

**TEACHERS RESOURCE
MANUAL**

**EVS - Science
Grade 3**

GRADE - 3



Introduction

Our Earth is rich in diversity, spanning from small organisms to large ones. The diversity within the animal kingdom is the primary focus of this unit. It aims to help students appreciate the variety of animals through various activities, providing opportunities for children to enjoy and classify animals based on various criteria. Additionally, this unit fosters an attitude of caring for animals.

Previous knowledge

- ◆ The child knows about the
 - animals around him.
 - animals in zoo.
 - feeding habits of animal near to him.
 - rearing of animals in home.

Learning Outcomes

The learner

- ◆ lists the peculiarities of animals based on their living place.
- ◆ classifies animals based on their body size.
- ◆ compares domestic and wild animals.
- ◆ comprehends and explains the feeding habits of animals.
- ◆ classifies animals based on the places where they live.
- ◆ associates in the animal protection activities.
- ◆ develops an attitude to take care of the domestic animals.

Major concepts

- ◆ Animals can be classified based on their body size.
- ◆ There are very big animals, big animals, small animals, very small animals and tiny insects.
- ◆ Animals which are reared in homes and farms are domestic animals.
- ◆ Pet animals are more close and friendly to man.
- ◆ The animals that live in forests and can take care of themselves are wild animals.
- ◆ Animals can be classified based on the places where they live.

- ◆ The animals that eat flesh of other animals are called Carnivores.
- ◆ The animals that eat flesh and plant foods are omnivores.
- ◆ We should take care of each animal.

UNIT FRAME

Name of Unit: 1. Ant to Elephant

Total Time: 5 period of 40 minute

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
<ul style="list-style-type: none"> ◆ Classifies animals based on their body size. 	<ul style="list-style-type: none"> ◆ Animals can be classified based on their body size. ◆ There are very big animals, small animals, very small animals and tiny insects. 	<ul style="list-style-type: none"> ◆ Picture observation, discussion, illustration analysis, completion of table 	<ul style="list-style-type: none"> ◆ Picture of comparing the weight and size of a blue whale and elephants ◆ Table 	<ul style="list-style-type: none"> ◆ Writing in 'MY science Diary', participation in group activity. ◆ Completed table in 'MY science Diary'
<ul style="list-style-type: none"> ◆ Compares domestic and wild animals. 	<ul style="list-style-type: none"> ◆ Animals which are reared in homes and farms are domestic animals. ◆ Pet animals are more close and friendly to man. ◆ The animals that live in forests and can take care of themselves are wild animals. 	<ul style="list-style-type: none"> ◆ Picture observation, discussion, comparison, table completion 	<ul style="list-style-type: none"> ◆ Picture of different animals ◆ Table 	<ul style="list-style-type: none"> ◆ Writing in 'MY science Diary', participation in group activity. ◆ Completed table in 'MY science Diary'
<ul style="list-style-type: none"> ◆ Classifies animals based on the places where they live. 	<ul style="list-style-type: none"> ◆ Animals can be classified based on the places where they live- live on land, live in air, live in water, live on land and water 	<ul style="list-style-type: none"> ◆ Illustration observation, discussion, activity completion 	<ul style="list-style-type: none"> ◆ Illustration in TB, Activity 	<ul style="list-style-type: none"> ◆ Writing in 'MY science Diary', participation in group activity, Completed activity in 'MY science Diary'
<ul style="list-style-type: none"> ◆ Comprehends and explain the feeding habits of animals. 	<ul style="list-style-type: none"> ◆ The animals that eat plants are called herbivores. ◆ The animals that eat flesh of other animals are called carnivores. ◆ The animals that eat flesh and plant foods are omnivores. 	<ul style="list-style-type: none"> ◆ Conversation, analysis, discussion, activity completion 	<ul style="list-style-type: none"> ◆ Conversation in TB, Activity 	<ul style="list-style-type: none"> ◆ Writing in 'MY science Diary', participation in group activity, Completed activity in 'MY science Diary'
<ul style="list-style-type: none"> ◆ Associates in the animal protection activities. Develops an attitude to take care of the domestic animals. 	<ul style="list-style-type: none"> ◆ We should take care of each animal. 	<ul style="list-style-type: none"> ◆ Description analysis, poster making 	<ul style="list-style-type: none"> ◆ Description in TB 	<ul style="list-style-type: none"> ◆ Posters prepared in the classroom and the posters in 'MY science Diary', participation in group activity

Teaching Manual

- ◆ **Concepts:**
 - Animals can be classified based on the places where they live - live on land, fly in air, live in water, live on land and water
- ◆ **Learning objective:**
 - Classifies animals based on the places

where they live.

- ◆ **TLM :**
 - Illustration in TB, Activity
 - Expected products: Writings in 'MY science Diary', Completed activity.
 - Time : 1Peroid

Process	Evaluation
<ul style="list-style-type: none"> ◆ The teacher asks the name of some animals. ◆ Random response from students. ◆ Lists the names in the BB. ◆ Suggests a criterion for classification of these animals. <ul style="list-style-type: none"> ● Based on their nature ● Based on body size ◆ Can you suggest anther criteria for classification? ◆ Random response. ◆ The students are directed to analyse the illustration in the TB and write their findings based on the living places of animals. ICT can be used for better classroom experience. <p>Consolidation</p> <ul style="list-style-type: none"> ◆ Animals can be classified based on the places where they live- live on land, fly in air, live in water, live on land and in water ◆ The animals that live both on land and in water are known as amphibians. ◆ Teacher asks to do the activity in class room (individually) ◆ Try to group the following animals. Write in 'My Science Diary' ◆ Write "L" for animals that live on land and, "A" for animals that fly in air, and "W" for animals that live in water. <p>Consolidation</p> <ul style="list-style-type: none"> ◆ Animals that live on land - Cat, Dog, Tiger, Elephant ◆ Animals that fly in the air - Parrot, Pigeon, Crow, Cuckoo, Eagle ◆ Animals that live in water - Jelly fish, Shark, Fish 	<ul style="list-style-type: none"> ◆ Writing in 'MY science Diary', participation in group activity. ◆ Completed activity in 'MY science Diary'

Classification of animals based on their body size. (2 periods)

Activity 1 (picture observation, discussion, illustration analysis)

- ◆ This activity aims to impart knowledge about the blue whale, the largest animal in the world. Beginning with a cartoon introduction, the discussion can transition to elephants. The teacher prompts children to share their experiences with elephants. Students engage in a group activity by observing pictures of elephants, analyzing conversations and illustrations. Each student records their findings individually in 'My Science Diary.' Utilizing ICT enhances classroom transactions.

Consolidation

- ◆ Elephant is the biggest animal on land.
- ◆ Blue whale is the biggest animal in the world.
- ◆ Blue whale's size and weight are equivalent to 25 adult elephants.

To the teacher

- ◆ The blue whale holds the title of the largest animal on the planet, weighing as much as 200 tons, which is approximately equivalent to 25 elephants. Scientifically known as *Balaenoptera musculus*, this majestic creature boasts a heart the size of a Volkswagen Beetle. Its stomach is capable of holding one ton of krill (a small shrimp-like planktonic crustacean of the open seas. It is eaten by a number of larger animals), and it needs to consume about four tons of krill daily. Blue whales are the loudest animals

on Earth, surpassing even a jet engine. Their calls can reach an astounding 188 decibels, while a jet engine reaches 140 decibels. The low-frequency whistle they emit can be heard for hundreds of miles and is likely used to attract other blue whales. Unfortunately, due to human activity, only an estimated 10,000 to 25,000 blue whales remain in the world. Ref : <https://www.worldwildlife.org/species/blue-whale>



Evaluation

- ◆ Writing in 'MY science Diary', participation in group activity.

Activity 2 (picture observation, discussion, completion of table)

- ◆ This activity is designed to compare and classify animals based on their size. Students are instructed to write the names of animals provided in the textbook. Engaging in a group activity, students observe pictures of animals and individually complete the table, recording their findings in 'My Science Diary.' The teacher encourages students to list more animals and add them to the table. Utilizing ICT enhances classroom transactions.

Consolidation

- ◆ Animals can be classified based on their body size.
- ◆ There are very big animals, small animals and very small animals.

Very big animals	Big animals	Small animals	Very small animals	Tiny insects
Elephant Giraffe	Cow Lion Tiger Horse	Dog Cat Goat	Rat Squirrel	Ant Mosquito Housefly

Evaluation

- ◆ Completed table in 'My Science Diary', participation in group activity.
- ◆ Classification of animals based on their nature. (1 period)

Activity 1 (picture observation, discussion)

- ◆ The aim of this activity is to identify domestic and pet animals and understand their utility to humans. Students engage in a group activity where they write the names of animals provided in the picture. The teacher facilitates a discussion based on the questions in the textbook and directs students to record their findings in 'My Science Diary.' Encouraging students to list additional domestic and pet animals is part of the activity. Utilizing ICT is beneficial for classroom transactions.

Consolidation

- ◆ Milk - Cow, goat Meat - Goat, hen, duck wool - Sheep Egg - Hen, duck
- ◆ Animals which are reared in homes and farms are domestic animals.
- ◆ Domestic animals give us various products like milk, meat, egg, wool.
- ◆ Dog, parrot - They are more close and friendly to man.
- ◆ Rabbits, Donkeys, Fishes, Camels, Horses, Pigs etc. are domestic animals.
- ◆ Pigeon, Mouse, Ornamental fishes etc. are pet animals.

Evaluation

- ◆ Writing in 'MY science Diary', participation in group activity.

Activity 2 (picture observation, discussion, comparison, table completion)

- ◆ The aim of this activity is to explore wild animals further. Students engage in a group activity where they write the names of animals provided in the textbook. They then compare these animals with domestic ones and write a comparative note in 'My Science Diary.' The

teacher encourages students to list more wild animals. Utilizing ICT is advantageous for classroom transactions. Additionally, students individually complete the table in the textbook and record their findings in 'My Science Diary.'

Consolidation

- ◆ The animals that live in forests and can take care of themselves are wild animals.
- ◆ Domestic animals can live with human beings, but Wild animals live in the jungle. Domestic animals are mainly vegetarians but Wild animals are mainly omnivorous. Wild animals find their own food and shelter and do not need human intervention to survive. Humans take care of domestic animals and provide them with food and shelter.
- ◆ Giraffe, Snake, Gorilla, Kangaroo, Elephant, Crocodile etc. are wild animals.

Domestic animals	Pet animals	Wild animals
Cow	Dog	Fox
Goat		Lion
Duck		Zebra
Donkey		Hippopotamus
Hen		Monkey

Evaluation

- ◆ Writing in 'MY science Diary', participation in group activity, Completed table in 'MY science Diary'.

Classification of animals based on the places where they live. (1 period)

Activity 1 (illustration observation, discussion, activity completion)

- ◆ The aim of this activity is to identify animals based on their habitats. Students analyze the illustration provided and write their findings regarding where the animals live. Utilizing ICT is advantageous for classroom transactions. Students individually complete the activity in the textbook and record their findings in 'My

Science Diary.’

Consolidation

- ◆ The animals which live on land, water and air.
- ◆ The animals that live both on land and in water are known as amphibians.
- ◆ Animals that live on land - Cat, Dog, Tiger, Elephant
- ◆ Animals that fly in the air - Parrot, Pigeon, Crow, Cuckoo, Eagle
- ◆ Animals that live in water - Jelly fish, Shark, Fish

Evaluation

- ◆ Writing in ‘MY science Diary’, participation in group activity, Completed activity in ‘MY science Diary’.

Classification of animals based on their feeding habits. (1 period)

Activity 1 (Conversation analysis, discussion, activity completion)

- ◆ The aim of this activity is to identify the feeding habits of animals. The teacher conducts a discussion in the classroom based on their food habits. Following the discussion, the teacher gives directions to analyze the conversation based on the indicators given below and write their findings in ‘My Science Diary.’

Indicators

- Herbivores
 - Carnivores
 - Omnivores
- ◆ The student individually completes the activity in the text book and write in ‘My Science Diary.’

Consolidation

- ◆ The animals that feed on plants are herbivores.
- ◆ The animals that eat flesh of other animals are called Carnivores.
- ◆ The animals that eat flesh and plant foods are omnivores.

- ◆ Herbivores - Cow, Goat
- ◆ Carnivores - Lion, Tiger
- ◆ Omnivores - Dog, Cat

Evaluation

- ◆ Writing in ‘MY science Diary’, participation in group activity, Completed activity in ‘MY science Diary’,

Caring of animals(1 period)

Activity 1 (description analysis, poster making)

- ◆ The aim of this activity is to foster an attitude of caring for animals. Students are instructed to observe the pictures in the textbook and comment on the situations depicted. Following this, the class should be divided into six groups. Three groups are given directions to create posters based on ‘Caring for domestic animals,’ while the other three groups are given directions to create posters based on ‘Caring for wild animals.’
- ◆ The students in each group complete the posters and display them in the classroom. Afterwards, each student is directed to prepare a poster in ‘My Science Diary’ based on the topics ‘Caring for domestic animals’ and ‘Caring for wild animals’ as a home assignment.

Consolidation

- ◆ Caring to domestic animals
- ◆ Caring to wild animals.

Evaluation

- ◆ Posters prepared in the classroom and the posters in ‘MY science Diary’, participation in group activity

WORKING GALLERY

Answers

1.
 - (B) tiny insect
 - (D) Fox, others are herbivores.
 - (b) Live in water
 - Eat the flesh of other animals

- (D) Statement (i) correct statement (ii) wrong
- Frog can live both on land and in water. So frog is an amphibian.
- Herbivores are animals that feed on plants. But carnivores are animals that eat flesh of other animals.
- I agree with this.
- Dog is a pet animal. They are more close and friendly to man.
- Cow is a domestic animal. Domestic animals are those animals which are bred in homes and farms for getting useful products or services.
- They spend most of their time in air. They have wings that help them to fly in the air.
- We should - give proper care and protection, give proper food, clean their shelters, give medical care.

2. Rabbit - Herbivore

- Lion - Carnivore
- Cat - Omnivore.

3.

- (i) Tiger - (d) Live on land
- (ii) Jelly fish (c) Live in water
- (iii) Eagle - (b) Fly in air.
- (iv) Salamander- (a) Live both in water and land.

Additional activity.

- ◆ Prepare a picture album of animals based on - their body size, their nature, the places where they live, their feeding habits.
- ◆ How the peculiarity of the teeth of herbivores and carnivores are suited for its food habit? Observe and write the findings.

Introduction:

A plant is defined as a living organism that grows on the earth. They provide us with a variety of necessities for our daily lives, including food to eat, air to breathe, clothes to cover our bodies, wood, medicine, shelter and numerous other products for human benefit. This chapter is aimed at exploring the world of greenery. This unit helps students appreciate the diversity among plants through various activities.

Previous knowledge

The child knows about the

- ◆ plants around him.
- ◆ uses of plants
- ◆ major parts of plants

Learning Outcomes

The learner

- ◆ identifies the parts of a plant.
- ◆ compares tap root and fibrous root systems.
- ◆ describes the functions of each part of a plant.
- ◆ classifies the plants based on criteria.
- ◆ appreciates the attitude of protecting trees.

Major concepts

- ◆ Part of a plant present below the soil is called root.
- ◆ Part of a plant present above the soil is called shoot.

- ◆ Plants have two types of root system - Tap root and fibrous root
- ◆ Shoot includes leaves, stem , branches, flower, fruit etc..
- ◆ Root fixes the plant in the soil and absorb water from the soil.
- ◆ The water reaches from roots to leaves through stem.
- ◆ The plants that grow in water are called aquatic plants.
- ◆ The plants that grow on land are terrestrial plants.
- ◆ Plants make their food in leaves.
- ◆ Plants are classified into trees, shrubs, herbs, creepers and climbers based on their growth habit.
- ◆ Seeds are formed from a flower.
- ◆ We have to protect plants.
- ◆ Plants provide valuable services.

Total Time: 6 period of 40 minute

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
Appreciates the attitude of protecting trees.	We have to protect plants. Plants provide valuable services.	description analysis, poster making	conversation in TB, Activity	Posters prepared in the classroom and the posters in 'MY science Diary', participation in group activity.

Identifies the parts of a plant.	Part of a plant present below the soil is called root. Part of a plant present above the soil is called shoot. Shoot includes leaves, stem, branches, flower, fruit etc..	description analysis, picture observation, labeling picture, Plant observation	Labeling the parts of plant in the text book, drawing of labeled picture in 'MY science Diary',	Writing in 'MY science Diary', participation in group activity.
Compares tap root and fibrous root systems. Describes the functions of each part of a plant.	Plants have two types of root system - Tap root and fibrous root Root fixes the plant in the soil and absorb water from the soil .	picture observation, discussion, illustration analysis, table completion, Plant observation Observing illustration, Engage in experiment, Completing practical record	Illustration in TB, table in text book, Experiment	Completed table in 'MY science Diary', participation in group activity. Record in 'MY science Diary', participation in experiment.
Describes the functions of each part of a plant. Classifies the plants based on criteria.	The water reaches from roots to leaves through stem. Plants are classified into trees, shrubs, herbs, creepers and climbers based on their growth habit. The plants that grow in water are called aquatic plants. The plants that grow on land are terrestrial plants.	picture observation, comparison, discussion, completing illustration	Comparing stem of two plants, , illustration in text book	Writing in 'MY science Diary', participation in group activity, Completed illustration, participation in discussion.
Describes the functions of each part of a plant.	Plant make their food in leaves.	Analysing description, discussion, Labeling diagram	Description in TB, unlabelled diagram of leaf in Text Book	Writing in 'MY science Diary', participation in group activity, Labeled diagram.
Describes the functions of each part of a plant.	Seeds are formed from a flower.	illustration analysis, discussion	Illustration in the text book	Writing in 'MY science Diary', participation in group activity

“PROTECT PLANTS.... PROTECT ENVIRONMENT” (1 period)

Activity 1(description analysis, poster making)

The aim of this activity is to cultivate an attitude to protect plants and to understand the valuable services provided by them. The class should be divided into six groups. Conduct a discussion on World Environment Day and emphasize the importance of plants. Prepare slogans for posters during the discussion. All groups are then directed to create three posters based on the theme ‘World Environment Day,’ utilizing any three slogans prepared in the classroom. The students in each group complete the posters and display them in the classroom.

Afterwards, each student is instructed to prepare posters in ‘My Science Diary’ as a home assignment.**Consolidation**

Posters based on

- ◆ We must take care of plants. They give us fresh air, food, shelter and everything.
- ◆ Green Today, Clean Tomorrow.
- ◆ Save tree, Save earth.
- ◆ Protect plants..... Protect environment.
- ◆ Plant a tree and get oxygen for free.
- ◆ Plants can survive without humans, but humans cannot survive without plants.

Evaluation

Posters prepared in the classroom and the posters in ‘MY science Diary’, participation in group activity

To the teacher

World Environment Day is celebrated annually on 5 June and encourages awareness and action for the protection of the environment. The United Nations General Assembly founded World Environment Day in 1972 to increase public awareness of environmental challenges and encourage action. It has since grown to be the largest global venue for environmental advocacy and is observed every

year on June 5.

Parts of a plant (1 period)

Activity 1 (description analysis, picture observation, labeling picture, Plant observation)

This activity is designed to understand the different parts of plants, such as the root and shoot system. Students are instructed to visit the school surroundings and collect plants, then identify the major parts of the plant. Engaging in a group activity involving analyzing conversations and pictures in the textbook, students individually label the pictures. Additionally, they draw a picture of a plant in ‘My Science Diary’ and label its parts.

Consolidation

- ◆ Part of a plant present below the soil is called root.
- ◆ Part of a plant present above the soil is called shoot.
- ◆ Shoot includes leaves, stem, branches, flower, fruit etc.

Evaluation

Labeling the parts of plant in the text book, drawing of labeled picture in ‘MY science Diary’, participation in group activity.

Roots (2 periods)

Activity 1 (picture observation, discussion, illustration analysis, table completion, Plant observation)

The aim of this activity is to understand tap roots and fibrous roots. The teacher asks the class why Sana and Sonu have different experiences in pulling out the plants. After discussion, the teacher concludes that this is due to the difference in the roots of these plants. Observing the illustration of roots (group activity), students individually complete the table and write in ‘My Science Diary.’

Consolidation

Tap root

- ◆ Long, thick root that grows downwards into the soil.
- ◆ Many small side roots grow from the main root.
- ◆ Hibiscus, Mustard, Mango are plants having taproot system.
- ◆ Some root store food, such as in carrot, radish and turnip.

Fibrous root

- ◆ A number of small roots grow out from the end of the stem.
- ◆ Roots do not grow deep into the soil.
- ◆ Roots are thin, with root hair
- ◆ Grass, wheat, rice are plants having fibrous roots.

Plants have two types of root system - Tap root and fibrous root.

Evaluation

Completed table in 'My Science Diary', participation in group activity.

Activity 2 (Observing illustration, engage in experiment, completing practical record)

This activity is designed to understand that roots absorb water from the soil. To demonstrate this, an experiment is to be carried out. Students are given directions to set up the experiment at home by observing the illustration in the textbook. After conducting this experiment, they are to write the record in 'My Science Diary.'

Record

Title: Function of roots.

Aim: To observe that roots absorb water from the soil.

Materials required: Beaker, Red ink, Water, Peperomia plant

Procedure: Take a beaker with red coloured water. Place a Peperomia plant in it. Keep its roots immersed in the coloured water. Keep it in the sun

for two hours.

Result: After two hours the colour of stem and leaves is changed to red colour.

Conclusion: Roots absorb water from the beaker. The water reached from roots to leaves through stem.

Consolidation

- ◆ Root fixes the plant in the soil.
- ◆ Roots absorb water from the soil.
- ◆ The water reached from roots to leaves through stem.

Evaluation

Record in 'My Science Diary', participation in experiment.

Stem (1 period)

Activity 1 (picture observation, comparison, discussion)

The aim of this activity is to identify the function of stems and classify plants based on their growth habits. Students are instructed to observe the pictures of stems of a coconut tree and a mango tree in the textbook. They are asked to compare their stems in a group activity and then write their findings individually in 'My Science Diary.' The findings should be modified with the teacher's intervention. The use of ICT is beneficial for classroom transactions.

Consolidation

- ◆ In both plants stem
 - is seen above the ground.
 - bears leaves, flowers and fruits.
 - is hard and tall.
- ◆ Coconut tree has erect or slightly curved stem which grows from a swollen base. The stem is topped with a crown of 60–70 spirally arranged leaves.
- ◆ Mango tree has many branches that carry leaves, flower and fruits. It has very strong and thick stems.

Evaluation

Writing in 'MY science Diary', participation in group activity.

Activity 2 (picture observation, discussion, completing illustration)

The aim of this activity is to classify plants based on their growth habits: trees, shrubs, herbs, creepers and climbers. Students are asked to identify the plants in the illustrations given in the textbook. The teacher conducts a discussion based on the given characteristics and gives directions to identify suitable plants in the textbook individually. The use of ICT is beneficial for classroom transactions. After completing the activity, students are directed to collect more examples of trees, shrubs, herbs, creepers, and climbers.

Consolidation

- ◆ Plants are classified into trees, shrubs, herbs, creepers and climbers based on their growth habit.
- ◆ Banyan tree - Trees have thick and strong stem and live for many years.
- ◆ Hibiscus - Shrubs have thin and woody stem. They are smaller than trees.
- ◆ Balsam - Plants smaller than shrubs are called herbs. They have soft, green stems.
- ◆ Cucumber - Creepers are weak plants that grow along the ground creeping.
- ◆ Snake gourd - Climbers have a weak stem, so it needs support. It climbs the support and grow.

Evaluation

Completed illustration, participation in discussion.

Activity 3 (picture observation, discussion)

"The aim of this activity is to identify aquatic plants and terrestrial plants. Students are directed to observe the pictures in the text and analyze them with the help of indicators (group activity). They write the inferences individually in 'My Science Diary.' The use of ICT is beneficial for classroom transactions. The teacher encourages students to

list more examples of aquatic and terrestrial plants.

Consolidation

- ◆ The plants that grow in water are aquatic plants.
- ◆ The plants that grow on land are terrestrial plants.

Evaluation

Writing in 'MY science Diary', participation in group activity.

Food factory of plants (1 period)

Activity 1 (Analysing description, discussion, Labeling diagram)

The aim of this activity is to understand the structure and function of leaves. The description in the textbook is analyzed using indicators (group activity), and students write their individual findings in 'My Science Diary.' The teacher gives directions to label the parts in the picture of a leaf (individual activity). Students are then instructed to redraw the labeled picture of the leaf in 'My Science Diary.'

Consolidation

- ◆ Plants make their food in leaves. Leaves make food in the presence of sunlight.
- ◆ Majority of leaves are green in colour. This is due to the presence of a green colored pigment. Some leaves contain other types of pigments which give them different colours like red, yellow, Purple etc.,
- ◆ Petiole is the part that connects leaf to the stem. The flat surface of the leaf is lamina. The large vein running through the middle of the leaf is mid rib.

Evaluation

Writing in 'MY science Diary', participation in group activity, Labeled diagram.

To The Teacher

All leaf colours come from pigments, which

are natural substances produced by leaf cells to help them obtain food. Leaves are green due to chlorophyll: Green leaves contain chlorophyll in high concentration. While most plant leaves are green, those with a high concentration of carotenoid pigment appear yellow or yellow-orange. Leaves with a high concentration of anthocyanin pigments appear red or purple in color.

Although chlorophyll is necessary for food production in green leaves, leaves of other colors, such as red, yellow, or purple also contain chlorophyll hidden under non-green pigments. Therefore, non-green leaves can also produce food for plants, as they contain chlorophyll.

Beauty of plants (1 period)

Activity 1 (illustration analysis, discussion)

“The aim of this activity is to identify the function of flowers.” The teacher asks the students, ‘Which part of the plant produces fruits?’. After receiving random responses, students write notes in ‘My Science Diary’ by analyzing the illustrations (group activity) in the textbook.”

Consolidation

- ◆ A bud grows on stem or branch. The bud turns into a flower. Flower becomes a fruit. Fruits grow bigger and ripens. Seeds are seen inside the fruits. New plant grows from the seeds.

Evaluation

Writing in ‘My Science Diary’, participation in group activity

WORKING GALLERY- Answers

1.

- (a) Root
- (b) Make food
- (a) Statement (i) and statement (ii) correct
- (d) Creeper
- (c) Tulsi, others are climbers

- The plants that grow on land are terrestrial plants.
- No. Hibiscus is not a tree. Trees have thick and strong stem and live for many years. Hibiscus have thin and woody stem and are smaller than trees. So Hibiscus is a shrub.
- Tap root - Long, thick root that grows downwards into the soil. Many small side roots grow from the main root.
- Fibrous root - A number of small roots grow out from the end of the stem. Roots are thin, with root hair.
- Flower becomes a fruit. Fruits grow bigger and ripens. Seeds are seen inside the fruits. New plant grows from the seeds.
- Creepers are weak plants that grow along the ground creeping. Climbers are also having a weak stem, so it needs support. It climbs the support and grow.

2. Redrawing

- (a) Lamina, identify and labeling
- (b) Petiole, identify and labeling

4. Neem, Banyan - Trees - Have thick and strong stem and live for many years.
Hibiscus, Lemon - Shrubs - Have thin and woody stem. They are smaller than trees.
Mint, Coriander - Herbs - Plants smaller than shrubs and have soft, green stems.
Watermelon, Cucumber - Creepers - Are weak plants that grow along the ground creeping
Pea , Snake gourd - Climbers -Have a weak stem, so it needs support. It climbs the support and grow.

Additional activity.

Prepare a presentation of plants based on their growth habit.

Introduction:

The unit deals with various states of matter like solids, liquids and gases. The solids can be changed to liquids by melting, and liquids can be changed into gases by boiling. The learners are expected to observe these process in their natural surroundings. They can enjoy the wonders in the nonliving world .They should develop process skills such as observation, classification, inference and experimenting. More over the learners can appreciate the wonderful phenomena in the non-living world.

Previous knowledge

The child knows about

- ◆ Ice, water, vapour and clouds
- ◆ Boiling , melting etc
- ◆ How clouds cause rain

Learning Outcomes

The learner

- ◆ Understands the three different states of water as Ice - solid, water-liquid, vapour-gas'
- ◆ Realises that melting causes conversion of solid state to liquid state.
- ◆ Understands boiling causes conversion of

liquid to gas.

- ◆ Experiences the process of melting

Major concepts

- ◆ Ice is the solid form of water
- ◆ Vapour is the gaseous form of water
- ◆ Matter exists mainly in three states viz solids, liquids and gases
- ◆ Melting converts matter from solid state to liquid state
- ◆ Conversion of matter from liquid state to gaseous state happens through boiling
- ◆ Evaporation causes cooling

Total Time: 5 period of 40 minute

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
Understands the three different states of water as Ice - solid, water-liquid, vapour-gas'	Ice is the solid form of water Vapour is the gaseous form of water	Text analysis Picture observation, Discussion, illustration analysis,	Picture in TB Table Ice Water	Writing in 'MY science Diary', Participation in group activity. Completed notes in 'MY Science Diary'

Realises that melting causes conversion of solid to liquid state Boiling causes conversion of liquid to gas state.	Boiling causes conversion of liquid to gas. Matter exists mainly in three states viz solids, liquids and gases Melting converts matter from solid state to liquid state	Picture observation, discussion, Discussion Comparison, table completion	Picture of boiling Picture in the TB	Writing in 'MY science Diary', participation in group activity. Completed table in 'MY science Diary'
Understands boiling causes conversion of liquid to gas. Experiences the process of melting	Conversion of matter from liquid state to gaseous state happens through boiling Evaporation causes cooling	illustration observation, discussion, activity completion	Illustration in TB, Activity	Writing in 'MY science Diary', participation in group activity, Completed activity in 'MY science Diary'

(2 periods)

Activity 1 Text analysis

Teacher narrates the situation

Let the learners experience the coolness of ice, keeping ice on their palms and melting of ice into water.

Teacher consolidates

- ◆ Ice is the solid form of water
- ◆ It absorbs heat from the palm
- ◆ And changes into water

Teacher says the consolidation points in the TB

Let children write the notes in their Science Diary

Assessment

Entries in ' My Science Diary'

Writing in 'My science Diary', participation in group activity.

Activity 2 (picture observation, discussion, making note)

Teacher instructs :

Read the dialogue between Sonu and Pappa

What is coming out from water when it is boiled?

Steam (Write in my Science Diary)

Do this Activity- A simple experiment

- ◆ Do the activity as directed in the TB
- ◆ Observe the result
- ◆ Where do the droplets come from?

Steam changes in to water

Then ask the students to complete the exercise given in the TB

Identify the state of matter in each and write them in the Science Diary

Consolidation

Consolidate with the points given in the box.

Assessment

Entries in ' My Science diary

Change of State

Experiment Design the Experiment

Format

Title

Aim:

Materials Required:

Procedure:

Group the students into 5 member groups.
Groups Do the experiment based on the design.

After Completing the experiment Write the
Record of Experiment

Title

Aim:

Materials Required:

Procedure :

Result/ Observation

Conclusion

Assessment : design of experiment and Record of Experiment

Activity: Illustration Analysis 9 Group Activity)

Instructs the groups to analyse the illustration given in the page 225 TB

Record the analysis in the given points

Teacher Consolidates with the two points given in the TB

Assessment :

Points filled in the Analysis of illustration in My Science Diary

Melting

Activity - Experiment

- ◆ Design the experiment
- ◆ Do the experiment in groups
- ◆ Write the record of experiment
- ◆ Write What is melting.

Assessment

Design and Record of the Experiment, Entries in My Science Diary

Boiling

Activity - Experiment

- ◆ Design the experiment
- ◆ Do the experiment in groups
- ◆ Write the record of experiment
- ◆ Write What is boiling

Assessment

Design and Record of the Experiment, Entries in the science Diary.

Activity

What happens to water in the earth? Analyse the conversation between Mom and Sana.

Look at the picture. Write the answers of the question given. Teacher consolidates with the points

- ◆ Water in the sea, ponds, lakes, rivers evaporates.
- ◆ The water vapour in the air condenses and fall as rain.

Assesment

Entries in 'My Sciecne Diary'.

Evaporation causes cooling

Teacher instructs with the points given in the text book. Let the learners experience.

Teacher asks. What happened to the sanitizer? From where did it get the heat?

Consolidation

- ◆ Sanitizer evaporates quickly.
- ◆ Heat is needed for evaporation, and it is absorbed from the palm.
- ◆ Evaporation causes cooling. So we feel cold on the palm.

Assesment

Entries in 'My Science Diary'.

Have you ever sweated

Activity : individual.

Teacher asks, Have you ever sweated?

What happens if there is wind at that time?

Consolidation

- ◆ The sweat evaporates.
- ◆ The wind increases the rate of evaporation.
- ◆ The heat is absorbed from the body.
- ◆ The speedy evaporation cools our body. This gives us the chillness.

Assesment

Entries in 'My Science Diary'.

WORKING GALLERY-ANSWERS

1.

- Solid
- Solid, Liquid
- Conversion
- Absorbed
- Heat is liberated.
- During wind the rate of evaporation increases.

- Changing a liquid into gaseous state by heating is boiling. The change of liquid state of a matter into gaseous state even without heating is called evaporation.
- Spirit evaporates quickly. Heat is needed for evaporation, and it is absorbed from the palm. Evaporation causes cooling. So we feel cold on the palm.

2. Water in earthen pot gets cooled - Evaporation of water takes place through the pores of the pot. Chillness is felt for a sweating person, if there is a wind - Wind increases the speed of evaporation.

3. Solid changing into liquid - Melting - Wax
Liquid changing into gas - Boiling - Water

4. Situation - Ice cube on the palm melts.

5. Reason - Condensation

4

BUILDING BLOCKS OF MATTER

Introduction:

In this unit, students will explore the basic building blocks of matter—atoms and molecules. They will learn about the fundamental characteristics of elements and compounds. They will become familiar with the names of certain elements and compounds. Compounds made up of different elements will fascinate them. The components of certain compounds are also included to introduce them to the wonders of chemistry. Students will also be engaged in some simple experiments.

Previous knowledge

- ◆ The learners know circumstances of breaking big objects in to small particles.
- ◆ They have prepared various solutions
- ◆ They handle many compounds like common salt, water etc
- ◆ They are familiar with so many metals.
- ◆ They are aware that everything is made up of smaller particles.

Learning out comes

The learner,

- ◆ explores the basic building blocks of matter,
- ◆ gains knowledge about atoms and molecules,
- ◆ understands the importance of elements and compounds,

- ◆ comprehends the difference between elements and compounds,
- ◆ Takes part in activities to identify elements and compounds and components of various compounds.

Major concepts

- ◆ All substances are made up of minute particles.
- ◆ The smallest particle that exhibits all the properties of a substance is the molecules.
- ◆ Molecules are made up of atoms.
- ◆ Substances made up of same kind of atoms are elements.
- ◆ Atoms are the smallest particles of elements.
- ◆ Atoms of different elements combines to form molecules of compounds

Total Time: 6 period of 40 minute

LO's	ACTIVITIES	TLM	VALUES	ASSESSMENT
All substances are made up of minute particles	Discussion, Narration, Experiment	Hammer, Stone, Sugar, Water, Potassium permanganate, Spoon	Co-operative mentality by participating in group activities	MCQ WS
Molecules	Experiment, Discussion	Same as above	Same as above	MCQ, WS



Atoms	Discussion, Narration	Pictures, TB	Same as above	MCQ, WS
Elements	Discussion, Narration Chart analysis	Charts, Periodic table, TB	Same as above	MCQ, WS
Naming of elements	Discussion, Narration Chart analysis	Charts, Periodic table, TB	Same as above	MCQ, WS
Compounds	Discussion, Experiment Narration, Chart analysis	Charts, Samples, TB	Same as above	MCQ, WS
Components of certain compounds	Chart analysis	Charts, TB	Same as above	MCQ, WS

Lesson Plan

Content analysis	Learning activities
All substances are made up of minute particles.	Discusses the situations described in the text book. Breaks a stone into minute particles using a hammer. Discusses such situations like flouring grinding etc.
Molecules are the smallest particles showing all the properties of a substance. Molecules are composed of atoms.	Teacher exhibits the experiments given in the text book and consolidates the concept of molecule. Through discussions and narration teacher consolidates the concept of atom.
Pure substances made up of same type of atoms are called elements.	Teacher exhibits different types of elements like gold ,copper, iron, aluminium , carbon and discuss their common features .Consolidates the term element.
Elements are found in all the three states of matter.	Teacher exhibits the chart of elements in different states of matter .A periodic table of elements can also be made use of for this purpose. Teacher narrates how the elements got their names and find more examples from periodic table if found necessary.
Compounds are made up of different types of elements.	Teacher conducts the experiment described in the text book(Heating of sugar)Consolidates that sugar is made up of the elements carbon, hydrogen and oxygen .Consolidates the concept of compounds giving more examples .Exhibits the chart of various compounds and the students find out the component elements in it.

WORKING GALLERY- Answers

- ◆ Atom
- ◆ Molecule
- ◆ Compounds
- ◆ Hydrogen and oxygen
- ◆ Sugar
- ◆ Compound
- ◆ Mercury/Bromine
- ◆ Carbon, Hydrogen and Oxygen
- ◆ Carbon is made up of same type of atoms.
Sugar is made of atoms of different elements.
- ◆ Carbon monoxide, Carbon dioxide

2.

Elements	Compounds
Hydrogen	Water
Nitrogen	Carbon dioxide
Copper	Sodium chloride
Gold	Glucose
Oxygen	Alcohol
	Cane sugar

3.

A	B
Element in solid state	Gold
Element in liquid state	Mercury
Combines with hydrogen and forms water	Oxygen
Contains carbon, hydrogen and oxygen	Glucose

4. Elements – A, D
Compounds – B, C

5.

Sl No.	Compound	Component elements
1	Sulphur dioxide	Sulphur, Oxygen
2	Potassium chloride	Potassium, Chlorine
3	Nitrogen dioxide	Nitrogen, Oxygen
4	Calcium oxide	Calcium, Oxygen
5	Silver bromide	Silver, Bromine

Extended activity

- ◆ Prepare a seminar paper on how elements got their names.
- ◆ Find out the component elements of as much compounds are possible.

Introduction:

Birds are fascinating creatures that add color, melody and life to our surroundings. Birds are extraordinary creatures with diverse characteristics and behaviors. As we delve deeper into the world of birds, we'll discover the unique features of each species and appreciate the important role they play in our environment. As nature's ambassadors, birds deserve our appreciation and protection. Simple acts like providing bird feeders in our gardens, keeping our environment clean, and respecting bird habitats contribute to the well-being of these feathered wonders. Get ready to spread your wings and explore the captivating world of birds through various activities.

Previous knowledge

The child knows about the

- ◆ birds around him.
- ◆ rear pet birds in home.
- ◆ feeding habits of birds around him.

Learning Outcomes

The learner

- ◆ lists the various birds in their surroundings.
- ◆ identifies the main parts of the bird.
- ◆ describes the functions and peculiarities of different types of feathers.
- ◆ comprehends and explain the feeding habits of birds.
- ◆ explains the peculiarity of beaks based on their feeding habits.
- ◆ describes how the legs and claws of birds are suited to their feeding habits.
- ◆ imitates sounds of different birds.
- ◆ explains how sounds produced by birds are useful to them.
- ◆ appreciates the attitude of protecting birds and

their nests.

Major concepts

- ◆ The body of a bird has three main parts - head, trunk and tail.
- ◆ Trunk has legs and wings.
- ◆ Flight feathers are seen on the wings and the tail. Help birds to fly.
- ◆ Body feathers cover the body of the bird. They give various colour to bird.
- ◆ Down feathers are seen close to the body of a bird. Helps to keep body warm.
- ◆ There is diversity in food and feeding habits among birds.
- ◆ Birds have beaks based on their feeding habits.
- ◆ Birds have feet, that help them to live in different places.
- ◆ Each bird can be recognized by the sounds they make.
- ◆ Some birds build nests on the ground and on the walls of buildings and some build holes in trees and burrows in the ground.

Total Time: 8 period of 40 minute

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
lists the various birds in their surroundings.	Different types of birds are seen around us.	picture observation, observation of feather, discussion	Picture in TB, Feathers of different birds.	Identifying the birds in the text book, Details of more birds in 'My Science Diary', participation in group activity.
identifies the main parts of the bird.	The body of a bird has three main parts - head, trunk and tail. Trunk has legs and wings.	picture observation, labelling the picture, drawing and colouring picture	Picture in TB, pictures of birds.	Labeling the parts of birds in the text book, drawing of labelled picture and colouring it in 'My Science Diary'.
describes the functions and peculiarities of different types of feathers.	Flight feathers are seen on the wings and the tail. Help birds to fly. Body feathers cover the body of the bird. They give various colour to bird. Down feathers are seen close to the body of a bird. Helps to keep body warm.	Picture observation, illustration analysis, Observation of types of feathers, rhyme completion, illustration completion	Picture in TB, Rhyme in TB, Illustration in TB	Completed rhyme and description of type of feathers in 'My Science Diary', participation in group activity, peer assessment among learners.
comprehends and explain the feeding habits of birds.	There is diversity in food and feeding habits among birds.	Discussion, illustration analysis, video/picture observation	Pictures in TB, videos or pictures of feeding habits of birds	Completed description of feeding habits in 'My Science Diary', participation in group activity.
explains the peculiarity of beaks based on their feeding habits.	Birds have beaks based on their feeding habits.	Discussion, picture analysis, Matching the activity	Matching activity in TB, Picture/video of kingfishers fish catching	Completed description of feeding habits in 'My Science Diary', participation in group activity.

describes how the legs and claws of birds are suited to their feeding habits	Birds have feet, that helps them to live in different places.	Picture observation, Illustration observation, Group discussion	Pictures and illustration in TB	Completed description related to the leg and claws of some birds suited to their feeding habits in 'My Science Diary'.
imitates sounds of different birds. explains how sounds produced by birds are useful to them. appreciates the attitude of protecting birds and their nests.	Each bird can be recognized by the sounds they made. Some birds build nests on the ground and on the walls of buildings and some build holes in trees and burrows in the ground.	Imitating sounds, Description analysis, Observing nature and collecting sounds of birds, Group discussion Collecting information of variety of bird nests, drawing nests, preparing the nest album	Video/audio of sounds of birds , picture/ videos of birds nest	Completed description related to the peculiarity and use of sounds of birds in 'My Science Diary', imitating sounds, digital sound album, participation in group activity. Drawing of nests, album of bird's nests, note on the wonderfulness of birds' nests. Participation in group activity.

Beautiful feathers (1 period)

Activity 1 (picture observation, observation of feather, discussion)

This activity aims to familiarize students with the birds around us. To bring the study to life, consider enhancing the introduction by bringing a parrot's feather into the classroom. This hands-on approach allows students to have a real and tactile experience, fostering a deeper connection to the world of birds. Observing and touching a parrot's feather provides a unique opportunity for students to explore the intricate details and vibrant colors of avian plumage, making the learning experience more immersive and memorable.

After reading the introduction the teacher conducts a discussion on the following points.

- ◆ Beauty of feathers.
- ◆ Hints help the grandfather to identify the bird's feather.
- ◆ Feathers of different colours.

The teacher encourages children to share their experiences with birds, fostering a sense of curiosity and engagement. To document their observations, the teacher provides an opportunity for students to write the names of birds depicted in the picture (page 240) in their 'My Science Diary.' Following this activity, the teacher guides the students to collect more names of birds along with their pictures. Students are then directed to paste this newfound information into their 'My Science Diary,' creating a personalized and interactive record of their exploration and discovery of various bird species.

Consolidation

- ◆ Beauty of feathers.
- ◆ Peacock, hen, sparrow, crow, duck, mynah, Koel Blue feathers. Red feathers, Green feathers, Yellow feathers etc.

Evaluation

Identifying the birds in the text book, Details of more birds in 'My Science Diary', participation in group activity.

Wings... Legs... Beaks... (2 periods)

Activity 1 (picture observation, labelling the picture, drawing and colouring picture)

This activity aims to familiarize students with the main parts of a bird. By observing the picture of a bird and identifying the main parts, namely the head, trunk, and tail, students will then be directed to label these parts in pictures of birds provided in TB below. Following this, students are instructed to draw a picture of a bird in 'My Science Diary,' labeling the parts - head, tail, wings, and beak, and colouring the picture as well.

Consolidation

The body of a bird has three main parts - head, trunk and tail. Trunk has legs and wings.

Evaluation

Labeling the parts of birds in the text book, drawing of labelled picture and colouring it in 'My Science Diary'.

Activity 2 (picture observation, illustration analysis, Observation of types of feathers, rhyme completion, illustration completion)

This activity aims to explore the various types of feathers and their functions. Students will individually complete a rhyme related to feathers and write it in 'My Science Diary.' Encourage the

students to add more lines to the rhyme (Group activity). The teacher should bring flight feathers, body feathers, and down feathers to the class. Students will have the opportunity to feel the feathers in groups and gather information about the peculiarities and functions of each feather by observing the textbook. Afterward, students are directed to complete an illustration individually. Evaluation can be conducted by exchanging books for peer assessment. Preparing a feather album is an interesting task for students.

Consolidation

- ◆ Rhyme
 - Birds have beaks, help them to eat
 - Birds have wings, help them to fly
 - Birds have leg, help them to walk
 - Birds have claws, help them to catch
- ◆ Flight feathers - Seen on the wings and the tail. Help birds to fly.
- ◆ Body feathers - Covers the body of the bird. They give various colour to bird.
- ◆ Down feathers - Seen close to the body of a bird. Help to keep body warm.

Evaluation

Completed rhyme and description of type of feathers in 'My Science Diary', participation in group activity, peer assessment among learners.

Food for birds (1 period)

Activity 1 (discussion, illustration analysis, video/picture observation)

The aim of this activity is to explore the diversity in food and feeding habits among birds. The activity can be introduced by presenting videos or pictures showcasing various feeding habits of birds. Participants will then engage in a group activity, observing illustrations related to feeding habits. Each individual will record their findings on the mode of feeding of birds in their 'My Science Diary.'

Consolidation

- ◆ Kingfishers hunt for fish by diving into the water. They primarily consume fish, but their diet also includes aquatic insects, freshwater shrimp and tadpoles.
- ◆ Woodpeckers obtain their food by boring holes into trees. They drill and drum on trees, extracting insects with their long, sticky tongues from deep within tree cavities.
- ◆ Hummingbirds feed by sucking. Using their long, straw-like beaks, hummingbirds suck nectar from flowers while hovering in midair.
- ◆ Sparrows have short, stout, cone-shaped beaks that they use to crack open seeds and nuts.
- ◆ Eagles possess sharp, pointed beaks designed for ripping and tearing prey into bite-sized pieces. Their powerful legs and feet are equipped with large talons used for killing prey.

Evaluation

Completed description of feeding habits in ‘My Science Diary’, participation in group activity.

Beaks to catch (1 period)

Activity 1 (discussion, picture analysis, Matching the activity)

The aim of this activity is to explore the peculiarities of bird beaks. The teacher initiates a discussion by presenting the picture of a kingfisher, focusing on how the structure of its beak aids in catching fish. Following the discussion, students are tasked with completing an activity related to beak structure and food habits individually. Peer assessment can be incorporated into this phase. Once the activity is completed, students are instructed to record their observations and insights in ‘My Science Diary.’

Consolidation

- ◆ Kingfishers have wedge shaped beak which helps them to catch the fish without splashing the water.
- ◆ Eagle - Hooked beak for ripping flesh from their prey.
- ◆ Sparrow - Strong short beak to pick and eat

insects.

- ◆ Woodpecker - Chisel shaped beak helps to drill wood and pick insect.
- ◆ Parrot - Curved strong beaks to crack nuts and seeds.
- ◆ Humming bird - Long, needle like beak to suck nectar from flowers.
- ◆ Duck - Broad and flat beak helps to filter its food from the water.

Evaluation

Completed description of feeding habits in ‘My Science Diary’, participation in group activity.

Walk...Perch...Hop...Pick up... (1 period)

Activity 1 (Picture observation, Illustration observation, Group discussion)

The aim of this activity is to understand how the legs and claws of birds are adapted to their feeding habits. Students will first observe pictures of the legs and claws of a duck and a hen, then write their inferences in ‘My Science Diary’ after a group discussion. Next, they will examine illustrations and engage in a discussion about the legs and claws of a crane, eagle, woodpecker, and crow. Following the discussion, students will individually document the peculiarities of the legs and claws of the crane, eagle, woodpecker and crow in ‘My Science Diary.’ Finally, students will determine the food habits of the birds by observing the legs and claws of each given bird. The use of ICT (Information and Communication Technology) is beneficial for classroom transactions.

Consolidation

- ◆ Duck:
 - Legs: Ducks have webbed feet, which are wide and flat. The webbing between their toes helps them swim efficiently in water.
 - Claws: Ducks have small, blunt claws that are not very prominent. These claws are

adapted for walking on land and paddling in the water.

- ◆ Hen (Chicken):
 - Legs: Chickens have scaly legs and strong, sturdy feet. Their legs are adapted for both walking and scratching the ground in search of food.
 - Claws: Chickens have relatively short and curved claws. These claws are helpful for digging and scratching at the soil to find insects and seeds.
- ◆ Crane - Have thin, long legs with wading feet. This type of feet helps to walk through water.
- ◆ Eagle - Have strong, sharp claws to catch and hold the prey.
- ◆ Wood pecker - Has four toes with sharply pointed, curved claws. Two toes forward and two toes pointing backwards, helps to get a firm grip on the tree bark.
- ◆ Crow - have feet to grip in branches of trees.
- ◆ Leg and claws of eagle (figure 1) - Have strong, sharp claws to catch and hold the prey.
- ◆ Leg and claws of wood pecker (figure 2) - Has four toes with sharply pointed, curved claws. Two toes forward, and two toes pointing backwards, helps to get a firm grip on the tree bark.

Evaluation

Completed description related to the leg and claws of some birds suited to their feeding habits in 'My Science Diary'.

“Caw” and “Kraa” (2 period)

Activity 1 (Imitating sounds, Description analysis, Observing nature and collecting sounds of birds, Group discussion)

The aim of this activity is to understand and imitate the sounds of birds. The introduction can involve students imitating bird sounds, which will be identified by their peers. The use of ICT is beneficial for facilitating classroom transactions. Students are encouraged to collect bird sounds

from their surroundings and tasked with creating a digital sound album. Furthermore, students are directed to engage in group activities to discuss and, individually, write a description in 'My Science Diary' on how these sounds are useful to birds.

Consolidation

- ◆ Each bird can be recognized by the sounds they make.
- ◆ Birds make sound to - alert others when there is danger, call others to fly together, travel in search of food, attract their mates.

Evaluation

Completed description related to the peculiarity and use of sounds of birds in 'My Science Diary', imitating sounds, digital sound album, participation in group activity.

To the teacher Sounds of birds

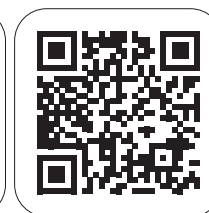
If you're interested in exploring bird sounds online, there are several reputable websites and platforms dedicated to birdwatching and ornithology. Here are a few popular ones where you can listen to and learn about bird sounds:



Xeno-canto



Macaulay
Library



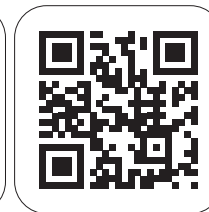
All About
Birds



British Trust
for Ornithology



eBird



Internet
Bird
Collection

When exploring these websites, keep in mind that many of them allow you to search for specific bird species or browse by region. Happy bird listening!

Activity 2 (Collecting information of variety of bird nests, drawing nests, preparing the nest album, Group discussion)

The aim of this activity is to appreciate the beauty of bird nests and collect information about the features of nests from various bird species. The class can begin by introducing pictures of different bird nests, fostering a discussion about their peculiarities and construction. Students will work in groups (six-member groups), tasked with drawing nests of different birds in 'My Science Diary.' Encourage an opportunity for assessment by having groups exchange their drawings. Following this, students are directed to create an album, collecting pictures of birds and noting the remarkable aspects of their nests. The use of ICT is beneficial for facilitating classroom transactions.

Consolidation

- ◆ Some birds build nests on the ground and on the walls of buildings. They build holes in trees and burrows in the ground.

Evaluation

Drawing of nests, album of bird's nests, note on the wonderfulness of birds' nests. Participation in group activity.

To the teacher

The construction of a bird's nest is a fascinating and intricate process, showcasing the ingenuity and resourcefulness of avian architects. Different bird species have unique nest-building behaviors, but the general process involves a series of well-coordinated steps:

Selection of Nest Site: Birds carefully choose a suitable location for their nest, taking into consideration factors such as safety, accessibility, and protection from predators. Nest sites can vary,

including trees, shrubs, cliffs, ledges, or even man-made structures like buildings and lampposts.

Gathering Materials: Birds collect a variety of materials for nest-building. Common items include twigs, leaves, grass, feathers, moss, and sometimes even human-made materials like paper or plastic. The specific materials used depend on the bird species and the environment in which they live.

Construction of the Frame: The first step often involves creating a basic framework or foundation for the nest. Birds interweave or layer materials to form the structure, starting with a rough outline that provides support for the overall shape of the nest.

Adding Soft Lining: Many bird species add a soft lining to the interior of the nest to provide comfort and insulation for the eggs and chicks. This lining may consist of feathers, fur or other soft materials that enhance the nest's coziness.

Shaping and Reinforcing: Birds meticulously shape and reinforce the nest to ensure stability and durability. This may involve adjusting the arrangement of twigs and other materials, weaving them together tightly, and reinforcing weak spots.

Camouflage and Concealment: Some birds take additional measures to camouflage or conceal their nests to protect them from predators. This can involve using materials that blend in with the surroundings or selecting a well-hidden location.

Completion and Readiness for Eggs: Once the nest is complete, the female bird lays her eggs inside. The number of eggs and the incubation period vary among species. The design of the nest often aligns with the bird's specific needs, providing a secure and stable environment for the eggs and, later, the chicks.

Throughout this process, each species exhibits unique adaptations and behaviors. Some birds, like the weaver birds, are known for their intricate woven nests, while others, like swallows, create mud nests attached to vertical surfaces. The

artistry and complexity of nest-building reflect the evolutionary adaptations that have developed over time to meet the challenges of each species' environment.

WORKING GALLERY- Answers

1.

- ◆ (b) Fish
- ◆ (d) Crane
- ◆ (b) Coo
- ◆ (a) Helps to keep body warm.
- ◆ (d) Statement (i) is correct statement (ii) is wrong
- ◆ Flight feathers are seen on the wings and the tail. These feathers help birds to fly. If flight feathers are lost in a bird, the bird cannot fly.
- ◆ For swimming in water, the bird should have webbed feet, which are wide and flat. The webbing between the toes helps them swim efficiently in water. Hen (Chicken) has scaly legs and strong, sturdy feet. Their legs are adapted for both walking and scratching the ground in search of food.
- ◆ Kingfishers have wedge shaped beak which helps them to catch the fish without splashing

the water.

- ◆ Birds make sound to - alert others when there is danger, call others to fly together, travel in search of food, attract their mates.
- ◆ Eagle mainly eats small animals and birds. They have hooked beak for ripping flesh from their prey. Humming bird has long, needle like beak to suck nectar from flowers.

2.

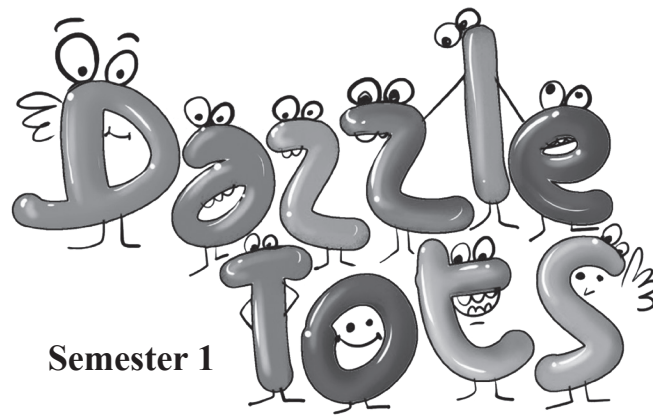
Wood pecker	Eagle
(b) There are two toes forward, and two toes pointing backwards.	(a) Has strong, sharp claws to catch and hold the prey.
(c) Chisel shaped beak helps to drill wood and pick insects.	(d) Hooked beak for ripping flesh from their prey.

3.

- Eagle - Rat
- Parrot - Nuts and fruits
- King fisher - Fish
- Woodpecker - Small worms

Additional activity.

- Prepare a model of a bird nest by using locally available materials.



**TEACHERS RESOURCE
MANUAL**

**EVS - Science
Grade 4**

GRADE - 4

Introduction

Photosynthesis is a biological process used by green plants as their food preparation. Leaves are often called the “kitchen of life” for plants because they play a crucial role in the process of photosynthesis. Photosynthesis is how plants make their own food using sunlight, water, and carbon dioxide from the air. Leaves are like little food factories where this magical process happens. Photosynthesis is vital for life on Earth. Not only do leaves produce food for plants, but they also release oxygen into the air, making them essential for life on Earth.. The activities included in this chapter aimed to understand the process and to inculcate the importance of plants on earth. This chapter deals with a variety of tools and techniques required to study photosynthesis in brief. Based on the chapter necessary learning activities should be planned to strengthen the learning process and also to express the values and attitudes towards society.

Previous Knowledge

- The learner knows about the
 - the parts of plants
 - functions of each part of a plant
- the need of food
- food contains nutrients
- food materials of different animals
- plant parts have different colours

Learning outcomes

The learner.

- ◆ identifies the leaves of the plants are the site of preparing food.
- ◆ comprehends the things needed for preparing food.
- ◆ demonstrates the experiment to prove the presence of chlorophyll in coloured leaves.
- ◆ gets the idea about the pigments in the leaf.
- ◆ engages in experiment of observing stomata.
- ◆ identifies the role of stomata in the exchange of gases.
- ◆ appreciates the process of photosynthesis.
- ◆ completes the equation for photosynthesis.
- ◆ differentiates autotrophs and heterotrophs.
- ◆ discriminates and categorizes heterotrophic plants based on their unusual food capturing mechanism.
- ◆ realises the importance of plants for life on earth.
- ◆ organizes the programmes for conservation of plants.

Major concepts

- ◆ The leaves are main site of preparing food in plants.
- ◆ Sunlight, carbon dioxide, water and chlorophyll are the factors needed for preparing food.
- ◆ Chlorophyll is there in all leaves.
- ◆ Stem, leaf, flower and fruits contain pigments.
- ◆ Chlorophyll is the major pigment.
- ◆ The various pigments give different colour to plant parts.
- ◆ Through stomata carbon dioxide gets in and oxygen comes out.
- ◆ Photosynthesis is a process in which plants synthesise their food by utilising carbon dioxide and water in presence of light and chlorophyll.
- ◆ Plants are the producers of earth.
- ◆ Other organisms depend on plants for their food and are heterotrophs.
- ◆ The life on earth depends on green plants.
- ◆ We should conserve the plants.
- ◆

UNIT FRAME

Unit -1 The Kitchen Of Life

Total Time: 8 Periods Of 40 Minutes

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
<ul style="list-style-type: none"> ◆ identifies the leaves of the plants are the site of preparing food. 	<ul style="list-style-type: none"> ◆ The leaves are main site of preparing food in plants. 	<ul style="list-style-type: none"> ◆ Cartoon analysis, labelling picture, drawing picture 	<ul style="list-style-type: none"> ◆ Cartoon and picture in TB 	<ul style="list-style-type: none"> ◆ Participation in group activity. Picture in 'My Science Diary'.
<ul style="list-style-type: none"> ◆ comprehends the things needed for preparing food. 	<ul style="list-style-type: none"> ◆ Sunlight, carbon dioxide, water and chlorophyll are the factors needed for preparing food. 	<ul style="list-style-type: none"> ◆ Illustration analysis, word web completion 	<ul style="list-style-type: none"> ◆ Experiment 1,2,3,4 in TB and word web 	<ul style="list-style-type: none"> ◆ Inferences in 'My Science Diary', Completed word web in TB.
<ul style="list-style-type: none"> ◆ demonstrates the experiment to prove the presence of chlorophyll in coloured leaves. 	<ul style="list-style-type: none"> ◆ Chlorophyll is there in all leaves. 	<ul style="list-style-type: none"> ◆ Discussion, Experimentation 	<ul style="list-style-type: none"> ◆ Materials for experiment 	<ul style="list-style-type: none"> ◆ Practical report in 'My Science Diary'
<ul style="list-style-type: none"> ◆ gets the idea about the pigments in the leaf. 	<ul style="list-style-type: none"> ◆ Stem, leaf, flower and fruits contain pigments. ◆ Chlorophyll is the major pigment. ◆ The various pigments give different colour to plant parts. 	<ul style="list-style-type: none"> ◆ Description analysis, illustration analysis, table completion 	<ul style="list-style-type: none"> ◆ Description, illustration and table in the TB, various plants parts with different colours 	<ul style="list-style-type: none"> ◆ Description in 'My Science Diary', Completed table in TB.
<ul style="list-style-type: none"> ◆ engages in experiment of observing stomata. ◆ identifies the role of stomata in the exchange of gases. 	<ul style="list-style-type: none"> ◆ Through stomata carbon dioxide gets in and oxygen comes out. 	<ul style="list-style-type: none"> ◆ Doing experiment, Illustration analysis, comparing image with picture, writing practical rec 	<ul style="list-style-type: none"> ◆ Materials for practical, illustration in TB, Picture in TB 	<ul style="list-style-type: none"> ◆ Practical report in 'My Science Diary', participation in practical.
<ul style="list-style-type: none"> ◆ appreciates the process of photosynthesis. ◆ completes the equation for photosynthesis 	<ul style="list-style-type: none"> ◆ Photosynthesis is a process in which plants synthesise their food by utilising carbon dioxide and water in presence of light and chlorophyll. 	<ul style="list-style-type: none"> ◆ Picture analysis, illustration analysis, completing equation 	<ul style="list-style-type: none"> ◆ Picture, illustration in TB, indicators, incomplete equation 	<ul style="list-style-type: none"> ◆ Description in 'My Science Diary', Completed equation.

<ul style="list-style-type: none"> ◆ differentiates autotrophs and heterotrophs. ◆ discriminates and categorizes heterotrophic plants based on their unusual food capturing mechanism. ◆ realises the importance of plants for life on earth. ◆ organizes the programmes for conservation of plants. 	<ul style="list-style-type: none"> ◆ Other organisms depend on plants for their food and are heterotrophs. ◆ Plants are the producers of earth. ◆ The life on earth depends on green plants. ◆ We should conserve the plants. 	<ul style="list-style-type: none"> ◆ description analysis, picture analysis, open discussion and poster making, planting and protecting trees. 	<ul style="list-style-type: none"> ◆ Pictures and description in TB, discussion points and hints for Poster 	<ul style="list-style-type: none"> ◆ Description in 'My Science Diary'. exhibition on display board, participation in group activity. Prepared posters, engage in plant protection activities.
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Site of photosynthesis (1 period)

Activity 1 (Cartoon analysis, labelling picture, drawing picture)

- ◆ This activity aims to familiarize students with the concept that leaves are the major site of photosynthesis. The students are divided into groups of six members. The cartoon in the textbook is analyzed in groups. The groups make guesses to address Sana's doubt and record their thoughts in "My Science Diary." For discussion, points such as "Our food," "Parts of plants," and "Functions of plant parts" can be explored. No consolidation is needed at this stage. Following this, students label the leaf as the kitchen of plants in the textbook. Each student draws this picture in 'My Science Diary' and labels the leaf as the kitchen in plants.

Consolidation

- ◆ Leaves are the main site of photosynthesis

Evaluation

- ◆ Participation in group activity. Picture in 'My Science Diary'.

We together make food (1 period)

Activity 1 (Illustration analysis, word web completion)

- ◆ This activity aims to explore the factors necessary for preparing food (photosynthesis).

By observing and analyzing the four illustrations, students write inferences about each experiment and ultimately arrive at a conclusion regarding the factors needed for the preparation of food. The following indicators can be used for analyzing the illustrations.

Indicators

- Result of each experiment (1, 2, 3 and 4)
- Name the factors considered for experiment
- List the factors essential for making food
- ◆ After analysing the students write their inferences of each experiment in "My Science Diary".
- ◆ Each student completes the word web in the TB and assesses by exchange with peers.

Consolidation

- ◆ Experiment 1 – The factors like sunlight, carbon dioxide, water and chlorophyll are present. Food production takes place.
- ◆ Experiment 2 – The factors like carbon dioxide, water and chlorophyll are present. Sunlight is absent. No food production in the absence of sunlight.
- ◆ Experiment 3 – The factors like sunlight, water and chlorophyll are present. Carbon dioxide is absent. No food production in the absence of carbon dioxide.
- ◆ Experiment 4 – The factors like sunlight, carbon dioxide and water are present. Chlorophyll is



absent. No food production in the absence of chlorophyll.

- ◆ In Experiment 1 factors like sunlight, carbon dioxide, water and chlorophyll are present. Food production also take place. But in other experiments some factors are absent. So in these experiments no food production occurs. From this it is clear that for food production factors like sunlight, carbon dioxide, water and chlorophyll are necessary.
- ◆ Carbon dioxide Water Chlorophyll

Evaluation

- ◆ Inferences in ‘My Science Diary’, Completed word web in TB

Colourful plants (2 period)

Activity 1 (Doing experiment, writing practical record)

- ◆ This activity aims to determine the presence of chlorophyll in non-green leaves through experimentation. The activity can commence with a conversation and the doubts expressed by Sana and Sonu. Bringing leaves of different colours into the classroom provides a real-life context. After a discussion, students are grouped into pairs to conduct the experiment. Upon completing the experiment, students are instructed to record their findings as a practical record in ‘My Science Diary.’

Consolidation

- ◆ **Aim:** To find out the presence of chlorophyll in non-green leaves.
- ◆ **Materials required:** Two or three red Amaranthus leaves and blotting paper.
- ◆ **Procedure:** Take a red leaf. Rub the leaf on a blotting paper. Observe the colour change on the blotting paper.
- ◆ **Observation:** Blotting paper become green colour along with red colour.
- ◆ **Inference:** Chlorophyll is there in all leaves.

Evaluation

- ◆ Practical record in ‘My Science Diary’, Skill

in doing experiment.

To the Teacher

- ◆ Teacher should follow the instructions given in the first part of the HB under the heading experimentation.
- ◆ Teacher can give assignment to collect and conduct experiment with more examples.

Activity 2 (Description analysis, illustration analysis, table completion)

- ◆ This activity aims to learn more about the pigments present in various plant parts that contribute to the colouration of these parts. The teacher brings in different plant parts exhibiting a variety of colours and initiates a discussion about the different colours observed in these plant parts. The students are directed to analyze the descriptions and illustrations based on the following indicators and write their inferences in ‘My Science Diary.’

Indicators

- Different colours seen in plant parts.
- Pigments.
- Types of pigments, the colour impart by them.

Consolidation

- ◆ Red, yellow, green, red, orange, violet are the major colours seen in plant parts.
- ◆ The substances which give colour to plant parts are called pigments.
- ◆ Chlorophyll is a pigment which gives green colour to plant parts. Xanthophyll. is a pigment which gives yellow colour to plant parts. Carotene is a pigment which gives red/orange colour to plant parts. Anthocyanin is a pigment which gives purple colour to plant parts.
- ◆ After completion each student individually completes the table in the TB. After peer assessment the completed table is redraw in ‘My Science Diary’.

Evaluation

- ◆ Description in 'My Science Diary', Completed table in TB.

Entry... Exit ... (1 period)

Activity 1 (Doing experiment, Illustration analysis, comparing image with picture, writing practical record)

- ◆ This activity aims to engage in an experiment to observe stomata and understand their role in the exchange of oxygen and carbon dioxide. The students prepare the procedure by analyzing the illustration. After conducting the experiment, the students compare the observed images from the microscope with the pictures provided in the textbook. They then individually write the practical record and draw the pictures of stomata in 'My Science Diary'.

Consolidation

- Practical record
- ◆ **Aim:** To observe the stomata in leaves.
- ◆ **Materials required:** Thick leaf, cello tape, Saffranine stain, petry dish, watch glass, glass slide, cover glass, microscope
- ◆ **Procedure:** Take a thick leaf. Stick cello tape on the lower surface of the leaf. Peel off a little from the surface. Place the peeling in a dilute stain for a few seconds. Place stained peeling on a microscopic glass slide with a drop of water. Cover with a cover glass. Observe under a microscope.
- ◆ **Observation:** Stomata (Draw picture also)
- ◆ **Inference:** Stomata are small openings seen on the surface of leaves.
 - Through stomata carbon dioxide gets in and oxygen comes out.

Evaluation

- ◆ Practical record in 'My Science Diary', Skill in doing experiment.

Photosynthesis (1 period)

Activity 1 (picture analysis)

- ◆ This activity aims to understand that sunlight and water are also essential for preparing food. By comparing plants in Picture A and B, students identify the reason for the bending of Plant B towards the window. Upon comparing the subsequent pictures, students grasp the importance of water. They then write their inferences in 'My Science Diary'.

Consolidation

- ◆ Sunlight and water are also needed for preparing food.

Evaluation

- ◆ Description in 'My Science Diary'.

Activity 2 (Illustration analysis, completing equation)

- ◆ The aim of this activity is to understand photosynthesis. By analyzing the description and illustration using the provided indicators, students will write their inferences in 'My Science Diary'. Following this, each student will complete the equation regarding photosynthesis in their textbook. Once completed, they will record it in 'My Science Diary'.

- ◆ Indicators
 - Photosynthesis
 - Autotrophs

Consolidation

- ◆ Plants synthesise their food by utilising carbon dioxide and water in presence of light and chlorophyll. This process is known as photosynthesis.
- ◆ Plants can make their own food through photosynthesis. So, they are autotrophs.
- ◆ Carbon dioxide + Water Chlorophyll Food + Oxygen

—————→
Sunlight

Evaluation

- ◆ Description in 'My Science Diary', Completed equation.

Autotrophs and heterotrophs(2 periods)

Activity 1 (description analysis, picture analysis)

- ◆ This activity aims to differentiate between autotrophs and heterotrophs. By analyzing the pictures and descriptions in the textbook, students make inferences about heterotrophs in “My Science Diary”. Additionally, students are directed to collect more examples of heterotrophs.

Consolidation

- ◆ Animals who depend on plants or other animals for food are called heterotrophs.
- ◆ Cow, elephant, deer, rabbit, lion, tiger, eagle are heterotrophs.
- ◆ Plants are the producers in nature.

Evaluation

- ◆ Description in ‘My Science Diary’.

Activity 2 (description analysis, picture analysis)

- ◆ This activity aims to explore the food capturing mechanisms in plants. By analyzing the pictures and descriptions in the textbook, students make inferences in ‘My Science Diary’. Additionally, students are directed to gather more information about the unusual food capturing mechanisms in plants for display on the bulletin board (Group activity).

Consolidation

- ◆ Rafflesia, Cuscuta - Absorb food materials from host plant using specialized roots.
- ◆ Loranthus - It can synthesise its food but absorb water from host plant.
- ◆ Monotropa, Neottia - Absorb nutrients from dead organic matter.
- ◆ Pitcher plant, Sun dew, Venus flytrap - Depend on insects for their requirement of nitrogen.

Evaluation

- ◆ Description in ‘My Science Diary’. exhibition on display board, participation in group activity.

To the teacher

- ◆ Rafflesia is a unique plant found in the rainforests of Southeast Asia. It is famous for having the largest flower in the world, sometimes growing up to one meter in diameter. Despite its enormous size, Rafflesia doesn’t have stems, leaves, or roots like most plants. Instead, it is a parasitic plant that lives off nutrients from a host vine called Tetrastigma. The flower of Rafflesia is a deep red or maroon colour with white spots, resembling a giant, blooming cabbage. Interestingly, it emits a foul odour similar to that of rotting meat to attract flies for pollination. Once pollinated, the flower produces large, round fruits filled with thousands of tiny seeds. Rafflesia is a rare and endangered plant due to habitat destruction and over-harvesting. Efforts are being made to conserve and protect this extraordinary species so that future generations can continue to marvel at its beauty.

Activity 3 (description analysis, picture analysis)

- ◆ This activity aims to understand the importance of conserving plants. After conducting group discussions about the significance of plants, each group is tasked with preparing awareness posters advocating for the conservation of plants. Additionally, each group is directed to plant a tree on their school campus and assign duties to protect and maintain it.

Consolidation

- ◆ The life on earth depends on green plants.
- ◆ We should conserve the plants.

Evaluation

- ◆ Prepared posters, participation in group activity, engage in plant protection activities.

WORKING GALLERY

Answers

Answer the following

- c) Oxygen
- Chlorophyll

- Xanthophyll

Match the following

Tomato - Carotene
 Orange - Xanthophyll
 Grapes - Anthocyanin

- ◆ (B) Statement (i) and statement (ii) are wrong.
- ◆ (C) Cuscuta, others depend on insects for their requirement of nitrogen
- ◆ AUTOTROPH - Rice, Carrot, Wheat, Grass
 HETEROTROPH - Giraffe, Fish, Spider, Tiger

Here are some activities suitable for a class 4 level to protect plants:

- ◆ **Plant a Garden:** Allocate a portion of the schoolyard for a garden where students can plant flowers, vegetables, or small trees. Teach them basic gardening skills such as planting, watering, and weeding.
- ◆ **Trash Pickup:** Organize a school-wide cleanup day where students collect litter and garbage from around the school grounds and nearby areas to prevent pollution that can harm plants.
- ◆ **Watering Schedule:** Create a watering schedule for classroom plants. Assign different students each day to water the plants, teaching them responsibility and the importance of consistent care.
- ◆ **Composting:** Set up a compost bin in the schoolyard where students can dispose of fruit and vegetable scraps from their snacks and lunches. Teach them about composting and how it enriches the soil for plants.
- ◆ **Plant Identification:** Take students on a nature walk where they can learn to identify

different types of plants. Teach them about native plants and why they are important for the local ecosystem.

- ◆ **Recycled Plant Pots:** Encourage students to bring in recyclable materials such as plastic bottles or containers to make their own plant pots. This activity teaches the importance of recycling and provides new homes for plants.
- ◆ **Bird Feeder:** Build bird feeders with the students using recycled materials. Hang them around the schoolyard to attract birds, which help in pollination and pest control for plants.
- ◆ **Tree Adoption Program:** Partner with local environmental organizations or nurseries to start a tree adoption program. Each class can adopt a tree, and students are responsible for caring for it throughout the year.
- ◆ **Nature Journaling:** Provide students with nature journals to record their observations of plants throughout the year. Encourage them to note changes in plant growth, flowering times, and any signs of pests or diseases.
- ◆ **Educational Campaign:** Have students create posters, presentations, or skits about the importance of protecting plants. They can share these with their classmates, school, or even the wider community to raise awareness.
 - Man is a heterotroph. Animals who depend on plants or other animals for food are called heterotrophs. Man depend on plants and other animals for food.
 - Photosynthesis directly provides oxygen and food for heterotrophs, helps maintain the balance of gases in the atmosphere, and provides habitat and shelter for many organisms, thus supporting the entire ecosystem.

Introduction:

Food is a fundamental aspect of our lives, providing nourishment, pleasure, and a means for social connection. Different types of food bring unique flavors and nutrients to our meals. Carbohydrates, proteins, fats, vitamins, and minerals are the key nutrients in food. Farmers are heroes who work hard to provide us with the food we need, supporting our communities. It's crucial to value and thank farmers for their vital role in agriculture and keeping our food supply steady. Embracing healthy eating habits is another way to enhance our well-being.

Previous knowledge

The child knows about the

- food items cooked in their house.
- various food items.
- various food preservation methods.
- Healthy food habits.

Learning Outcomes

The learner

- lists the various food items.
- describes the major nutrients in food and their functions.
- identifies the food items rich with carbohydrates, proteins, fats, vitamins and minerals.
- explains the importance of water and fibres in food.
- comprehends and explains about the food needed at different age groups.
- appreciates the efforts of farmers.
- describes how the various food material are

preserved.

- practices healthy food habits in life.

Major concepts

- ◆ We eat different types of food.
- ◆ Nutrients in food – Carbohydrates, proteins, fats, vitamins and minerals.
- ◆ Carbohydrates provide energy.
- ◆ Fats provide energy.
- ◆ Proteins help to grow.
- ◆ Vitamins and minerals protect us from diseases.
- ◆ Water is needed for life activities.
- ◆ Fibre helps for the easy removal of undigested food.
- ◆ We assess the nutritional requirements based on age and lifestyle.
- ◆ Farmers work hard to produce food items.
- ◆ We should respect farmers.
- ◆ Boiling, pickling, sweetening, salting, canning, dehydration are the various food preservation techniques.
- ◆ Healthy food habits.

Total Time: 11 period of 40 minute

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
lists the various food items.	We eat different types of food.	Picture observation, conversation, analysis, discussion	Pictures in TB	Identifying the food items in the text book, List of food items they like in 'My Science Diary', participation in group activity. Picture in bulletin board.
describes the major nutrients in food and their functions. identifies the food items rich with carbohydrates, proteins, fats, vitamins and minerals.	Nutrients in food – Carbohydrates, proteins, fats, vitamins and minerals. Carbohydrates provide energy. Fats provide energy. Proteins help to grow. Vitamins and minerals protect us from diseases.	Picture observation, listing the food items, completing illustration	Pictures in TB, Illustration	List of food items in each group in 'My Science Diary', Completed illustration in TB, participation in group activity.
explains the importance of water and fibres in food.	Water is needed for life activities. Fibre helps for the easy removal of undigested food.	Description analysis, discussion, poster preparation	Description and slide in the TB	Descriptions in 'My Science Diary', posters, participation in group activity.
comprehends and explain about the food needed at different age groups.	We assess the nutritional requirements based on age and lifestyle.	Observing, illustration, discussion	Illustration in TB	Completed description in 'My Science Diary', participation in group activity.
appreciates the efforts of farmers.	Farmers work hard to produce food items. We should respect farmers.	Observing, illustration, discussion, writing description, drawing illustration, Interview with farmer	Illustration and hints in TB	Completed descriptions in 'My Science Diary', participation in group activity, Completed illustration. Prepared questionnaire in 'My Science Diary', participation in group activity and interview. Completed report.

describes how the various food material are preserved.	Boiling, pickling, sweetening, salting, canning, dehydration are the various food preservation techniques.	Collage analysis, article analysis, discussion	Collage and article from science magazine in TB	Descriptions in 'My Science Diary', participation in group activity.
practices healthy food habits in life.	Healthy food habits	Completing Rating scale, preparing posters, peer assessment	Rating scale in TB	Completed rating scale, Prepared poster in 'My Science Diary'.

Types of food (1 period)

Activity 1 (picture observation, conversation analysis, drawing and colouring picture, discussion)

This activity aims to familiarize students with the food items we use. By analyzing the picture and conversation in the textbook, the teacher leads a discussion on healthy food habits, such as washing hands and eating food at proper times. Following this, students are instructed to write the names of food items in the table by observing the picture in the textbook and recording them in their 'My Science Diary.' Each student is guided to write down the food items they like in 'My Science Diary.' Afterward, the students are divided into groups (six members each) and instructed to draw and color a picture of their favorite food item to display on the class bulletin board.

Consolidation

- ◆ Healthy food habits - Wash your hands, take food in proper time. Taking food in proper time will keep the diseases away.
- ◆ Food items on the table - rice, chapatti, vegetable curry, chicken curry, fish curry, boiled eggs and fruits
- ◆ Food items students like – Rice, chapatti, parotta, Biryani, vegetable curry, chicken curry, fish curry, boiled eggs, bread sandwich,

Evaluation

Identifying the food items in the text book, List

of food items they like in 'My Science Diary', participation in group activity. Picture in bulletin board (Group).

Nutrients in food (2 periods)

Activity 1 (picture observation, listing the food items, completing illustration)

This activity aims to familiarize students with the nutrients contained in food. The class starts with students sharing their breakfast of the day. Afterward, the students are divided into four groups and instructed to identify the food items (as pictures in TB) in each group. They are then individually tasked with writing down the food items in each group in their 'My Science Diary.' Upon completing these activities, students are directed to fill in the illustration in the textbook. In the empty box, the teacher provides directions to write the food items and their functions. After completion, the students assess it with their peers.

Consolidation

- Carbohydrates - Wheat, rice, maize
- Fat - Ghee, coconut oil
- Protein - Meat, egg, pea, Ground nut
- Vitamins and minerals - Orange, apple, carrot, cabbage
- Carbohydrates - Wheat, rice, maize - provide energy.
- Fat - Ghee, coconut oil - provide energy
- Protein - Meat, egg, pea, Ground nut - help to grow.
- Vitamins and minerals - Orange, apple,

carrot, cabbage - protect us from diseases.

Evaluation

List of food items in each group in 'My Science Diary', Completed illustration in TB, participation in group activity.

Activity 2 (Description analysis, discussion, poster preparation)

This activity aims to understand the importance of water and fibers. Students will analyze the passage and slides using indicators as part of a group activity. Subsequently, they will individually write the consolidation in their 'My Science Diary.' The students are instructed to create posters in groups highlighting the importance of water and fibre, which will be displayed on the class bulletin board.

Indicators

Role of water.
Importance of fibre rich food.

Consolidation

- ◆ Water is needed for life activities. Water helps for digestion of food we eat. Water helps to remove waste materials from our body. A healthy person should drink 8 to 10 glasses of water daily.
- ◆ Vegetables are rich in fibre. Fibre helps for the easy removal of undigested food.

Evaluation

Descriptions in 'My Science Diary', posters, participation in group activity.

Need of food (1 period)

Activity 1 (Observing illustration, discussion)

This activity aims to assess the nutritional requirements based on age and lifestyle. The class begins by comparing the dietary needs of a baby and a sports person. Following this, students are directed to conduct a discussion analyzing illustrations in the textbook to explore

the correlation between food requirements, age and lifestyle. After the discussion, students are instructed to document their findings in 'My Science Diary.'

Consolidation

- ◆ New born baby - Mother's milk which contains all nutrients is enough.
- ◆ Growing baby – In addition to mother's milk, smashed potatoes, banana, steamed apples, cereals are also needed.
- ◆ Growing child - Need protein rich food for the growth of the body.
- ◆ Sports person - Need more energy. So carbohydrate rich food is needed.
- ◆ Old person - No physical exercise, so need less energy Take less food and include more fruits and vegetables in their diet.
- ◆ People need food based on their age and living style.

Evaluation

Completed description in 'My Science Diary', participation in group activity.

Farmer's effort (4 periods)

Activity 1 (Observing, illustration, discussion)

This activity aims to understand the hard work done by farmers in producing food and emphasizes the importance of respecting their efforts. The teacher initiates the discussion by posing the question, "Have you ever thought about how these food items are produced?" Following the question, a discussion is conducted without consolidation. Subsequently, students are directed to analyze illustrations and write a description in 'My Science Diary' highlighting the hard work of various individuals involved in bringing grains to our homes.

Consolidation

- The journey of grains from the field to our homes involves several crucial stages:

First, farmers plant seeds in their fields. When the plants grow up, farmers collect the grains. They put the grains in bags to keep them safe and make them easy to move. These bags are taken to big storage places called warehouses using trucks. In the warehouse, the grains are kept in good conditions until they are sent to stores. From there, the grains go to local shops, and we buy them to use at home. This whole process needs many people, like farmers, drivers, and store workers, to make sure we have food on our tables.

Evaluation

Completed description in 'My Science Diary', participation in group activity.

Activity 2 (Discussion, writing description, drawing illustration)

This activity aims to learn about the journey of different food items. After conducting discussions about the journey of fish, vegetables, milk, meat, and eggs, the students are instructed to write descriptions about their journeys in 'My Science Diary.' The hard work of various people, including farmers, is also emphasized. After completion, the students are divided into five groups. Each group is assigned a specific topic (the journey of fish, vegetables, milk, meat, or eggs). They are then tasked with drawing illustrations related to their assigned topic, similar to the illustrations provided in the textbook.

Consolidation

◆ The journey of vegetables from the farm to our homes involves a series of essential stages:

First, farmers grow different vegetables in their gardens or fields. They take care of the plants by watering them, giving them nutrients, and protecting them from bugs. After growing, the vegetables are taken to a storage place where they're sorted and packed. Then, they're sent to big sellers, called wholesalers, who supply them to local stores. You buy these vegetables from your nearby grocery store or market, where they are nicely displayed. Finally, you bring the vegetables

home and use them to make tasty and healthy meals.

◆ The journey of fish from the sea to our homes involves a series of essential stages:

A fish's journey starts in the sea. Then, a skilled fisherman uses a net to catch the fish. He pulls them from the sea, starting a new part of their journey. The fisherman takes the catch to a busy harbor where boats unload treasures. The fish moves to a lively market, where vendors sell to retailers and buyers. Chosen by a retailer, the fish heads to a local store. Customers select the freshest fish. Finally, the fish reaches homes and becomes a tasty part of meals—grilled, baked, or fried. This journey connects people to the ocean, the fisherman's hard work, and the cycle of nature, industry, and human enjoyment.

◆ The journey of milk from the farm to our homes involves a series of essential stages:

Milk's journey from the farm to our homes is a simple story of freshness and goodness. It all starts on the farm, where caring farmers look after their cows. Farmers take good care of the cows to ensure the milk's quality. In the farm house, the milk is collected and processed, keeping it clean and fresh. Once ready, the milk goes to retailers, where it's nicely packaged and displayed for customers to choose. The journey ends at our homes when we bring the milk from the store. It becomes a daily source of nourishment, used in cereal, cooking, or enjoyed on its own. This simple journey connects the hard work of farmers, the processing at the farm house, the role of retailers, and the everyday lives of families.

◆ The journey of meat from the farm to our homes involves a series of essential stages:

Meat's journey starts on the farm, where caring farmers raise animals. These animals live in a farm setting, and their well-being is a top priority. When the animals grow up, they go to a slaughterhouse where the meat is processed carefully and following ethical standards. After leaving the slaughterhouse, the meat goes to retailers, like

stores, where you can choose from various meat products. The journey ends at our homes when we bring the meat from the store. We cook it in different ways—grilled, baked, or fried—to enjoy a tasty and nourishing meal. This simple journey connects the farm, the farmer’s care, the retailer, and our dining tables, making sure we get quality and safe meat for our daily lives.

◆ **The journey of egg from the farm to our homes involves a series of essential stages:**

Eggs start on the farm where farmers take good care of hens, and they lay fresh eggs in a comfy place. Farmers collect these eggs daily, making sure they are clean and high quality, and they also look after the health of the hens. Some eggs might go to a hatchery, but mostly this step is for hatching chicks. The next stop is wholesalers who handle lots of eggs and send them to retailers. At grocery stores or supermarkets, the eggs are nicely displayed for customers. They come in protective packaging to stay fresh. When customers buy eggs, they bring them home and use them in different recipes for tasty and nutritious meals. So, from the farm to the farmer’s care, and maybe through a hatchery and a wholesaler, eggs make their way to the retailer and finally to our homes. Each step is important to make sure we get fresh and good-quality eggs.

Evaluation

Completed descriptions in ‘My Science Diary’, participation in group activity, Completed illustration.

Activity 3 (Interview with farmers)

This activity aims to learn more about farmers. The students are divided into groups of six members each. They are instructed to prepare questions for an interview with a locally available farmer. After the presentation of questions, high-quality questions are selected. Duties are then assigned to students. After conducting the interview, the farmer should be honored, and the contributions of farmers to our country acknowledged. The students are directed to write a report of the interview in ‘My Science

Diary.’

Consolidation

Interview questionnaire.

Evaluation

Prepared questionnaire in ‘My Science Diary’, participation in group activity and interview. Completed report.

Food preservation (2 periods)

Activity 1 (Collage analysis, discussion)

This activity aims to understand the need of food preservation. After analyzing the collage of newspaper reports and having a general discussion in groups of six members, based on the indicators given in TB, inferences made during group discussions are written individually in ‘My Science Diary.’

Consolidation

- ◆ Food spoil due to the following reasons – too much of water in food, temperature of surroundings, lack of preservation methods.
- ◆ Causes of food poisoning - tiny invisible germs, leaving food in open places, mixing different food materials together (for example, meat, fish, and vegetables), improper washing of food materials and vessels, and improper cooking.
- ◆ Prevention of food spoilage – By using adequate food preserving methods.

Evaluation

Descriptions in ‘My Science Diary’, participation in group activity.

Activity 2 (Article analysis, discussion)

This activity aims to understand various food preservation techniques. The class can be started with the local preservation methods adopted by mothers in home. Following this by analyzing the article from a science magazine and inferences made about the various food preservation methods,

during group discussions, are written individually in 'My Science Diary.'

Consolidation

- ◆ The peculiarities of various food preservation techniques – Boiling, pickling, sweetening, salting, canning, dehydration
- ◆ Food preservation for Meat – Salting, Raw mango – pickling and dehydration, Milk – Boiling. Cherry – Sweetening, Ripe mango – Sweetening and dehydration

Evaluation

Inferences in 'My Science Diary', participation in group activity.

Healthy Food habit (1 period)

Activity 1 (Rating scale completing, preparing posters, peer assessment)

This activity aims to practice the healthy food habits. Each student individually completes the rating scale given in TB. After this each student prepare a poster on healthy food habits in 'My Science Diary'. After the completion of posters the posters are assessed by peer groups

Consolidation

- ◆ Healthy food habits

Evaluation

Completed rating scale, Prepared poster in 'My Science Diary'.

WORKING GALLERY- Answers

- ◆ Carbohydrate
- ◆ d) Egg, others are in carbohydrate rich food item.
- ◆ d) Statement (i) is correct, statement (ii) is wrong
- ◆ help to grow.
- ◆ d) water
- ◆ Legumes, nuts, green Peas, soya milk.

- ◆ In both canning and dehydration moisture is removed. In Canning, moisture and oxygen present in the food are removed. After removing moisture from food, it is sealed in cans. Dehydration can be done by sunlight or drier. Fruits are preserved by this method.
- ◆ Dehydration. Germs need water to grow. So, removal of water is also a good preservative method. Dehydration can be done by sunlight or drier.
- ◆ Fibre helps for the easy removal of undigested food.
- ◆ Shinoj should include fruits and vegetables in his diet.
- ◆ Avial is a delicious and nutritious South Indian dish made with a variety of vegetables, coconut, and yogurt. It's seasoned with coconut oil and curry leaves, giving it a unique flavor. Here's a basic recipe for preparing Avial:

Ingredients:

1 cup mixed vegetables (carrots, beans, drumsticks, pumpkin, ash gourd, potatoes, etc.), cut into long strips, 1/2 cup grated coconut, 1/2 cup plain yogurt, 1 green chili, chopped, 1/2 teaspoon cumin seeds, A pinch of turmeric powder, Salt to taste
Curry leaves, 2 tablespoons coconut oil.
For Tempering (Optional) - 1 teaspoon mustard seeds, 1 dried red chili, broken into pieces, Curry leaves

Instructions:

Cut the vegetables into long, thin strips. You can use a combination of your favorite vegetables. In a large pan, cook the vegetables with a little water, turmeric powder, and salt until they are just tender. Be careful not to overcook. Once done, drain any excess water. In a blender, grind together grated coconut, green chili, cumin seeds, and a few curry leaves to a coarse paste. You can add a little water if needed. Add the ground coconut mixture to the cooked vegetables. Mix well. Whisk the yogurt and add it to the vegetable-coconut mixture. Stir gently to combine. Season with Coconut Oil. Heat coconut oil in a pan. Add mustard seeds, dried red chili pieces (if using), and curry leaves for

tempering. Once the mustard seeds splutter, pour this seasoning over the avial.

- ◆ A balanced and nutritious food plan is essential for the healthy growth and development of 11-year-old children. It's important to provide a variety of foods from different food groups to ensure they receive the necessary nutrients.
- ◆ If you have a friend in the fourth grade who tends to waste food, it's essential to approach the situation with empathy and provide positive guidance. Here's some advice you could give your friend:
 - Explain the Importance: Share with your friend why it's important not to waste food. Explain that there are many people who don't have enough to eat, and wasting food contributes to the problem.
 - Start Small: Suggest starting with smaller portions. Encourage your friend to take just enough food that they can comfortably finish, and they can always go back for more if they're still hungry.
 - Take Only What You Can Eat: Teach your friend to be mindful when serving themselves. Help them understand that taking more than they can eat not only leads to waste but is also not good for their health.
 - Share Leftovers: If your friend has leftovers, suggest sharing them with someone else or saving them for later. This way, they won't go to waste, and your friend can enjoy the food at another time.
 - Be Grateful: Remind your friend to be grateful for the food they have. Encourage them to appreciate the effort that goes into preparing meals and to recognize that

not everyone has the privilege of having regular, nutritious meals.

- Think Before Tossing: Before throwing away food, ask your friend to think about whether there's another use for it. For example, some food scraps can be composted instead of being thrown in the trash.
- Set an Example: Lead by example. Show your friend how you make an effort to avoid wasting food. Sometimes, seeing others being mindful can encourage positive behavior.
- Involve Them in Meal Planning: If possible, involve your friend in planning meals. When individuals have a say in what's being served, they may be more inclined to eat what's on their plate.
- Make it Fun: Turn mealtime into a fun and enjoyable experience. Encourage your friend to try new foods and make meals together. When children are engaged in the preparation process, they may be more inclined to appreciate the food.
- Talk to a Teacher or Parent: If the issue persists, consider talking to a teacher or your friend's parents. They may be able to address the situation and provide additional guidance.

Remember to approach the conversation with kindness and understanding. It's important to create a supportive environment where your friend feels comfortable learning and adopting more mindful eating habits.

Additional activity.

Prepare a healthy food with the help of your parents.

Introduction:

Measurement! Isn't it something that we do in our everyday life? Can you ever think about a world without measurement? But think once upon a time there was a time when there was no measurements and no facilities for that. But in course of time there came a need for measurement due to several natural needs like flood and other problems. As a result researches progressed and the units for measurement came into being. In this unit we will learn about the measurements regarding length, time, mass, fundamental quantities and the cares to be taken while measuring etc. Let's see them one by one.

Previous knowledge

The child knows about the

- ◆ Length
- ◆ Time
- ◆ Weight

Learning Outcomes

The learner understands

- ◆ the need for measurements and units
- ◆ the need for unified units
- ◆ metre, centimetre, kilometre etc
- ◆ the precautions to be taken while measuring the length
- ◆ what mass is and its units like gram, kilogram

etc

- ◆ the unit of time like second, minute, hour, etc
- ◆ fundamental quantities

Major concepts

- ◆ The basic unit of length is metre
- ◆ The cares to be taken while measuring length
- ◆ Relation between m, cm, km etc
- ◆ Mass
- ◆ The basic unit of mass is kilogram
- ◆ The relation between kg, g, quintal etc
- ◆ The basic unit of time is second
- ◆ The relation between second, minute and hour
- ◆ The fundamental quantities

Total Time: 6 periods of 40 minutes

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
Comprehends the need for standard units.	For measurement we need units. This unit must be unified and standardized or else there will be difficulty in comparing quantities.	Picture observation, discussion, discussions	Scale (ruler) Picture of using hand span Conversion table like m into cm, m into km etc	Writing in 'MY science Diary', participation in group activity. Completed table in 'MY science Diary'

understands the necessity of measuring length, mass, and time.	The basic unit of length is metre. The basic unit of mass is kilogram The basic unit of time is second	Discussions Completing the worksheets Comparisons etc	Scale Common balance Watch Picture of common balance, clock etc	Writing in 'MY science Diary', participation in group activity. Completed table in 'MY science Diary'
appreciates fundamental units based on SI units and use them appropriately in different situations.	Understands that the length, mass and time are not depending on any other quantities. Hence they are fundamental quantities.	illustration observation, discussion, activity completion	Illustration in TB, Activity	Writing in 'MY science Diary', participation in group activity, Completed activity in 'MY science Diary'
Takes place in activities to record units and their symbols properly in different situations.	Understands that each unit can be written using appropriate symbols	Conversation analysis, discussion, activity completion	conversation in TB, Activity	Writing in 'MY science Diary', participation in group activity, Completed activity in 'MY science Diary'

Activity 1 (picture observation, discussion, illustration analysis)

The teacher can start the discussion based on measuring the length of the table in the figure.

Then the teacher can ask the students to measure the length of the desk or bench in the class room using the unit hand span. Let all the children measure the length of the same desk using hand span and note down the length in " My Science Diary"

Now the teacher can raise the question, are you all getting the same answer?

Then teacher can ask if the unit of handspan is convenient and sufficient?

Based on the answers the teacher can explain the need for a unified unit which is convenient to all.

Now the metre scale can be shown and tell the students that this length, the so called metre, is the standard unit.

Also introduce centimeter, millimeter by demonstrating and explain the relation between them. Then ask the students to complete the TB work

- a) 1 m = cm
- b) 1 m = mm
- c) 1 km = m
- d) 1 km = cm

ans a) 100 b) 1000 c) 1000 d) 100000

Consolidation

Unit is necessary to measure length

The unit must be convenient

It must be unified



Evaluation

Writing in 'MY science Diary', participation in group activity. Completing the work sheet in the text book

Activity 2 (picture observation, discussion, completion of table)

Now the teacher can discuss the cares to be taken while doing measurements and convince the children about the need for it. For this use the pictures.



Now we can ask the children to measure the length and breadth of the class room using a metre scale , the length of the desk etc., and to note them down in " My Science Diary"

Then let the students complete the work sheets in the text book.

Now ask the children to draw a curve line in " My Science Diary" and guide them to measure its length using the thread which should be supplied.

Now the teacher can give an assignment to find out the distance between two places in km.

Consolidation

- ◆ Use the unit cm for measuring small length like the length of a note book
- ◆ Use the unit metre to measure the length of a desk, class room etc.
- ◆ Yes the unit km to find the distance between two places.
- ◆ Use convenient method to measure the length.

Assessment

Completed table in 'MY science Diary', participation in group activity etc

Activity 3 (picture observation, discussion) If possible take a common balance and weights to the class.

We can begin the discussion about buying fruits and the way of measuring the quantity. Let the

teacher explain that anything which occupies space is a matter and that the quantity of matter in it is the mass of it.

Suitable by showing the picture or common balance make the children understand what mass is and the way of measuring it.

Explain the unit kilogram, gram, quintal etc., as well.



Now explain this table as well.

1 kg	1000 g
1 Quintal	100 kg
1 ton	1000 kg
1 g	1000 mg

Assessment:

Completed work sheets, My science Diary and participation in the discussions

Activity 4 (picture observation, clock observation, discussion

Teacher can ask the students by what time did you reach the school? By what time will you leave? Now what may be the time etc.

Then teacher can show a clock or its picture and explain about the time, the unit of time etc.

Then the teacher can explain that one day is 24 hour, one hour is 60 minute, one minute is 60 second etc. Then the teacher can ask the children to complete the following work sheet.

One week = - - - - - days

One day = - - - - - hour

One hour = - - - - - minute

One minute = - - - - - second

One day = - - - - - hour = - - - - - minute
= - - - - - second



Assessment:

Completed work sheets, My science Diary and participation in the discussions

Activity 5 Seminar

Let the teacher arrange a seminar on the topic about the symbols of various units and the rules to be followed while writing down the units; All the children should have the seminar paper and let one student be the facilitator. Before that the children should be given instructions about the way of conducting a seminar.

How to Conduct a Seminar: A Guide for Students

Are you excited to learn how to conduct a seminar? A seminar is a special meeting where you share information about a topic with others. Here are some simple steps to help you organize and present your seminar:

1. Choose a Topic

Pick a subject that interests you and your classmates. It should be something you want to learn more about and share with others.

2. Research

Gather information about your topic. Use books, websites, or ask a teacher for help. Remember to note down important points.

3. Plan Your Presentation

Decide how you will present your information. You can use:

- ◆ Slides: Create simple slides with pictures and key points.
- ◆ Posters: Make colorful posters to display your information.
- ◆ Props: Bring objects related to your topic to show your classmates.

4. Practise

Practise speaking in front of a mirror or with a friend. Make sure you know what you want to say

and try to speak clearly and confidently.

5. Prepare Handouts

You can make small handouts with key points or fun facts about your topic. Your classmates can take these home to learn more.

6. Set Up

On the day of the seminar, make sure everything is ready:

- ◆ Arrange your slides or posters.
- ◆ Check any equipment like projectors or computers.
- ◆ Make sure you have your handouts and props.

7. Start the Seminar

Begin by greeting your audience and introducing yourself. Explain what your seminar is about and why you chose this topic.

8. Present Your Information

Share the information you gathered. Remember to:

- ◆ Speak in a good tone and tune
- ◆ Present the report as well

Evaluation: Seminar presentation, the participation of each, the questions asked etc

Working Gallery Answers

1.

- a. kg b. m³
- b. second
- c. kilogram
- d. 1000
- e. 2000
- f. Mass of a substance is the quantity of matter contained in it
- g. length, mass, time
- h 1 mm
- i. Keep the scale close to the object without any inclination. The position of the eye must be proper.
- j. a) km b) cm

2.

A	B	C
1. Length	Meter scale	cm
2. Time	Watch	s
3. Mass	Common balance	kg

3.

Quantity	Ancient	Modern
◆ Length	Arm span	metre
◆ Mass	pound	kilogram
◆ Time	Length of shadow	Clock/ watch

4) Convert the following units into SI units without changing their values.

- a) 45000 g = 45 kg
- b) 13 km = 13000 m
- c) 2 h = 120 minute
- d) 100 cm = 1 metre
- e) 6000 mm = 6 m
- f) 3000 mm = 3 m
- g) 60 minute = 3600 s

5) A train is expected to arrive at 16:00 hour. 4 pm
Another train which was expected to arrive at 14
hour is late by 4 hour. $14 + 4 = 18$ hour = 6 pm .
 7 pm = 19 .00 and 7 am = 7.00

Additional activity.

Prepare an album showing the picture of different tools used in ancient times to measure length , mass and time. .

4

THE ENERGY THAT CHANGED THE WORLD

Introduction:

Electricity is a versatile form of energy that plays an essential role in our daily lives. Its wide use stems from its ability to be easily converted into various forms such as heat, light, chemical, and sound energy. We can store electrical energy in batteries and reuse it as needed, with dry cells being a common example. A battery consists of two or more cells connected in a specific manner. The invention of the filament lamp revolutionized our world, demonstrating the significant impact of electrical energy. It is crucial to educate children about the importance of conserving electricity, emphasizing that it is a valuable resource that should never be wasted. Additionally, it is important to make them aware that the electricity supplied by KSEB (Kerala State Electricity Board) is very powerful and must be handled with the utmost care to ensure safety.

Previous knowledge

The child

- ◆ knows about the the working of bulb, fan etc
- ◆ is familiar with dry cells or batteries
- ◆ have seen distribution lines on sides of roads

Learning Outcomes

The learner can

- ◆ comprehend the idea of conductors and insulators.
- ◆ understand how a circuit is to be made and what are the things essential for it.
- ◆ understand what a battery is and the two ways

of making a battery.

- ◆ understand what a resistor is and the need of a resistor in a circuit
- ◆ appreciate and enjoy the working of a filament lamp.

Major concepts:

- ◆ Conductors and insulators
- ◆ Electric circuit, its components and their symbols
- ◆ Battery
- ◆ Filament lamp
- ◆ Energy change in electrical devices.

Time: 6 period of 40 minute

Concepts	TLM	Materials required	Assessment	Values	Time
Conductors and insulators	Experiment using metal wires, insulator wires, bulb and battery Discussion QR Code operation	2.5 V bulb 2 dry cells Wires, insulators projector	Giving connections Science diary	All substances are not conductors	40 minute

Electric circuit ,its components and their symbols	Experiment using metal wires, insulator wires, bulb and battery discussion	2.5 V bulb 2 dry cells Wires, Switch Chart of symbols	Giving connections Drawn symbols Science diary	We can shorten drawing using symbols	80 minute
battery	Demonstration Discussion	Cells, Torch Connecting wires Bulb	Giving connections Science diary	Grouping is possible in our life and it will lead to success.	80 minute
Filament lamp	Demonstration discussion, Narration of life of Edison or its seminar	Filament lamp Connecting wire battery	Observation, Science Diary Seminar report	The bulb brought out a revolution. Hard work will lead to success.	40 minute

Conductors and insulators (1 period)

Activity 1 (picture observation, discussion, doing experiments)

The teachers can introduce this part with an interesting experiment. Connect the devices as directed in the textbook and demonstrate. Based on that, you can define conductors as substances that allow electric current to flow through them, while insulators do not.

Consolidation

- ◆ Examples for conductors are copper, aluminium, brass, gold, iron, silver etc
- ◆ Examples for insulators are plastic, rope, dry wood, paper, tiles, sand, dry leaf etc

Evaluation

Entries in the ‘My Science diary’, The way in which they make connections.

Electric circuit, its components and their symbols (2 periods)

Activity 1 (picture observation, discussion, doing experiments)

This part can also be demonstrated through experiments. You can ask the students to connect a bulb and a battery. Once the connection is complete, you can ask, “Don’t you want to switch

the circuit on or off? Which component will we use for that? Isn’t it the switch?” After everything is set up, you can explain that what they have created is an electric circuit. Now, you can ask them to list the essential parts of the circuit:

- Source of current
- Connecting wires
- Switch
- Device to consume current (e.g., bulb)

Then, ask the students to draw the circuit in their notebooks. After they attempt the drawing, you can ask, “Is it difficult to make such a drawing?” Then, you can explain that it can be made easier by using symbols. Introduce the symbols through a chart or a blackboard drawing (blackboard drawing is better than a PowerPoint presentation because they can see the drawing process step-by-step).

Consolidation

- ◆ Electric circuit, its components and their symbols
- ◆ Battery

Evaluation

Entries in the ‘My Science diary’, The way in which they make connections, drawing circuits

Battery (2 periods)

Activity 1 (picture observation, discussion, doing experiments)

Try to light a 6V bulb using one cell. It may not glow, and if it does, it will be very dim. Then use two cells, three cells, and finally four cells. Now, you can ask the question:

When was the bulb giving maximum brightness?

Which is better, using one cell or grouped cells?

Using this technique, you can introduce the need for grouping cells. Then, you can explain that such an arrangement is called a battery. Next, the teacher can explain the modes of parallel connection and series connection. Have the children draw batteries with series and parallel combinations using symbols.

Consolidation

- ◆ A battery is the combination of two or more cells in a suitable manner to meet the requirement.
- ◆ A battery can be made by connecting the cells either in parallel or in series.

Evaluation

Entries in the 'My Science diary', The way in which they make connections, drawing battery

Activity 2 (picture observation, discussion)

The teacher asks the question How mobile, laptop work with out using electricity from direct supply?

The students response randomly.

How do we charge these devices?

What is the advantage of storage batteries?

After discussion, the teacher consolidates it.

Consolidation

- ◆ We charge these devices by plugging them into an electrical outlet using a charger. The charger fills the battery with energy, so the device can work even when it's not plugged in.
- ◆ The advantage of storage batteries is that they can store energy. This means you can use your devices, like a phone or a flashlight, without keeping them plugged into an outlet all the time. They are very handy because you can

take them anywhere and use them whenever you need to.

Evaluation

Entries in the 'My Science diary', participation in discussion.

Activity 2 (picture observation, discussion)

By observing the pictures on page 207 of text book, the students try identify the objects and find which form of energy supply to these objects?

Consolidation

- ◆ Loud speaker, Electric iron, Lamp
- ◆ They all use electrical energy.

Following this the teacher asks to find out the form of energy that each object give us? The students record their findings in 'My Science Diary'.

Consolidation

- ◆ Loud speaker – Sound energy, Electric iron – Heat energy, Lamp – Light energy
- ◆ Electrical energy can easily be converted into many other forms with minimum loss.
- ◆ Electrical energy can easily be converted into many other forms of energy like heat, light, sound etc.

Evaluation

Entries in the 'My Science diary', participation in discussion.

Filament lamp (1 period)

Activity 1 (picture observation, observing experiments, discussion, seminar,)

Show a filament lamp and light it suitably. Let the children enjoy it. If you have the children make the bulb, use only torch bulbs and batteries.

Explain that it was the scientist Edison who popularized the filament lamp. Share the history of Edison's work in finding the proper filament for

a bulb and how he exhibited it at Menlo Park in America. Tell them about the night when Edison showcased the bulb to the public at midnight, when there was no moonlight. The people were overjoyed and gave an excellent welcome to this invention.

We can conduct a seminar on the history of Edison, as it will greatly motivate the children.

Then, you can demonstrate heat formation in a resistor by connecting a nichrome wire of 4 to 5 cm in length to an eliminator. The nichrome wire will turn red, which will be fascinating for the children to see.

Consolidation

- ◆ A lamp converts electrical energy into light energy. (need not mention about the heat formation since it is discarded. The heat is not needed for us). Tungsten is used to make the filament of filament lamp.
- ◆ Tungsten is used as filament since it can - be made into a very thin wire, can offer a high resistance, with stand high temperature without melting , has high melting point.
- ◆ Nichrome is used to make the heating coil in electric heating devices.
- ◆ In electric heating devices nichrome is used to make the coil for the following reasons. - can withstand high temperature, will not be damaged by the air even in the hot condition when exposed to air., can remain red hot for a very long time without melting due to high melting point.

Evaluation

Entries in the 'My Science diary', participation in discussion, doing experiment, seminar presentation, seminar report.

To the teacher

Tungsten is used as a filament in light bulbs primarily because of its unique properties that make it suitable for this purpose:

High Melting Point: Tungsten has an extremely high melting point, around 3422 degrees Celsius

(6192 degrees Fahrenheit). This property allows it to operate at very high temperatures without melting, which is essential for producing light efficiently.

Good Electrical Properties: Tungsten is a good conductor of electricity, which means it can easily carry electrical current through it to produce light when heated.

Stability and Longevity: Tungsten is chemically stable, which prevents it from reacting with the gases inside the light bulb or oxidizing at the high temperatures it operates at. This stability contributes to the longevity of the filament, allowing light bulbs to last longer.

Efficient Light Production: When tungsten is heated by an electric current, it emits light across a broad spectrum, making it suitable for general lighting purposes.

Reference:

1. <https://www.energy.gov/articles/history-light-bulb>
2. <https://www.electronicclinic.com/edison-light-bulb-history-and-invention/>
3. <https://www.si.edu/newsdesk/snapshot/edison-light-bulb>
4. Electricity is everywhere by Nadia Higgins
5. Electricity & Electronics : by Wonder House Books

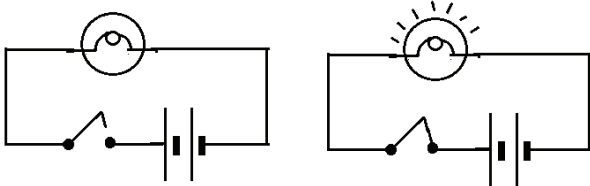
WORKING GALLERY- Answers

Answer the following

- electrical , light
- electrical , heat
- tungsten
- copper (This is a conductor, the rest are insulators)
- A battery is the combination of two or more cells in a suitable manner to meet the requirement.
- Two ways. A battery can be made by connecting the cells either in parallel or in

series.

- Source of current (ii) Connecting wires (iii) Switch (iv) Device to consume current (eg bulb)

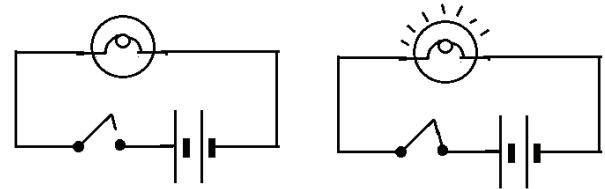


Identify the following symbols.

Symbol	Name
	Cell
	Battery
	Filament bulb
	Switch

- ◆ source of current, connecting wire, device to use current and a switch
- ◆ a switch
- ◆ cell (or battery)
- ◆ conductor
- ◆ insulator
- ◆ resistance

Circuit diagram



Write down the energy change in the following devices.

- ◆ Oven - Electrical energy into heat energy.
- ◆ Bulb - Electrical energy into light energy
- ◆ Loud Speaker - Electrical energy into sound energy

Extended activities

1. Draw a chart of various components and their symbols in a chart and exhibit it in the class
2. Draw a simple circuit in a chart paper and exhibit it in the class.

Introduction:

In this unit, students will explore the fascinating world of mixtures and solutions. They will learn about the different types of mixtures and solutions, how they are formed, and why they are important for our daily lives. Additionally, they will become familiar with various methods of separating mixtures, such as filtration, distillation, and evaporation, and understand their applications. Students will also delve into the basics of solutions, including what solutions are, the different types of solutions, and their properties. Furthermore, they will learn about the distinctions between unsaturated, saturated, and supersaturated solutions.

Previous knowledge

The learners

- ◆ are familiar with different mixtures like food items juices, soft drinks etc,
- ◆ have prepared different solutions like salt solution, sugar solution etc,
- ◆ are familiar with different methods of separation like hand picking, washing in water winnowing, sedimentation etc
- ◆ know the uses of some mixtures and solutions.

Learning out comes

The learners,

- ◆ comprehend different types of mixtures and solutions,
- ◆ appreciate different properties of mixtures and solutions,
- ◆ develop positive attitude in handling different mixtures and solutions,
- ◆ take part in activities to prepare different mixtures and solutions,

- ◆ explore the different methods of separation of the components of mixtures.

Major concepts

Pure substances

- ◆ Mixtures
- ◆ Homogeneous mixtures
- ◆ Heterogeneous mixtures
- ◆ Separation of the components of mixtures- handpicking, washing in water, sedimentation, decantation, winnowing,
- ◆ magnetic separation, sieving, filtration, evaporation, distillation.
- ◆ Solutions, solute, solvent.
- ◆ Different types of solutions- (diluted, concentrated, saturated, super saturated.)
- ◆ Universal solvent
- ◆ Solubility
- ◆ Solutions in different states of matter.

Total Time: 6 period of 40 minute

Concepts	Activities	TLM	Assessment
Pure substances	Identifying, classification	Different substances	MCQ, WS
Mixtures	Identifying, classification	Different substances, Water, Common salt Mixtures	MCQ, WS

Homogeneous mixtures	Identifying, classification	Different samples Solutions Mixtures Pictures	MCQ, WS
Heterogeneous mixtures	Identifying, classification	Different samples solutions Mixtures Pictures	MCQ, WS
Separation of the components of mixtures	Discussion Narration, Video presentation Picture analysis	Videos Pictures	MCQ, WS
Hand picking	Discussion Narration, Video, Picture	Video, Pictures	MCQ, WS
Washing in water	Discussion, Narration Video presentation Picture analysis	Videos Pictures	MCQ, WS
Sedimentation	Experiment, Discussion	Beaker, Soil, Water	MCQ, WS
Decantation	Experiment, Discussion	Beaker, Soil, Water	MCQ, WS
Winnowing	Discussion Narration Video presentation Picture analysis	Video, Picture	MCQ, WS
Magnetic separation	Experiment Discussion	Magnet, Iron powder, Sand	MCQ, WS
Sieving	Experiment, Narration Video presentation	Sieve, Video	MCQ, WS
filtration	Experiment, Discussion	Conical flask Funnel, Filter paper	MCQ, WS
Evaporation	Experiment Video Discussion	Beaker, Watch glass salt, Water, video	MCQ, WS
Distillation	Experiment,	Beaker, Watch glass salt water	MCQ, WS
Solute ,solvent, solution	Experiment Narration	Different solutes water beakers	MCQ, WS
Solutions of different concentration	Experiment Discussion	Sugar, Salt, Beaker Water	MCQ, WS
Universal solvent	Experiment, Discussion	Different solutes Water Beakers	MCQ, WS
Solubility	Experiment Discussion	Salt, Sugar, Vinegar, Spirit, Curry powders	MCQ, WS
Solution in different states of matter	Chart analysis Discussion Picture analysis	Charts Pictures	MCQ, WS

LESSON PLAN

Content analysis	Learning activities
Mixtures contain two or more type of substances.	Teacher presents the situation described in the text. Ask the students to list their food items and list the contents in each of them .Consolidates the concept of mixtures.
Pure substances contain same type of particles .	Teacher exhibits samples of mixtures, water, Aluminium, sugar ,salt etc and compare their properties. Distinguishes between mixtures and pure substances.
A mixture in which components are uniformly spread is a homogeneous mixture. A mixture in which the components are not uniformly spread is heterogeneous mixture.	The teacher conducts the experiment given in the text and differentiates between homogeneous mixture and heterogeneous mixture. Find more examples for them.
It is often necessary to separate the components of mixtures.	Teacher discusses the situations where separation of the components of mixtures become necessary. For example separating chaff from paddy, dreg from tea, butter from milk, pebbles from rice etc.
Hand picking and washing in running water are two common methods used for separation	Teacher explains with suitable examples from life situations.
Winnowing is widely used to separate chaff from paddy.	Teacher exhibits the picture and video of winnowing and the property made use of here.
Magnetic separation is used to separate magnetic components from mixtures.	Teacher conducts experiment to separate iron dust from sand using a magnet. Explains the application of this method in industries. Shows video clippings of magnetic separation.
Particles of different sizes can be separated by sieving.	Teacher explains the occasions where sieving is made use of and shows pictures and videos of sieving. Teacher conducts experiment of filtration and describes the situations where it is made use of.
Very minute particles from liquids are separated by filtration.	Teacher conducts the experiment and consolidates sedimentation.

<p>Sedimentation is the process used to separate insoluble heavier particles from water.</p>	<p>Teacher conducts the experiment and consolidates decantation.</p>
<p>Decantation is the process of separating the clear water after sedimentation.</p>	<p>Teacher conducts the experiment given in the text book .Explains how common salt is separated from sea water.</p>
<p>Evaporation is the method of separating the dissolved solid particles from a solution.</p>	<p>Teacher conducts experiment in the text. Explains the applications of distillation and the uses of distilled water.</p>
<p>Distillation is used to separate both solid and liquid components in a solution.</p>	<p>Teacher exhibits a separating funnel and separate the components of a mixture of water and kerosene.</p>
<p>A separating funnel is used to separate the components of a mixture of two immiscible liquids.</p>	<p>Teacher demonstrates the experiments in the text book and consolidates the concepts-solute, solvent and solution.</p>
<p>Solutions are homogeneous mixtures.A substance that dissolves in another substance is the solute .A substance which dissolves other substances in it is the solvent. The solute and solvent together make the solution.</p>	<p>Teacher dissolves different solutes in water like, salt, sugar vinegar ,baking soda spirit etc and consolidates the concept of universal solvent</p>
<p>Water dissolves many substances in it and is widely used to prepare solutions. So it is called universal solvent.</p>	<p>Teacher conducts experiments and exhibits different solutions.</p>
<p>Depending up on the concentration of the solute dissolved, solutions can be classified into dilute ,concentrated, saturated and super saturated solutions.</p>	<p>Teacher dissolves various solutes in water separately (baking soda, salt, sugar, honey etc) and checks their solubility. Consolidates that solubility of substances vary.</p>
<p>Solubility of a solution is its ability to of the substance to dissolve in another to form a solution.</p>	<p>Teacher discusses the solute and solvents of various solutions. Exhibits chart and analyses the components of different solutions. Shows examples of solutions of different states.</p>

WORKING GALLERY- Answers

- Distillation
- Muddy water
- Sedimentation
- Decantation
- Separating funnel
- Chaff is separated from paddy by winnowing
- Evaporation
- Solute-copper, solvent-gold
- Separate iron powder using a magnet, Dissolve in water to get salt solution, Filter out the sand
- Distill the salt solution to get salt and water. Take water in a beaker. Add sugar and dissolve until some sugar remain undissolved. Heat the beaker till all sugar dissolves Add some more sugar and cool. The solution obtained will be super saturated.

Classify the following as homogeneous mixture and heterogeneous mixture.

- ◆ Homogeneous mixture - Sugar solution, Salt water,
- ◆ Heterogeneous mixture - Muddy water, Dilute acid, Cement and sand, Sand and Iron powder

Name the method that can be used to separate the components of the following mixtures.

- ◆ Sugar and Water - Distillation
- ◆ Sand and Water - Filtration
- ◆ Sand and Iron dust- Magnetic separation

- ◆ Water and Kerosene - Separating funnel
- ◆ Muddy water - Sedimentation

Some methods of separations and the property made use is given below. Match them suitably.

Sl No.	Method of separation	Property made use of in separation
1	Sedimentation	Contains heavier insoluble components.
2	Sieving	Particles differ in size.
3	Evaporation	Liquid component change into vapour.
4	Winnowing	Components differ in mass.
5	Separating funnel	Components immiscible liquids.

Extended activities

- List as many mixtures you find in your home, including food items, juices soft drinks etc .Find out their components.
- Prepare solutions of various concentrations of different substances. Make a list of insoluble substances in water.
- Dissolve sugar candy in water. Heat the solution and add more and more sugar candy to get a super saturated solution of it .Hang a piece of sugar candy tied in a thread into it using a rod. Observe after a few hours. Find out the reason.



**TEACHERS RESOURCE
MANUAL**

**EVS - Science
Grade 5**

GRADE - 5



1

MINIMISING EFFORT

Introduction

We are all accustomed to doing a lot of work. But when we hear that there's a way to make the work easier, how do we feel? Excited, right? Absolutely! There are indeed ways and means to simplify our tasks. To achieve this, we utilize simple machines. From ancient times, humans have employed simple machines such as the inclined plane and pulley. Even in modern times, despite the use of highly advanced machinery, we still rely on simple machines to reduce our effort. For instance, we use a nail cutter for trimming our nails. Similarly, levers are used for various purposes. Let's delve into them in detail.

Previous Knowledge

- Children know what a force is.
- They know the uses of force.
- They know how to use some simple machines like nail cutter, nut cracker, plier etc.
- All of them have experienced simplifying of works.

Learning outcomes

The learner.

- ◆ comprehend the uses of simple machines
- ◆ apply the knowledge of levers in different life situations
- ◆ appreciate the uses and easiness of simple machines
- ◆ take part in various activities by using simple machines like inclined plane, screw, wedge, pulleys etc
- ◆ develop the skill of solving mathematical problems.

Major concepts

- ◆ • Simple machines and their uses
- ◆ • Lever
- ◆ • First order lever
- ◆ • Second order lever
- ◆ • Third order lever
- ◆ • Pulley
- ◆ • Wheel and axle
- ◆ • Inclined plane
- ◆ • Wedge
- ◆ • Screw

UNIT FRAME

Unit -1 Minimising Effort

Time: 9 periods of 40 minute

CONCEPTS	TEACHING LEARNING PROCESS	TEACHING LEARNING MATERILAS	ASSESSMENT	VALUES	TIME
◆ Simple machine	◆ Demonstration ◆ Figure analysis ◆ Discussion	◆ Picture, A simple machine like a nail cutter	◆ Entry in the Science Diary ◆ Understanding, Asking simple questions	◆ We can make our works easier	20 minute

◆ Lever ◆ Mechanical advantage	◆ Figure analysis ◆ Discussion, Doing numerical examples	◆ Picture, Sample of a lever	◆ Entry in the Science Diary, Understanding, Numerical solving	◆ We can make our works easier	40 minute
◆ First order lever and examples	◆ Figure analysis, Demonstration	◆ Pliers, A pair of scissors ◆ Beam of a balance etc	◆ Entry in the Science Diary, ◆ Mentioning more examples	◆ Care of things is essential in life	40 minute
◆ Second order lever and examples	◆ Figure analysis, Demonstration	◆ Picture ◆ Nut cracker	◆ Entry in the Science Diary ◆ Mentioning of more examples in the Science Diary	◆ Work is very easy	30 minute
◆ Third order lever and examples	◆ Figure analysis ◆ Demonstration	◆ Picture, Forceps	◆ Entry in the Science Diary ◆ Mentioning of more examples in the Science Diary	◆ Care of things is essential in life	40 minute
◆ Pulley	◆ Figure analysis ◆ Demonstration	◆ Picture, Pulley	◆ Entry in the Science Diary ◆ Drawing the diagram of a pulley	◆ Using a pulley makes the work convenient	30 minute
◆ Wheel and axle	◆ Figure analysis ◆ Demonstration	◆ Picture, Sample of a wheel and axle	◆ Entry in the Science Diary	◆ Knowledge gained in one place can be applied to another context	40 minute
◆ Inclined plane	◆ Figure analysis ◆ Demonstration ◆ seminar	◆ Figure , Seminar report	◆ Entry in the Science Diary ◆ Seminar report	◆ Efforts were minimised from early time itself	40 minute
◆ Wedge	◆ Figure analysis	◆ Figure	◆ Entry in the Science Diary ◆ Drawing the diagram of an inclined plane	◆ A combination of simple machine is also possible	30 minute
◆ Screw	◆ demonstration	◆ Figure, Paper drawing folded along a pencil	◆ Entry in the Science Diary ◆ Observation		30 minute

Simple Machines (1 period)

Activity 1 (picture observation, discussion)

- ◆ Let the teachers start with a compelling introduction about the remarkable achievements in ancient times when advanced technology was not available, and inspire the students with how these tasks were accomplished. Next, explain how inclined planes were ingeniously used to lift heavy stones to the tops of construction sites.

Now, clarify what a simple machine is. Explain

that a simple machine allows us to simplify and streamline our work, and it can also alter the direction of applied force.

Consolidation

- ◆ A simple machine makes the work easy and convenient.
- ◆ There are simple machines like lever, pulley, wheel and axle, inclined plane wedge and screw

Evaluation:

- ◆ Solving the numerical problems, Fraction analysis, Entries in the Science Diary.

Lever (3 periods)**Activity 1 (picture observation, discussion)**

- ◆ Before the next portion bring out the ability to analyse fractions in mathematics. For example
- ◆ $10 / 10 = 1$ If numerator = denominator, then the value of fraction is equal to one.
- ◆ $10/20 < 1$, If numerator $>$ denominator, then the value of fraction is greater than one.
- ◆ $10/ 5 > 1$. If numerator $<$ denominator, then the value of fraction is less than one.
- ◆ Introduce the term lever by demonstrating a sample of a lever. With the help of figures introduce the terms effort (E), load (L), fulcrum (F), effort arm and load arm. Using the method of solving numerical examples, introduce the term mechanical advantage and its formula. Then make them solve more numerical examples.
- ◆ Now go into the classification of a lever by locating the position of E, F and L.

First Order Lever:

- ◆ First of all take the children into the concept of a first order lever. Then take them to the three ways in which first order lever comes.
 - If the F is midpoint, then $EA = LA$. So $MA = 1$. Hence $E = L$
 - If the F is near the E, then $EA < LA$. So $MA < 1$. Hence $E > L$
 - If the F is near the L, then $EA > LA$. So $MA > 1$. Hence $E < L$
- ◆ To understand this idea, the children should have a thorough knowledge of the mathematical fact given in the box above.
- ◆ Now ask the children to find out more examples of first order lever and ask them to note them down in 'My Science Diary' which can be used for assessing them.
- ◆ Some examples are pliers, a pair of scissors, crow bar etc
- ◆ Now enter into the second order lever.

Second Order Lever

- ◆ This is a case of E coming in between L and F. F is at one end and E is at the other end. Hence the full length of the lever is EA and LA is only a part of it.
- ◆ Hence always $EA > LA$, $MA > 1$ and $E < L$
- ◆ More examples are wheel barrow, stapler, bottle opener etc.
- ◆ Now enter into the third order lever.

Third Order Lever

- ◆ L comes at one end and F at the other end. The full length is the Load arm and EA is only a part of it.
- ◆ Hence always $EA < LA$, $MA < 1$ and $E > L$. Then children may ask you why should we use a third order lever as a simple machine if $E > L$. The answer is it helps to handle things safely. That is the use of third order lever.
- ◆ Examples are forceps, fire tongs, fishing rod, bow and arrow, human jaw etc.

Consolidation

- ◆ If F comes in between L and E then it is a first order lever.
- ◆ If the F is midpoint, then $EA = LA$. So $MA = 1$. Hence $E = L$
- ◆ If the F is near the E, then $EA < LA$. So $MA < 1$. Hence $E > L$
- ◆ If the F is near the L, then $EA > LA$. So $MA > 1$. Hence $E < L$
- ◆ If L comes in between F and E then it is a second order lever.
- ◆ In a second order lever, always $EA > LA$, $MA > 1$ and $E < L$
- ◆ If E comes in between F and L then it is a third order lever.
- ◆ In a third order lever, always $EA < LA$, $MA < 1$ and $E > L$. It helps to handle things safely

Evaluation

- ◆ Quoting examples for different order of levers, Classification of levers, Entries in the Science diary.

Pulleys (3 periods)

Activity 1 (picture observation, discussion, doing experiments)

- ◆ Now we can go into Pulleys. A single Pulley is an application of a first order lever. F is the centre of the pulley. This means $EA = LA =$ radius of the pulley. Since $EA = LA$, $MA = 1$ and $E = L$. Then children may ask, why should it be used as a simple machine? The answer is it is used to change the direction of force making the work convenient. Tell them that a group of pulleys are used in cranes.

Wheel and axle:

- ◆ Wheel and axle consists of a wheel on an axle that can be rotated. It is a version of a lever itself. $MA = \text{Radius of wheel} / \text{radius of axle}$. Effort is applied on the wheel and load on the axle. Since it can give a $MA > 1$, it is a second order lever.

Inclined plane:

- ◆ Inclined plane is also a simple machine with length of the plane as effort arm and height of the plane as LA. Hence $MA = \text{length of the plane} / \text{height of the plane}$. Always we will make the length of the plane $>$ height of the plane. This makes
- ◆ $MA > 1$ and $E < L$ We can increase the MA and reduce the E by increasing the length of the plane. In this context we have to go deep into the introductory matter of usage of inclined plane in the construction of pyramids.

Wedge:

- ◆ With the help of figure, explain that wedge is double inclined plane. Hence it is also simple machine. The length of the plane / width of the wedge give MA. Hence we can reduce E by increasing the length of the plane.

Screw:

- ◆ Screw can easily be shown as a simple machine as per the activity shown in the text book. It is also a simple machine. The $MA > 1$ and $E < L$.

This is because it is equivalent to an inclined plane.

IT MAY BE MADE TO REMEMBER THAT THERE IS NO GAIN WHEN A SIMPLE MACHINE IS USED. THIS IS BECAUSE WHAT IS GAINED IN EFFORT IS LOST IN THE DISPLACEMENT.

Consolidations

- ◆ The MA of a pulley is 1 if it is fixed. It is equivalent to a first order with F as midpoint. Hence $EA = LA$ and $MA = 1$. Hence $E = L$. It helps to change the direction of effort
- ◆ A wheel and axle is equivalent to second order lever with $EA > LA$ and $E < L$. $MA > 1$
- ◆ In the case of inclined plane, $MA = \text{length of the plane} / \text{height of the plane}$. Always we will make the length of the plane $>$ height of the plane. This makes $MA > 1$ and $E < L$
- ◆ Wedge is double inclined plane. $MA = \text{length of the plane} / \text{width}$. $MA > 1$ and $E < L$
- ◆ Screw is a modified form of inclined plane with $MA > 1$ and $E < L$

Evaluation

- ◆ Entries in the Science diary. Checking the knowledge of E and L in pulleys, inclined plane, wedge etc.

The children can remember the three orders by using the word FRE. The other letters come on either sides. This is the way in which the one comes in between the other two.

First order E - F - L

Second order F - L - E

Third order F - E - L

Extended activities

1. Let the children make the miniature of levers and exhibit them in the class
2. Let the children draw the line diagrams of the three order levers in the way in which F, L and E comes.
3. Give them more numerical analysis questions

like if $EA = 60 \text{ cm}$, $LA = 20 \text{ cm}$, $L = 10 \text{ kg}$, find the E etc.

4. List out different orders of levers found in life and say which order lever each is

CHECK YOURSELF- Answers

- One
- nut cracker
- forceps
- inclined plane
- fulcrum
- to make the work easy, to change the direction of force etc.
- There is a gain in the effort when a simple machine is used.
- A pulley that will move along with the load.
- a). first order
- b) one
- c) $E = L$
- a) To raise a load to a height in an easy manner.
b) No. To reduce effort.

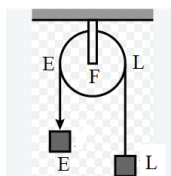
1. Classify the following into three orders of lever.

First order lever	Second order lever	Third order lever
<ul style="list-style-type: none"> • See saw • Plair • a pair of scissors • beam of a common balance 	<ul style="list-style-type: none"> • wheel barrow, • lemon squeezer • crow bar • nut cracker 	<ul style="list-style-type: none"> • fire tong • forceps

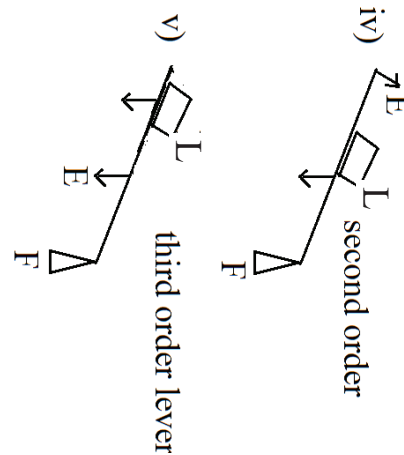
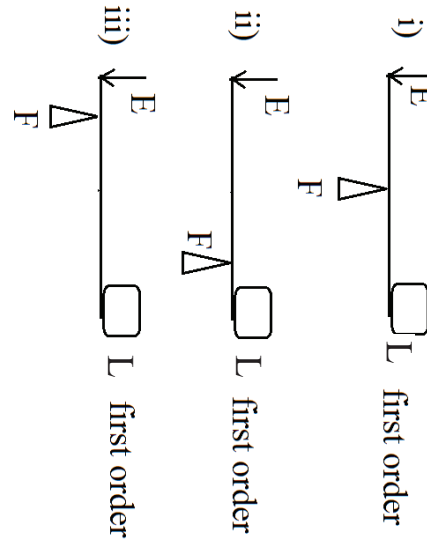
2.

Mechanical advantage is one	Mechanical advantage is greater than one	Mechanical advantage is less than one
<ul style="list-style-type: none"> • See saw • a pair of scissors • beam of a common balance 	<ul style="list-style-type: none"> • Plair • wheel barrow, • lemon squeezer • crow bar • nut cracker 	<ul style="list-style-type: none"> • fire tong • forceps

3.



4.



Introduction:

This chapter aims to realise the basic organisation of organisms. The cell is the basic structural and functional unit of all forms of life. The discovery of cells led to the development of cell theory. Every cell consists of cytoplasm enclosed within a membrane, and contains nucleus and other structures. This chapter deals with different types of cells, cell features, unicellularity and multicellularity. This chapter also extends the awareness about differentiation of plant and animal cell. There are the grades of organization among cells as tissues, organs and organ systems. Teacher should plan a variety of learning activities by considering the importance of this chapter whenever necessary and introduce so as to reinforce the concepts and develop skills and attitudes.

Previous Knowledge

The learner knows:

- ◆ The parts of a human body
- ◆ Role of each part in our body
- ◆ Variety of plants and animals
- ◆ Structure of stomata in plant leaf
- ◆ Blood cells in man

Learning outcomes

The Learner..

- defines and appreciates the beauty of diversity of organisms
- is convinced that animal body is composed of cells
- classifies organisms into unicellular or multicellular
- generalizes the theories about cells
- analyses the structure of plant and animal cells
- identifies the different components of a cell.

- constructs different types of models up of animal cells
- differentiates plant cell and animal cell.
- appraises the discovery of cell.
- summarises that the body of every organism is made of cells.
- analyses the levels of organization among cells

Theme : My body :: Sub-theme : Organs

Major concepts

- Diversity of organisms on earth
- Animal body is composed of cells
- Organisms are Unicellular or multicellular
- Cells are the basic unit of every organism
- Discovery of cell and cell theory
- Cell contains cytoplasm, nucleus and other structures enclosed within a membrane
- Differences between plant and animal cell
- The cells are organised in multicellular organisms in to tissue, organ or organ system.

TOTAL TIME: 4 PERIODS OF 45 MINUTES

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
Defines the diversity of organisms	Diversity of organisms on earth	Open discussion	TB-Fig.2.1, Discussion points	Participation, prepared list
Convinces that animal body is made up of cells	Animal body is composed of cells	Cartoon analysis & discussion (Groupwise)	TB-Fig.2.2	My Science Diary
Classifies organisms into unicellular or multicellular	Organisms are Unicellular or multicellular	Group discussion and comparison	TB-Fig. 2.3 & 2.4	Participation and My Science Diary
Summarises that the body of every organism is made of cells.	Cells are the basic unit of every organism	Observation and comparison	TB-Fig.2.5	Comparison notes
Generalizes the theories about cells	Discovery of cell and cell theory	Role-play	TB- running matter about cell theory	MCQs, Participation and My Science Diary
Identifies the different components of a cell.	Cell contains cytoplasm, nucleus and other structures enclosed within a membrane	Making comparative table(Group wise)by group discussion	TB-Fig. 2.6 & 2.7 and discussion points	MCQs, Participation and My Science Diary
Analyses the levels of organization among cells	The cells are organised in multicellular organisms	Analysis of flow charts in the TB (Groupwise)	TB-Fig. 2.8 & 2.9 and discussion points	My Science Diary

Process

Diversity of organisms

ACTIVITY-1 : Open discussion using TB Fig.1.1 and indicators like

- Names of plants
- Names of animals
- Place where they live

Consolidation :

There are around 8.7 million species of plants

and animals in nature, along with different kinds of microorganisms. All these organisms together constitute Biodiversity on Earth.

EVALUATION

Participation of each student and their notes in 'My Science Diary'

Basic unit of animal body

ACTIVITY-2: Analysis of cartoon given in the

TB and Group discussion based on it.

Key points to discuss

- Body size
- Similarity in basic unit
- Response to the Textual questions

Consolidation:

All animal bodies are composed of cells

EVALUATION

Participation of each student and their notes in 'My Science Diary'

Unicellular and multicellular organisms

ACTIVITY-3: Comparison and group discussion based on the TB-Figs. 2.3 & 2.4

Key points to discuss

- Number of cells
- Shape of cells
- Other peculiarities of cells

Consolidation :

- There are different kinds of organisms both unicellular and multicellular.
- The organisms with single cell are unicellular organisms.
- Multicellular organism is made up of more than one cell.
- Multicellular organisms have different types of cells.

EVALUATION

Participation of each student and their notes in 'My Science Diary'

Cell is the basic unit of every organism

ACTIVITY-4: Comparison of Fig. 2.5 with 2.3 & 2.4

- Comparison based on number and shape
- Response to the indicators given in TB

Consolidation:

The body of every living organism is made up of

cells.

EVALUATION

Participation of each student and their notes in 'My Science Diary'

Cell theory

ACTIVITY-5: Role-play

- Prepare a screen play based on the running matter in the TB
- Presentation in class room

Consolidation : Discovery of cell and contributions of scientists to postulate Cell theory.

To the Teacher: . Ensure the contributions of students in writing screen play.

EVALUATION

Participation of each student and their notes in 'My Science Diary'

Components of a cell

ACTIVITY-6: Observation of Fig. 2.6 & 2.7, fill up the blanks in the word web and spaces in the figure and complete the comparative table

Consolidation:

- Cell contains cytoplasm, nucleus and other structures enclosed within a membrane.
- Chloroplast, cell wall and vacuoles are seen only in plant cell.

EVALUATION

Completed word web, comparative table and their notes in 'My Science Diary'

Levels of organization

ACTIVITY-7: Observe the flow chart of plants and animals given in the TB (2.8 & 2.9) individually then discuss group wise based on the points given by teacher.

Key points to discuss:

- Cells form a tissue

- Tissues form an organ
- Organs form an organ system
- All organ system together form an organism

Consolidation :

- ◆ The cells are organised in multicellular organisms in to tissue, organ or organ system.

EVALUATION

Participation of each student and their notes in 'My Science Diary'

Have you Ever wondered what we're made of? The simple answer is cells. These are the smallest building block of every living thing on our planet, including us. We have trillions of cells in every part of our body that do everything from changing our food into energy to keeping us healthy.

Check Yourself -Answers

1. (B) Chloroplast
2. (C) Elephant, others are unicellular organisms.

- 3. (D) Seen in plant cells
- 4. (A) Statement (i) and statement (ii) are correct
- 5. (B) Nucleus
- 6. Outer covering of a cell. It protects the cell..
- 7. They are organisms with only one cell.
- 8. defined the cell as the basic unit of animal structure
- 9. Cytoplasm – The fluid portion of a cell. It contains all the parts for the life activities of a cell.
- 10.



- (a) Vacuole
- (b) Nucleus

Extended Activities

- ◆ Prepare some work sheets like those given in the TB

3

ATTRACTION AND REPULSION

Introduction:

All of us are familiar with magnets. In one way or another, most of the children have used or played with magnets. They may have noticed their attractive properties and directive properties, even if unknowingly. However, they are often unaware that the Earth itself is a magnet! They might have also seen magnets of different shapes but don't know about the magnetic field. So, we will explore both familiar and unfamiliar areas. Let's help the children understand all these concepts in detail.

Previous Knowledge

- ◆ Children know what magnets are.
- ◆ Magnets can attract iron.
- ◆ Children have experienced that two magnets making a sound.

Learning Outcome

The learner

- comprehends that a magnet has two poles.
- takes up activities to know that a magnetic needle comes to rest in the North – South direction.

- appreciates the magnetism of the earth
- can apply the law of magnetism for various uses
- draw the field lines around a magnet

Major concepts

- Attractive property
- Directive property.
- Law of magnetism
- The Earth is a magnet
- Magnetic compass
- Magnetic field

Total Time: 5 period of 40 minute

CONCEPTS	TEACHING LEARNING PROCESS	TEACHING LEARNING MATERILAS	ASSESMENT	VALUES	TIME
Attractive property	Figure analysis Experiment	Magnet -Iron dust mixed with sand Wooden piece, pin etc Paper, Figure	Entry in the Science Diary, Observation skill Understanding ability Asking questions	Learning is possible by playing also	40 minute

Directive Property	Figure analysis Experiment	Magnet, Thread, ICT	Entry in the Science Diary, Observation skill Understanding ability Asking questions	Some things are hidden in nature	40 minute
Law of magnetism	Experiment	Threads, A pair of bar magnet, ICT	Entry in the Science Diary, Observation skill Understanding ability	Results are not always as we wish	40 minute
The Earth is a Magnet	Figure analysis	Chart, ICT	Entry in the Science Diary	The Earth is something beyond our imagination	40 minute
Magnetic compass	Demonstration,	Magnetic compass	Asking questions	A magnet has wide uses	20 minute
Magnetic field	Discussion		Asking Questions	There are unseen things in nature	20 minute

Lesson Plan

Period 1 (40 minute)

Concepts:

- ◆ Law of magnetism.

Materials Needed:

- ◆ a pair of bar magnets, threads

Values : Children develops the feeling that the results are not always as we wish

Procedure

Activity	Student Response
The teacher starts the lesson by checking the checking the previous knowledge like attractive property, directive property etc	
The teacher asks ‘haven’t you seen magnets?’ Will they attract iron? Does a magnet give attraction only? Let’s see	
The teacher suspends a bar magnet using two threads	



Now North Pole of a magnet is brought near the South Pole of the suspended magnet. Now asks What do you see? Are like poles or unlike poles facing each other?	
Now South Pole of a magnet is brought near the North Pole of the suspended magnet. Now asks What do you see? Are like poles or unlike poles facing each other?	
Now North Pole of a magnet is brought near the North Pole of the suspended magnet. Now asks What do you see? Are like poles or unlike poles facing each other?	
Now South Pole of a magnet is brought near the South Pole of the suspended magnet. Now asks What do you see? Are like poles or unlike poles facing each other?	
Now the teacher asks to make a general conclusion. When the children say the correct answer teacher explains that this is the law of magnetism	

Reflection

NB : During each activity, the teacher makes assessment as well. The teachers should write down the assessment by the time the teacher completes one lesson plan.

Attractive property (1 period)

Activity 1 (picture observation, discussion, participating in experiments)

The teacher can start the class by recalling all the previous knowledge. Now the teacher can show magnets and say that they are special substances named magnets.

Let the teacher put some iron pieces, iron dust, pin etc on the table and bring the magnets near them. The children can see them getting attracted by the magnet.

Now the teacher can put a wooden piece, a paper piece, sand etc on the table and bring a magnet near them. None of them are attracted by the magnet.

The teacher can bring a magnet wrapped with a paper near a mixture of sand and iron and can separate them based on this property. The magnet attracting magnetic substance is what we call as

attractive property.

Conclusion

- ◆ Some substances are attracted by a magnet. Such substances are the magnetic substances.
- ◆ Those which are not attracted by a magnet are non magnetic substances.
- ◆ A magnet can attract some substances named magnetic substances. - Attractive property

Evaluation

Writings in 'My Science Diary', participation in discussion and experiments.

To the teacher

When bringing a magnet near iron dust or a mixture of iron dust and sand, wrap the magnet fully with a piece of paper first. If you do not do this, the iron dust will stick directly to the magnet, making it difficult to separate. By wrapping the magnet with paper, you can easily remove the iron dust along with the paper when you take the magnet away..

Directive Property (1 period)

Activity 1 (picture observation,

discussion, participating in experiments)

Let the teacher take a bar magnet and suspend it using a thread. After waiting for some time, observe that it comes to rest in the North-South direction. Now, slightly rotate the magnet and wait again. You will see that the magnet once again comes to rest in the North-South direction. The teacher can then explain that a freely suspended magnet will always come to rest in the North-South direction. This is known as the directive property. It is important to mention that a magnet placed on a table will not align itself in this direction because it cannot move freely due to the friction from the table. A large force would be needed to move the magnet on the table, whereas a small force is sufficient to move the suspended magnet.

Consolidation

- ◆ A freely suspended magnet will come to rest in the North - South direction - Directive property.

Evaluation

- ◆ Entries in the Science Diary, Active participation in the experiment.

To the teacher

- ◆ Care on children while handling magnets.

The Law of magnetism (1 period)

Activity 1 (picture observation, discussion, participating in experiments)

Suspend a bar magnet using two threads as shown in the figure in the text. Bring the North Pole of another magnet near the North Pole of the suspended magnet. The children will observe repulsion. Repeat the process by bringing the South Pole of another magnet near the South Pole of the suspended magnet. They will again observe repulsion. The teacher can explain that North and North are like poles, and South and South are

also like poles. Next, bring the magnets together so that unlike poles (North and South) are facing each other. This time, the children will observe attraction. The teacher can then ask the students what they observed and why this happened, leading to a discussion on magnetic poles and their interactions.

Conclusion

- ◆ A magnet has two Poles – a North seeking Pole named the North Pole and a South seeking Pole named South Pole
- ◆ Like Poles will repel each other and unlike Poles will attract other. - Law of magnetism

Evaluation

- ◆ Entries in the Science Diary, Active participation in the experiment.

To the teacher

- ◆ Instead of suspending the magnet you can perform the experiment by placing the magnet over cylindrical pens or pencils on a table.
- ◆ Special care: While suspending the magnet ensure that you are using two threads as shown in the text book (ie., two threads). If not when you bring the like Poles near the suspended magnet will twist, the unlike Poles will face each other and they will attract. This will bring a wrong concept.

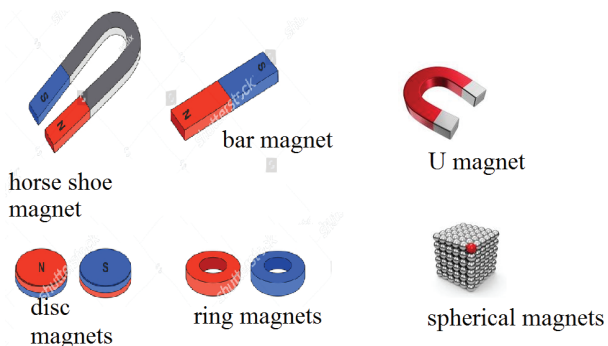
The Earth is a Magnet (1 period)

Activity 1 (picture observation, discussion, participating in experiments)

The teacher can explain that the Earth is also a magnet with a North Pole and a South Pole. They should tell the students that the magnetic North Pole of the Earth is near the geographic South Pole, and vice versa. Therefore, the geographic North Pole of the Earth (which is the magnetic South Pole of the Earth) will attract the South Pole of a magnet. This is the reason for the directive property of magnets.



Then show magnets (or their pictures) of different shapes and familiarize them



Compass: Next you can show a magnetic compass and explain what it is and that its magnetic needle will always be in the North – South direction and say that it is used for navigation and other purposes for this reason.

Magnetic field: Now the teacher can say that the force of a magnet is not felt at all regions. But it extends only up to certain region. If so the teacher can say that this region around a magnet where the force due to the magnet is felt is the magnetic field.

Consolidation

- ◆ The Earth itself is a magnet. Its magnetism is known as ‘geo magnetism’
- ◆ Magnetic compass is used to find out directions
- ◆ Magnetic field: The space around a magnet where the force of the magnet is felt.

Evaluation:

Entries in the Science Diary, Define magnetic field.

Reference:

10 books about magnetism by Monica Lozano Hughes
 What makes a magnet by Franklyn Mansfield Branley

CHECK YOURSELF- Answers

1.

- a) Iron

- b) Steel (magnetic, others are not so)
- c) repel ,attract
- d) North
- e) Magnetic field
- f) For finding out direction during sea travelling, for finding out direction in air travelling, to detect the presence of another magnet etc
- g) Attractive property, directive property. like poles can repel etc.
- Like Poles repel. Unlike Poles attract
- h) i a) attraction
- b) repulsion
- c) attraction
- d) repulsion
- i) Bring the North Pole of the magnet with known polarity near to one end of the magnet whose polarity is not known.

- ◆ If there is a force of attraction then the near end is the South Pole and the other end is the North Pole
- ◆ If there is a force of repulsion then the near end is the North Pole and the other end is South the Pole

2.

No	Magnetic Substance	Non magnetic Substance
1	Iron	Wood
2	steel	Plastic
3	Nickel	rubber
4	Cobalt	

3.

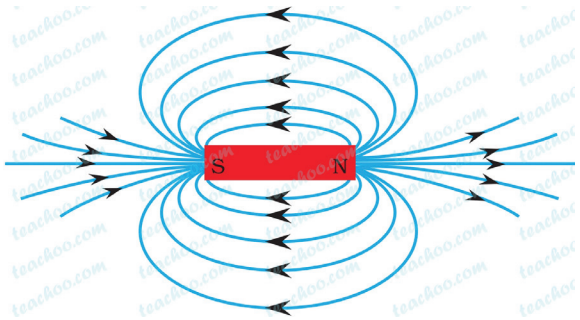
- Magnetic
- Magnetic
- Non magnetic
- Attracted
- South Pole
- North Pole
- Repel, attract
- directive property.
-

4.

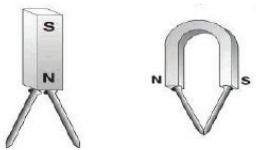
A	B
Iron	Magnetic substance
Plastic	Non magnetic substance
Magnetic compass	To find the direction
Like poles repel each other	Law of magnetism
Freely suspended will remain in the North South direction	Directive property

5.

- a). We can see the iron dust getting arranged in a pattern.
- b) Draw the magnetic field lines around a magnet as shown in the figure,.



6. Correct figures are



Extended activities

- ◆ Put some iron dust on a card board. Then move a ring magnet below the card board. Let the children enjoy the pattern
- ◆ Place a bar magnet on a desk (this is bench wise demonstration only). Bring a compass near it and then slowly move it away. You can

see a point where the needle does not deflect. That is the force of the magnet is not felt here after.

Sample Question Paper

Time: 40 minute Maximum Score: 20

1. Iron is a ----- substance (1)
2. Plastic is a ----- substance (1)
3. Find out the odd one. (1)
(steel, paper, nickel, cobalt)
4. Find out the relation from the first pair and complete the other. (1)
North and North Poles: repulsion :: South and South Poles :
5. What do you mean by magnetic field? (2)
6. State the law of magnetism (2)
7. Find out whether the force between magnets in the following figures is repulsion or attraction. (3)

- a)

S	N
---	---

S	N
---	---
- b)

S	N
---	---

N	S
---	---
- c)

N	S
---	---

N	S
---	---

8. How can you show that a magnet can attract some substances while some substances are not attracted? (3)
9. Classify the following as magnetic and non magnetic. (3)
Nickel, wood, paper, cobalt, iron, plastic
10. A freely suspended magnet will come to rest in the North – South direction. Why? (3)

Valuation Key

Qn No	Value Point	Split Score	Total score
1	Magnetic	1	1
2	Non magnetic	1	1
3	paper	1	1
4	repulsion	1	1
5	The space around a magnet where the force of the magnet is felt	1 1	2
6	Like Poles repel Unlike Poles attract	1 1	2
7	Attraction Repulsion Attraction	1 1 1	3
8	Bring a magnet near pins, iron dust, plastic piece, paper etc. We can see that pins and iron dust are attracted Plastic piece and paper are not attracted.	1 1 1	3
9	Magnetic : Nickel, cobalt, iron, Non magnetic: wood, paper, plastic	$\frac{1}{2} \times 6$	3
10	Earth's magnetic North Pole is near its geographic south Pole and vice versa Hence the attraction is accordingly This brings the directive property	1 1 1	3

Introduction:

The skeletal and muscular systems are two organ systems of our body. The skeletal system is made up of all the bones in our body, which gives us shape and support. Without bones, we would not be able to stand up, walk, or even sit in a chair. Bones are not just hard and strong; they also protect important organs like the brain, heart, and lungs. The muscular system works with the skeletal system to help us move. Muscles are soft tissues that can contract and relax to produce movement. Some muscles, like those in our arms and legs, help us run and play, while others, like our heart, work automatically to keep us alive. Our bones and muscles need calcium, protein, and exercise to stay strong and healthy. Together, the skeletal and muscular systems allow us to do everything from blinking our eyes to running a marathon! Isn't it amazing how these two systems which work together to keep us moving and doing all the things we love can be learned from this unit. The teacher must organise learning activities so as to develop attitudinal skills towards exercises.

Previous knowledge

The learner knows

- ◆ their body parts
- ◆ different types of organs and organ systems
- ◆ functions of some organs
- ◆ movement of different body parts.
- ◆ Foods containing nutrients

Learning outcomes

The Learner.

- ◆ illustrates the number and arrangement of bones in our body
- ◆ locates the position of joints in our body
- ◆ classifies joints in our body
- ◆ discriminates movable and immovable bones
- ◆ identifies the largest and smallest bones.
- ◆ convinces how the bones protect internal organs
- ◆ summarizes the functions of skeletal system
- ◆ realizes the injuries related to bones
- ◆ comprehends the functions of muscular system in our body
- ◆ identifies and categorizes different types of muscles.

- ◆ develops importance of exercise including yoga in our daily life.

Major concepts

- ◆ We have a total of 206 bones in our body
- ◆ Bones are arranged in such a way as skull, chest bones, back bone, arms and legs.
- ◆ The joints are classified as pivot, ball and socket, hinge and gliding joints
- ◆ The joints in the skull are immovable.
- ◆ Skeletal system help us move and protect our important internal organs
- ◆ Sprains and fractures are injuries related to bones
- ◆ Muscles contribute to the functions of skeletal system
- ◆ There are three types of muscles namely skeletal muscles, smooth muscles and cardiac muscles
- ◆ Practicing exercises including yoga help us to improve and strengthen the muscles and bones.

TOTAL TIME: 6 PERIODS OF 40 MINUTES

LOs	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESSMENT
Illustrates the number and arrangement of bones in our body	Bones are arranged in such a way as skull, chest bones, back bone, arms and legs.	Observation of a skeleton and group discussion	Model of a human skeleton, discussion points and TB Figs. 4.1 – 4.4	MCQs, Participation and My Science Diary
Locates the position of joints in our body and classifies them	The joints are classified as pivot, ball and socket, hinge and gliding joints	Observation of a skeleton and TB Fig. 4.7, Group discussion	Model of a human skeleton, discussion points and TB Figs. 4.6 & 4.7	MCQs, Participation and My Science Diary
Summarizes the functions of skeletal system	Skeletal system help us to move and protect our important internal organs	Observation of a skeleton and TB Figs. 4.9 & 4.10	Model of a human skeleton, discussion points and TB Figs. 4.9 & 4.10	MCQs. and My Science Diary
Realizes the injuries related to bones	Sprains and fractures are injuries related to bones	Open discussion on incidents	TB-Fig.4.11 & 4.12	MCQs. and My Science Diary
Comprehends the functions of muscular system in our body	Muscles contribute to the functions of skeletal system	Open discussion	TB Fig. 4.13	MCQs, Participation and My Science Diary
Identifies and categorizes different types of muscles.	There are three types of muscles namely skeletal muscles, smooth muscles and cardiac muscles	Analyses the Fig. given in the TB and fill up the table	TB Fig. 4.14	MCQs, Participation and My Science Diary
Develops importance of exercise including yoga in our daily life.	Practicing exercises including yoga help us to improve and strengthen the muscles and bones.	Observation of a yoga class through video and open discussion	Video of a yoga class	

PROCESS

Introductory Activity

Teacher provides clay

Asks the learners to make models of their choice

Let them share, speak about and enjoy.

Let them comment on the models prepared by Sonu and Sana.

Teacher asks-

Why was Sonu's model more perfect than that of Sana?

Elicits responses

Comes to the concept of Skeletal system

Teacher consolidates the matter given in the TB

Sonu's model has a frame work inside his clay model, so it is strong and has a good shape

Assessment :

Perfection in model making, Notes in My Science Diary

Activity : Picture Observation

Teacher asks:-

How is our skeleton formed?

Students observe the picture of Skeleton given on Page 228 TB

Number and arrangement of bones

Activity :

(1) Observation of a model of human skeleton with open discussion.

(2) Observation and discussion (Group wise) on TB-Fig. 4.1 to 4.4

The students should write their inference individually. Then complete the table given in the TB

To the teacher :Teacher should ensure that every student clearly observed the model and counted the bones as per the TB.

Teacher can give chances to the students to count the bones in the model.

Consolidation :

- ◆ We have a total of 206 bones in our body.
- ◆ Bones are arranged in such a way as skull, chest bones, back bone, arms and legs.

Assessment

Participation of each student, completed table and their notes in 'My Science Diary'

Activity : Text analysis

How do we get a definite shape?

Let the learners read the textual part and make notes

Assessment : Entries in My Science Diary

The Largest ... The Smallest

Teacher asks

Analyse the two pictures

Let the students read and write the matter in their Science Diary

Assesment: Notes in My Science Diary

To Move To Dance.....To Pick (Functions of Skeletal system)

Teacher says

Look at the skeleton? What does it says ? Read it

Write the functions of skeletal system.

Make notes in 'My Science Diary'

Consolidation :

- ◆ Skeletal system help us to move
- ◆ Skeletal system protects our important internal organs like heart, lungs, etc.

Teacher can give assignment to collect more examples

Assessment

Entries in ' My Science diary'- Functions of Skeletal system

Joints in Action

Teacher gives the instructions

Let them write their experiences in the ' my science

Diary’

Activity: Observation of a model of human skeleton by referring the TB-Fig. 4.7

The students should complete the table in the TB individually

Teacher should continue discussion on the immovable bones.

Consolidation :

- ◆ The joints are classified as pivot, ball and socket, hinge and gliding joints
- ◆ The bones in the skull are immovable.

Assessment

Participation of each student and their notes in ‘My Science Diary’

To collect more examples

JOINTS AND BODY MOVEMENTS

Teacher asks to read the article related to body movements

Make notes in ‘ My Science Diary’

Assessment : Entries in the Science diary

Type of joints and Body parts

- ◆ Group activity
- ◆ Teacher asks to analyse the picture and the information (facts) and then to complete the table.
- ◆ Teacher gives necessary help

Assessment

Completed table and entries in ‘ My Science Diary’

Immovable Joints

Teacher shows the picture or model of a skull and a single bone

Are the joints in the skull movable?

Let them read the information (facts) given in TB page 233

Write a note on immovable joints.

Assessment

Entries in “ My Science Diary’

Which are the important internal organs in the body?

- ◆ Lead a discussion
- ◆ Teacher consolidates the list of internal organs.
- ◆ Make entries in ‘ My Science diary’

Assessment: Entries in ‘My Science diary’.

How are these organs protected?

Activity : Individual Activity

Let each student fill up the table

ORGAN	PROTECTED BY
Heart	Ribs
Brain	Skull
Lungs	Ribs and sternum

Assessment

The completed table - Brain, Lungs, Heart

Text analysis.

Why should we wear helmet or seat belt while driving?

Lead a discussion

- ◆ Importance of protecting brain
- ◆ What will happen to skull when a head is injured?
- ◆ Importance of wearing seat belt while driving?

Let the learners read the consolidation points given in the TB page 234

The largest... The smallest

Read and make notes

What is a fracture?

Assessment

Entries in the Note Book

Take care of Old People

Activity

Teacher asks

- ◆ How can we care older people (Grandparents)?

- ◆ Let the learners read the points given in the box on page 235 of TB

Assessment

Entries in ‘ My Science Diary’

MUSCULAR SYSTEM

Activity

Teacher asks

- ◆ Listen and read the dialogues of skeleton and the Muscles page no 236 TB
- ◆ Do you agree with their comments?
- ◆ Read What Grandpa says and sonu’s comment
- ◆ Teacher Consolidates the major points
- ◆ Let the learners make notes

Assessment

Entries in ‘ My Science Diary’

TYPES OF MUSCLES

Activity : Text analysis and Table completion - Group activity

- ◆ Divide the learners into 5 member groups
 - ◆ Instruct the groups to read the Address tags
- Let each group observe the pictures thoroughly and fill up the table.

Consolidation

- ◆ There are three types of muscles namely skeletal muscles, smooth muscles and cardiac muscles
- ◆ Skeletal muscles are seen attached to the skeleton
- ◆ The wall of the internal organs composed of smooth muscles
- ◆ Cardiac muscles seen only in heart walls.

Assessment

Completed Table

How can we strengthen our muscles?

Group activity

- ◆ Sit in groups

- ◆ Read the textual matter
- ◆ Discuss and add more points

Assessment

Completed points -Entries in ‘ My Science Diary’

Check yourself - answers

1.

- a. Neck
- b.Skeletal muscle
- c.Statement (1) is wrong and (2) is correct
- d. The skeletal system helps to protect many vital internal organs from external injury, helps in the movement of body parts and give shape to our body.
- e .In an adult person bones of some parts fuse together and thereby the number is reduced compared to a child.
- f. Skeletal muscles are seen as attached to bones and can control by ourselves. Smooth muscles are organized on the walls of internal organs and are not under our control.
- g. Any suitable message in the poster
- h. Intake of nutrient rich healthy food and regular exercises or yoga.
- i . Brain, kidney etc
- j. largest bone Femur, Smallest bone Stapes

2.

ORGAN	PROTECTED BY
Heart	Ribs
Brain	Skull
Lungs	Ribs and sternum

3.

SMOOTH MUSCLE	CARDIAC MUSCLE	SKELETAL MUSCLE
Intestine	Heart	Hand, thigh
Stomach		Jaw

Extended Activities

- Prepare some work sheets like those given in the TB

5

ACIDS, BASES AND SALTS – FASCINATING SUBSTANCE

Introduction:

In this chapter, students will learn about the fundamental facts regarding acids, bases, and salts. They will understand how to identify acids and bases through experiments. They will learn the use of indicators and will become capable of performing simple experiments using acids and bases. The uses of some common acids, bases, and salts will also become familiar to them.

Previous knowledge

The Learners

- ◆ are familiar with acids containing substances.
- ◆ have tasted acid containing substances.
- ◆ have seen vinegar using in pickles.
- ◆ are familiar with basic substances like slaked lime, baking soda, washing powder etc.
- ◆ have seen antacids like gelusil and know the use of them.
- ◆ They know that butter milk, tamarind etc are not kept in metal vessels

Learning out comes

The learners

- ◆ comprehend the idea of acids, bases and salts,
- ◆ apply the knowledge about acids ,bases and salts in different situations,
- ◆ appreciate the uses acids ,bases ,and salts in various occasions,
- ◆ explore the methods to identify acids and

bases,

- ◆ develop skill in handling chemicals and doing experiments.

Major concepts

- ◆ Acids
- ◆ Indicators
- ◆ Bases
- ◆ Alkalies
- ◆ Characteristics of acids
- ◆ Uses of acids
- ◆ Characteristics of bases, Uses of bases
- ◆ Reaction of acids with carbonates
- ◆ Reaction of acids with metals
- ◆ Neutralization reactions
- ◆ Application of neutralization reactions
- ◆ Antacids
- ◆ Salts
- ◆ Common name, chemical name and uses of salts

Total Time: 5 period of 40 minute

Concepts	Activities	TLM	Values	Assessment
Acids	Discussion Narration, Chart analysis	Chart Samples		Recordings in 'My Science Diary', participate in discussion

Indicators	Experiment	Acids Bases, Indicators		Recordings in 'My Science Diary', participate in experiments
Bases	Experiment	Acids Bases Indicators		Recordings in 'My Science Diary', participate in experiments
Characteristics of acids	Experiment Discussion Chart analysis	Acids Bases Indicator charts		Recordings in 'My Science Diary', participate in experiments
Characteristics of bases	Experiment Discussion, Chart analysis	Acids, Bases Indicators charts		Recordings in 'My Science Diary', participate in experiments
Uses of acids	Chart analysis Discussion Narration	Charts	Appreciates the importance of acids.	Recordings in 'My Science Diary', participate in experiments
Uses of bases	Chart analysis Discussion Narration	Charts	Appreciates the importance of bases.	Recordings in 'My Science Diary', participate in experiments
Reaction of acids with acids	Experiment	Acids Marble Egg shell	Appreciates the importance of chemical reactions.	Recordings in 'My Science Diary', participate in experiments
Reaction of acids with metals	Experiment	Acids Zinc Magnesium	Appreciates the importance of chemical reactions.	Recordings in 'My Science Diary', participate in experiments
Neutralization reactions	Experiment	Hydrochloric acid Sodium hydroxide Phenolphthalein Boiling tube Dropper		Recordings in 'My Science Diary', participate in experiments
Application of neutralization reactions	Video presentation Picture analysis Discussion Narration	Videos Pictures Antacid bottles	Appreciates the contribution of chemistry.	Recordings in 'My Science Diary', participate in experiments
Salts	Chart analysis Sample presentation Discussion Narration	Charts , samples Salts	Appreciates the importance of salts.	Recordings in 'My Science Diary', participate in discussions.

Teaching Manual

Expected products: Writings in ‘My Science Diary’, Completed activity.

Time : 5 Periods

Content analysis	Learning activities
Sour tasting substances contain acids.	Teacher discusses the situation given in the text book .Using chart consolidates that sour tasting substances contain acids. Differentiates natural acids and mineral acids giving examples.
Litmus shows colour change in acids. So litmus is used as an indicator for acids. Phenolphthalein and methyl orange are other widely used indicators.	Teacher conducts all experiments and activities given in the text book. consolidates the colour of indicators in acids.
Acids have many uses.	Teacher exhibits the chart showing the uses of various acids.
Bases are opposite in nature to acids in properties.	Conducts experiments with bases and indicators. Consolidates the result and compares with charts.
There are many substances which can be used as acid-base indicators.	Teacher asks the students to do it as a project and present in science club.
Bases have many uses.	Teacher exhibits a chart showing the uses of bases. Teacher conducts the experiments given in the text book.
Acids reacts with carbonates and liberate carbon dioxide gas.	Teacher demonstrates the experiment given in the text book.
Acids react with metals like magnesium and zinc to form hydrogen gas.	Teacher demonstrates the experiment given in the text book and consolidates neutralization reactions.
When acid reacts with base, salt and water is formed . Both acid and base lose its properties .such reactions are neutralization reactions.	Teacher explains the application of neutralization reaction like sprinkling of slaked lime in fields, use of antacids etc. Exhibits antacids, shows pictures and videos of sprinkling slaked lime in fields.
Neutralisation reactions have many practical applications. Salts have many uses.	Teacher narrates the uses of some of the salts with the help of charts.

CHECK YOURSELF- Answers

1.

- a. (a) Acids
- b. Alkalies
- c. Hydrochloric acid
- d. Hydrogen
- e. Salt + Water
- f. Phenolphthalein/ Methyl orange
- g. Add a few drops of blue litmus in to it. If it turns red it is an acid.
- h. Antacids are used to reduce acidity in the stomach.
- i. (a) Lime Water - Calcium hydroxide
(b) Vinegar - Acetic acid (c) Soda water - Carbonic acid (d) Slaked lime - Calcium hydroxide

2. Match the following suitably.

A	B
Sulphuric acid	Mineral acid
Tartaric acid	Natural acid
Acetic acid	Vinegar
Carbonic acid	Soda water

3. Classify the following as acidic and basic substances and write down them in the table given below.

Acidic substances	Basic substances
Vinegar	Lime water
Lemon juice	Baking soda
Tamarind	Washing powder

4. Classify the following statements and enter in the table given below.

Applicable to acids	Applicable to bases
Sour to taste	Soapy to touch
Corrosive	Bitter to taste
Turn litmus red	Turn litmus blue

5. Complete the table suitably.

Name of indicator	Colour in acidic medium	Colour in basic medium
Litmus	Red	Blue
Phenolphthalein	No colour	Pink
Methyl orange	Reddish pink	Golden yellow

Extended activities

- ◆ Prepare natural indicators as per the directions given in the text book and test various substances around you with them. Classify those substances as acidic substances and basic substances.
- ◆ Make a portable fire extinguisher with vinegar and baking soda as shown in the text book and demonstrate it in your science club.
- ◆ With the help of parents identify the main components used in antacids.