow of current in an electric circuit
- *recall* the concept of electric circuits
- *state and clear* misconceptions on electricity flow

Induction/Introduction

In this section, students will learn to draw and explain the parts of an electric bulb. They will learn to construct simple electric circuits using a bulb, a battery and wires. They will learn to define electric circuits - open and closed circuits. They will learn about the direction of flow of electric current.

Vocabulary:

Electric cell, terminals, electric bulb, filament, simple circuit,

Hook:

Teacher shows the below picture and asks students what they observe.

What is needed to make the lights glow?

Electricity

Experience and reflection:

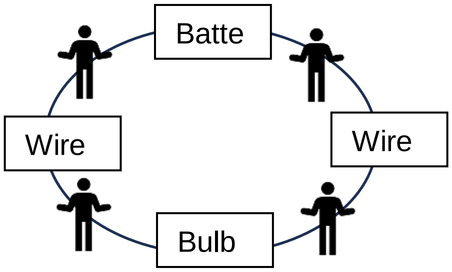
Have you ever wondered what is inside the light bulb? When the light bulb glows does the whole bulb glow or only a part of it glows?

Period 9. 4

Learning Objectives:

Student will be able to

- *define* an electric circuit
- *construct* a simple electric circuit
- *explain* the flow of current in an electric circuit
- *recall* the concept of electric circuits
- *state and clear* misconceptions on electricity flow

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
1. Teacher recalls the concepts taught in the previous class. **Activity 5:** How do we make a light bulb (small LED) glow? We learnt this using activities in the last class. Now let us repeat one of the activities we did in last class. I am going to call 3 students to act as battery, wire and bulb. And as before, we are going to pass the electricity from the battery to the bulb. But is this how your arrangement looked in the activity? Something is missing here. Yes, in the activity we had two connecting wires. Teacher calls one more student to act as a wire and the wire connects the bulb and the battery, so that the students form a circle.  Now let's see how the electricity passes between them. Teacher passes the paper ball. Whom should I give the ball to first? Yes, to the battery. Then it is passed on to the wire, then to the bulb, then to the wire and back to the battery and it goes on. You can see that the electricity passes in a circle. So, the light continues to glow. This closed path followed by electricity is called an electric circuit. The electric circuit here is made up of a battery, connecting wires and a bulb. What will happen if they stand in a straight line and the last person does not pass the ball back? Will the light continue to glow?	1. Before we do the activities, we are going to write down some definitions and words. Teacher writes the definition of the electric circuit on the board and draws a simple electric circuit. Children copy it in their notebooks and are given time to read them in pairs. **Activity 6: (Think-pair-share activity)** We are going to do this activity in pairs. Each group has a worksheet (Worksheet 9.2). You have to read the questions, discuss it with your partner and you have to write the answers in the worksheet. Teacher brings the class together and discusses the activity. Teacher defines complete and incomplete circuits. 2. **Group discussion:** I am going to show you a cartoon /share a story of children discussing in a classroom about an electric circuit. Girl 1 says: I can tie a knot in the wire tight enough to stop the electricity getting through. Boy1 says: The knot slows down the electricity but doesn't stop it completely. Girl 2 says: I think that knot doesn't make any difference.  Who do you think is correct? Can you raise your hand if you think Girl 1 is correct? (Students respond.)	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. Define and draw an electric circuit. 2. Will a bulb continue to glow if the filament is broken? Why or why not? 3. Have you ever been told not to touch an electric bulb when it is ON? Do you know the reason? 4. Draw a simple electric circuit and show the flow of current in an electric circuit. 5. You have used different coloured wires to make your circuit. Do you think the circuit would work if you used the same color of the wires?

The light will not glow because the electric circuit is incomplete.

2. Teacher recalls the concepts taught in the previous class.
Do you remember the activity we did in class about electric circuits?
We know how electricity passes in a circuit.
There are particles called electrons that pass from the battery to the wire to the bulb and back.

But do you remember that an electric cell has two terminals? Positive and negative.
Electric current also flows in a specific direction. Let us look at the picture and understand.

Can you identify which is the positive and negative terminal of the battery?
Yes, the top one is the positive end and the bottom end is the negative end. (Teacher shows the terminals with a battery in hand.)
In an electric circuit, the direction of current is from the positive to the negative terminal of the electric cell.

Teacher gives students to draw the diagram in their notebooks under the heading, “Direction of flow of electric current”.

CFU (Open ended/ Factual)
1. What is an electric circuit?
2. Does an electric circuit need to be a closed shape like a circle or can it be open like a straight line?
3. What are the parts of a simple electric circuit?
4. What is an electric circuit?
5. Can you show me which is the positive and negative end of a battery? (teacher can call one or two students forward)
6. In which direction does the electric current flow in a circuit?

Can you raise your hand if you think Boy 1 is correct? (Students respond.)
Can you raise your hand if you think Girl 2 is correct? (Students respond.)
Can you raise your hand if you think something other than what these 3 students think? (Students respond.)
Now let us discuss why we think the way we do.
I am going to give you two minutes. Can you share with the person next to you what you think and why?
After two minutes the teacher calls the attention back to the full group and leads the discussion.
(The answer is that the knot doesn’t make any difference. The electrons are so small that they continue to flow through the knot.)
Activity 7:
Do you want to try this and see?
You are going to make a simple electric circuit just as you have done before.
Then you are going to tie a small knot in one of the connecting wires and connect the circuit again. You have to observe if there is any change in the brightness of the bulb.
You are going to work in groups. As I told you earlier, you must be careful not to touch the ends of the wires when the circuit is connected and the bulb is glowing.
The teacher divides the children into groups and provides each group a battery, LED lights and connecting wires.
Teacher gives time for the students to try the experiment and discuss.

Teacher brings the class together and discusses the activity. Teacher defines complete and incomplete circuits.

Teacher assigns Homework:
1. We observed the working of a torch in one of the previous classes. Can you draw the electric circuit for a torch?

Answer the following:
1. In an electric circuit, what is the role of :
   a) Battery
   b) Connecting wires
   c) Light bulb
2. In our circuits so far, we have used only light bulbs, can we use something else instead? What are some materials that can be used?

Closing

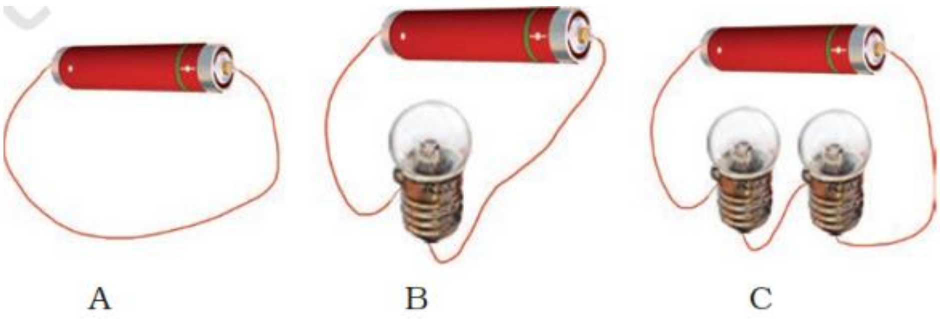
Teacher recalls the concepts taught:

Summary:

"What is an electric circuit?"
"How does the current flow in a simple electric circuit?"
"Why are some electric circuits called incomplete?"
"Are there any other questions about today's lesson that you are curious to know more about?"
"What concept did we explore today?"
"How does current flow in an electric circuit?"
"What are some places in your home where you have seen electric circuits?"
Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment of concept 4:

1. In which of the below circuits, the electric cell will get used up very rapidly? Why?



Concept 5: Electric switches

Teaching Learning Process

Learning Objective/s:

Students will be able to

- Define an electric switch
- Model an electric switch using a safety pin
- Explain the working of an electric switch
- Justify the role of switches in conserving energy.
- Construct a model of a two-way switch

Induction/Introduction

In the next 2 classes, children will learn to define a switch. They will learn to draw and construct a simple switch using a battery, bulb, connecting wires and a safety pin. They will also learn how a 2-way switch works.

Vocabulary:

Electric switch, electric circuit, flow of current

Hook:

Teacher starts with a real-life situation.

Tara's father is worried that the electricity consumption in the house is high. He sees that the fans, lights and TV are always running. How can Tara and her family help to reduce the consumption of electricity?

(Students respond.)

Yes, they can switch off the devices like fans, lights and TV when not needed. This saves a lot of electricity.

What are some devices that are always ON in your home? What about in our classroom?

(Students respond)

What are some devices that are used only once a week or so at home?

(Students respond)

Can you tell me where the switches to the fans and lights are in our classroom?

(Students respond)

What do you think is inside the switch?

(Teacher need not go into details.)

Experience and reflection:

Have you ever wondered why the light turns on as soon as you press a switch? What do you think happens inside the circuit to make that happen?

Period 9.5 Electric switch

Learning Objectives:

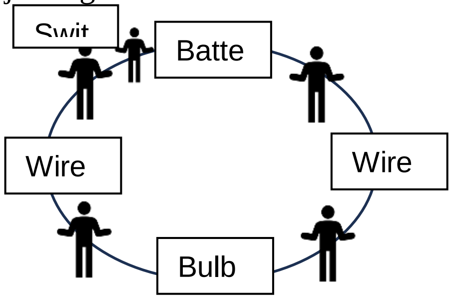
Student will be able to

- Define an electric switch
- Model an electric switch using a safety pin
- Explain the working of an electric switch
- Justify the role of switches in conserving energy.
- Construct a model of a two-way switch

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
1. Teacher recalls the concepts taught in the previous class. Energizer activity: You know that the fan starts working when the switch is ON and it stops when the switch is OFF. Let's try a small game. When I say, the switch is ON, you all have to stand and clap your hands. When I say, the switch is OFF, all of you have to sit down silently. Teacher checks if students understood the game. What should you do when I say the switch is ON? What should you do when I say the switch is OFF? Teacher gets the children to play a few rounds of this activity.	1. Before we start the activity, let us write down the definition of an electric switch. Teacher writes the definition on the board and asks students to copy it. An electric switch is a simple device that breaks or completes the circuit. **Activity 8:** We are going to do this activity in groups. You are going to make an electric switch and see how it works. Teacher gives each group a set of materials – a battery, connecting wires, a bulb/LED, a safety pin, a thermocol board or small piece of cardboard. In your groups, you have to do 2 things. First, you have to find out a way to use all the components and make the light bulb glow. Second, you have to find a way to switch the light bulb OFF by only moving the safety pin.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. What is an electric switch? 2. Write the names of some devices that have switches. 3. What is the similarity between an electric switch and a water tap? 4. What would happen if devices did not have switches?

Now let's understand what goes on in an electric circuit with a switch. Do you remember the activity we did in class where 4 students formed a circle to demonstrate an electric circuit?
Let us repeat that activity, but this time I am going to ask one more student to join the circle as "switch".

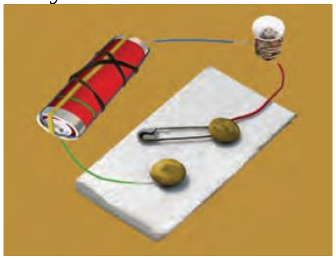
Teacher calls 5 students and assigns the role of battery, bulb, connecting wire 1 connecting wire 2 and switching to the students. The students stand in a circle joining hands.



When the teacher says, the switch is OFF, the student acting as switch should let go of one hand.
When the teacher says, the switch is ON, the student acting as switch joins hands with the next person.

Teacher can ask what happens when the switch is ON and what happens when it is OFF.
We learnt what an electric switch does. It controls the flow of electricity, just like a tap controls the flow of water.
2. Teacher recalls the concepts taught in the previous class.
Teacher encourages students to share about the homework in the previous class. Students share their ideas on reducing electricity consumption.

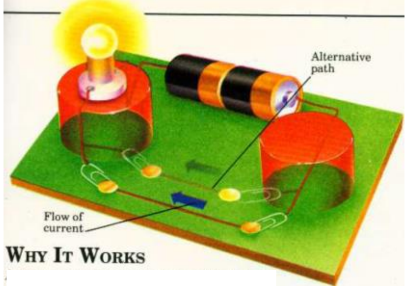
After completion of each step, you can discuss with your groups and draw the diagram in your notebooks.

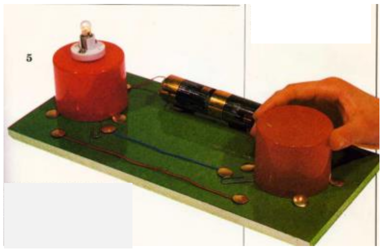


Teacher goes around the class and helps the groups that are struggling. Teacher helps students draw diagrams.

At the end of the activity, the teacher brings the class together and discusses the activity.

2. Teacher gathers the children in a group and gives them instructions regarding the activity.
(This activity is a little difficult, if the teacher wants to do it as a demo instead of a group activity, that can also be done.)
Activity 9:
We are going to do this activity in groups.
Teacher displays the picture of the circuit on the board/on a chart.

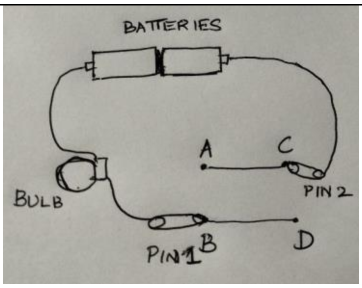




Each group has 2 batteries, connecting wires, a bulb and 2 safety pins. The circuit can be constructed on a thermocol board or cardboard. (The plastic lids shown in the image above are optional.)

5. What is a 2-way switch?
6. Draw a simple circuit to demonstrate a 2-way switch.

Teacher can keep the model of the 2-way switch on her table and give time for children to come and check the circuit if they have any doubts.

Teacher asks, “We all know that there are switches in our homes. What are the different types of switches?” Have you seen switches that can be turned ON and OFF in both directions? The teacher can show a picture of a two-way switch.  Where have you seen such switches? You may have seen them in staircases, there might be one switch on the ground floor and another on the first floor. Can you think of reasons why we need these 2-way switches? What could be the advantages of using them? For staircases, it is safer to have the light switch on both the floors. Similarly, in other cases, it is convenient if there are two locations from which the same switch can be turned ON or OFF. Today we are going to do a simple activity to understand how 2-way switches work. **CFU (Open ended/ Factual)** 1. What is an electric switch? 2. Name some devices which have switches. 3. Are there any devices that do not have switches? 4. What is the role of a switch in a circuit? 5. What is a 2-way switch? 6. Where have you seen 2-way switches? 7. Why is it important to have 2-way switches in certain places?	 We are going to follow these steps: 1. Copy the circuit diagram on your cardboard. 2. Mark the points A, B, C and D. 3. Connect the two batteries as shown in the picture. 4. Connect one end of the battery to the bulb as shown on the right side. 5. Connect the other end of the bulb to safety pin 1. 6. Place safety pin 1 on point B as shown in the picture. 7. Connect the other end of the battery to safety pin 2 as shown on the left side. 8. Place safety pin 2 on point C as shown. 9. Connect points A and C using a wire. 10. Connect points B and D using a wire. 11. Now our two-way switch circuit is ready. Safety pin1 and 2 are the 2-way switches. Now, both the switches are in the off position. We can move any one of the pins and turn on the bulb. Let’s try with pin 1. Now it is in OFF position. To turn it on, we can move the pin to point A as shown. The bulb glows! Now let us move pin1 back to its original position. Let us try with pin 2. Now it is in OFF position. To turn it on, we can move the pin to point D as shown. The bulb glows!	Teacher assigns Homework: 1. Observe the electric devices at your home. Can you count the devices that have switches? 2. Now write down how long they are used for everyday? Can you think of any ideas to reduce the use of these devices? 3. Observe the places in your home and at school where there are 2-way switches. If there aren’t any, can you suggest where they can be used?

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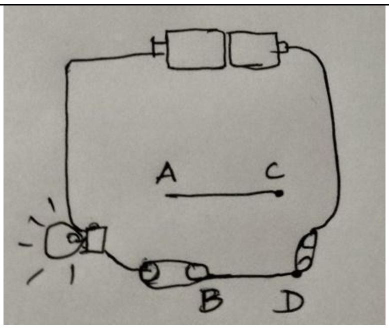
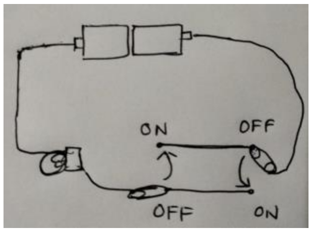
<td>

Now we can see how a two-way switch works.


Teacher discusses the activity and asks students if they have any questions.</td>
<td>4. Do you think there can be 3 or 4-way switches as well?
<table>
<tr><th>Name of device</th><th>How many hours is it used for?</th><th>Ideas to reduce the number of hours of use</th></tr>
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Closing

Teacher recalls the concepts taught:

Summary:

“What concept did we explore today?”

“What is an electric switch?”

“What are some devices that can be controlled by switches?”

“How does the safety pin act as a switch? “

“What are the different types of switches?”

“What are 2-way switches? Where have you seen them?”

“What are some places where you think 2-way switches can be used? “

“Are there any other questions about today’s lesson that you are curious to know more about?”

Students are given time to write their questions on the “Question corner” chart in the classroom.

Assessment of Concept 5:

1. Define an electric switch.
2. Name 2 electrical appliances that have switches.
3. What is the importance of having switches?
4. Will the bulb glow in the circuit shown here? What changes can you make to the circuit to make it a complete circuit?

5. An electric bulb is connected to a cell through a switch in the circuit shown. But the bulb doesn't glow. Mention any 2 possible reasons.

Concept 6: Electric Conductors & Insulators-1

Teaching Learning Process

Learning Objective/s:

Student will be able to

- *define* electric conductors and insulators
- *infer* if a given object is a conductor or insulator
- *differentiate* between electric conductor and insulators
- *deduce* the uses of conductors and insulators in daily life
- *recall* the definition of electric conductors and insulators
- *give examples* of conductors and insulators
- *perform* experiments to test if a given object is a conductor or insulator

Induction/Introduction

In the next 3 classes, children will learn about conductors and insulators. They will learn to construct a simple circuit and test if the given materials are conductors or insulators. They will learn the uses of conductors and insulators. They will also learn about safety precautions and energy conservation methods while using electricity.

Vocabulary:

Electric conductors, electric insulators

Hook:

(Start with thermal conductivity, because that is a concept children are very familiar with.)

Observe the following picture. What is happening here?

Why should the child not touch the vessel on the stove?
Yes, because it is hot. But why do you think the child is able to touch the wooden table?
Yes, because it is not hot.
So, different materials have different properties. Some can transfer heat, some cannot.

Let us come back to electricity.
In the last classes we learnt about electric switches, we know that electricity passes through the switches. But why don't we feel a shock when we touch the switch?
Teacher can probe children further to ask what material is the outer covering of the switch made of?

Then the teacher can narrate this incident.
"There was a problem with the electrical switches in Razia's house. Till the repair work was done, her father used a wooden stick to turn the lights ON and OFF. Why do you think he did so?"
Like in the example of the child above, here too, the wooden stick doesn't give Razia's father a shock.

Experience and reflection:
Have you ever wondered why the iron box at your home has a handle made of plastic, but the part that heats up is made of a different material? What would happen if the handle was not made of plastic?

Period 9.6 - Electrical conductors and Insulators

Learning Objectives:

Student will be able to

- *define* electric conductors and insulators
- *infer* if a given object is a conductor or insulator
- *differentiate* between electric conductor and insulators
- *deduce* the uses of conductors and insulators in daily life
- *recall* the definition of electric conductors and insulators
- *give examples* of conductors and insulators
- *perform* experiments to test if a given object is a conductor or insulator

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** *(We Do)*	**Independent Work** (You Do)
1. Teacher recalls the concepts taught in the previous class. Teacher recalls the concept of electric circuit, complete and incomplete circuits. Teacher recalls the concept of switches. Last class, we used a safety pin to make a model of a switch. What if we had used a plastic scale instead?	1. **Activity 10 :** We are going to do this activity in groups. Do you all remember the activity where we made an electric switch using a safety pin? In today's activity we are going to make the same circuit. But instead of the safety pin, we are going to use different materials and see if the light bulb glows. Before you start the activities, please copy down the following table. I will give you few minutes to discuss with your group and fill up the first 3 columns of the table.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook.

Do you think the bulb would have glowed?

We are always using connecting wires and we know that current passes from the battery to the light through these wires. How is it that we do not get a shock?

Let us take a closer look at the connecting wires.

This is a picture of an electric wire used in appliances like the television, fridge, even the phone chargers etc. What do you see in the picture? What are some questions that are coming up? Can you take 1 minute and share with the person sitting next to you?

The electric wire has smaller wires inside that allow electricity to pass through, but it has an outer black covering that does not allow electricity to pass through. That is why we can touch the wire even when it is plugged in and we do not get a shock. Is it safe to touch the smaller wires inside?

Do not try it, you will get an electric shock.

Teacher defines conductors and insulators.

Object	**Material it is made of**	**Will the bulb glow?* Yes/No**	**Did the bulb glow?* Yes/No**
Nail	Iron		

*the teacher must encourage the students to guess what they think will happen

Once the students finish filling up the first 3 columns, the teacher can provide the groups with the following set of materials:

- Battery, connecting wires, LED /light bulb and holder
- The teacher can keep a variety of miscellaneous objects like keys, old tin boxes, plastic covers, papers, etc in a tray. Students can choose the objects that they want to use for the activity.

The teacher can display the circuit diagram for reference or ask students to refer to the Fig.9.12 on page 54.

Now you are ready to make the circuit and try the various objects you have written in the table.

Students try the activity in their groups and fill up the tabular column.

At the end of the activity, the teacher brings the class together and discusses the activity.

2. **Group discussion:**

In the previous class, we made an electric circuit to test whether some materials were conductors or insulators. We will continue to do that today, but this time we are going to predict, discuss and then try the experiment as a whole class.

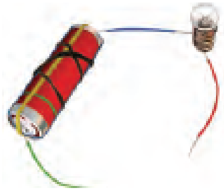
Activity 12:

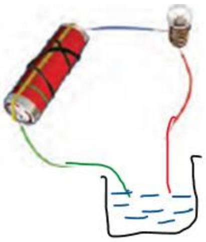
We see a lot of objects around us and now we some of them conduct electricity and some others do not.

Part-1:

Have you ever wondered if air is a good or bad conductor of electricity?

1. What are conductors and insulators?
2. Draw the electric circuit you used to find out if objects conduct electricity.
3. Can you write examples of conductors and insulators from the activity you performed?
4. Draw a circuit to test if air is a conductor or insulator.
5. Is water a conductor or insulator? How will you check?
6. Why should you not touch electric switches at home or at school with wet hands?

Materials which allow electric current to pass through them are called conductors. Materials which do not allow electric current to pass through them are called insulators. 2. Teacher recalls the concepts taught in the previous class. Teacher makes students recall the definitions of electric conductors and insulators. Students give examples of electric conductors and insulators. **Activity 11:** “Do you remember the electric circuit activity we did with 4 children standing in a circle and passing a paper ball? The paper ball was electricity.” Let’s repeat that activity. Teacher calls 4 students to act as battery, wire 1, bulb, wire2. Now I am going to call one more student and gives her instructions. The teacher will tell the child secretly if she is a conductor or insulator. If the teacher says conductor, she has to continue passing the ball. If the teacher says ‘insulator’, she breaks the circle and keeps the ball with her and doesn’t pass it. You have to guess if she is a conductor or insulator.	I am going to give you some time to think on your own. After a few seconds, the teacher asks, can you raise your hand if you think air is a good conductor of electricity? (Students respond.) Can you raise your hand if you think air is a bad conductor of electricity? (Students respond.) Think-pair-share activity: (It is important to use this think-pair-share as often as possible, since there might be children who are too shy to speak in front of the whole class. Through this activity, slowly, it builds confidence and everyone feels heard.) Now, I am going to give you 2 minutes to talk to the person next to you and tell them why you think air is a good or bad conductor of electricity. After 2 minutes, teacher brings the class together. Let’s start with those who think air is a good conductor. Can anyone share why you think so? Students respond. Now can anyone share why they think air is a bad conductor? Students respond. Thank you for engaging in the activity and sharing your ideas. Now we are going to test and see if air is a good or bad conductor. Teacher builds an open circuit with a battery, wires and bulb.  What is between the two wires? (Students might say nothing. The teacher has to ask further questions and make them understand there is air.) There is air between the wires. But, we know that the bulb doesn’t glow. What does this mean? Yes, this means that air is a bad conductor of electricity. Teacher discusses why it is good for us that air is an insulator. If air was a conductor, then it would be so unsafe for us to use electricity.	

Let’s begin round 1. The teacher asks the child to ask as insulator. The 5 students stand in a circle and pass the ball. When the child who is the ‘insulator’ gets the ball, she sits down and doesn’t pass the ball. What happened now? Electricity did not pass through her. The circuit broke. So, what is she? She is an insulator. Can you give me some examples of insulators? Students give examples. In the next round, the teacher asks that child to act as conductor. The 5 students stand in a circle and pass the ball. When the child who is ‘conductor’ gets the ball, she continues to pass it around. What happened this time? Electricity continued to pass through her. Now is she a conductor or insulator? Yes, she is a conductor. Can you give me some examples of conductors? We will do an activity to find examples of conductors and insulators around us. **CFU (Open ended/ Factual)** 1. Do all materials allow electricity to pass through them? 2. What are conductors? 3. What are insulators?	Part-2 : We learnt that air is a bad conductor of electricity. Have you ever wondered if water is a good or bad conductor of electricity? I am going to give you some time to think on your own. After a few seconds, the teacher asks, can you raise your hand if you think water is a good conductor of electricity? (Students respond.) Can you raise your hand if you think water is a bad conductor of electricity? (Students respond.) Think-pair-share activity: Now, I am going to give you 2 minutes to talk to the person next to you and tell them why you think water is a good or bad conductor of electricity. After 2 minutes, teacher brings the class together. Let’s start with those who think water is a good conductor. Can anyone share why you think so? Students respond. Now can anyone share why they think water is a bad conductor? Students respond. Thank you for engaging in the activity and sharing your ideas. Now we are going to test and see if water is a good or bad conductor. Teacher builds a circuit with a battery, wires and bulb and a beaker of tap water. (While doing the experiment, the teacher must be careful to show that the two wires are not touching in the water.)  What is between the two wires? There is water between the wires. Does the bulb glow? What does this mean? Yes, this means that tap water is a good conductor of electricity.	**Teacher assigns Homework:** Based on the activity done in class, can you think of what objects in your house can be conductors or insulators? Guess and write down the names of the objects. (Do not try any experiments with the Main power supply at home. It is very dangerous.)

4. Where do you think insulators can be used? 5. Why are some materials called conductors? 6. Give examples of conductors and insulators? Why are insulators important?	The next question is, do you think all conductors conduct electricity equally or do you think some conduct electricity more and others less? Teacher takes student responses and discusses about it. Yes, not all conductors pass electricity equally well. We saw that tap water is a good conductor of electricity. What about salt water? Teacher takes student responses to see what they think. Teacher repeats the above circuit, adding salt to the water in the beaker. As the salt is added, the bulb glows brighter. Is salt water a good or bad conductor of electricity? Yes, it is a good conductor of electricity. Between tap water and salt water, in which case, did the bulb glow brighter? When we used salt water the bulb glowed brighter. So salt water is a better conductor of electricity than tap water.	

Closing

Teacher recalls the concepts taught:

Summary:

“What concept did we explore today?”

“What is an electric conductor? What is an electric insulator?”

“Give examples of conductors and insulators?”

“Do you think all conductors allow current to pass through equally? Did you notice a difference in the brightness of the light with various object used during the activity?”

“Where are insulators used? “

“What is a conductor? Is air a conductor or an insulator?”

“What can you do to make water a better conductor of electricity?”

“Are there any other questions about today’s lesson that you are curious to know more about?”

Students are given time to write their questions on the “Question corner” chart in the classroom.

Period 9.7: Conductors and Insulators-2

Learning Objectives:

Student will be able to

- *classify* the given substances as conductors or insulators
- *discuss and write* the applications of conductors and insulators

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work *(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. Teacher recalls the concept of conductors and insulators. Teacher writes examples of few materials on the board and asks students if they are conductors or insulators. Students respond. Teacher asks, “Do you think all conductors conduct electricity equally?” Students respond. How many of you think that all conductors conduct electricity equally? Students respond. How many of you think that all conductors do not conduct electricity equally? Some materials conduct more electricity and some conduct less. Students respond. I am going to give you 1 minute to talk to the person next to you and say what you think about conductors. After one minute the teacher takes few students’ responses as to why they think all conductors conduct electricity equally or not equally.	Let us look at some examples from daily life where conductors and insulators are used. Think-pair-share activity Example 1:  Can you tell me what this is? Power transmission line. Can you guess if the wires are made of materials that are conductors or insulators? You can share your answer with the person next to you. Then the teacher takes a few student responses. These wires are made of materials that are highly conductive because they have to carry electricity over long distances. Example 2:  Can you guess what this is? This is the inside of an electric plug point. You can see that there are wires here that are similar to the connecting wires you have been using for your circuits.	“Thank you for engaging in the group activity so well. I saw some interesting responses. Now it’s time for you to work on your own.” Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. Classify the following as conductors or insulators: Steel spoon, plastic scale, glass, eraser, wooden table, iron key, cotton cloth, rubber slippers 2. List any 2 uses of conductors 3. List any 2 uses of insulators. 4. Can you name any 2 devices or materials that use both conductors and insulators?

Do you remember the activity with tap water and salt water? Did we notice any difference in the brightness of the bulb?

We noticed that the bulb became brighter when we added salt. Hence, salt water is a better conductor of electricity than tap water.

Let’s try to find out about the conductivity of a few more materials.

CFU (Open ended/ Factual)

1. Is iron an electrical conductor?
2. Which is a better conductor of electricity – salt water or tap water?

How will you find out which of any two given materials is a better conductor of electricity?

Though the outer covering of these wires is made of plastic, it has electrical conductors inside. They help to conduct electricity from the plug point to your television, TV, laptop etc.

Can you discuss and tell me why the wires and the electric plug have a plastic outer covering?

Teacher gives students time to discuss and then takes student responses.

Plastic is an insulator. The inner wires and the plug have a covering of plastic to protect us, so that we don’t get a shock.

Example 3:

What is happening in this picture?

Can you discuss with your partner and tell me why this person is wearing rubber gloves?

Teacher gives students time to discuss and then takes a few student responses before explaining the answer.

Rubber is an insulator. The electrician is wearing rubber gloves so that the rubber stops the electricity from the wires getting into his hands.

What would happen if he doesn’t use the rubber gloves?

He will get an electric shock. It is not safe.

Now we know that it is important to know about conductors and insulators for our safety.

Let’s watch a short video on electrical safety.

Teacher plays the video on this link Play animation

Teacher discusses the following questions:

What are some of the things that you saw in the video?

Teacher assigns Homework:

Observe and write:

We discussed about the uses of conductors and insulators. Observe electrical devices used at your home and guess which part of the device is made of a conductor and which part is made of an insulator.

If you cannot write the name, you can draw the answers as well.

Device	Part made of conductors	Part made of insulators

	Why should we not touch electric plugs or switches with wet hands? We will get a shock. Can you recall why? This is related to an experiment done in the previous class. Water is a good conductor of electricity. Why should electrical items not be taken to the bathroom? Because there is water and water is a good conductor of electricity, so we might get a shock. What are some other things we must be careful about, while using electrical appliances? Students respond. Teacher gives some basic safety tips like: 1. Do not use wet hands while switching anything ON or OFF. 2. Be careful when you use electrical devices near water. 3. Be sure to switch off electric appliances after use. Do not put your fingers inside a plug point.	

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

"Do all conductors conduct electricity equally?"

"What are some uses of conductors and insulators?"

"Name a device that uses both conductors and insulators."

"Why do some devices have both conductors and insulators?"

"Are there any other questions about today's lesson that you are curious to know more about?"

Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment of Concept 4 :

I. State True or False:

1. Human body is an electric insulator.
2. Electricity can pass through the brick walls of a house.
3. The connecting wires can be entirely made of plastic inside and outside. They will still conduct electricity.

4. Electricity can flow through your pencil lead.

II. Answer the following questions:

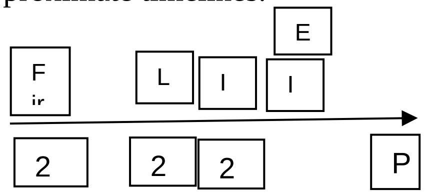
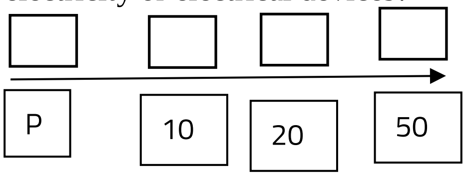
1. What are conductors? Give 2 examples.
2. What are insulators? Give 2 examples.
3. You are given a set of materials like a rubber ball, an iron key, a plastic scale etc. You have to find out if they conduct electricity through them. How will you do it? Draw the circuit diagram and explain.
4. Why do electricians use rubber gloves while repairing an electric switch at your home? Explain.
5. Using the conduction tester on an object, it was found that the bulb begins to glow. Is that object a conductor or an insulator? Explain.
6. Why are the handles of tools like the screwdrivers and pliers made of plastic or have rubber coverings? Explain.

Period 9. 8: Summary & Extended Activities

Learning Objectives:

Student will be able to

outline the impact of inventions in electricity over the years

Explicit Teaching/Teacher Modelling ***(I Do)***	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. We have learnt a lot of concepts about electricity so far. We learnt that we need to be safe while using electricity. Today let's look at some interesting facts about electricity including how it was discovered. Can you guess how many years ago the first experiments with electricity were done? Teacher takes few student responses. The first experiments on electricity were done almost 2600 years ago. Do you remember the experiment we did in the first class, where we rubbed a balloon against our hair many times and pieces of paper stuck to it?	The teacher writes the following timeline on the board and has a group discussion with the students and helps them complete the upper boxes of the timeline. The teacher must remind students that these are approximate timelines.  Once the students complete this, the teacher can ask students to extend the timeline on the right side as given below: Teacher gives the question: What new things will be invented in future, these maybe facts about electricity or electrical devices?  	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. When was the first electricity experiment performed? 2. Who invented the first battery? 3. How many years ago, was the first light bulb invented? 4. Match the event with the time it happened:

  Someone from Greece, called Thaleus of Miletus did a similar experiment 2600 years ago. That was the beginning of the discovery of electricity. Is there anything in nature that reminds you of electricity? (Students respond.) Lightning is similar to the spark that electric plugs give, but it is much more dangerous. People were curious to know if lightning is a form of electricity. About 250 years ago, a scientist called Benjamin Franklin performed an experiment to prove that lightning is also electricity. What is the most simple object we can use to get electricity? When you made your electric circuits, what did you use to light up your bulb? (Students respond.) Battery. Can you guess how many years ago, the first battery was invented? Teacher takes students' responses. About 200 years ago, an Italian scientist called Alessandro Volta made the first ever battery. This completely changed the study of electricity because now batteries could be used to generate electricity and make appliances from. After this, many people discovered other uses of electricity. One of the most important among those, was that of the electric bulb. Do you remember who invented it? Teacher takes students' responses. It was invented by Thomas Alva Edison around 140 years ago.	Students work in groups and complete the activity. Teacher brings the class together and discusses the activity. Each group is given time to present their ideas.	(a) Invention of the bulb - 2600 years ago (b) First electricity experiment - 250 years ago (c) Invention of the battery - 200 years ago (d) Discovery of lightning as electricity - 140 years ago **Teacher assigns Homework:** Write or make pictures of important events in the discovery of electricity. If you were to design an electric device, what would it be and why?

Did you know that the world's largest light bulb is in a museum in the USA in the same place where Edison invented it?

Around the same time, electricity was not available in homes. It was used in science labs and certain places. Another scientist called Nikola Tesla developed a kind of electric current called Alternating current. You will learn more about this in higher classes. That is the kind of current we use in our homes.

Can you guess what electrical appliances were among the first to be used in homes?
Bulbs and fans

Since then, there have been many new inventions of electric appliances.
Can you guess when the first electric car was invented?
Teacher takes student responses.
The first electric car was invented more than 100 years ago.

CFU (Open ended/ Factual)

1. When was the first electricity experiment done?
2. Which occurrence in nature produces electricity? (lightning)
3. Why was the invention of battery important?

What new electrical devices will be invented in future?

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

"What were some of the important events in the discovery of electricity?"

"Why is it important for different people to share their findings in science?"

"Can we say that any one-person invented electricity? "

"What electric devices do you think will be invented in the future?"
"Are there any other questions about today's lesson that you are curious to know more about?"
Students are given time to write their questions on the "Question corner" chart in the classroom.

Period 9.8: Summary & Extended Activities-2

Learning objectives:

Student will be able to

- *summarize* concepts of electricity learnt in this chapter
- *discuss and examine* answers to some of the "Question Corner" questions

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work *(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in this chapter. She recalls and discusses the key concepts of the chapter: What is electricity? List the uses of electricity? What did we learn about an electric cell? Are there different types of electric cells? Can you give examples? What are the parts of an electric bulb? Why are some circuits called open or incomplete circuits? What are conductors and insulators? Give examples. What are some uses of conductors and insulators?	Teacher can use this time to discuss some of the questions children have written in the "Question corner" chart in the class. If the teacher feels that some questions cannot be explained at this level, she can tell the students that they will learn the answers to those questions in higher classes. Teacher can also show videos on the questions if they are available. Below are some possible questions and ideas for discussion: "How do we get electricity in our homes/ to our phones?" Teacher can lead the discussion towards power transmission lines, where do you think they come from and so on. Short videos like this can also be used. "How do batteries get electricity?" Teacher can talk about how there are chemicals stored in the battery. Experiments to understand this better will be done in higher classes. (electrolysis) "Why does a fridge use more electricity than a fan?"	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. List any 5 uses of electricity. 2. Draw an electric cell and its parts. 3. Draw and explain the parts of an electric bulb. 4. Explain open and closed circuits. 5. Define conductors and insulators. Give examples.

	Teacher can speak about the functions and the parts like the motor in the fridge and compressor that have to be running continuously. "In future, can there be a time when there is no electricity?" Teacher can talk about renewable sources of electrical energy. "Can plants produce electricity?" Yes, plants produce small amounts of electricity. But we cannot use them as sources of electricity like the way we use wind or solar energy. Some experiments are being done to use them for smaller electricity needs."	**Teacher assigns Homework** to revise the chapter and prepare for the assessment.

Closing- 5 minutes
Teacher recalls the concepts taught in the chapter.

Student Independent Practice:

Periods : 9.9, 9.10, 9.11, 9.12 - Worksheet 9.3 and Worksheet 9.4

Period 9.13, 9.14 - Remedial teaching

TEACHER'S DIARY

Name of the Teacher:				**Name of the Month:**	
Name of the Lesson:				Class:	
Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
9.1	Introduction to electricity and electric cell				
9.2	Electric bulb				
9.3	A Bulb connected to an electric cell				
9.4	Simple electric circuit				
9.5	Electric switch				
9.6	Electric conductors & Insulators-1				
9.7	Electric conductors & Insulators-2				
9.8	Summary and extended activities (like discussing Science concept cartoons on electricity, discussing and researching student questions on electricity)				
9.9	Student Independent Practice				
9.10	Student Independent Practice				
9.11	Student Independent Practice				
9.12	Student Independent Practice				
9.13	Remedial teaching				
9.14	Remedial teaching				

1.	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

February 2026

C2M1S3
No bag Day

F1S8Y2
Cluster Complex

E5F4M6
Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Sunday 1	2 NI	3 NI	4 NI	5 NI	6 NI	No Bag Day 7
Sunday 8	9 FA - 4	10	11	12 NI	13 10.1	Second Saturday 14
Sunday 15 Maha Sivaratri	16 10.1	17 10.2	18 10.3	19 10.4	20 10.5	No Bag Day 21 Cluster, PTM, SMC meeting
Sunday 22	23 10.5	24 NI	25 NI	26 NI	27 NI	No Bag Day 28 National Science Day

Week1: **NI**

Week 2: **FA -4, 10.1**

Week 3: **10.1-10.5**

Week 4: **11.5, NI**

↓ TEACHER'S NOTES ↓

10

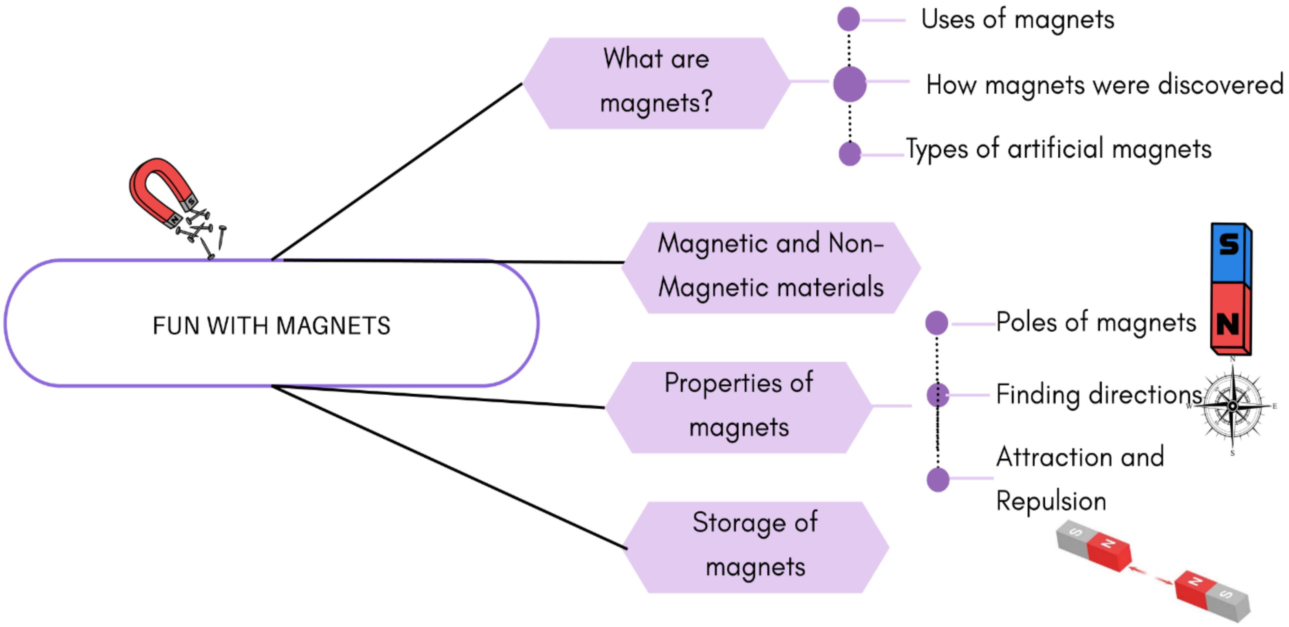
FUN WITH MAGNETS

Learning Outcomes:

Student will be able to

1. Understands the discovery of magnets.
2. Classify the materials into magnetic and non magnetic.
3. Identify the pole of a magnet
4. Conduct the experiments with magnets and compass
5. Make his own magnet.
6. Understand the magnetics attraction and repulsion phenomena.
7. Learn to store the magnets safely.

CONCEPT MAP



SYNOPSIS

- Magnets were discovered several years ago in Greece.
- We use magnets in many ways in our daily life like magnetic cranes, refrigerator doors, fridge magnets, some toys and in electrical motors.
- Magnets can be natural or artificial magnets.
- Artificial magnets include bar magnets, horse-shoe magnets, ring magnets, circular magnets etc.

Magnetic and Non-magnetic materials

- Materials which get attracted to a magnet are called magnetic materials. For example, safety pins, keys, iron door latches etc.
- Materials which do not get attracted to a magnet are called non-magnetic materials. For example, plastic spoons, wooden scale, cloth etc.

Properties of Magnets

- The regions of the magnets that attract the most magnetic substances are called the poles of the magnet.
- Every magnet has two poles.
- A freely suspended magnet comes to rest in the North-South direction.
- A compass is a small circular device with a magnetic needle inside a glass lid, that is used to find directions.
- We can convert magnetic materials like an iron bar or blade to a temporary magnet by rubbing a magnet unidirectionally over it repeatedly.
- When two magnets are brought near each other, the unlike poles attract each other and the like poles repel.
- The property of like poles repelling is used in mag-lev trains, where repulsion between magnets causes magnetic levitation.

Storage of Magnets

- Magnets can lose their properties on heating, hammering or dropping them from a height.
- Magnets must be stored carefully. When magnets are stored in pairs, their unlike poles should be on the same side and they must be separated by a piece of wood, while two pieces of soft iron must be placed across their ends.
- Magnets must be kept away from cassettes, mobiles, television, music system and computers.

Period-wise Topics

Chapters and Concepts

Period No.	Topic	Remarks
10.1	Introduction to magnetism, how magnets were discovered?	
10.2	Magnetic and Non-magnetic materials	
10.3	Poles of magnet	
10.4	Finding directions	
10.5	Make your own magnets	
10.6	Attraction and Repulsion between magnets	
10.7	A Few Cautions	
10.8	Summary and extended activities (like discussing and researching student questions on magnetism)	
10.9	Student Independent Practice	
10.10	Student Independent Practice	
10.11	Student Independent Practice	
10.12	Student Independent Practice	
10.13	Remedial teaching	
10.14	Remedial teaching	

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Force is a push or pull that can cause objects to move or change directions.
- There are different kinds of forces in nature like gravity.
- Different materials have different properties depending on what they are made of.
- Simple machines like levers and pulleys work with the application of force.

Teacher References:

NCERT Class 6 Textbook

- Bal Vaigyanik Class 6, Eklavya
- Electricity and magnetism – Arvind Gupta website
- How and Why Wonderbook of Magnetism
- Magnetism - Basic Science booklet
- How do magnets work?
- Earth and compasses

Teaching Learning Material (TLM):

- Chart for “Question corner”
- Magnet, paper cup, lid, safety pin, thread, stand for Activity 1 (Text book activity)
- Horse-shoe, ring, bar, cylindrical and circular magnets
- Fine iron filings, magnets of different shapes for Activity 2
- Stick, thread, bar magnets, variety of everyday objects for Activity 3
- Glass beaker, paper for making paper boat, pins, magnet for Activity 4
- Foam or cardboard board, thread, safety pin, stick, magnet for Activity 5
- Bar magnet, horseshoe magnet and neodymium magnet for period 5
- Paper cup, tape, safety pins, clothes clip, magnet for Activity 6
- Bar Magnet, scale, safety pin for Activity 7
- Bar magnet, iron filings for Activity 8(Textbook Activity 4)
- Some pieces of iron (or iron paper clips or iron filings), a bar magnet, a horse-shoe magnet, a ring magnet and circular magnet for Activity 9
- Bar magnet for Activity 10
- Bar magnet, thread, wooden stand for Activity 11(Text book Activity 5)
- Thread, bar magnet, pencil and wooden scale and wooden stand for Activity 12
- Flat piece of iron, bar magnet for Activity 13
- Small piece of cork/foam, a beaker/mug of water, a needle and a magnet for Activity 14 (Text book Activity 6)
- Toy cars, bar magnets, rubber bands for Activity 15 (Textbook activity)
- Straw, tape, foam board, ring magnets for Activity 16
- Foam board, 3 ring magnets, pencil, piece of cardboard for Activity 17
- Different types of magnets, storage materials like small cardboard boxes, pieces of wood and paper, iron pieces, chart paper for Activity 18
- Link to imagePeriod 1
- Link to imagePeriod 2
- Link to imagePeriod 6

Concept 1: Introduction to magnetism - How magnets were discovered?

Teaching Learning Process

Learning Objective/s:

Student will be able to

- *Describe* how magnets were discovered
- *List* the uses of magnets in their daily life

Induction/Introduction

In this concept, children will learn the uses of magnets and how magnets were discovered. They will also learn about artificial magnets and their types.

Vocabulary:

Magnets, force

Hook:

Teacher performs a magic trick in the class.

Teacher wears gloves (with a magnet hidden inside) and moves an iron key by moving her hand above it.

(Ref. Video: https://www.youtube.com/watch?v=TK-ZA__kiso&t=2089s)

(3 minute onwards)

The teacher asks students to guess how she performed the trick.

Experience and reflection:

Where have you seen magnets being used in the school or at your home?

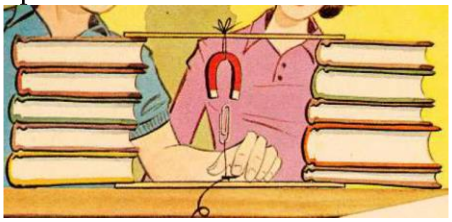
Period 10.1

Learning Objectives:

Student will be able to

- *Describe* how magnets were discovered – natural and manmade magnets
- *List* the uses of magnets in their daily life
- List the types of magnets

<table>
<tr>
<th>Explicit Teaching/Teacher Modelling
<i>(I Do)</i></th>
<th>Group Work <i>(We Do)</i></th>
<th>Independent Work (You Do)</th>
</tr>
<tr>
<td>Activity -1: Introduction to magnets
(Teacher demo)
Teacher does the following activity (Page number 98-99 in the textbook)

● Fix a plastic or paper cup to a stand as shown.
● Place a magnet inside the cup and cover the cup.
● Attach a thread to an iron paperclip.
● Fix the other end of the thread at the base of the stand.
● When the clip is brought near the base of the cup, the clip is raised in the air without support.
Alternately, the teacher can also use this set-up:

Teacher asks students, “What did you observe happening?”
Students respond.
“What do you wonder?”
Students respond.

Then the teacher explains that there is a magnet inside the cup and it attracted the paper clip. That made the paper clip rise in the air.
“What do you think is special about magnets?”
They attract certain substances.</td>
<td>“Now let’s work in our groups for the next activity.”
Before we start exploring, can you work in your groups to fill in the table below?
<table>
<tr><th>What do I <i>know</i> about magnets?</th><th>What do I want to <i>know</i> about magnets?</th></tr>
<tr><td></td><td></td></tr>
</table>
After the children have finished writing, the teacher conducts the following group discussion.
“I am going to show you a few pictures and you have to tell me what is common between them. Remember, raise a silent hand if you know the answer.”
Teacher shows the following pictures:
A crane pulling out materials made of iron from the junk (textbook image)

Magnets on a fridge door:(Link to image)

“Can you guess what is common to these pictures?”
“What did you see in the first picture?”
You see a crane that is picking up only some kind of materials from the junk.
Can you guess what they are?
Those are materials made of iron.
Let us look at the second picture.
What is on the fridge door?
There are stickers. How do they stick to the door?
(Children might say magnets.)
Let us look at the third picture.</td>
<td>“Thank you for engaging in the group activity so well. I saw some interesting responses. Now it’s time for you to work on your own.”
Teacher writes down questions on the board and asks students to write their answers in the notebook.
1. Write a few uses of magnets.
2. Can you explain how magnets were discovered?
3. What are natural and artificial magnets?
4. What are the types of man-made magnets? Draw and explain.
5. If you are given iron filings, how will you use them to find out the type of magnet?
6. Did you notice anything interesting in the shape of the iron filings during the activity?</td>
</tr>
</table>

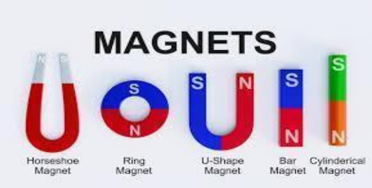
Teacher briefly describes the story of the discovery of magnets – in the place called Magnesia.

Teacher introduces students to the concept of natural magnets. Natural magnets are the magnets that can be found in nature. For example, like the stone we saw in the story of the discovery of magnets.

We can also make magnets using materials like iron and steel. These are called artificial magnets.

Teacher brings the different types of magnets to the class and shows them each of them and tells students what they are called. While introducing each of the magnets, the teacher asks the students if they have seen that kind of magnet before and where have they seen them.

(Below image is a representative image, the teacher will be showing physical magnets)



Children can also mention that there are other kinds of magnets they have seen or played with. The teacher must encourage students to share about those.

CFU (Open ended/ Factual)

Factual CFUs

1. What is a special property of magnets?
2. How were magnets discovered?
3. What are natural and artificial magnets?
4. What are man-made magnets?
5. What are the different types of man-made magnets?

Open ended CFUs

1. Can you think of any reasons why certain materials are attracted to magnets while others are not?
2. Can you think of a scenario where magnets could be used to solve a real-life problem?

We see a door knob. When we open the door fully, both parts ‘stick’ together. Can you guess what is happening?

Teacher must encourage the children to see that all three actions occur due to magnets.

“How are magnets used in each case?”

Students respond.

Then the teacher gives students time to work in their groups and write about the uses of magnets. Have they observed magnets used in any other ways?

The teacher lets students work creatively, they can draw or write about their scenario.

“Have you ever wondered how these magnets are made?”

Teacher shows students the following video:

How magnets are made

Teacher then discusses about the video and asks students what they understood.

Activity 2:

Teacher divides students into groups.

“Now I am going to give each group, a paper and some iron filings. I will also be giving you a magnet kept inside a paper packet. You cannot see or touch the magnet. You have to place the packet under the paper and spread the iron filings over it. Using the shape of the iron filings, you have to guess what type of magnet you have got.”

In the notebook, children have to draw and write:

S.No	Shape of iron filings (Draw the shape of iron filings here)	Type of magnet

Teacher demonstrates using one magnet, so that children understand the experiment.

Teacher assigns Homework:

What are some of the uses of magnets in your home and in the classroom?

How do you think the discovery of artificial magnets changed the way people use magnets in everyday life? Provide an example of a tool or device that was improved because of artificial magnets.

If you could make a magnet of any shape, what shape of magnet would you create and why?	Teacher demonstrates using one magnet, so that children understand the experiment. For a bar magnet, the result will look something like this:[Link to image]  (As this is the second class on magnets, children are not familiar with the concept of magnetic field. It is sufficient if they can identify the shape of the magnet using the iron filings.) The teacher can let each group take turns, so that all the groups get to experiment with all shapes of magnets. Teacher brings the class together and discusses the activity. The teacher can also take this time to clear any questions children have. Teacher brings the class together and allows time for each group to present their work.	

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

"What are some uses of magnets?"

"How were magnets discovered?"

"Are there any other questions about magnets that you are curious to know more about?"

"What are man-made magnets?"

"What are some types of man-made magnets?"

"What are magnets made from?"

Assessment of Concept 1:

1. Choose the correct answer:
   - (i) _______________ is an example of a natural magnet.
     (a) Lodestone (b) calcium (c) magnesium
   - (ii) ___________ can be used to make artificial magnets.
     (a) Plastic (b) iron (c) wood

2. What are some common uses of magnets?
3. What is the difference between natural magnets and artificial magnets?
4. Draw and explain the types of artificial magnets.
5. What do you think makes an object magnetic?
6. Paheli has two identical iron pieces and only one of them is magnet. How can she identify the magnet?

Concept 2: Magnetic and non-magnetic materials

Teaching Learning Process

Learning Objective/s:

Students will be able to

- *Define* magnetic and non-magnetic objects
- *Perform* simple activities to *classify* objects as magnetic or non-magnetic

Induction/Introduction

In the next 2 classes, children will learn to classify given objects as magnetic and non-magnetic objects. They will define magnetic and non-magnetic objects. They will also learn about the nature of magnetic force. They will learn that it is a non-contact force and that it can pass through non-magnetic materials.

Vocabulary:

Attract, magnetic, non-magnetic

Hook:

Teacher starts the class with a small game.

Teacher sets up two magnets in repulsion mode (or levitation mode.)

“I am not able to bring these two magnets close together, how much ever I try.”

“I have a variety of materials here. Which of these can help me bring the two magnets closer?

Teacher shows the following materials:

Leaf, flower, iron nail, key, sticks.

Teacher takes ideas from students. Then the teacher calls a student to come forward and try the materials one by one. Before trying each one, the teacher gives time for students to discuss and respond to why they chose a particular object.

“Can you now divide these materials into 2 groups? What is similar and different between objects in each group?”

Today we are going to do some activities to sort materials into groups.

Experience and reflection:

Have you sorted materials into groups in school or at home? What materials have you used?

Period 10.2

Learning Objectives:

Students will be able to:

- Define magnetic and non-magnetic objects
- Classify objects as magnetic and non-magnetic
- *Explain* the nature of magnetic force
- *Find out* through which objects magnetic effects work

<table>
<tr><th>Explicit Teaching/Teacher Modelling <i>(I Do)</i></th><th>Group Work <i>(We Do)</i></th><th>Independent Work (You Do)</th></tr>
<tr>
<td>Teacher recalls the concepts taught in the previous class.
In the previous class we learnt about the uses of magnets. We also learnt about natural and artificial magnets. We saw how magnets are special in that they attract certain materials.
Today we are going to perform a simple experiment to find out which objects are attracted to a magnet in our surroundings.

Teacher defines magnetic and non-magnetic materials and asks students to write down the definitions in their notebooks.
The materials which get attracted to a magnet are called magnetic.
The materials which are not attracted to a magnet are called non-magnetic.</td>
<td>Activity 3:
Teacher divides students into groups and explains the activity.
‘Today we are going to go on a “Magnes walk”. Do you remember the story of the discovery of magnets? We are going to do something similar today. Each group will have a magnet tied to the end of a stick. You have to walk through the school playground very carefully observing which materials are attracted to the magnet. Before actually testing with the stick, you must fill in the first two columns of the table. You must write your guess and then find out the answer. “
<table>
<tr><th>Object</th><th>What do I think? Will it get attracted?</th><th>What happened? Did it get attracted?</th><th>Is it magnetic/non-magnetic?</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
After the activity, the teacher brings the class together and has a discussion on each group’s findings.

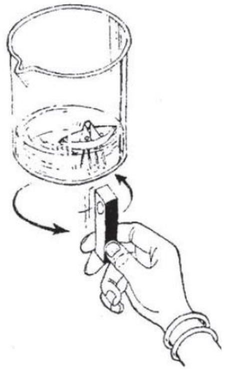
Activity 5:
The teacher divides students into groups and asks them to set up the following experiment to investigate which materials magnetism passes through.</td>
<td>“Thank you for engaging in the group activity so well. I saw some interesting responses. Now it’s time for you to work on your own.”
Teacher writes down questions on the board and asks students to write their answers in the notebook.
1. Define magnetic and non-magnetic materials.
2. Give examples of magnetic and non-magnetic materials.
3. What is common to all or most of the magnetic materials?
4. How will you prove that magnetism is a non-contact force?</td>
</tr>
</table>

Teacher recalls the concepts taught in the previous class.

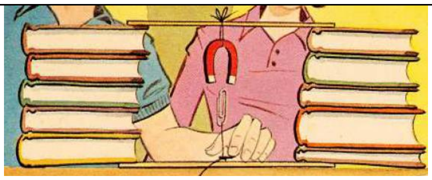
“We know that when a force acts on an object, it makes it change its position. I can use force to pull or push the door. But what kind of force is exerted through a magnet? Does distance effect the force? Can it pass through objects? These are some questions we are going to explore today.”

Activity 4:

Teacher sets up the following experiment.



- Fill a glass beaker with water
- Make a small paper boat and insert a few pins in it from the top, so that they project out from the bottom of the boat.
- Place the boat in the water in the beaker.
- Ask students how you can move the boat without touching it?
- Bring a magnet to the sides of the beaker and see what happens when the magnet is moved.



(This experiment is very similar to the introductory activity of raising a paper clip in air.)

- Attach a thread to an iron paperclip and attach its other end to the base of a stand.
- Place it on a table as shown and place two piles of books on both sides.
- Tie a horse-shoe magnet to a stick or scale and place it as shown in the picture.

(The length of the thread should be such that there is little gap between the magnet and the paperclip when the paperclip is raised in the air. We need this gap to insert and test different materials.)

“We can see that the clip is attracted to the magnet. Now let us see if the magnet can attract the clip through different materials.”

The teacher can guide the students to try placing different materials in the gap between the clip and the magnet. Before trying each of those, students have to fill in the table:

Material	What do I think will happen?	What I observed?
Piece of paper		
Piece of cardboard		
Piece of flat plastic		
Piece of cloth		

The teacher can ask students what they observed and if they have any other suggestions for objects to try.

“Do you think magnets can attract through any material?”

Students respond.

“Let us try one more material. “

Teacher asks students to place an iron nail between the magnet and the clip. The clip will fall off.

The teacher can encourage students to repeat this experiment with different magnetic materials like an iron key or lock, another iron clip etc.

Then the teacher can have a discussion with the students about what they observe.

5. What are some materials through which magnets can attract objects?

Teacher assigns Homework:

Identify 5 magnetic objects at home using a magnet and mention the material each of them is made of.

When a magnet passes through a sheet of paper, you can feel its force, but it doesn’t stick to the paper. Why do you think the magnet can affect metal objects underneath the paper but not the paper itself? Can you think of any real-life situations where magnets pass through materials like this?

Teacher can then lead a discussion to bring out the point that magnetism is a non-contact force. It can pass through air and some substances like air and water. **CFU (Open ended/ Factual)** Factual questions: 1. Define magnetic objects. 2. Define non-magnetic materials. 3. What are some substances that are attracted to magnets? 4. Does a magnet have to touch an object to attract it? Is magnetism a contact force or a non-contact force? Open ended questions: 1. How does knowing the difference between magnetic and non-magnetic materials help us in our daily activities? 2. How can you prove that magnetic force passes through some objects?	‘Hence, we know that magnets attract through non-magnetic materials like plastic and paper, but when a magnetic material is used, magnetism does not pass through. “	

Closing

Teacher recalls the concepts taught:

Summary:

“What concept did we explore today?”

“What are magnetic and non-magnetic materials?”

“Why are only some materials attracted to magnets?”

“Are there any other questions about magnetic and non-magnetic materials that you are curious to know more about?”

“What is magnetism?”

“Can magnetic effects work through all objects? Why?”

“Are there any other questions about magnetic force that you are curious to know more about?”

Students are given time to write their questions on the “Question corner” chart in the classroom.

Assessment of Concept 2:

1. Fill in the blanks:
    (a) ________ (iron/plastic) is a magnetic material.
    (b) __________ (steel/ wood) is an example of a non- magnetic material.
    (c) Magnetism is a ________ (contact/non-contact) force.
    (d) Magnetic effect can be exerted through ________ (sheet of paper/ iron blade).
2. Define magnetic and non-magnetic materials.
3. Give 3 examples each of magnetic and non-magnetic materials.
4. Can you think of a situation where magnetic and non-magnetic materials are used together?
5. How will you prove that magnetism is a non-contact force?
6. In a recycling plant, magnets are used to separate metal from non-metal materials. How do you think magnets can be used to sort items like cans from plastic bottles?

Concept 3: Poles of magnet

Teaching Learning Process

Learning Objective/s:

Students will be able to

- *Identify* the north and south poles of a magnet
- *Experiment on and describe* the north and south poles of a magnet
- *Describe* the properties of attraction and repulsion of magnets

Induction/Introduction

In the next few classes, children will learn about the properties of magnets. They will learn that all magnets have two poles, that magnetic force is strongest at the poles. They will also learn that different magnets have different strengths. They will learn to find directions using a magnet and explain the working of a compass. They will experiment and learn about attraction and repulsion between magnets. Finally, they will use this knowledge of the properties of magnets to learn the best ways to store and use magnets so that they don’t lose their properties.

Vocabulary:

North pole, South pole, compass, attraction, repulsion

Hook:

Teacher starts the class with a small game.

“I am going to call one student to the front of the class and blindfold him/her. To the rest of you, I will show an object. You have to describe the object, without saying its name or what it is used for and help the blindfolded student guess what the object is. ”

Teacher can use a variety of objects like a light bulb, a leaf, a spoon, a magnet etc.

After each round get the students to discuss what did they use to describe the object. The properties of an object are characteristics that help us describe them. For example, an iron nail has the characteristic of being attracted to a magnet, so it has the property of being magnetic.

We know that magnets have the property to attract certain objects, let us look at some more unique properties of magnets.

Experience and reflection:

Why do you think it is important to know the properties of objects? Can you think of an object you use every day and how its properties make it useful?

Period 10.3

Learning Objectives

Students will be able to:

- *identify* the poles of a magnet
- *draw* and *explain* the poles of a magnet

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. "In the last class, we saw how different magnets attracted objects to a different extent. In this class, we will look more closely into one type of magnet. Do all parts of a magnet attract objects equally?" **Activity 8:** (Teacher Demo) (Activity 4 in the Textbook, Page no. 68-69) Teacher spreads some iron filings on a sheet of paper and places a bar magnet over it. Then she moves the magnet over the iron filings.  Teacher asks the students what they observe. Did the iron filings stick all over the magnet or in some parts more than the others? Teacher takes student responses. Teacher repeats the experiment with iron nails and asks students their observations. The teacher explains that the iron filings are attracted more to the ends of the magnets.	**Activity 9:** Teacher divides students into groups. "We observed the poles of a bar magnet. Now you are going to repeat the experiment in your groups. You are then going to use magnets of different shapes and find their poles." Each group is given some pieces of iron (or iron paper clips or iron filings), a bar magnet, a horse-shoe magnet, a ring magnet and circular magnet. Students are instructed to try the experiment with each magnet and draw their findings in their notebooks. After the students complete the activity, the teacher brings the class together and discusses the findings. **Activity 10:** (Activity 3 in the textbook – page number 68-69) In the same groups, children can try this activity, Each group has a bar magnet. They are instructed to go outside and rub the magnet in the soil. Shake the magnet to remove the soil. Some iron filings would be sticking to the magnet. The students are instructed to repeat the same activity in different parts of the school and record their observations.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. Draw and explain what is meant by poles of a magnet. 2. How can you find the poles of any given magnet? 3. How is the knowledge of poles of a magnet useful?

<table>
<tr>
<td>Teacher defines poles of the magnet. The parts of the magnet that attract the largest part of the iron filings are called its poles.

CFU (Open ended/ Factual)
Factual questions
1. What are the poles of a magnet?
2. Draw the poles of a magnet.
Open - ended questions:
If you cut a bar magnet in half, what do you think will happen to its poles? Why?</td>
<td>
<table>
<tr><td>Name of the location</td><td>Did you find iron filings sticking to the magnet? (Many/very few/none)</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>

After the activity, the teacher brings the class together and discusses their findings.</td>
<td>Teacher assigns Homework:
Some doors in factories or labs use magnets to close automatically. How do the poles of the magnets play a role in ensuring that the door stays securely closed?</td>
</tr>
</table>

Closing

Teacher recalls the concepts taught:

Summary:

“What concept did we explore today?”

“What are poles of a magnet?”

“How can you identify the poles of a magnet?”

“Are there any other questions about magnetic poles that you are curious to know more about?”

Students are given time to write their questions on the “Question corner” chart in the classroom.

Assessment of Concept 3:

I. Choose the correct answer:

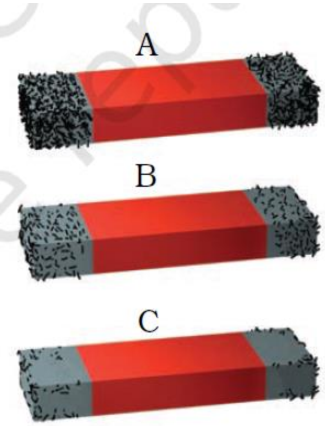
1. The number of poles of a magnet are:

(a) One (b) two (c) three

2. ________ poles of a magnet repel each other.

(a) Similar (b) different (c) all

3. Three magnets are dipped in a heap of iron filings. The amount of iron filings on them is shown below.



The strength of these magnets will be:

(a) A=B=C (b) A>B>C (c) A<B<C

II. Short Answer Questions

1. Where are the poles of a magnet located?
2. How will you find the poles of a magnet?

Concept 4: Finding directions

Learning Objectives:

Students will be able to

- Find directions using a magnet
- Explain the working of a magnetic compass
- Explain the scenarios where magnets lose their properties

Induction/Introduction

In the next few classes, children will learn about the properties of magnets. They will learn that all magnets have two poles, that magnetic force is strongest at the poles. They will also learn that different magnets have different strengths. They will learn to find directions using a magnet and explain the working of a compass. They will experiment and learn about attraction and repulsion between magnets. Finally, they will use this knowledge of the properties of magnets to learn the best ways to store and use magnets so that they don't lose their properties.

Vocabulary:

North pole, South pole, compass, attraction, repulsion

Hook:

Teacher starts the class with a small game.

"I am going to call one student to the front of the class and blindfold him/her. To the rest of you, I will show an object. You have to describe the object, without saying its name or what it is used for and help the blindfolded student guess what the object is. "

Teacher can use a variety of objects like a light bulb, a leaf, a spoon, a magnet etc.

After each round get the students to discuss what did they use to describe the object. The properties of an object are characteristics that help us describe them. For example, an iron nail has the characteristic of being attracted to a magnet, so it has the property of being magnetic.

We know that magnets have the property to attract certain objects, let us look at some more unique properties of magnets.

Experience and reflection:

Why do you think it is important to know the properties of objects? Can you think of an object you use every day and how its properties make it useful?

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. "In the previous class we learnt about the poles of a magnet. We saw that the poles are the regions on the magnets which attract the most iron filings." "In this class, let us learn another unique property of magnets which is very useful to us." "Did you know that people have been using magnets for many years to find directions? In the olden days, when sailors used to get lost in the sea, they used magnets to find directions. Let us learn how they did it." **Activity 11:** (Teacher demo) (Activity 5 in the textbook page number 70-71) Teacher demonstrates this activity.  ● Take a bar magnet. ● Put a mark on one end using a chalk piece. ● Tie a thread around the middle of the magnet and suspend it from a wooden stand. ● Check if the magnet can rotate freely. ● Turn the magnet gently and wait for it to stop spinning. ● Draw a line on the ground below the magnet to show the direction in which it came to rest. ● Call a student as a volunteer and ask them to stand with hands outstretched pointing in the same direction as the magnet (as shown in the picture below). ● (This helps children to see very visually that the magnet always comes to rest in the same direction.) ●	**Activity 12:** Teacher divides students into groups and provides each group with a thread, bar magnet, pencil and wooden scale and a stand (if stands are not available for all the groups, the teacher can encourage students to try other ways of suspending a magnet freely, like tying the magnet to a stick and placing a stick on two piles of books (as was done in Activity 4). First, students are instructed to repeat Activity 9 in their groups and write their observations. -Did the magnet stop in the same direction every time? - How do you know? Next, students are instructed to repeat the same experiment with a pencil. "We will be repeating the same activity as above with a pencil. What do you think will happen? Will the pencil also come to rest in the same direction?" (Think-pair-share) "Share with the person sitting next to you, what will happen and why." Teacher takes some student responses. "Let us try and see." Teacher gives students time to perform the experiment and write their observations. -Did the pencil stop in the same direction every time? -How do you know? Teacher discusses the observations of the students.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. How do magnets help us find directions? 2. What experiment can you do to find how magnets help to find directions? 3. Explain the working of a magnetic compass. 4. What do you think will happen if you bring a magnet close to a compass?

 ● Also mark the position of the two poles of the magnet on the line. ● Now, rotate the magnet gently again and wait for it to stop. ● Mark the position where it comes to rest as one before. ● Ask the student to stand with arms outstretched as before. (For more reinforcement, the teacher can ask 2 students to volunteer, so it's easier for children to see that the magnet comes to rest in the same position.) The teacher must repeat this activity multiple times to show that the magnet always comes to rest in the same position. Ask the children what they observe. “Does the magnet always come to rest in the same position?” Explain to the class that a freely suspended magnet always comes to rest in the same direction, i.e the North-South direction. **CFU (Open ended/ Factual)** Factual: 1. How is a magnet useful in finding directions? Open-ended What experiment can you perform to prove that magnets can be used to find directions?	Teacher instructs students to repeat the activity with a wooden scale and write their observations. Teacher discusses the observations. “We can conclude that magnets have the unique property of coming to rest in the same direction every time. This is the North-South direction.” Teacher introduces the concept of a magnetic compass.  “This is the principle of the working of the magnetic compass. It is a small box with a glass cover on it. It has a magnetized needle inside that can rotate freely. It also comes to rest in the North-South direction. The painted /marked end of the needle is the North pole of the magnet.” “Using the compass as reference, we can mark the North and South poles of the bar magnet now.” “All magnets have two poles. The end that points towards North is called the North seeking end or the North pole of the magnet. The end that points towards the South is called the South seeking end or the South pole of the magnet. You can observe the letters ‘N” and “S” marked on most artificial magnets.”	**Teacher assigns Homework:** How does understanding the poles of a magnet help us use a compass effectively for direction-finding in daily life and in outdoor activities like sailing?

Closing
Teacher recalls the concepts taught:
Summary:
"What concept did we explore today?"
"What is a magnetic compass?"
"How do magnets help us find directions?"
"Are there any other questions about magnetic compasses that you are curious to know more about?"
Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment of Concept 4:

1. What is the direction in which a freely suspended magnet points towards?
2. Write any two properties of a magnet.

Concept 5: Make your own magnets

Induction/Introduction

In the next few classes, children will learn about the properties of magnets. They will learn that all magnets have two poles, that magnetic force is strongest at the poles. They will also learn that different magnets have different strengths. They will learn to find directions using a magnet and explain the working of a compass. They will experiment and learn about attraction and repulsion between magnets. Finally, they will use this knowledge of the properties of magnets to learn the best ways to store and use magnets so that they don't lose their properties.

Vocabulary:

North pole, South pole, compass, attraction, repulsion

Hook:

Teacher starts the class with a small game.

"I am going to call one student to the front of the class and blindfold him/her. To the rest of you, I will show an object. You have to describe the object, without saying its name or what it is used for and help the blindfolded student guess what the object is. "

Teacher can use a variety of objects like a light bulb, a leaf, a spoon, a magnet etc.

After each round get the students to discuss what did they use to describe the object. The properties of an object are characteristics that help us describe them. For example, an iron nail has the characteristic of being attracted to a magnet, so it has the property of being magnetic.

We know that magnets have the property to attract certain objects, let us look at some more unique properties of magnets.

Experience and reflection:

Why do you think it is important to know the properties of objects? Can you think of an object you use every day and how its properties make it useful?

Period 10.5

Learning Objectives

Students will be able to:

- *Create* their own magnet and magnetic compass
- *Differentiate* between temporary and permanent magnets

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work *(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. "In the previous class we learnt about how magnets can be used to find directions. In this class, we will learn how to make our own magnet and magnetic compass." **Activity 13:** (Teacher demo)  ● Take a rectangular piece of iron and place it on the table. ● Take a bar magnet and place its North pole near one end of the iron piece (say point A). ● Without lifting the bar magnet, drag the magnet along the surface of the iron till you reach the other end. ● Now lift the magnet and place it again the same way as when you started (the North pole near point A). ● Drag the magnet along the length of the iron piece as before. ● Repeat this process 30-40 times. ● Now take a few safety pins near the iron piece. Ask the children what they observe. The safety pins stick to the iron piece. The iron piece is now behaving like a magnet. (If the iron piece is not magnetized, the same step can be repeated a few more times till it gets magnetized.)	**Activity 14:** (Activity 6 in the textbook, page number 108-109 Teacher divides students into groups. Each group is given a small piece of cork/foam, a beaker/mug of water, a needle and a magnet. Teacher gives the students the instructions to do the experiment as follows:  ● Magnetise the needle using the magnet, as we did in the demo activity (by rubbing the magnet on the needle in the same direction again and again). ● Insert the magnetised needle into the cork as shown in the picture. ● Let the cork float on the water. Make sure that the needle does not touch the water. Your model of the compass is ready ! ● Rotate the needle and observe if it comes to rest in the same direction every time.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. How can you make your own magnet? 2. Draw and explain how you can make your own magnetic compass. 3. Imagine you have a metal spoon, a needle, and a piece of iron. How would you decide which one can be magnetized?

"This way we can make our own magnet. We can use any of the other magnetic materials like an iron nail or blade to make a magnet." "Do you think this magnet that we created is as strong as the bar magnet?" Teacher takes students' responses. The teacher can show that after a few minutes the magnetized iron piece loses its property of attracting magnetic objects. The teacher can explain that it was a temporary magnet. The teacher defines permanent and temporary magnets and explains that the bar magnet is a permanent magnet and the iron piece we created is a temporary magnet. **CFU (Open ended/ Factual)** Factual: 1. How can you create your own magnet? Open-ended : Can all materials be magnetized?	● Make a note of the direction in which it comes to rest. The teacher can compare that with that of the magnetic compass and show that both point in the same direction. Students perform the activity and observe the position of the needle. Teacher brings the class together and discusses the activity and clears any doubts that students might have.	**Teacher assigns Homework:** Use a magnet to create your own magnets at home. How could you use your homemade magnets creatively around the house? Can you think of a way to make a fun science project or activity using your new magnets?

Closing

Teacher recalls the concepts taught:

Summary:

"What concept did we explore today?"

"What materials did we use to make our own magnet?"

"How can we make our own compass?"

"Are there any other questions that you are curious to know more about?"

Students are given time to write their questions on the "Question corner" chart in the classroom.

Assessment of Concept 5:

1. You are given an iron strip. How will you make it into a magnet?

Concept 6: Attraction and Repulsion

Learning Objectives

Students will be able to

- Infer the properties of attraction and repulsion of magnets
- Construct models to understand applications of attraction and repulsion between magnets
- Compare the strengths of different magnets
- Explain how distance and the type of material affect magnetic strength

Induction/Introduction

In the next few classes, children will learn about the properties of magnets. They will learn that all magnets have two poles, that magnetic force is strongest at the poles. They will also learn that different magnets have different strengths. They will learn to find directions using a magnet and explain the working of a compass. They will experiment and learn about attraction and repulsion between magnets. Finally, they will use this knowledge of the properties of magnets to learn the best ways to store and use magnets so that they don't lose their properties.

Vocabulary:

North pole, South pole, compass, attraction, repulsion

Hook:

Teacher starts the class with a small game.

"I am going to call one student to the front of the class and blindfold him/her. To the rest of you, I will show an object. You have to describe the object, without saying its name or what it is used for and help the blindfolded student guess what the object is. "

Teacher can use a variety of objects like a light bulb, a leaf, a spoon, a magnet etc.

After each round get the students to discuss what did they use to describe the object. The properties of an object are characteristics that help us describe them. For example, an iron nail has the characteristic of being attracted to a magnet, so it has the property of being magnetic.

We know that magnets have the property to attract certain objects, let us look at some more unique properties of magnets.

Experience and reflection:

Why do you think it is important to know the properties of objects? Can you think of an object you use every day and how its properties make it useful?

Period 10.6

Learning Objectives

Students will be able to

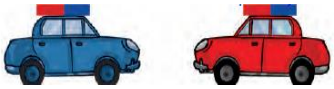
- *Infer* the properties of attraction and repulsion of magnets
- *Construct* models to understand applications of attraction and repulsion between magnets

Explicit Teaching/Teacher Modelling *(I Do)*

Teacher recalls the concepts taught in the previous class.

"In the last class, we created our own magnet and we also know that magnets can be used to find directions. Today we are going to explore another interesting property of magnets."

Teacher uses two toy cars. A bar magnet is fixed on top of each of the cars using rubber bands.



The teacher makes the two cars face each other such that the opposite poles of the magnets face each other.

"What do you think will happen when I bring these two cars closer?"

Students might respond that the cars will crash into each other.

Teacher tries the experiment and shows what happens.

"Now what will happen if I turn the red car around?"

Students respond.

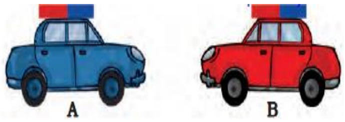
Teacher tries it and shows that the two cars seem to be running away from one another. No matter how close you try to bring them, they always move apart.

Group Work *(We Do)*

Activity 15:

Teacher divides students into groups. Each group gets two toy cars and two bar magnets. Teacher instructs students to fix the bar magnet on top of the cars as she had shown in the demo.

"You have to work in groups and find out when 2 magnets attract each other and when they repel each other."



Students are instructed to fill the table below as they do the activity:

Position of the cars	Cars move towards each other/ away from each other	Attraction/Repulsion
Front of car A facing the front of car B		
Car A placed behind car B		
Rear of car A facing the front of car B		
Rear of car A facing the front of car B		

After the activity, teacher brings the class together and discusses students' findings.

Can you now fill in the blanks:

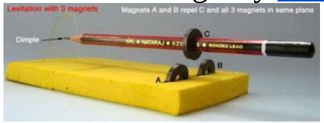
Independent Work (You Do)

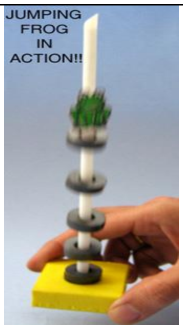
"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own."

Teacher writes down questions on the board and asks students to write their answers in the notebook.

1. What is attraction and repulsion?
2. Fill in the blanks.

Position of Magnetic poles of two magnets near each other	What will happen? Attraction/ Repulsion
North-North	
North-South	
South-North	
South-South	

The teacher explains that this property is called attraction and repulsion. When the magnets move closer to each other, it is due to attraction. When the magnets move away from each other it is due to repulsion. “Now you will perform some experiments to understand when two magnets attract each other and when they repel.” **Activity 16:** (Teacher demo) Teacher sets up the following activity. ● Take a small foam board and fix a straw on it. ● Take a few ring magnets and put them into the straw as shown so that they are attracting each other. ● Attach a frog to the straw with tape such that it can move up and down on the straw. ● Now if we remove the magnets and put them in repelling mode (as shown in the image), and pull the last magnet down, we can see that the frog starts jumping. (Video for teacher reference: Magnetic jumping frog)	1. There is attraction between magnets when their _______ poles face each other. 2. There is repulsion between magnets when their ________ poles face each other. **Activity 17:** “Let us do another simple activity to understand what magnetic levitation is.” “We are going to make a pencil spin in the air using magnets.” Teacher divides students into groups and gives each group the following materials – a pencil, a foam board, three ring magnets and a coin. Students are instructed to set up the assembly in the following way: Link to image   (The picture shows a glass piece, but instead of that a coin, a cardboard with a small crevice etc. can also be used.) If the magnets are fixed correctly in repelling mode, then the pencil levitates in air and if it is given a slight spin, it continues to spin for a long time. After the students complete the activity, teacher brings the class together and discusses what they observed. “Why did the pencil levitate in air?” “What were some of the challenges you had while setting up the experiment?” (Setting up the magnets in repelling mode can be a little challenging but can be done with some trial and error.) The teacher can then explain that this concept of magnetic levitation is used in bullet trains also called mag-lev trains. These are high speed trains that operate on the principle of magnetic levitation.	3. What happens when opposite poles of a magnet are brought near each other? 4. If you wanted to increase the strength of the attraction or repulsion between two magnets, what factors would you change? 5. Can you explain how magnetic levitation trains work? 6. Draw and explain a simple experiment for observing magnetic levitation. 7. What is meant by the strength of a magnet? 8. Do different magnets have different strengths? 9. Name any 2 factors that affect the strength of a magnet.



Teacher can ask students what they observe and why it happens? Then she can explain that this is called magnetic levitation.

"We will do another activity to understand the concept of levitation."

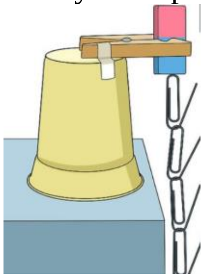
"We know that magnets attract certain objects. Do all magnets attract objects equally?"
Students respond.
Teacher shows the different types of magnets – bar magnet, horseshoe magnet and neodymium magnet.
"Which of these magnets do you think is the strongest?"
Students respond.
"Can you discuss with the person next to you why you think a particular magnet is strongest?"
Teacher gives time for students to discuss and takes some responses.
"What makes a magnet strong or weak?"
Students share their ideas.
Teacher explains that magnets have different strengths. Some can pick up heavier objects, while others can only pick up lighter ones. The strength of a magnet refers to its ability to attract or repel objects.

"Now let's work in our groups for the next activity."
Teacher divides students into groups. Each group gets a bar magnet and a neodymium magnet, safety pins, clothes clip, tape and paper cup.

Activity 6

"First, we will compare the strengths of the two magnets. "
Teacher does a demo set-up on her table following these steps:

1. Tape a paper cup on the table upside down as shown.
2. Tape a clothes clip on the paper cup as shown.
3. Insert the magnet into the clothes clip as shown.
4. Now your experimental set-up is ready.



"Keep adding safety pins to the end of the magnet. How many safety pins can the magnet hold before they fall?"
Teacher asks students to note their observations in the table given below:

Magnet	Number of pins it holds
Bar magnet	
Neodymium magnet	

After students finish the activity, the teacher discusses the strength of magnets and how it is affected by the material the magnet is made of.

Activity 7:

"Next we will compare the strength of a magnet at various distances."
Each group gets a bar magnet, a scale and a safety pin.

Teacher assigns Homework:

- How do you think the distance between two magnets affects the strength of the attraction or repulsion between them? Can you think of an experiment you could design to test how distance impacts these forces?
- Think of 3 problems in your daily life where magnets could be used to solve them. Explain how you would use magnets for each problem.

CFU (Open ended/ Factual)

Factual:

1. What is attraction?
2. What is repulsion?
3. What happens when opposite poles of magnets are brought closer?
4. How will you demonstrate attraction and repulsion in ring magnets?
5. What is meant by the strength of a magnet?
6. Do all magnets attract objects to the same extent?

Open ended:

1. Do you think circular magnets also will show attraction and repulsion or is it only a property of bar magnets?
2. Can you think of a situation where magnetic repulsion between objects is useful?
3. What is meant by the strength of a magnet?

Do all magnets attract objects to the same extent?

Distance between object and magnet	1cm	3cm	5cm	7cm	9cm
Did the magnet attract the object?					

In their groups, children have to test whether the magnet attracts the pin at different distances. At what distance does the magnet stop attracting the pin?

After students finish the activity, the teacher discusses how distance affects the strength of magnets. As the distance between the object and magnet increases, the magnetic strength decreases.

Closing

Teacher recalls the concepts taught:

Summary:

“What concept did we explore today?”

“What is attraction and repulsion?”

“How do you think this property of attraction and repulsion is useful to us?”

“Are there any other questions that you are curious to know more about?”

“What is attraction and repulsion between magnets?”

“What principle is used in bullet trains?”

“Are there any other questions that you are curious to know more about?”

“What property of magnets did we explore today?”

“Among the two magnets you used today, which was the stronger one?”

“How does distance affect the strength of a magnet?”

Students are given time to write their questions on the “Question corner” chart in the classroom.

Assessment of Concept 6:

1. It was observed that a pencil sharpener gets attracted by both the poles of a magnet although its body is made of plastic. Name a material that might have been used to make some part of it. (LO 2)

Concept 7: A Few Cautions

Learning Objectives

Students will be able to

- *List* the methods of storing magnets
- *Explain* the scenarios in which magnets lose their properties

Induction/Introduction

In the next few classes, children will learn about the properties of magnets. They will learn that all magnets have two poles, that magnetic force is strongest at the poles. They will also learn that different magnets have different strengths. They will learn to find directions using a magnet and explain the working of a compass. They will experiment and learn about attraction and repulsion between magnets. Finally, they will use this knowledge of the properties of magnets to learn the best ways to store and use magnets so that they don't lose their properties.

Vocabulary:

North pole, South pole, compass, attraction, repulsion

Hook:

Teacher starts the class with a small game.

"I am going to call one student to the front of the class and blindfold him/her. To the rest of you, I will show an object. You have to describe the object, without saying its name or what it is used for and help the blindfolded student guess what the object is."

Teacher can use a variety of objects like a light bulb, a leaf, a spoon, a magnet etc.

After each round get the students to discuss what did they use to describe the object. The properties of an object are characteristics that help us describe them. For example, an iron nail has the characteristic of being attracted to a magnet, so it has the property of being magnetic.

We know that magnets have the property to attract certain objects, let us look at some more unique properties of magnets.

Experience and reflection:

Why do you think it is important to know the properties of objects? Can you think of an object you use every day and how its properties make it useful?

Period 10.7

Learning Objectives

Students will be able to

- *List* the methods of storing magnets
- *Explain* the scenarios in which magnets lose their properties

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
Teacher recalls the concepts taught in the previous class. "What are some of the properties of magnets we learnt about?" Students respond. - Magnets attract certain objects - Different magnets have different strengths. - Magnets have two poles – regions that attract more than the other parts of the magnet. - A freely suspended magnet always comes to rest in the North-South direction. - When opposite poles of two magnets are brought together they attract each other. When the same poles of two magnets are brought together they repel each other. "We are now going to understand how magnets can be stored and what can make them lose these properties." "We have observed that magnets have different strengths. But even strong magnets can lose their properties if we do not store them well. Magnets can lose their properties if they are - Exposed to high temperatures /heated - Hammered - Dropped from some height." Magnets must be stored in the following ways:	**Activity 18:** Teacher divides students into groups and provides each group with the following materials: Each group gets 2 magnets of one type like bar magnets, horse-shoe magnet, ring magnet, circular magnet etc. They also get storage materials like rubber bands, cardboard pieces, iron pieces etc and a small chart and sketch pens. "In your groups, you have to find the best way to store the magnets you got and you have to draw it on the chart. Also draw how the magnets should not be stored." Teacher gives time for students to discuss and do the activity. Then the teacher brings the class together and allows time for each group to present their work.	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. Why is it important to store magnets well? 2. What causes magnets to lose their properties? 3. How might the temperature or humidity of an environment affect the storage of magnets? What kind of environment would you recommend for storing magnets in a school or science lab? 4. What do you think happens if a magnet is stored near other electronic devices or metallic objects? 5. How might storing a magnet in a wooden box compare to storing it in a metal box? Which option would be better for preserving the magnet's strength, and why?

- When two or more magnets are stored in the same box, they must be separated by a non-metallic barrier and their like poles must be facing each other. - Magnets must be stored in a box to avoid physical damage. - Magnets must be stored away from heat/direct sunlight and electronic items.” **CFU (Open ended/ Factual)** Factual: 1. What are the ways in which magnets lose their properties? 2. What are some precautions that must be kept in mind while storing magnets? Open ended: What do you think would happen if you stored two magnets with the same poles facing each other?		**Teacher assigns Homework:** Imagine that you are responsible for storage of magnets in a factory manufacturing them. What kind of storage system would you design?

Closing

Teacher recalls the concepts taught:

Summary:

“What concept did we explore today?”

“How should we store magnets?”

“How can magnets lose their properties?”

“Are there any other questions that you are curious to know more about?”

Students are given time to write their questions on the “Question corner” chart in the classroom.

Assessment of Concept 7:

I. Choose the correct answer.

1. A magnet can be made weaker by

(a) Keeping it wrapped in cotton wool (b) Hammering it (c)Playing with it

II. Answer the following:

2. What are the ways in which magnets lose their properties?

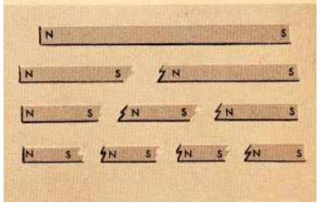
Period 10.8

Learning Objectives:

Student will be able to

- *summarize* concepts of magnets learnt in this chapter
- *discuss and examine* answers to some of the "Question Corner" questions

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)

Teacher recalls the concepts taught in this chapter.
 	
She recalls and discusses the key concepts of the chapter:
● Discovery of magnets
● Magnetic and non-magnetic materials
● Properties of magnets
  - Poles of a magnet
  - Directionality of magnets
  - Attraction and repulsion between magnets
How to store magnets
	Teacher can use this time to discuss some of the questions children have written in the "Question corner" chart in the class.
	If the teacher feels that some questions cannot be explained at this level, she can tell the students that they will learn the answers to those questions in higher classes.
	Teacher can also show videos on the questions if they are available.
	
	Below are some possible questions and ideas for discussion:
	
	Why do magnets attract iron?
	Though this is a complex idea to explain, the teacher can show this video and discuss
	How do magnets work?
	
	Can a magnet have only one pole?
	No, it is not possible for a magnet to have only one pole. All magnets have two poles.
	Even if a magnet is broken into smaller pieces, the pieces will have two poles.
	
	Why do magnets come to rest in N-S direction?
	The teacher can start by explaining that Earth itself acts like a big magnet and show this video and discuss - Earth and compasses
	
	What happens when we bring a magnet near a compass?
	This can be demonstrated in the class
		"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own."
		
		Teacher writes down questions on the board and asks students to write their answers in the notebook.
		1. Define magnetic and non-magnetic materials.
		2. Given two identical bars, how will you find out which is a magnet?
		3. Explain the working principle of a compass.
		What are some things we must keep in mind while storing magnets?

	 When the North pole of a magnet is brought closer to the North pole of the compass needle, it moves away. When the South pole of the magnet is brought closer to the North pole of the compass needle, it moves closer.	

Closing

Teacher recalls the concepts taught in the chapter.

"What are magnetic and non-magnetic substances?"

"How can we find if an object is magnetic?"

"How do we find the poles of a magnet?"

"What happens when we bring two magnets close to each other?"

"How is a compass useful?"

Teacher assigns Homework to revise the chapter and prepare for the assessment.

Period 10.9, 10.10, 10.11, & 10.12

Student Independent Practice:

Worksheet 10.1 and Worksheet 10.2

Period 10.13 & 10.14 Remedial Teaching

TEACHER’S DIARY

Name of the Teacher:

Name of the Month:

Name of the Lesson:

Class:

Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
10.1	Introduction to magnetism, how magnets were discovered?				
10.2	Magnetic and Non-magnetic materials				
10.3	Poles of magnet				
10.4	Finding directions				
10.5	Make your own magnets				
10.6	Attraction and Repulsion between magnets				
10.7	A Few Cautions				
10.8	Summary and extended activities (like discussing and researching student questions on magnetism)				
10.9	Student Independent Practice				
10.10	Student Independent Practice				
10.11	Student Independent Practice				
10.12	Student Independent Practice				
10.13	Remedial teaching				
10.14	Remedial teaching				

1.	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher’s Signature Teacher’s Signature

Head Teacher’s Suggestions:

Teacher Notes:

March 2026

No bag Day

Cluster Complex

Teacher Resources

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Sunday	2 11.1	3 11.2	4 Holi	5 11.3	6 11.4	7 No Bag Day
8 Sunday International Women's Day	9 11.5	10 11.6	11 NI	12 NI	13 NI	14 Second Saturday International π day
15 Sunday	16 Srirama Navami Potti Sriramulu Jayanti	17 RV	18 RV	19 Ugadi	20 RV	21 No Bag Day Ramadan
22 Sunday	23 RV	24 RV	25 RV	26 Srirama Navami	27 RV	28 No Bag Day
29 Sunday	30 RV	31 RV				

Week1	**11.1 – 11.4**
Week 2:	**11.5 – 11.6**
Week 3:	**Revision**
Week 4:	**Revision**
Week 5	**Revision**

TEACHER'S NOTES

11

AIR AROUND US

Learning Outcomes:

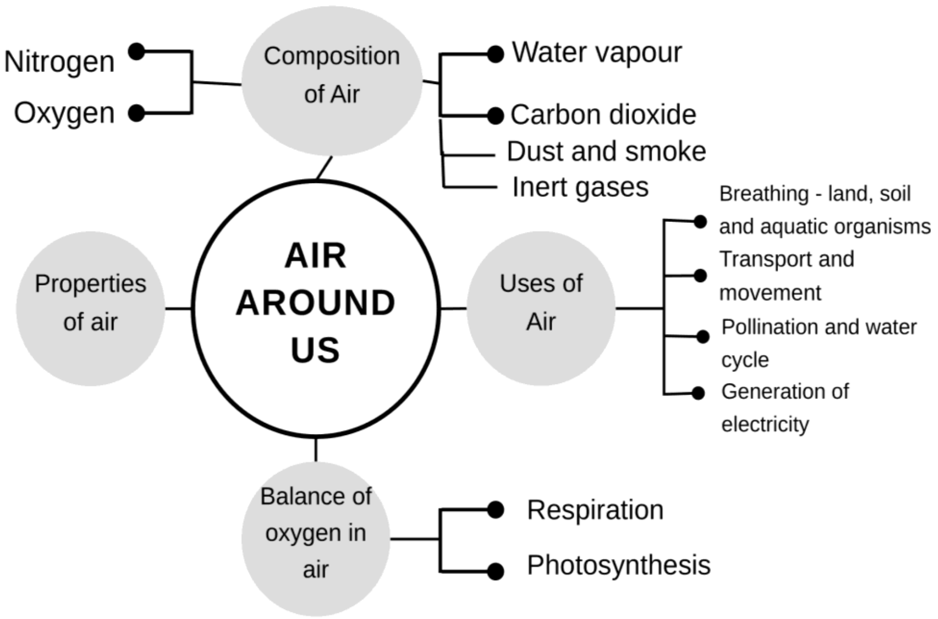
Students will be able to

1. Makes different types of firki
2. Conducts an experiment to prove that air is present everywhere around us
3. Identify the components of air and their importance
4. Explain the role of oxygen in the atmosphere
5. Understand that air is essential for all living things
6. Construct the windmill model using materials from the surroundings

Prior Concept/ Skills:

- Substances exist as solids, liquids and gases.
- Students understand the concept of mixtures.
- Students are aware of the concepts of photosynthesis and respiration (covered in the previous chapters).

CONCEPT MAP



Period-wise Topics

Chapters and Concepts

Period No.	Topic	Remarks
11.1	Introduction, Activity 1	
11.2	Is air present everywhere around us?	
11.3	What is air made up of - Activity 3	
11.4	Observing dust**,** Air pollution - Activity 4	
11.5	How does oxygen become available - Activity 5,6	
11.6	How is the oxygen in the atmosphere replaced?	

Period: 11.1

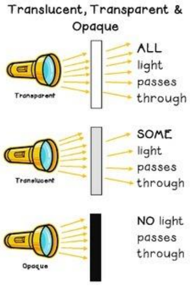
1. Topic: Introduction , Activity 1

Explicit Teaching/Teacher Modelling *(I Do)*	**Group Work** ***(We Do)***	**Independent Work** (You Do)
1. In today's class we will look at a new property to differentiate between objects around us. T: Have you ever observed a plastic mug while taking a shower? What happens when you put it in a bucket full of water? T: Have you ever dropped a soap in a bucket full of water? What happens to the soap? T: When it rains near our school or home, you might have made paper boats to play? What happens to the boat? T: What happens when you throw a stone in a pond or a bucket of water? Plastic mug, paper boat floats on the surface of water, whereas things such as soap and stone sinks down in the water. Can someone guess why some objects float while others sink in the water?	1. Let us do a small activity first. Instructions for the teacher: **Materials:** A large clear container (e.g., a fishbowl or a large glass jar) Water Various household objects (e.g., a cork, a coin, a plastic toy, a wooden block, a rock) - Teachers can choose any household items to do this activity. **Procedure:**	1. Which pair of substances among the following would float in a tumbler half filled with water? (a) Cotton thread, thermocol (b) Feather, plastic ball (c) Pin, oil drops (d) Rubber band, coin 2. Give five examples of objects that float in water and five examples of objects that sink in water 3. Why do some objects float on water while some objects sink in water? 4. Which type of the following materials is used for making the front glass (wind screen) of a car? (a) Transparent

Well it depends. It depends on whether the density of the object is lower or higher than the density of water. Explain here: Density tells us how tightly packed the material in an object is. For example, if you take a stone and a sponge of the same size, which will feel heavier? Stone feels heavier since matter is more tightly packed inside it, while the sponge has tiny holes filled with air. → If the density of the object is lower than the water then it floats on the surface of water. In simple words, when the object is light it floats. → If the density of the object is higher than the water then it sinks in the water. In simple words, when an object is heavy it sinks. Example: Float in water: Dry leaf, rubber band, etc Sink in water: Stone, metal pen, soap brick etc 2. In today's lesson we are going to look at an interesting topic which is transparency. Knowingly or unknowingly we all face this concept in our daily lives. T: While playing hide and seek where would you hide? S: behind the door, under the table, behind the wall T: Would you hide behind a glass door, through which we can see? S: No T: When you go to a shop, where are the candies kept? S: Inside a glass jar T: Why is it kept inside a glass jar? S: So that we can choose what we want to buy. Explain: Those substances or materials, through which things can be seen, are called transparent. Glass, water, air and some plastics are examples of transparent materials. Shopkeepers usually prefer to keep biscuits, sweets and other eatables in transparent containers of glass or plastic, so that buyers can easily see these items.	**Prediction:** Ask students to predict which objects will float and which will sink. Encourage them to discuss their reasoning based on their observations of the objects. **Experiment:** Fill the container with water. One by one, gently place each object into the water. Observe what happens to each object. Record the results in a table. Discuss the results and reinforce the concept of density Relate the results with practical concepts such as why boats float while submarines sink in the water. **In pairs try to solve this worksheet.** Worksheet Link Activity for 5 minutes: Divide the class in pairs and give each group a rough paper and some drops of oil. Instructions Take a sheet of paper and look through it towards a lighted bulb. Make a note of your observation. Now, put 2-3 drops of some oil and spread it on the sheet of paper. You can also take a food item that contains fat and rub it on the paper gently. Can someone tell why I am taking a food item with fats in it? Can someone give me an example of a food item with fats in it? *(Here we are checking if the students remember this concept from initial classes.)*	(b) Translucent (c) Opaque (d) All the above 5. You are provided with the following materials: (i) Magnifying glass (ii) Mirror (iii) Stainless steel plate (iv) Glass tumbler Which of the above materials will you identify as transparent? (a) (i) and (ii) (b) (i) and (iii) (c) (i) and (iv) (d) (iii) and (iv) 6. Boojho found a bag containing the following materials (a) Mirror (b) Paper stained with oil (c) Magnet (d) Glass spectacles 7. While doing an activity in class, the teacher asked Paheli to hand over a translucent material. Which among the following materials will Paheli pick and give her teacher? (a) Glass tumbler (b) Mirror (c) Muslin cloth (d) Aluminium foil 8. On a bright sunny day, Shikha was playing hide and seek with her brother. She hid herself behind a glass door. Do you think her brother will be able to locate her? If yes, why? If no, why not? **Homework:** Take a small cotton ball and place it in a tumbler/bowl filled with water. Observe it for at least 10 minutes. Will it float or sink in water and why? Discuss with your siblings

On the other hand, there are some materials through which you are not able to see. These materials are called opaque. You cannot tell what is kept in a closed wooden box, a cardboard
carton or a metal container. Wood, cardboard and metals, are examples of opaque materials.
Are there objects through which you can partially see?

The materials through which objects can be seen, but not clearly, are known as translucent.
We will get a better idea about translucent objects in our group activity.



CFU (Open ended/ Factual)

Factual:

What kind of objects float in water? Why?
What kind of objects sink in water? Why?
What are opaque objects? Give some examples.
What are translucent objects? Give some examples.

Open-Ended:

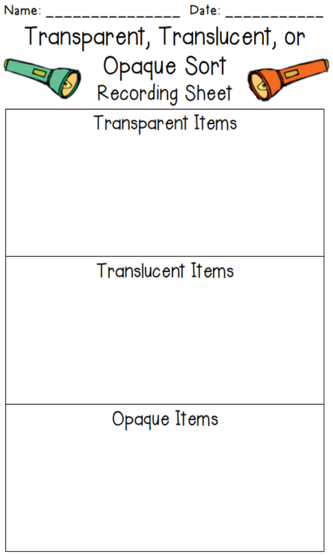
- A paper boat sinks in water after a few minutes. Why?

If a nail is made of wood instead of iron, will it float or sink? Why?
Why do you think summer shades are mostly black in color?
If water is transparent why can't we see what is inside the pond or lake with our naked eyes?

Look again towards the lighted bulb through that portion of the paper on which the oil has been spread.
Question - What is your observation?
When can you see more light from the bulb? Do you see the bulb clearly?

Worksheet Instructions:

1. Each student needs a "Transparent, Translucent, or Opaque" sorting chart and a set of picture cards. 2.The student will decide if the item pictured on the card is transparent, translucent, or opaque.
3.The student will place/glue that card in the chart.



Name: _______________ Date: ___________

Transparent, Translucent, or Opaque Sort
Recording Sheet

Transparent Items

Translucent Items

Opaque Items

or parents at home.
Observe the items at your home. Make a table in your notebook and classify the items at home as opaque, transparent or translucent. You can take help of a torch if you want to do this activity.

Concepts Covered:

1. Making a simple firki
2. Wind mill

Learning Objectives:

Students will be able to

- define air and identify its characteristics
- demonstrate that air occupies space

TLM Required:

1. Papers, pin, sticks

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

- NCERT Class 6 Textbook
- AHA Activities, Arvind Gupta toys website or YouTube channel

Igniting Activity:

- The teacher switches off the fan for a few minutes. Ask students how they feel and why?
- Air is all around us. It blows in our houses, open spaces, fields and everywhere, but we don't see it.
- The teacher asks students to hold their breath for a few seconds and asks them how they feel and why?

Experience and reflection:

Think of examples when you felt the presence of air though we cannot see it?

Learning Point:

- **Makes different types of firki**

<table>
<tr><th>I do (Direct Instructions)</th><th>We do (Guided Practice)</th><th>You do (Independent Practice)</th></tr>
<tr>
<td>"Let us look at some properties of air"
"Can we see air?"
Expected Student Response: No
"Can we feel air?"
Expected Student Response: Yes
"Give some examples from your life of how you have felt air?"
Expected Student Response: Balloon, tyres, football, clothes drying in the wind etc
(Teacher takes students' responses).
"Now let us do a simple experiment to understand more about air."
Teacher dips a handkerchief in water and leaves it under the fan for some time.
"What happens after a while? Why?"

Activity 1 :
The teacher follows the instructions given in the video to make a <i>firki</i>.
Make your own firki and observe how air helps it spin.
Video:
https://www.youtube.com/watch?v=HN0GxOQMzME</td>
<td>Before we start exploring the concept of air, work in pairs to fill in the table below?<table><tr><th>What do I <i>know</i> about air?</th><th>What do I <i>want</i> to know about air?</th></tr></table>Activity 2
Each group is provided with Worksheet 1.
"You are provided with 6 statements about air. You have to think about it, you can use any materials inside the classroom, discuss with your group and write if each statement is True or False. You have 8 minutes to complete this activity"</td>
<td>"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own."
Teacher writes down questions on the board and asks students to write their answers in the notebook.
1. Define atmosphere.
2. How do you know that air occupies space?
3. List a few properties of air.
4. How can we detect the presence of air in everyday life?

Closing</td>
</tr>
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The teacher asks a few questions and takes student responses. "What makes the *firki* spin?" "What factors affect the spinning of the *firki?"* "What happens when we move the *firki* slowly? What happens when we move it fast? Why do you notice a difference?" The teacher takes students' responses and explains how it works. The teacher takes any questions from the students before proceeding to the next part. Teacher introduces the concept of Atmosphere. "There is a layer of air surrounding the Earth. It extends to a few kilometres above the surface of the Earth and is called the atmosphere." **CFU (Open ended/ Factual)** Factual CFUs 1. What is atmosphere? 2. List a few properties of air. Open ended CFUs What do you think would happen if there was no air around us? How might it affect the things we see, hear, or even breathe	Students work in the groups to read the statements, explore answers and write True/False. Teacher goes around the class and guides the discussion in the groups. Teacher brings the class together and has a whole-group discussion of the statements. The teacher lets students work creatively, they can draw or write about their scenario. After the students have completed, she brings the class together and allows time for each group to present their work.	Teacher recalls the concepts taught: "What concept did we explore today?" "What are some properties of air?" "How do we know that air is present in a given space?" "What is atmosphere?" "Are there any other questions that you are curious to know more about?" Students are given time to write their questions on the "Question corner" chart in the classroom. **Teacher assigns Homework:** How would you explain to a younger child that air is all around us even though we can't see it? Think of simple ways to show them that air occupies space? Draw and explain your answer.

Summary:

- Air is present everywhere around us, though we cannot see it.
- Moving air is called wind.
- Air occupies space and exerts pressure.
- The envelope of air that surrounds the Earth is known as the atmosphere.
- Atmosphere is essential for life on Earth.

CFU (Open ended/ Factual)

Factual CFUs:

1. Give some examples where you can see air occupying space.
2. What is a simple experiment that you can do to show that air occupies space?

Open ended CFUs:

1. If you fill a balloon with air and then let it go, why do you think the balloon flies around the room? How does this show that air occupies space?

Home work:

How would you explain to a younger child that air is all around us even though we can't see it? Think of simple ways to show them that air occupies space? Draw and explain your answer.

Period: 11.2

1. Topic 11.1 Is air present everywhere around us ?

Concepts Covered:

- Nothing is empty (at least it filled with air)
- Atmosphere

Learning Objectives:

Students will be able to

- *understand that air is mixture of gases*
- *demonstrate* that air occupies space

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Substances exist as solids, liquids and gases.
- Students understand the concept of mixtures.
- Students are aware of the concepts of photosynthesis and respiration (covered in the previous chapters).

TLM Required:

- Bottle, tub, water

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

- NCERT Class 6 Textbook
- AHA Activities, Arvind Gupta toys website or YouTube channel
- Bal Vaigyanik Class 7, Eklavya
- The Wonderland of Air book
- Ladybird Junior Science Air -Book
- Easy to make Science experiments air
- Know all about wind Book

Igniting Activity:

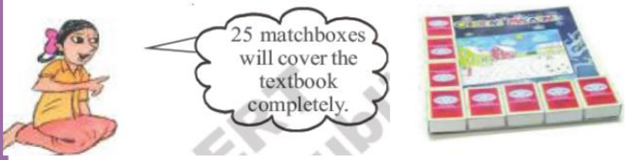
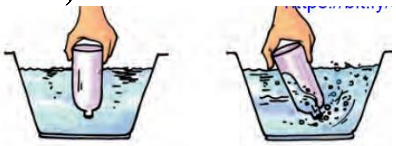
- The teacher switches off the fan for a few minutes. Ask students how they feel and why?
- Air is all around us. It blows in our houses, open spaces, fields and everywhere, but we don't see it.
- The teacher asks students to hold their breath for a few seconds and asks them how they feel and why?

Experience and reflection:

- Think of examples when you felt the presence of air though we cannot see it?

Learning Point:

- **Conducts experiment to prove air is present everywhere around us**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Teacher recalls the concepts taught in the previous class. "We learnt about air and some of its properties." "Now let us explore more in detail about air." **Activity 3:** The teacher demonstrates the following activity for students to understand what it means by an object 'filling up space'. "How many match boxes can cover your Science textbook?" Materials: Matchboxes The teacher narrates the following story to the children. Lavanya is playing a game. She is putting matchboxes on a Science textbook in such a way that there is no gap between adjacent matchboxes and the matchboxes also do not overlap each other.  The teacher asks students to estimate how many boxes are needed to cover their textbooks completely. The teacher gives a few minutes time for the students to try the activity and see. **Activity 4** Before the activity, the teacher can have a discussion with the class about what they think about air. Do you think air also occupies space like the matchboxes in the previous activity? "Here, I have an empty bottle. What is inside the bottle?" (Students might say, "Nothing' or "Air") "Let us find out. I am going to dip the bottle upside down into this bucket filled with water. What do you think will happen?" (Students will write their predictions in their notebooks. Teacher takes a few responses from the students.)  (Teacher performs the experiment.) "What did you notice?"	The teacher divides students into groups and explains the below activity. **Activity 5** Each group gets two empty plastic bottles and a balloon. Place the balloon inside the bottle and loop the mouth of the balloon over the mouth of the bottle.(as shown in the picture) Now try to blow the balloon up inside the bottle. Are you able to blow it? In the second bottle, put a small hole on the side. Repeat steps 1 and 2 with the second bottle. Are you able to do it? Here's an extra trick: as soon as you are finished blowing, put your finger over the hole. Take the bottle from your mouth, keeping your finger on the hole but don't cover the end of the balloon. The balloon stays blown up! Isn't it amazing?  The teacher encourages students to write the answers to these questions: Why were they not able to blow the balloon in the first bottle? What happened with the second balloon? Why were they able to blow it? Why did the air not escape from the balloon even after we finished blowing in the second case? The teacher then gives the following explanation: Even though we can't see it, there is air in the empty bottle and it takes up space. When we try to blow the balloon, we are trying to add extra air to it. But there is no more space for it. In the second case, when we put a hole in the bottle, we are letting the air that is inside the bottle already to escape out. So now there is extra space. So we are able to fill the balloon. Now in the trick, in the last step, what we are doing is: We are putting a finger over the hole	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. Draw and explain an experiment to demonstrate that air occupies space. 2. Explain why a balloon expands when you blow air into it. What happens to the space inside the balloon when the air is added? 3. Imagine a balloon filled with air. What happens when you squeeze the balloon? What does this tell you about air? (ESR: When you squeeze a balloon, you're pushing the air inside into a smaller space. The air inside the balloon resists being squeezed, which is why it feels hard to squeeze. This tells us that air occupies space.)

(Expected Student Response: Water did not enter the bottle.)
"Now let's tilt the bottle slightly. What do you notice?"
(Expected student response: "We see bubbles coming out of the bottle.")
"Where did the air bubble come from or what do they indicate?"
(Students to respond and the teacher takes couple of responses)

"Yes, the bubbles indicate that air was present in the bottle. When we pushed the bottle upside down, the air could not escape out and hence water didn't get in. When we tilted the bottle, air came out in the form of air bubbles and water filled into the bottle."

"Through this experiment, we know that air occupies space."

"We have also seen that in balloons and footballs air is filled in and it occupies space."

If the teacher feels that the above activity is not safe to try in the classroom, the activity below can be demonstrated instead.

This activity requires the following materials: two sink plungers

<u>Procedure:</u>

Put the plungers together as shown in the image.

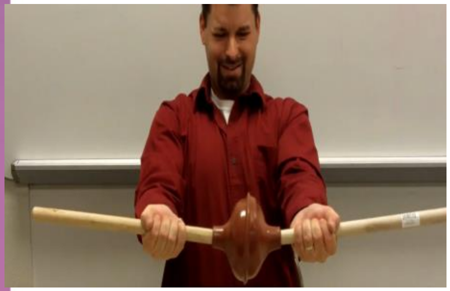
Push the plungers together so that you remove any air between them.

Invite two students to come and hold the plungers by their outside ends and try to pull them apart. Instruct the students not to twist or peel them, just pull.

Are they able to pull them apart?

This can be like an interesting 'Tug of War' game in the class.

The teacher asks students to discuss why this happened.



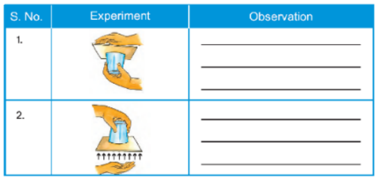
The teacher explains that when air is inside the plungers, it exerts the same amount of force as the air on the outside. When you remove the air inside the plungers, however, the air on the outside presses and covering it. So, we are stopping outside air from entering the bottle. So the outside air is not able to push the air out of the balloon – the balloon stays blown up.

The teacher divides students into groups and gives them instructions for the following activity.

Each group is given a glass tumbler, a square piece of cardboard and water.

Activity 7:

It is best if this activity can be performed outdoors, since there might be spillage of water and the activity needs to be repeated multiple times.



S. No.	Experiment	Observation
1.		
2.		

1. Take a glass tumbler and fill it with water up to the brim.
2. Hold it with your left hand. With your right hand, close the mouth of the tumbler with a square piece of cardboard and press it down.
3. Holding the cardboard firmly with your right hand, invert the tumbler.
4. Now carefully remove your right hand.

After completing the activity, the teacher asks students to note the following in their notebooks.

The teacher gives the following discussion questions for the students and asks them to discuss in their groups:

Why did the cardboard not fall when the glass was inverted?

How long does the cardboard stay like that?

What do you feel, when you try to pull the cardboard?

After the students complete it, the teacher brings the class together and discusses the answers.

The teacher explains that the cardboard does not fall even when the hand is removed, because air exerts pressure on it.

The teacher then asks students to try the following variation of the experiment.

Repeat the experiment but this time change the amount of water in the cup. Does it make any difference?

The teacher then asks students to discuss the following questions in their groups:

4. Think of an empty plastic bottle. If you squeeze the bottle and then release it, what happens? How does this show that air occupies space inside the bottle?

(ESR: When the empty bottle is squeezed, the air inside the bottle is forced to take up less space. This makes the air molecules come closer together and the bottle feels firm. When the bottle is released, the bottle comes back to its original shape. The fact that the bottle returns to its original shape when released demonstrates that the air inside the bottle was occupying space. When we squeezed the bottle, the air inside was compressed, showing that air takes up room. Upon releasing the pressure, the air pushes back, expanding the bottle as it fills the space again.)

"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own."

Teacher writes down questions on the board and asks students to write their answers in the notebook.

the two halves of the plungers together. If you peel the plungers apart slightly and let air back inside, the two sides will no longer stick together as the force on the inside and the outside will once again be the same. The teacher then explains the concept of air pressure and how air pressure decreases as we go higher up. This leads to lower levels of oxygen at higher altitudes. So, mountaineers carry oxygen cylinders with them.	1. What about if you switch the container? Will a wider cup hold the card better than a narrower cup? (ESR: If we use a wider cup it will not hold the card better because the volume of water is greater,, the weight of the water is also greater. This means there's more force pulling the water downward, which could make the experiment less stable in a very wide glass. In a narrower glass, there is less surface area and less volume of water. This means that less weight is pulling down, so the air pressure from the surrounding environment may be more effective at holding the water in place.) 2. What if you poke a small hole in the bottom of the cup? (ESR: The activity will no longer work if a hole is poked in the bottom of the cup. The air pressure from the outside will force the water to fall out, and the water will no longer stay inside the cup. Hence the cardboard will not stay in place.) After the students complete the discussion, the teacher brings the class together and discusses the answers. The teacher can also take this time to clear any questions children have.	1. How can you prove that air exerts pressure? 2. Why is it harder to breathe when you're at the top of a mountain compared to when you're at sea level? a. When a cooldrink is opened after being shaken, you hear a "pop" and sometimes see bubbles. Do you think air pressure has a role in this process? b. Do you think air pressure is different in space or on the moon? Why?

Summary:

- Air occupies space and exerts pressure.
- The envelope of air that surrounds the Earth is known as the atmosphere.
- Atmosphere is essential for life on Earth.

CFU (Open ended/ Factual)

Factual CFUs

1. What is atmosphere?
2. List a few properties of air.
3. What is air pressure?
4. How can you prove that air exerts pressure?

Open ended CFUs

1. What do you think would happen if there was no air around us? How might it affect the things we see, hear, or even breathe?
2. Have you ever experienced the feeling of your ears popping when you go up or down a mountain? Why do you think this happens? How might air pressure be involved?
3. Have you ever noticed how a cool drink bottle is hard to open after it's been shaken? How do you think air pressure plays a role in that?

Home work:

- How will you show that air occupies space?
- Draw and explain a simple experiment to prove that air exerts pressure.
- Define atmosphere.

- Explain why a balloon expands when you blow air into it.

Period: 11.3

1. Topic: 11.2 What is air made up of ? Activity 3

Concepts Covered:

1. Components of air
2. Dust and smoke

Learning Objectives:

Students will be able to

- *analyse* the components in air
- *illustrate* and *describe* the composition of air

Prior Concept/ Skills:

Breathing, fire, smoke

TLM Required:

- Glass of lemon juice for Activity 8
- 2 glasses of water, ice and ink for Activity 9
- 2 glasses of water, ice, ink, newspaper and rubber band for Activity 10
- 2 candles, 1 glass tumbler for Activity 11

Teacher Resources:

- NCERT Class 6 Textbook
- AHA Activities, Arvind Gupta toys website or YouTube channel
- Bal Vaigyanik Class 7, Eklavya
- The Wonderland of Air book
- Ladybird Junior Science Air -Book
- Easy to make Science experiments air
- Know all about wind Book

Igniting Activity:

"Let's start the class with a small activity."

(The teacher must use this activity to recall what is a mixture.)

Activity 8

The teacher pours some lemon juice into a glass tumbler and asks students to guess what it is.

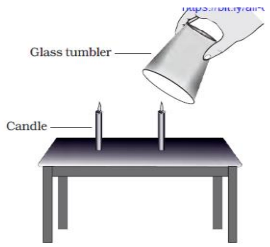
Teacher takes student responses and then reveals it is lemon juice.

"What is lemon juice made of?"

Learning Point:

- **Identify the components of air and their importance**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Teacher recalls the concepts taught in the previous class. "We learned about some properties of air like air occupies space and that it exerts pressure." "Today we will learn what air is made up of." **Activity 9:** The teacher demonstrates the following activity.	"We learnt about the presence of water vapour in the air. Let us learn about another component of air."	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own."

"We saw the example of lemon juice. Now let us observe two glasses of water for a minute. One glass has water at room temperature and the other glass has cold water. I am going to add some ink to both the glasses, so that the water has a colour and it is easy to observe. Observe what happens at the surface of the glass." (Video reference: why water droplets form on a cold surface) "What do you notice?" Students may respond that there is water on the surface of the glass with cold water. Where do you think the water came from? Students might say that the water came from inside the glass or that the water evaporated and condensed on the glass. The teacher can show that the condensed water is colourless and hence not from inside the glass. "The water came from the air. Air contains water vapour, which condenses when it comes in contact with a cold surface." **Activity 10:** The above activity can be further extended as described below to clarify that water droplets do not come from inside the glass. (Video reference: Do water droplets come from inside the glass?) "Now let us take the two empty glasses as above and cover one of them from the outside with a newspaper and secure it with rubber bands. Now I am going to pour cold water into both the glasses. We will observe for a few minutes. What do you think will happen?" Teacher takes students' responses. "What do you notice?" Students may respond that there is water on the surface of the glasses. "Do you think the newspaper will be wet?" After taking student responses, the teacher can show that the newspaper is not wet. Then the teacher can discuss why this is so. The teacher explains that in the first glass, the water vapour in air came in contact with the cold surface of the glass and condensed. In the second glass that was covered with newspaper, we see that the newspaper is not cold enough. Even when water vapour hits it, it doesn't get condensed, so the newspaper is not wet. This activity also clearly shows that the water is not coming from inside the glass. Teacher recalls the concepts taught in the previous class. "In the previous class, we learnt that water vapour, oxygen and nitrogen are present in the air."	Below activity can be demonstrated by the teacher or carried out by students in groups, but under strict supervision since it involves working with candles. **Activity 11:** (Activity 3 in the textbook) Materials required: 2 candles, 1 glass tumbler Steps: 1. Fix two small candles of the same size on the table. (as shown in the picture). 2. Light the candles and then cover one of them with the inverted glass (as shown in the figure). 3. Observe carefully what happens to the burning candles.  The teacher can encourage students to "think-pair share" (Students think of the answer on their own, then they share it with their partner) with the questions as given below: - Do the candles continue to burn or go off? - What happened to the candle that was covered with the glass? - What can be the reason for this? After this the teacher brings the whole class together and explains the following: Burning can occur only in the presence of oxygen. We see that one component of air is oxygen. Now, the amount of air and hence its oxygen component inside each glass in our experiment, is limited. When most of this oxygen is used up by the burning candle, it can no longer burn and	Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. What is a mixture? 2. Is air composed of one substance or many substances? 3. How do you prove the presence of water vapour in air? 4. In which season do you think there would be more water vapour in the air, in the rainy season or summer season? 5. How can you prove the presence of oxygen in air? 6. Which gas is present in the highest amount in air?

"Let's look at what other components are present in air." **Activity 12:** Materials required: Lime water- diluted solution of calcium hydroxide, test-tube The teacher demonstrates the following experiment. Procedure: 1. Place a little amount of clear lime-water in the test-tube. 2. Fill your mouth with air and blow into the lime water using a straw. 3. Observe what happens to the lime water. The teacher can ask students what they observe and why they think this happens. The teacher can explain that the lime water turns milky because of the reaction of carbon dioxide with the lime water. 4. Fill another test tube with lime water and leave it undisturbed for a few days. Note your observations. It will be observed that white deposits of limestone form around the edge of the test tube at the surface of the lime-water. (This is the result of carbon dioxide in the air combining with the lime-water.)	blows out. The teacher then explains about the presence of nitrogen. The major part of air (which does not support burning candles) is nitrogen. It takes up nearly four-fifth of the space that air fills. Nitrogen is used as natural manure."	

Summary:

Composition of Air

- Air is a mixture of gases.
- Nitrogen is the gas that is present in the most amount in air. It makes up four-fifths of air.
- Air also contains oxygen, water vapour, carbon dioxide, dust and smoke and inert gases.
- Air pollution is the presence of substances in the atmosphere that are harmful to humans and other living beings, or cause damage to the environment.

CFU (Open ended/ Factual)

Factual CFUs:

1. What is water vapour?
2. How can you prove that air contains water vapour?

Open-ended CFUs

3. Think of a time when you've noticed water vapor in the air. What did it look like, and where did you see it?
4. How do you think the amount of water vapour in the air changes in different regions like say deserts and forests?

Home work:

- After taking a warm water bath, look at a mirror in the bathroom. Observe what happens to the mirror. Why do you think the mirror becomes foggy?
- Go outside in the morning on a cool day (when it's not too cold) and observe any dew on the grass. You can also walk barefoot on the grass and feel the wetness.Why do you think water forms there in the morning? How does this prove about air?

Period: 11.4

1. Topic : Activity 4

Concepts Covered:

1. Observing dust
2. Air pollution

Learning Objectives:

Students will be able to

- *find the dust in air*
- *understand the air pollution*

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Dust, smoke,

TLM Required:

- ❖ Lime water- diluted solution of calcium hydroxide, test-tube for Activity 12
- ❖ Stones or seeds of different colours for Activity 14

Teacher Resources:

- NCERT Class 6 Textbook
- AHA Activities, Arvind Gupta toys website or YouTube channel
- Bal Vaigyanik Class 7, Eklavya
- The Wonderland of Air book
- Ladybird Junior Science Air -Book
- Easy to make Science experiments air
- Know all about wind Book

Igniting Activity:

“Let’s start the class with a small activity.”

(The teacher must use this activity to recall what is a mixture.)

- Do you want to see the natural spot light

Activity 8

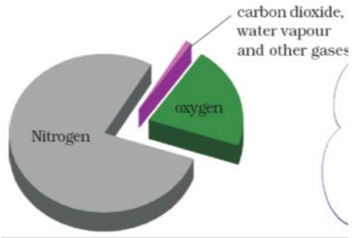
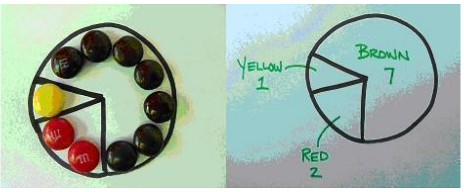
The teacher pours some lemon juice into a glass tumbler and asks students to guess what it is.

Teacher takes student responses and then reveals it is lemon juice.

“What is lemon juice made of?”

Learning Point:

- **Explain the role of oxygen in the atmosphere**

I do (Direct Instructions)	**We do (Guided Practice)**	**You do (Independent Practice)**
Through this activity, the teacher gets students to infer that dust and smoke are present in the air.  Steps: 1. Find a sunny room in the school. Close all the doors and windows with curtains pulled down to make the room dark. 2. Now, open the door or a window facing the sun, just a little, in such a way that it allows sunlight to enter the room only through a slit. 3. Look carefully at the incoming beam of sunlight. “Do you see some tiny shining particles moving in the beam of sun light? What are these particles?” The teacher takes a few student responses and then explains that air also contains dust particles. The presence of dust particles in air varies from time to time, and from place to place. “You must have heard elders tell you not to breathe through your mouth. Do you know why?” The teacher takes a few student responses and explains that we inhale air when we breathe through our nostrils. Fine hair and mucus are present inside the	The teacher explains that air contains some gases, water vapour and dust particles. The gases in air are mainly nitrogen, oxygen, small amount of carbon dioxide, and many other gases. However, there may be some variations in the composition of air from place to place. We see that air contains mostly nitrogen and oxygen. In fact, these two gases together make up 99% of the air. The remaining 1% is constituted by carbon dioxide and a few other gases, water vapour and dust particles. The teacher illustrates the following diagram on the board. (Image reference: Textbook page number 92,93)  Then the teacher divides students into groups and gives them instructions for the below activity. **Activity 14:** “We learnt that air is composed of different gases. Now let us try to visually represent them. For this activity, you will work in groups of 2-3.” (In this example, stones of 3 different colours are used, but the teacher can choose to use any other materials that are locally available. It could be as simple as leaves, stones and flowers etc.”) “In your groups, place 10 black stones along the ends of a circle. Now take a chalk and trace the circle. This circle represents air.”  “Next can you replace one black stone with a yellow one?” “Now can you replace two black stones with red ones?” “List the fractions of each coloured ball? (Black – 7/10, red – 2/10, yellow – 1/10)” “Guess what each colour ball represents in this picture?” Teacher takes student responses. “The black balls show the amount of Nitrogen in the air. This is the gas that is majorly present. The red balls indicate oxygen. The yellow ball indicates Carbon dioxide, water, vapour, dust and smoke.” The teacher gives time for the students to complete the activity in their groups.	“Thank you for engaging in the group activity so well. I saw some interesting responses. Now it’s time for you to work on your own.” Teacher writes down questions on the board and asks students to write their answers in the notebook. Draw and explain the composition of air. How can you prove that there are dust particles in the air? How does carbon dioxide in the air affect plant life? Do you think human activities change the composition of air? Why or why not? Thank you for engaging in the group activity so well. I saw some interesting responses. Now it’s time for you to work on your own.” Teacher writes down questions on the board and asks students to write their answers in the notebook. What is air pollution? What are some causes of air pollution? How can living in an area with polluted air affect us?

nose to prevent dust particles from getting into the respiratory system. When you breathe through your mouth, harmful dust particles may enter your body. The teacher then explains that air is also made up of some gases which do not participate much in chemical reactions. These gases are called inert gases. Inert gases (neon, argon, crypton, xenon) are filled in bulbs which give bright coloured lights.	Then the teacher asks students to individually repeat it in their notebooks/ a sheet of paper – draw a circle, colour and label the various components of air. This is an activity to make the students aware that our everyday activities contribute to pollution. The teacher divides students into groups and instructs them about the activity. **Activity 15:** Materials required for each group: Clean cup of water, colours- blue, green, red, yellow Procedure: 1. The teacher tells students that the cup of clean water in front of them represents unpolluted air. You'll add drops of colours (food colouring or different colours of paints can be used) to the cup to represent the different types of air pollutants caused by the everyday activities that I'll describe to you. We'll use the following colours to represent these pollutants: Colour Key Blue—pollutants from consumer products and paints Green—pollutants from lawn, garden, and construction machinery Red—pollutants from cars and trucks Yellow—pollutants from power plants and industrial processes As the teacher describes the activity, the students have to add colour to their cups accordingly. (a) You took bath in hot water and got ready for school. Add one drop of blue and one drop of yellow colour to your cup if this activity applies to you. You can add one drop for each student in the group. Blue—pollutants emitted by soap, shampoo, etc. Yellow—pollutants emitted by combustion used to heat the water. Remember, electric water heaters often depend on combustion too, because a lot of power plants burn fossil fuels to generate electricity. b) Coming to school, you took the bus or rode in a car. Add one drop of red colour to your cup if this activity applies to you. Add one drop for each student in the group. Red— pollutants emitted by the engine in your school bus or car. c) At lunchtime, you bought lunch in the canteen or you got some snack packet along with your lunch. Add one drop of yellow colour to your cup if this activity applies to you. Add one drop for each student in the group. Yellow—pollutants emitted by cooking lunch, Styrofoam trays, and plastic utensils. d) Going home, you took the bus or rode in a car. Add one drop of red colour to your cup if this activity applies to you. Add one drop for each student in the group.	What is the effect of air pollution on other living beings? What are some steps you can take to reduce air pollution at school and at home? "Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher writes down questions on the board and asks students to write their answers in the notebook. Why is oxygen in soil important for soil organisms? What are some factors that affect oxygen content in soil? Soil that is tightly packed has _______ oxygen compared to soil that is loose and aerated. Draw a diagram of healthy soil with air pockets

	Red—pollutants emitted by the engine in your school bus or car. These are example statements; the teacher can give more such statements based on the students' context. After the activity the teacher asks students to discuss the following questions in their groups: ● Look inside your cups. If the air pollution around you were this apparent, would you want to breathe the air? ● What other sources of air pollution, beyond those mentioned in this demonstration, could you think of as being produced in a single day? ● What could you do to reduce the number of pollutants released each day? ● If you have a container large enough, ask your students to pour their water into it, and then ask them to comment on the combined effect of each individual's pollution. After students complete the activity, the teacher brings the class together and has a discussion. She can also take this time to address any concerns that students have.	

Summary:

Composition of Air

- Air is a mixture of gases.
- Nitrogen is the gas that is present in the most amount in air. It makes up four-fifths of air.
- Air also contains oxygen, water vapour, carbon dioxide, dust and smoke and inert gases.
- Air pollution is the presence of substances in the atmosphere that are harmful to humans and other living beings, or cause damage to the environment.

CFU (Open ended/ Factual)

Factual CFUs:

1. How do you prove the presence of carbon dioxide in air?
2. How can you prove the presence of dust particles in air?

Open ended CFUs:

1. Under what conditions do you think the amount of dust particles in the air increases?
2. How is the carbon dioxide in the air important for plants and animals?

Home work:

- Why do you think astronauts carry oxygen tanks when they go into space?
- How do you think the composition of air changes between a village and a city?

Period: 11.5

1. Topic: 11.3 How does oxygen become available > Activity 5, 6

Concepts Covered:

1. Oxygen present in water
2. Oxygen present in soil

Learning Objectives:

Students will be able to

- *conduct activity to find the oxygen present in water and soil*
- *justify* the need of air to sustain life on Earth
- *observe* and *describe* how oxygen is taken up by aquatic and soil organisms
- *create* a model of a windmill.

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Components of Water and air

TLM Required:

- Image reference
- Beaker and a glass for Activity 17
- 0.3-0.5 L glass bottles, soil, water, sugar, balloons for Activity 18

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

- NCERT Class 6 Textbook
- AHA Activities, Arvind Gupta toys website or YouTube channel
- Bal Vaigyanik Class 7, Eklavya
- The Wonderland of Air book
- Ladybird Junior Science Air -Book

Igniting Activity:

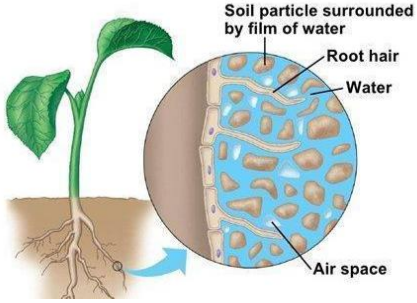
- Can you breathe under water?
- Who can breathe under water and how?

Learning Point:

- **Understand that air is essential for all living things**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Teacher recalls the concepts taught in the previous class. “We learned about air and the composition of air in the last few classes. Now we will learn about how air is used and replenished by living beings.” **Activity 16:** “We saw that there is water vapor in the air, do you think there is any component of air in water?” “Let us do a simple experiment to check this. We are going to heat some water in a vessel and observe what is happening. We are also going to check the temperature of the water using a thermometer.” ***Note to the teacher:*** When students observe the bubbles in the heating water, they can be confused if it is because of water evaporating or because of dissolved air in water. To clear this confusion, it is important to measure the temperature of water as it heats up. The boiling point of water is 100 degrees C. If we notice bubbles at a lower temperature, say 50-60 degrees, that could indicate bubbles from the dissolved air. But as the water heats up and reaches closer to 100 degrees, the bubbles indicate water changing to steam and evaporating. The teacher places a vessel of water on a tripod stand and heats it slowly. After 3 minutes, she measures the temperature of the water. The temperature might be close to 50 degrees. “What do you notice?” Teacher takes student responses. “The bubbles in the water come from the oxygen dissolved in water. When we heat the water, the oxygen dissolved in water escapes.” “What will happen if we continue heating	The teacher can go into more detail about Dissolved Oxygen by showing the below video: How Oxygen gets into water video After showing the video, the teacher can pair up the students and ask them to discuss the following questions: Why do we not see the dissolved oxygen in water? (Ans: Similar to how we cannot see salt or sugar dissolved in water.) How does oxygen get into the water? (Ans: Through the atmosphere and photosynthesis) What are some of the factors on which the Dissolved Oxygen in water depends on? (Water saltiness, water temperature and amount of DO in water compared to that in the surrounding air) How does DO content change with saltiness? (Ans: When the water is very salty, the salt molecules take up more space, so there is less DO) How does water temperature affect DO? (Ans: When water temperature is higher, the oxygen molecules escape into the air, which means warm water contains less DO than cold water.) How does the amount of DO in water compared to the surrounding air affect DO levels? (Ans: When there is more DO in the water compared to the surrounding air, the oxygen molecules try to escape from the water into the surrounding air and vice-versa.) Why are DO levels important? (Ans: The DO levels are important indicators of how healthy an aquatic ecosystem is. Also, different kinds of fish thrive in different DO levels.) After giving students time to discuss, the teacher brings the class together and discusses the questions and also clears any doubts that students might have. Teacher divides students into groups and	“Thank you for engaging in the group activity so well. I saw some interesting responses. Now it’s time for you to work on your own.” Teacher writes down questions on the board and asks students to write their answers in the notebook. 1. What is dissolved oxygen? 2. How can you prove the presence of dissolved oxygen in water? 3. Why are dissolved oxygen levels important? 4. How do fish obtain oxygen from water? 5. How do you think water pollution might affect the amount of dissolved oxygen in a lake or river?

the water?” Teacher takes student responses. “The water itself will change to steam and evaporate.” The teacher explains what is meant by Dissolved Oxygen (DO). Dissolved oxygen is oxygen that is mixed into water, which aquatic organisms like fish and aquatic plants need for respiration. The teacher shows the following video about how fish breathe under water. How do fish breathe video After showing the video the teacher discusses the following questions: - Why do we need oxygen? - Which organs in our body help us take in oxygen? - Have you ever tried breathing underwater like during swimming? Why did you find it difficult? - What are some adaptations that fish have which help them breathe underwater? Teacher recalls the concepts taught in the previous class. “In the last class, we learnt about dissolved oxygen in water. We learnt that organisms like fishes and other aquatic organisms use the oxygen dissolved in water to breathe. Have you ever wondered how soil organisms like earthworms breathe?” The teacher takes a few student responses. The teacher then explains that just like we breathe oxygen in the air, soil organisms also need oxygen to survive, and oxygen is present in the soil! “Today we will learn about how oxygen is present in the soil and how it helps organisms like earthworms, microbes, and insects breathe.” The teacher explains that the soil has tiny air pockets and shows or draws the above image on the board. (Image reference)	provides instructions for the activity. **Activity 17** (Activity 6 in the textbook) Each group is provided with a beaker and a glass. Students are instructed to go and collect some soil from the school garden and put it in the beaker. After returning to the class, they must add a little water to the soil in the beaker and observe what happens. The teacher must ask students to discuss in their groups what they observe and why do they think this happens.  After the students complete the activity, the teacher brings the class together and discusses that they must have observed bubbles come out of the soil when they poured water. This is because there is air in the air pockets of the soil. When water is poured, the air in these pockets is replaced by water and air escapes as bubbles. This also explains why soil organisms tend to come out of the soil during the rainy season. The air pockets in the soil get filled by water during the rainy season and hence the organisms find it difficult to breathe under the soil. So, they come out of the soil. The teacher then discusses with students what do they think is an ideal soil ecosystem. What are some factors that can affect the amount of air in the soil? After allowing students some time to discuss, the teacher takes a few student responses. Then she explains the importance of soil aeration, and how it is done in the beginning of a cultivation process. The teacher also explains that the amount of oxygen in the soil decreases with depth and there is more oxygen in the soil during the dry season than during the rainy season.	

 The teacher explains that □Oxygen exists in the spaces between soil particles (air pockets in the soil). Plants release oxygen into the soil through their roots during respiration. Soil organisms like earthworms, bacteria, fungi, and other creatures rely on this oxygen to survive, much like we rely on air for breathing. “How do you think oxygen gets into the soil?” The teacher takes a few student responses and then explains that oxygen gets into the soil through processes like rain, plant roots, and natural air circulation. “We will be doing experiments to observe the presence of air in the soil.” **CFU (Open ended/ Factual)** Factual CFUs: 1. Give some examples of soil organisms. 2. How do soil organisms breathe? Open ended CFUs: 1. What do you think could be the reason why soil organisms come out during the rainy season?	**Activity 18** (This is an optional activity as it requires observation over many days.) This is an activity to observe respiration of soil organisms, mostly soil microbes. Materials required are 0.3-0.5 L glass bottles, soil, water, sugar, balloons. This simple activity can be used to demonstrate the relative amount of microorganism activity in the soil. Water and a food source are added to the soil, and a balloon is placed on the bottle to collect the carbon dioxide released as the organisms decompose the food source.  Fill each bottle with the same amount of soil, a little more than ¾ full. Add soil a bit at a time and gently tap the bottle on the table or a hard service between each addition. Apply treatments, then place the balloon over the mouth of the bottle. The following treatments can be set up: Bottle 1: soil Bottle 2: soil + water Bottle 3 : soil +water +sugar Make observations every 2 to 3 days for the first two weeks, then weekly thereafter. Some balloons may fill within a few days, others may take weeks or not fill at all. The size of the balloon indicates the amount of biological activity – respiration. (Image and activity reference: Does soil breathe activity) After the activities, the teacher brings the class together and clears any doubts they have.	

Summary:

Composition of Air

Air and living beings

- Air is present as dissolved oxygen in water that is used by aquatic organisms to breathe.
- Air is also present in the air pockets in the soil. This helps soil organisms breathe.

The balance of oxygen and carbon dioxide in air is maintained by respiration of plants and animals and photosynthesis of plants

CFU (Open ended/ Factual)

Factual CFUs:

1. How do we know that there is dissolved air (Oxygen) in water?
2. What is the importance of dissolved oxygen in water?

Open ended CFUs:

1. How do you think fishes and other underwater creatures get oxygen?

Home work:

- If you were designing a fish tank, what would you do to ensure the oxygen levels in the water are healthy for the fish?

Period: 11.6

Topic: 11.4 How is the oxygen in the atmosphere replaced ?

Concepts Covered:

1. Uses of air

Learning Objectives:

Students will be able to

- understand the importance of air *and oxygen.*

Prior Concept/ Skills: *(Essential concepts and skills to be checked/bridged before teaching the current concept.)*

- Components air, photosynthesis.

TLM Required:

- A small fan, a simple motor, LED light, connecting wires, Fevicol, a 3 inch PVC pipe, Foam board for Activity 19
- Make a simple model of windmill video

Teacher Resources:

(Any external links that would help teachers to create activities on their own. This includes NCERT Material, OERs, Digital links etc.)

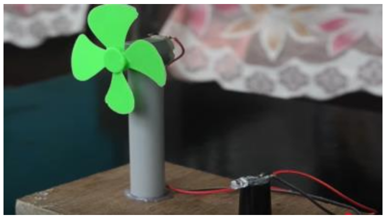
- NCERT Class 6 Textbook
- AHA Activities, Arvind Gupta toys website or YouTube channel
- Bal Vaigyanik Class 7, Eklavya
- The Wonderland of Air book
- Ladybird Junior Science Air -Book

Igniting Activity:

- Can you breathe under water?
- Who can breathe under water and how?

Learning Point:

- **Construct the windmill model using materials from surrounding.**

I do (Direct Instructions)	We do (Guided Practice)	You do (Independent Practice)
Teacher recalls the concepts taught in the previous class. "In the previous class, we learnt about how soil organisms breathe. We also learnt about how underwater creatures breathe. Have you ever wondered why all the oxygen in the atmosphere doesn't get used up since there are so many organisms breathing in oxygen and breathing out carbon dioxide?" The teacher takes a few student responses and then recalls photosynthesis. The teacher then explains that plants make food and oxygen during photosynthesis. Plants also respire where they take in oxygen, but they produce more oxygen than they consume. The balance of oxygen and carbon dioxide is maintained through the respiration in plants and animals and photosynthesis in plants." The teacher then gives students time to think and share with a partner about the uses of air. After taking a few student responses, the teacher lists the following uses of air: ● Breathing - Air contains oxygen, which is needed by living organisms to survive. ● Transportation: Air helps in the movement of vehicles like airplanes, ships, gliders, parachutes, sailing yachts etc. It also helps birds, bats and insects to fly. ● Weather: Air (wind) plays a major role in determining weather patterns, like windstorms and breezes. ● Sound: Air is essential for the transmission of sound. ● Pollination: Air carries pollen from one plant to another, helping plants reproduce. ● Role in water cycle: Air also plays an important role in the water cycle. ● Generation of electricity: Moving air or wind is used for the generation of electricity using windmills Then the teacher gives time to students to think of any other uses of air and discusses the same.	The teacher divides students into groups. **Activity 19** Each group is provided with a small fan, a simple motor, LED light, connecting wires, Fevicol, a 3 inch PVC pipe, Foam board. The teacher shows the video of making the windmill. Video link: [Make a simple model of windmill video]() ● Take a 3 inch plastic pipe (PVC pipe) and make two holes on two ends. ● Then we insert two connecting wires from one hole and pull them out of the other hole. ● The two wires can be fixed in place using tape or Fevicol. ● Take the wooden or foam board, place the pipe on it and draw the outline. ● Use Fevicol to stick the pipe to the board. ● Take the DC motor and connect it to the fan. ● Now apply some Fevicol on top of the pipe and fix the motor on top of it. ● Connect the two wires to the two terminals of the motor. ● Connect the other two ends of the wires to the two terminals of an LED light. ● (Optional) Fix the bulb on top of a stand. ● Now the model is ready. When the wind blows, the fan will spin and it will cause the light to glow, as current is generated by the motor. 	"Thank you for engaging in the group activity so well. I saw some interesting responses. Now it's time for you to work on your own." Teacher asks students to answer the questions given below: 1. How does air help living organisms survive? 2. Explain how wind is used in transportation. 3. How do you think life on Earth would be different if there were no air? 4. How is oxygen in the air replenished? 5. How can we make sure that we are using air in a sustainable way? After the students finish, the teacher takes time to discuss the answers and clarify any questions that the children might have.

Summary:

Composition of Air

Air and living beings

- Air is present as dissolved oxygen in water that is used by aquatic organisms to breathe.
- Air is also present in the air pockets in the soil. This helps soil organisms breathe.

The balance of oxygen and carbon dioxide in air is maintained by respiration of plants and animals and photosynthesis of plants.

CFU (Open ended/ Factual)

Factual CFUs:

1. What are some uses of air?
2. How is the balance of oxygen and carbon dioxide maintained in air?

Open ended CFUs:

1. What would happen if there was no air?

Home work:

- Design a small machine that is powered by wind. It could be a simple windmill that does a task, like lifting a small weight or turning a fan.
- Design a simple model of a wind-powered water pump. This project can involve creating a mechanism where wind (or a fan) moves a water pump to lift water, which can be useful for irrigation in farming

TEACHER'S DIARY

Name of the Teacher:		**Name of the Month:**	
Name of the Lesson:		Class:	

Period No	**Name of the Concept to be taught**	**Date**	**Activities Conducted during the teaching**	**TLM Used**	Remarks
11.1	Introduction, Activity 1				
11.2	11.1 Is air present everywhere around us?				
11.3	11.2 What is air made up of? Activity 3				
11.4	Activity 4				
11.5	11.3 How does oxygen become available? Activity 5,6				
11.6	11.4 How is the oxygen in the atmosphere replaced?				

1	What were some of the specific strategies that I used to encourage participation? How effective were they? What will I do differently next time?
2	Were there any concepts or activities that students found particularly difficult? How will I adapt my approach to address these difficulties in the next lesson?
3	What additional resources or modifications could improve the effectiveness of this lesson in future implementations?
4	How well did I adjust my teaching based on student reactions or unforeseen challenges?

Head Teacher's Signature

Teacher's Signature

Head Teacher's Suggestions:

Teacher Notes:

April

C2M1S3
No bag Day

F1S8Y2
Cluster Complex

E5F4M6
Teacher Resources

2026

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3 Good Friday	4
5 Sunday Babu Jagjivan	6	7	8	9	10	11 Second Saturday
12 Sunday	13	14 Dr. B R. Ambedkar Jayanthi	15	16 Kandukuri Veeresalingam Jayamti	17	18 PTM & SMC meeting
19 Sunday	20	21	22 Earth Day	23	24	25
26 Sunday	27	28	29	30		

Week 1:

Week 2:

Week 3:

Week 4:

Week 5:

TEACHER'S NOTES