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Semester 2

GRADE - 3

TEACHERS RESOURCE MANUAL

SCIENCE
Grade 3

6 FACTORS OF GROWTH AND ENERGY

Introduction

- Just like plants need sunlight and water to grow, our bodies need good food to stay strong and healthy. But what makes our food so special? Let's find out! This chapter will show us how the food we eat gives us energy and helps us grow. From yummy fruits and veggies to grains and proteins, everything we eat helps us feel good and do our best. We'll learn why it's important to eat healthy food for our bodies and our minds. So, get ready to learn all about eating right for a happy, healthy life!

Previous knowledge

- The child knows about the variety of food items.
- The child practises some healthy food habits.

Learning Outcomes

The learner

- identifies the various nutrients in food.
- comprehends the functions of nutrients.
- classifies the sources of food into plant origin and animal origin.
- differentiates vegetarians and non-vegetarians.
- discriminates the edible parts of different plants.
- keeps healthy food habits.

Major concepts

- The substances in food that provide us with energy that facilitates growth and helps to carry out different life processes are called nutrients.
- Carbohydrates and fats help in providing energy.
- Protein helps in body- building.
- Vitamins and minerals keep us healthy by fighting against diseases.
- Vegetarians take food of plant origin and may use milk and milk products like butter, cheese, ghee, etc.
- Non-vegetarians prefer meat, fish, chicken, egg, etc. in addition to plant products.
- The sources of food may be Plant or Animal origin.
- The various parts of plants which are used as food materials by us are: Roots, Stems, Leaves, Flowers, Fruits and Seeds.
- Some plants have two or more edible parts.
- Health through food should be our motto.

UNIT FRAME

Name of Unit: 6. Factors of Growth and energy Total Time: 6 period of 40 minute

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESMENT
♦ Identifies the various nutrients in food. ♦ Comprehends the functions of nutrients.	♦ The substances in food that provide us with energy that facilitates growth and helps to carry out different life processes are called nutrients. ♦ Carbohydrates and fats help in providing energy.	♦ picture observation, illustration analysis, description analysis, table completion	♦ Picture, illustration, table in Text book	♦ Writing in 'My Science Diary', participation in group activity, completed table in 'My Science Diary'

	♦ Protein helps in body-building. ♦ Vitamins and minerals keep us healthy by fighting against diseases.			
♦ classifies the sources of food into plant origin and animal origin. ♦ differentiates vegetarians and non-vegetarians.	♦ Vegetarians take food of plant origin and may use milk and milk products like butter, cheese, ghee, etc. ♦ Non-vegetarians prefer meat, fish, chicken, egg, etc. in addition to plant products. ♦ The sources of food may be Plant or Animal origin.	♦ discussion, conversation analysis, identifying food items, classifying food items	♦ Conversation, pictures, table in Text book	♦ Complete the table in Text book, Writing in 'My Science Diary', participation in discussion
♦ discriminates the edible parts of different plants.	♦ The various parts of plants which are used as food materials by us are: Roots, Stems, Leaves, Flowers, Fruits and Seeds.	♦ picture observation, identifying parts, observing illustration, doing assignment, table completion	♦ Picture and table in the text book	♦ Description in 'My Science Diary', participation in group activity. Complete table in text book
♦ keeps healthy food habits.	♦ Health through food should be our motto.	♦ conversation analysis, collecting information and presenting seminar	♦ Conversation and hints in the text book	♦ Participation in seminar, seminar report

Types of food (1 period)

♦ **Activity 1 (picture observation)**

♦ This activity aims to provide an introduction to the importance of food and the variety of food. Analysing the picture (group activity) and the teacher conducts discussion on the doubts raised by Sana and Sonu. The teacher also encourages the students to raise similar doubts in class room. After discussion the teacher consolidates their responses on the black board. Afterwards, each student will write their findings individually in their 'My Science Diary'.

Consolidation

- Food for energy.
- Lack of food or excess lead to diseases.
- Eating a variety of food helps to provide

the body with adequate nutrients.

Evaluation

- Writing in 'My Science Diary', participation in group activity.

- **Activity 2 (illustration analysis, description analysis, table completion)**
- This activity focuses on familiarizing students with different types of food. It involves observing an illustration and description in groups of six members, then completing a table individually in text book based on their observations. After completion, there's an opportunity for peer assessment, which encourages collaboration and reinforces learning. It's a hands-on approach to learning about food classification and encourages students to engage with the material actively. Following this the table should be written in 'My Science Diary'

Consolidation

- The substances in food that provide us with energy that facilitates growth and helps to carry out different life processes are called nutrients.

Food items	Nutrient present in it	Function in our body
Wheat, rice potato, sugar	Carbohydrate	Give energy.
Cheese, Beans, pulses, egg, fish	Protein	Helps in the growth of the body.
Oil, Ghee	Fats	Give energy.
Vegetables and fruits	Vitamins	Fighting against diseases.
Vegetables and fruits	Minerals	Fighting against diseases

- Different foods have various nutrients, like carbohydrates, proteins, vitamins, fats, and minerals.

Evaluation

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

Sources of food (1 period)

- **Activity 1 (discussion, conversation analysis, identifying food items, classifying food items)**
- This activity aims to classify the sources of food into plant origin and animal origin. The class can begin with a normal inquiry into the foods eaten by students on the previous day. The teacher lists the students' responses into two groups, such as plant and animal origin, on the blackboard. The teacher then encourages the students to identify the criteria for this grouping. By analyzing the conversation using indicators, the teacher writes the inferences in 'My Science Diary'.
- Afterwards, the students write down the names of food items given in the textbook. They are directed to classify these items in the table and record their findings in 'My Science Diary'. Peer assessment can also be implemented in this activity.

Indicators

- Vegetarians
- Non-vegetarians

Consolidation

- Vegetarians take food of plant origin and may use milk and milk products like butter, cheese, ghee, etc.
- Non-vegetarians prefer meat, fish, chicken, egg, etc. in addition to plant products.
- Plant origin – Fruits, vegetables, cereals, seeds, cauliflower, turnip, potato, ginger, mint, onion, cabbage, spinach
- Animal origin - Egg, meat, fish, prawn, milk

Evaluation

- Complete the table in Text book, Writing in 'My Science Diary', participation in discussion.

Edible parts of plants (2 periods)

- **Activity 1 (picture observation, identifying parts)**
- This activity aims to discriminate the edible parts of different plants. The students are directed to identify the plants in the picture. After this the students are directed to identify the part which is used as food (Group activity). Write in 'My Science Diary'.

Consolidation

- Spinach - Leaf used as food.
- Carrot - Root used as food.
- Sugarcane - Stem used as food.
- Cauliflower - Flower user as food
- Rice - Seed used as food.
- Apple – Fruit used as food.
- The various parts of plants which are used as food materials by us are: Roots, Stems, Leaves, Flowers, Fruits and Seeds.

Evaluation

- Writing in 'My Science Diary', participation in group activity.

- **Activity 2 (observing illustration, doing assignment)**
- This activity aims to explore the concept of storing food in modified roots and underground stems. By observing the illustrations, students will write examples of food storage in modified roots and underground stems in their 'My Science Diary.' Additionally, students will be assigned to collect more examples of food storage in modified roots and underground stems as a group activity and paste them on the class bulletin board.

Consolidation

- Radish, Beetroot are plants that store food in modified roots
- Onion, Potato, Turmeric are plants that store food in modified underground stems.
- Sweet Potatoes, Carrots, Turnips are examples for plants that store food in modified roots.
- Taro, arrowroot, Ginger are examples for plants that store food in modified underground stems.

Evaluation

- Description in 'My Science Diary', participation in group activity.

To the teacher

- Numerous plant species have specialized stems that grow under the soil, adapting to different environments. One common underground stem is the rhizome. It spreads horizontally underground, making new shoots and roots. Rhizomes help plants make new plants and survive changes. Tubers are another kind of underground stem. They store food for plants when they can't grow. Bulbs are also underground stems. They store food and help plants survive tough times. These underground stems show how plants can adapt and stay strong in different places.
- Plants have special roots that do more than just hold them in the ground and take in water and nutrients. These modified roots have changed to do specific jobs, helping plants survive better. One kind is storage roots, which store food to help plants live through tough times. Sweet potatoes have tuberous roots full of starch, while carrots and beets have taproots full of sugars. Another type is prop roots, which grow down from stems or branches to support plants in windy or flood-prone places. Mangrove trees use prop roots to stay steady in muddy areas near the coast. Some plants even have roots that grow above the ground! These "adventitious" roots can stick out from stems and help the plant stay attached or get moisture from the air. Orchids use adventitious roots to cling to trees or other things they grow on.

- **Activity 3 (table completion)**
- This activity aims to assess the understanding of the parts of plants that are used as food. After completing the table in the textbook individually, the students are given the opportunity for peer assessment. The students

are directed to write the completed table in 'My Science Diary'.

Consolidation

- Ginger - Underground stem
- Broccoli - Flower
- Turnip - Modified roots
- Cabbage - Leaf
- Garlic - Underground stem
- Wheat – Seed
- Mango – Fruit
- Green gram – Seeds
- Bengal gram - Seeds

Evaluation

♦ Complete table in the text book.

Healthy food habits (2 periods)

♦ **Activity 1 (conversation analysis, collecting information and presenting seminar)**

♦ This activity aims to practise healthy food habits. After analyzing the conversation, the students will add more points about the healthy food habits practised by them. Following this, a seminar related to healthy food habits will be conducted in the next class. The students are assigned to collect information related to the seminar by using the hints in the textbook. After individual preparation, the prepared materials will be improved in groups (8 groups). The recordings will be made in 'My Science Diary'. In the next period, the seminar will be conducted. The teacher should assign duties related to the seminar on the conducting day. While presenting the seminar, the missing points should be recorded in 'My Science Diary'. The seminar will be presented with the help of presentation slides or chart paper. After the completion of the seminar, the students are requested to prepare a seminar report in 'My Science Diary'.

Consolidation

Seminar hints:

♦ **Eating Lots of Fruits and Vegetables** - We need to eat lots of fruits and vegetables! They are like magic potions that keep our bodies strong and healthy. Fruits and veggies give us vitamins and minerals that help us grow big and strong, and they make our tummies happy too!

♦ **Including Different Food Items in Our Diet** - It's super important to include different kinds of foods in our meals. That means eating grains like rice and bread, proteins like beans and chicken, and dairy products like milk and cheese. When we eat a variety of foods, our bodies get all the different nutrients they need to stay healthy.

♦ **Chewing Food Properly** - Did you know that chewing your food properly is like giving your tummy a big hug? When we chew our food slowly and thoroughly, it's easier for our bodies to digest it and get all the good stuff out of it. So, remember to take your time and chew your food properly!

♦ **Drinking Plenty of Water** - Water is like magic potion number two! It keeps us hydrated, helps our bodies work properly, and makes our skin glow. So, make sure you drink plenty of water every day, especially when you're playing and being active.

♦ **Avoiding Overeating** - Now, let's talk about portion sizes. It's important not to eat too much food at once. When we overeat, it can make us feel uncomfortable and sleepy. So, listen to your tummy and stop eating when you feel full.

♦ **Reducing the Use of Oil, Sugar, and Salt** - We should also try to use less oil, sugar, and salt in our food. Too much of these things can be bad for our health. Instead, we can use herbs and spices to make our food tasty without adding extra oil, sugar, or salt.

♦ **Avoiding Eating in Front of Screens** - Eating while watching TV or playing on our tablets might seem like fun, but it's not good for our health. When we're distracted, we don't pay attention to how much we're eating, and we might end up overeating. So, let's try to eat our meals without any screens around.

♦ **Eating Meals Together as a Family** - Last but

not least, eating meals together as a family is super important. It's a great time to talk, laugh, and share stories with each other. Plus, when we eat together, we're more likely to make healthy food choices.

- Remember, eating healthy is not just about staying strong and fit, it's also about feeling happy and energized every day. So, let's make healthy eating a super fun adventure!

Evaluation

- Participation in seminar, seminar report

Working Gallery

- (B) Carrot, others are plants in which leaf is used as food.
- (B) Protein
- (B) Carbohydrate and fats
- (C) Proteins
- Statement (i) and statement (ii) are correct
- This is a healthy food habit to include leafy vegetables and fruits in the food. Vegetables and fruits are protective food. They contain vitamins and minerals that keep us healthy by fighting against diseases.
- No, non-vegetarians, they prefer meat, fish, chicken, egg, etc. in addition to plant products.
- Carbo hydrate. Examples - Wheat, maize, Potato, Sugar
  - Fat . Example - Oil
  - Protein. Example - Pea
  - Vitamins – Example – Fruits and vegetables
- Person A – Carbohydrate
- Person B – Protein, Carbohydrate
  - Plant origin – Fruits, vegetables, cereals, seeds
  - Animal origin - Egg, meat, fish, milk

Food item	Edible part
Cauliflower	Flower
Potato	Stem
Orange	Fruit
Carrot	Root
Cabbage	Leaf

7 THE JOURNEY OF FOOD

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Introduction

♦ Digestion is the breakdown of large insoluble food molecules into small water-soluble food molecules so that they can be absorbed into the blood. Digestion is one among many life processes observed in almost all living organisms. This chapter is an introduction to the journey of food through alimentary canal. The digestive system has the functions like digestion of food, absorption of nutrients from food, and elimination of food waste. The traditional nutrition styles can be incorporated wherever necessary and introduced so as to reinforce the concepts and develop skills and attitudes. The activities included in this chapter are aimed to understand the process of digestion and to inculcate the importance of healthy food habits in students.

Previous knowledge

♦ The important organs in our body
♦ Need of food

Learning Outcomes

♦ The learner
♦ defines digestion
♦ illustrates and classifies teeth
♦ realises the importance of tongue
♦ identifies the role of stomach
♦ summarises the function of intestine
♦ develops healthy food habit

Major concepts

♦ The breaking down of food into smaller particles known as digestion.
♦ Our alimentary canal consists of mouth, oesophagus, stomach, intestine and anus.
♦ Digestion starts from mouth.
♦ There are different types of teeth on each jaw.
♦ Care must be taken for the health of teeth.
♦ Tongue helps us to crush and swallow the food.
♦ Tongue can differentiate many tastes.
♦ Digestion completes in small intestine.
♦ Small intestine absorbs nutrients to blood.
♦ Large intestine absorbs water from undigested food.
♦ The undigested food expels as faeces through anus.
♦ We should maintain a healthy food habit.

UNIT FRAME

Unit: 7. The Journey of Food Total Time: 7 periods of 40 minutes

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESMENT
♦ defines digestion	♦ The breaking down of food into smaller particles known as digestion.	♦ description analysis, conversation analysis	♦ description and conversation in the text book	♦ Description in 'My Science Diary', participation in group activity.

♦ illustrates and classifies teeth ♦ realises the importance of tongue	♦ Digestion starts from mouth. ♦ There are different types of teeth on each jaw. ♦ Care must be taken for the health of teeth. ♦ Tongue helps us to crush and swallow the food. ♦ Tongue can differentiate many tastes.	♦ Story analysis, picture analysis, illustration analysis, illustration completion, model preparation, conversation analysis, poster making	♦ Story, picture, illustration, conversation in the text book, ICT	♦ Description in 'My Science Diary'. Completed illustration in the text book, participation in group activity, Prepared model of each tooth. Completed poster,
♦ identifies the role of stomach ♦ summarises the function of intestine ♦ develops healthy food habit	♦ Digestion completes in small intestine. ♦ Small intestine absorbs nutrients to blood. ♦ Large intestine absorbs water from undigested food. ♦ The undigested food expels as faeces through anus. ♦ We should maintain a healthy food habit.	♦ Story analysis, picture analysis, animation observation, description analysis, picture observation, flow chart completion, conversation analysis, poster drawing	♦ Story, picture, illustration, conversation, flow chart in the in the text book, ICT	♦ Description in 'My Science Diary', Completed flow chart and picture of alimentary canal in 'My Science Diary'. Completed posters, participation in group activity.

Digestion (1 period)

♦ **Activity 1 (description analysis, conversation analysis)**

♦ This activity aims to provide an introduction to the concept that digestion results in the release of nutrients. The teacher will elicit prior knowledge by employing the indicators provided below. Through analyzing conversations and descriptions provided in the textbook, using these indicators, each student will individually write their findings in 'My Science Diary'.

Indicators

- Importance of food
- Nutrient
- Factors of nutrients
- Digestion
- Importance of digestion

Consolidation

- Food is one of the basic necessities of life. Food contains substances essential for the growth, repair, and healthy maintenance of body. Food provides energy for the functioning of our body.
- These factors we get from food are called nutrients.

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- Carbohydrate, fat, protein, Vitamins and minerals are the important nutrients
- The food gets broken down in to smaller parts. This process is called digestion.
- Digestion results in the release of nutrients.

Evaluation

♦ Description in 'My Science Diary', participation in group activity.

Digestion in mouth (3 periods)

♦ **Activity 1 (Story analysis, picture analysis)**

♦ This activity aims to know about the digestion in mouth. By analysing the story and picture the student writes description about the digestion in mouth in 'My Science Diary'.

Indicators

- Role of teeth
- Role of tongue
- Journey of food from mouth

Consolidation

- Teeth made food into smaller and smaller pieces by cutting and grinding.
- The food is got mixed with saliva. The tongue pushed the food all around.
- After becoming pulp, food was pushed into the oesophagus.

Evaluation

♦ Description in 'My Science Diary'.

♦ **Activity 2 (Conversation analysis, illustration analysis, model preparation , illustration completion)**

♦ This activity aims to explore the peculiarities and functions of different types of teeth. The teacher should provide an opportunity for students to feel their own teeth by analyzing conversations and illustrations in groups, and having each student individually complete the illustrations in the textbook. After peer assessment, the illustrations are copied into 'My Science Diary'. Students are divided into four groups. Each group is assigned to prepare a model of a specific type of teeth, which can be given as an extended activity.

Consolidation

♦ Canines - Two in each jaw. Sharp, elongated and pointed teeth. Helps to tear the food like flesh.

♦ Incisors - Four in each jaw. Flat and sharp teeth. Helps in cutting and biting the food.

♦ Premolar - Four in each jaw. Strong wide teeth with ridges. Helps in crushing and grinding the food.

♦ Molars - Six in each jaw. Strong teeth having large and flat biting surface. Helps to grind the food.

Evaluation

♦ Completed illustration in the text book, participation in group activity, Prepared model of each tooth.

To the teacher

♦ Dentition refers to the arrangement, number, and types of teeth in a particular species or individual. In humans, for example, dentition typically refers to the set of teeth, including incisors, canines, premolars, and molars, arranged in the upper and lower jaws. Human dentition refers to the arrangement and characteristics of the teeth in the upper and lower jaws. Humans typically have two sets of teeth during their lifetime: primary (deciduous) teeth, commonly known as baby teeth, and permanent teeth. Here's an overview of human dentition:

♦ **Primary Dentition (Baby Teeth):**

♦ Children usually have 20 primary teeth, which start to erupt around six months of age and are gradually replaced by permanent teeth.

♦ The primary dentition consists of 8 incisors (4 upper and 4 lower), 4 canines (2 upper and 2 lower), and 8 molars (4 upper and 4 lower).

♦ These teeth serve essential functions in chewing, biting, and speech development during childhood.

- **Permanent Dentition:**
- Adults typically have 32 permanent teeth, including 16 in the upper jaw (maxilla) and 16 in the lower jaw (mandible).
- The permanent dentition includes the same types of teeth as primary dentition but with additional premolars and molars.
- The permanent dentition consists of 8 incisors (4 upper and 4 lower), 4 canines (2 upper and 2 lower), 8 premolars (4 upper and 4 lower), and 12 molars (6 upper and 6 lower).
- **Dental Formula:**
- The dental formula represents the number and types of teeth in one half of the upper or lower jaw. In humans, the dental formula for one half of the permanent dentition is:
- 2(incisors) 1(canines) 2(premolars) 3(molars) = 16
- Activity 3 (conversation analysis, poster making)
- This activity aims to understand the suggestions for taking care of our teeth. The teacher introduces the importance of dental care by analyzing the conversation in the textbook. After conducting discussions about the suggestions for dental care, the students individually write in 'My Science Diary'. The students are divided into groups of six members and are directed to prepare posters related to the topic of 'teeth care'. After preparing the posters, they are assessed by their peers.

Consolidation

- Suggestions to take care of our teeth – Points to be specified in the poster
- **Brushing**: Brush your teeth at least twice a day, ideally after meals, using fluoride toothpaste. Make sure to brush for at least two minutes, covering all surfaces of your teeth.
- **Flossing**: Floss daily to remove plaque and food particles that your toothbrush may not reach. This helps prevent cavities and gum disease.
- **Healthy diet**: Limit sugary and acidic foods and drinks, as they can contribute to tooth decay. Instead, opt for a balanced diet rich in fruits, vegetables, lean proteins, and dairy products.
- **Regular dental check-ups**: Visit your dentist regularly for check-ups and professional cleanings. Your dentist can identify and address any oral health issues early on.
- **Avoid tobacco**: Avoid smoking or using tobacco products, as they can stain your teeth, cause gum disease, and increase your risk of oral cancer.
- **Use fluoride:** Use fluoride mouthwash or rinse to strengthen tooth enamel and prevent tooth decay. Your dentist may also recommend fluoride treatments during check-ups.
- **Protect your teeth:** Wear a mouthguard when playing contact sports to prevent dental injuries. Also, avoid using your teeth to open bottles or packages, as this can cause chips or cracks.
- **Stay hydrated:** Drink plenty of water throughout the day to help rinse away food particles and keep your mouth hydrated, which reduces the risk of tooth decay and dry mouth.
- **Manage stress:** Stress can contribute to teeth grinding and jaw clenching, which can damage your teeth over time. Practise stress-relief techniques like deep breathing, meditation, or yoga to help reduce tension.
- **Replace your toothbrush:** Replace your toothbrush or toothbrush head every three to four months, or sooner if the bristles become frayed. A worn-out toothbrush is less effective at cleaning your teeth.

Evaluation

- Completed poster.

Activity 4 (Description analysis)

- This activity aims to know about the functions of tongue. By analysing the description, the students write description about the functions of tongue in ‘My Science Diary'.

Consolidation

- Tongue helps to swallow the food.
- Our tongue has different taste buds.

- These taste buds help to distinguish different tastes.

Evaluation

- Description in 'My Science Diary'.

Digestion in stomach and intestine (3 periods)

- **Activity 1 (Story analysis, picture analysis, animation observation)**
- This activity aims to explore the process of digestion in the stomach. By analyzing the story and pictures using indicators, students will write descriptions about digestion in the stomach in 'My Science Diary'. The use of animations related to the content is beneficial for classroom instruction.

Indicators

- How food reach to stomach
- Changes of food in stomach

Consolidation

- By particular movement of oesophagus the food reaches to the stomach.
- The juices made by glands on the stomach wall help to digest fruit pulp into juicy form. The movement of stomach also helps to make the food to juicy form.

Evaluation

- Description in 'My Science Diary'.

- **Activity 2 (Story analysis, picture analysis, animation observation)**
- This activity aims to explore the process of digestion in the intestine. By analyzing the story and pictures using indicators, students will write descriptions about digestion in the intestine in 'My Science Diary'. The use of animations related to the content is beneficial for classroom instruction.

Indicators

- Journey of food from stomach
- Digestion in small intestine
- Distribution of nutrients.

Consolidation

- From the stomach, the partially digested juicy food enters into the small intestine.
- In small intestine the complete digestion occurs. The nutrients in the digested food are absorbed by the blood in the intestine.
- Later the nutrients are distributed to all parts of our body through blood.

Evaluation

- Description in 'My Science Diary'.

- **Activity 3 (description analysis, picture analysis, animation observation)**
- This activity aims to explore the pathway of the undigested part of food. The class begins with the question: "What happens to the undigested part of food?" The students respond to this question. No consolidation is needed at this stage. By analyzing the description and pictures using indicators, students will write descriptions in 'My Science Diary'. The use of animations related to the content is beneficial for classroom instruction.

Indicators

- Action in large intestine.
- Removal of faeces

Consolidation

- The undigested part of food is pushed to the large intestine. Here, the water is absorbed from the undigested matter.
- After the absorption of water from the undigested matter, it is temporarily stored as faeces in the rectum of large intestine. At last, the faeces get removed from our body through anus.

Evaluation

- Description in 'My Science Diary'.

- **Activity 4 (picture observation, flow chart completion)**
- This activity aims to understand the pathway by which the food we eat passes from the mouth to the anus. By observing the picture of the alimentary canal in the textbook, students individually complete the flow chart of the alimentary canal. Afterwards, peer group assessment should be conducted. The students are directed to draw the picture of the alimentary canal in 'My Science Diary' and label its parts.

Consolidation

- The alimentary canal is the pathway by which the food we eat passes from mouth to anus.
- Mouth – Oesophagus – Stomach – Small intestine – Large intestine – Rectum – Anus

Evaluation

- Completed flow chart and picture of alimentary canal in 'My Science Diary'.

- **Activity 5 (conversation analysis, poster drawing)**
- This activity aims to prepare posters related to healthy food habits. The students are divided into six groups and directed to create posters showcasing healthy eating habits. To facilitate poster creation, group discussions are conducted in the classroom based on the conversation in the text book. Once completed, the posters are displayed in the classroom, and assessment by other groups is carried out.

Consolidation

- Eat food three times daily as breakfast, lunch and supper.
- The process of digestion is completed in about 3-4 hours.
- We choose food based on all the required nutrients.
- We should cultivate a food habit that helps to maintain the health of the digestive system and its easy functioning.
- Consuming a variety of foods from all the major food groups, including fruits, vegetables, whole grains, lean proteins, and dairy products, ensures that the body receives essential nutrients for optimal health.
- Drinking an adequate amount of water throughout the day is essential for hydration and proper bodily functions.

Evaluation

- Posters, participation in group activity.

Working Gallery

- (A) Canines
- (D) Small intestine
- (B) Digest food in to juice form
- Mouth, oesophagus, stomach, small intestine, large intestine, rectum, anus
- Renil's habit of brushing his teeth twice daily is excellent! It helps keep his teeth and gums healthy, prevents cavities, and ensures fresh breath. It's important for everyone to follow this habit for good oral hygiene.
- In small intestine the complete digestion occurs. The nutrients in the digested food is absorbed by the blood in the intestine.
- The undigested part of food is pushed to the large intestine. Here, the water is absorbed from the undigested matter. Then it is temporarily stored as faeces in the rectum of large intestine.
    - In the mouth the tongue helps the food to mix with saliva. For this the tongue pushes the food all around the mouth. The tongue helps to swallow the food. Our tongue has different taste buds. These taste buds help to distinguish different tastes.

Digestive organ	Function
Mouth	Helps to chew and taste food.
Stomach	Makes the food to juicy form.
Small intestine	Digestion is completed.
Large intestine	The absorption of water from the undigested matter
Rectum	Stores undigested food temporarily as faeces.

- 1. (a) Canines
- (b) Helps to tear the food like flesh.
- Incisors - Flat and sharp teeth. Helps in cutting and biting the food.
- Premolars - Strong wide teeth with ridges. Helps in crushing and grinding the food.
- 2. A – Stomach - The juices made by glands on the stomach wall help to digest fruit pulp into juicy form.
- B - Large intestine - The water is absorbed from the undigested food matter.
- C – Rectum – The undigested food is temporarily stored as faeces.

- **3. Match the following.**

Teeth	Peculiarity
Fig.of incisor	Flat and sharp
Fig.of canine	Sharp, elongated and pointed
Fig.of premolar	Strong wide teeth with ridges

8 FOUNDATION OF LIFE

Introduction

- This unit introduces young learners to fundamental elements that are essential to life on Earth: air, water, and soil. Through simple observations, experiments, and discussions, students will explore these natural resources, understand their composition, uses, and the importance of conservation. Activities include practical experiments to observe properties of air, water, and soil, fostering curiosity about the environment and the students' role in protecting it.

Previous Knowledge

- **Students may already be familiar with:**
  - Basic understanding of weather patterns (rainy and sunny days).
  - Basic uses of water and air (e.g., drinking, breathing).
  - General awareness of soil as the ground surface and where plants grow.

Learning Outcomes

- Identify and describe the components of air and explain their significance.
  - Understand the sources and uses of water, emphasizing the importance of conservation.
- Recognize the components of soil, its formation, and its significance to plant life.
- Conduct simple experiments and record observations, fostering scientific thinking.

Major Concepts

- Air is everywhere around us and is composed of different gases.
- Oxygen is essential for breathing and combustion.
- Conservation of clean air is crucial for life.
- Activities include observing a storm scene and conducting a candle experiment to show oxygen's role in burning.
- Water is essential for all living things and has various uses (drinking, farming and transportation).
- The water cycle demonstrates how water circulates between the Earth and the atmosphere.
- Conservation of water is necessary to ensure sufficient availability.
- Activities include calculating water use, identifying sources of water, and understanding the water cycle.
- Soil is a complex mix of minerals, humus, air, and water, and it supports plant life.
- Soil formation occurs through weathering of rocks.
- Properties of soil include its capacity to hold water and air.
- Activities include soil layering and percolation experiments to understand soil composition and its properties.

Components of air (1 period)

- **Activity 1: (Picture Observation, Table analysis and Discussion)**
- This activity introduces the concept of storms, the nature of air, and its components. Students will observe and discuss a picture showing a storm scene on television and analyze a conversation between a father and his daughter. The activity encourages students to question, explore, and understand air and its composition. Following the discussion, and analyzing table students will record their findings individually in their 'My Science Diary.' ICT tools are suggested for a visual representation of storms and atmosphere.

Consolidation

- Nitrogen.

- Oxygen.
- Argon.
- Carbon dioxide
- Water vapour, dust, smoke etc

Evaluation

- Writing in 'My Science Diary': Answer questions based on the table of air components, such as identifying the most and least abundant gases and understanding the role of oxygen.
- Participation in group discussions and observations.

Oxygen is essential for burning. (1 period)

- **Activity 1 (Experiment and Observation)**
- This activity introduces students to the concept that oxygen is essential for burning. It involves conducting an experiment with candles to observe how the presence of oxygen affects burning. Students will then explore and discuss the various uses of air. After the activity, each student will record their findings in their 'My Science Diary.'

Practical Record

- Aim: To demonstrate that oxygen is essential for burning.
- Materials Required: Two candles, Two plates, Water, Glass tumbler, Matchstick or lighter
- Procedure: Place both candles upright in separate plates. Pour a small amount of water into one of the plates. Light both candles. Carefully cover one of the candles with a glass tumbler, ensuring that the tumbler rests on the plate with water. Observe the behavior of the candle flames.
- Observation: The candle that is covered by the glass tumbler extinguishes after a short period, while the uncovered candle continues to burn.
- Inference: The flame inside the glass tumbler goes out because the oxygen inside is used up during burning. This demonstrates that oxygen is essential for combustion. Without a continuous supply of oxygen, burning cannot occur.

Evaluation

- Students will record their observations and inferences in 'My Science Diary' and participate in a group discussion and engage in the experiment.

Water - The Elixir of Life (2 periods)

- **Activity 1 (Conversation Analysis and Observation)**
- This activity aims to create awareness about the importance of conserving water and understanding the uses of water in our daily lives. Students will observe a conversation on water usage and participate in activities to measure and analyze their daily water consumption. Each student will write their observations in 'My Science Diary.'

Consolidation

- Here's an example of how the table might look when filled in, based on average water usage for each activity. You can adjust the values based on your specific observations.

Sl. No	Purpose	Quantity of Water (in mugs)
1	Use in toilets	15
2	Brushing	1
3	Bathing	20
4	Washing clothes	10
5	Washing utensils	8
6	Cleaning the floor	5
7	Watering the plants	6
8	Drinking	3

- These values provide an estimate and can vary depending on individual habits and the size of the mugs used. Filling this table with actual usage values can help in understanding water consumption and finding opportunities to save water.
- To calculate the quantity of water needed

for one person in a month and a year, we can multiply the daily usage by the days in a month (around 30) and in a year (365). Then, to calculate for a family, we can multiply the yearly total by the number of family members.

♦ **Step-by-Step Calculation. Example:**

1. Daily Usage Total

- Using the filled table above, let's assume the total daily water usage is around 68 mugs.

2. Monthly Usage for One Person

- 68 mugs/day×30 days=2040 mugs/month
- 68 mugs/day×365 days=24,820 mugs/year

3. Yearly Usage for a Family

- For a family of, say, 4 people:
- 24,820 mugs/person/year×4=99,280 mugs/year for the family
- So, approximately 99,280 mugs of water are needed annually for a family of four. This exercise highlights the significant amount of water required for daily activities, helping to identify where conservation efforts can make a difference.

Evaluation

♦ Students will record their water usage and other observations in 'My Science Diary' and participate in group discussions about the uses and conservation of water.

♦ **Activity 2 (Picture observation, group discussion)**

♦ In this activity, students will observe an illustration showing different uses of water and analyze it. They will then document their findings in their 'My Science Diary'.

Consolidation

♦ Picture 1: Watering plants and animals drinking water.

♦ Picture 2: A large tea estate where water is used by sprinklers.

♦ Picture 3: The use of water to produce products in a factory.

♦ Picture 4: Ships and boats traveling in water.

♦ Water is essential not just for personal use, but also for agriculture, industry, and transportation. Water helps in irrigation and is used by animals for drinking. In agriculture, water is used by sprinklers to maintain crops. Factories require water to produce goods (such as in cooling processes or raw material processing). Water is used in ships and boats for transportation across oceans and along rivers.

Evaluation:

♦ Writing in 'My Science Diary'

♦ **Activity 3 (Illustration Observation and Analysis)**

♦ Students observe illustrations that showcase various uses of water and the water cycle, promoting a deeper understanding of the role of water in nature and the importance of the water cycle. Students will then write their findings in 'My Science Diary.'

Consolidation

♦ Uses of Water: Watering plants, supporting animal life, aiding agriculture, and enabling transportation (e.g., ships).

♦ The Water Cycle: Water from oceans and lakes evaporates, forms clouds, and returns to the Earth as rain, illustrating nature's continuous water circulation.

Evaluation

♦ Students will write their observations on the uses of water and the water cycle in 'My Science Diary' and discuss the importance of water conservation.

♦ **Methods to Conserve Water**

♦ Students will review various methods to conserve water, such as:

- Repairing leaks in pipes and taps.
- Using low-flow fixtures and water-efficient appliances.
- Practicing drip irrigation in agriculture.

- Turning off taps when not in direct use.
- Harvesting and reusing rainwater.

Evaluation

- Students will list water conservation methods in 'My Science Diary' and discuss additional strategies in the class.

To the teacher

Conservation of Water: A Vital Necessity for Our Future

- Water is one of the most essential resources for life on Earth. It sustains ecosystems, supports agriculture, and is a fundamental part of human survival. Despite its abundance, fresh water—a resource that is clean and usable—is becoming increasingly scarce. With growing populations, urbanization, and changing climate patterns, the demand for water is rapidly increasing, while its availability is diminishing. Therefore, conserving water has become a critical responsibility for every individual, community, and nation.

Why Is Water Conservation Important?

- **Limited Availability of Freshwater**: Although about 70% of the Earth's surface is covered by water, only a small fraction—around 2.5%—is freshwater, and most of it is locked in glaciers and ice caps. The remaining 1% of freshwater is available for drinking, agriculture, and industry. This small percentage is under increasing pressure due to overuse and pollution.
- **Rising Water Demand**: The global population is rapidly increasing, leading to higher demand for clean water. Agriculture consumes around 70% of global freshwater supplies, followed by industrial and domestic use. As cities expand and industrial activities increase, the pressure on water resources continues to grow.
- **Climate Change**: Climate change has caused shifts in rainfall patterns, leading to extreme weather conditions, including droughts and floods. This disrupts the natural water cycle, impacting water availability. Regions that were once water-rich are now facing water shortages, and droughts are becoming more frequent and severe.
- **Pollution and Contamination**: Water pollution from industrial waste, agricultural runoff, and untreated sewage is contaminating our water sources. This pollution makes water unsafe for drinking and irrigation, thus further reducing the available freshwater supply.

Ways to Conserve Water

- **Reduce Water Wastage at Home:**
- **Fix Leaks**: Even a small drip from a leaky faucet can waste gallons of water every day. Repairing leaks promptly can save a significant amount of water.
- **Use Water-Efficient Appliances**: Install low-flow showerheads, faucets, and water-saving toilets to reduce water usage in daily activities.
- **Turn Off the Tap**: Avoid leaving the water running while brushing your teeth, washing dishes, or shaving. Simply turning off the tap when not in use can save gallons of water.
- **Efficient Laundry and Dishwashing**: Run washing machines and dishwashers only when full to maximize efficiency. Consider using eco-friendly detergents that use less water for rinsing.

- **Water-Efficient Gardening and Landscaping:**
- **Use Native Plants**: Native plants require less water because they are adapted to local climate conditions. Choosing these plants for your garden can significantly reduce water usage.
- **Water Early in the Morning or Late in the Evening**: Watering your plants during cooler times of the day prevents excessive evaporation and ensures the plants receive more water.
- **Collect Rainwater**: Install rainwater harvesting systems to collect and store rainwater for use in gardening and other non-potable needs. This reduces the demand on municipal water supplies.

- **Conserve Water in Agriculture:**
- **Drip Irrigation**: This method involves delivering water directly to the roots of plants, reducing evaporation and runoff. It is a more efficient way to water crops compared to traditional irrigation techniques.
- **Soil Moisture Management**: Using organic mulch and practicing no-till farming can help maintain soil moisture and reduce the need for frequent irrigation.
- **Public Awareness and Education**: Education plays a crucial role in water conservation. Raising awareness about the importance of water conservation and the ways individuals can help is key to long-term change. Governments, NGOs, and educational institutions should promote water-saving habits and technologies to encourage sustainable water use.
- **Government and Policy Initiatives**: Governments around the world must create and implement policies to manage water resources effectively. This includes regulating the use of water, improving water infrastructure, and investing in technologies that reduce water wastage. Policies should also focus on reducing water pollution and promoting wastewater treatment and recycling.
- Water conservation is no longer just an environmental concern but an urgent global necessity. Each individual, community, and organization must take responsibility for managing this vital resource efficiently. By adopting water-saving practices in our daily lives and encouraging sustainable policies, we can protect water supplies for future generations. Remember, every drop counts—small actions collectively lead to significant savings. Let's all commit to conserving water and ensuring a sustainable and water-secure future.

Soil – The Foundation of Life (3 periods)

- **Activity 1: Soil Exploration (Observation, Experimentation)**
- This activity is designed to introduce students to the composition of soil, helping them understand why soil is different from sand and its importance in plant growth. It involves observation, analysis, and reflection based on the indicators provided below. By observing the sand from the porch and some soil from the field and write through a hand lens. Are they similar in nature? Note the difference between sand and soil, Components of soil (minerals, humus, air, water, organisms). Prepare a practical record in the above given format.

Consolidation

- Soil is not just sand; it contains minerals, humus, air, and organisms that are vital for plant life.

Evaluation

- Students will write their findings in 'My Science Diary' based on their observations.
- Participation in the activity, analysis of the differences between sand and soil, and understanding the components of soil.

To the teacher

Difference Between Soil and Sand

- Soil and sand are both natural materials found on the Earth's surface, but they differ significantly in their composition, properties, and roles in the environment. Below is a detailed comparison between the two:

1. Composition

- **Soil**: Soil is a mixture of various particles such as sand, silt, clay, organic matter (humus), air, and water. It has a complex structure that includes different sizes of particles, with organic material being a crucial component. The proportions of sand, silt, and clay in the soil determine its texture and fertility.
- **Sand**: Sand consists primarily of small, loose grains of mineral material, mostly quartz (silicon dioxide). The size of sand particles is relatively large compared to silt or clay. Sand does not contain significant amounts of organic matter or nutrients like soil does.

2. Particle Size

- **Soil**: Soil particles are classified into different types based on their size. The primary types of soil particles are:
  - Sand (larger particles)
  - Silt (medium-sized particles)
  - Clay (smallest particles)
- Soil is a combination of these particles, and the size of the particles influences the soil's texture and how it behaves in terms of water retention, drainage, and fertility.
- **Sand**: Sand consists of larger particles, typically ranging in size from 0.0625 mm to 2 mm in diameter. The larger size of sand particles allows for more space between them, making sand relatively more porous than soil.

3. Water Retention

- **Soil**: Soil has a higher capacity for water retention compared to sand, especially loamy soils (which maintain a balance of sand, silt, and clay). The smaller particles of soil, especially clay and silt, create more surface area for water to be absorbed and held.
- **Sand**: Sand has low water retention capacity. Due to its larger particle size and spaces between them, water drains through sand quickly and doesn't stay in the soil for long periods. This makes sandy soil less suitable for growing plants that need constant moisture.

4. Drainage

- **Soil**: Soils with a high proportion of sand have good drainage, while soils with more clay may have poor drainage. Well-balanced soils (loam) have adequate drainage and water-holding capacity, making them ideal for plant growth.
- **Sand**: Sand has excellent drainage properties because of its large particle size and the wide spaces between the particles. However, this also means that it dries out quickly and doesn't retain nutrients well.

5. Nutrient Content

- **Soil:** Soil, particularly fertile soils, contains essential nutrients such as nitrogen, phosphorus, potassium, and other minerals, along with organic matter. These nutrients are essential for plant growth. The presence of organic material (humus) in soil improves its fertility and structure.
- **Sand**: Sand typically lacks nutrients because it doesn't contain significant organic material or fine particles that can retain nutrients. Sand-based soils need to be enriched with fertilizers and organic matter to support healthy plant growth.

6. Colour

- **Soil**: The color of soil can vary widely depending on the mineral content, organic material, and moisture. It can range from brown, black (rich in organic matter), red (due to iron content), yellow, or gray.
- **Sand**: Sand is usually light-colored, ranging from white to yellow, brown, or even red, depending on the minerals it contains. The color of sand is primarily influenced by the type of rock it originated from, often quartz or limestone.

7. Fertility

- **Soil**: Soil is typically fertile and supports the growth of plants. The presence of organic material (humus) and minerals in soil makes it suitable for sustaining plant life. The fertility of soil depends on the balance of sand, silt, clay, and organic matter.
- **Sand**: Sand is generally infertile because it lacks essential nutrients and organic matter. However, sandy soil can be improved with organic matter and fertilizers to increase its fertility.

8. Uses

- **Soil**: Soil is used for farming, gardening, construction, and erosion control. It is essential for growing crops, plants, and trees.
- **Sand**: Sand is used in construction (concrete, mortar), for making glass, in sandblasting, and as a soil amendment (to improve drainage in clay-heavy soils). Sand is also used in

recreational areas like beaches and volleyball courts.

9. Structure

- **Soil**: Soil has a more complex structure, and its texture depends on the proportion of sand, silt, and clay. It can form various structures, including crumbly, sticky, or firm, depending on the organic matter and particle sizes present.
- **Sand**: Sand has a loose and granular structure. The particles are large and don't stick together well, which makes it crumble easily and gives it a loose feel.

- **Activity 2: Soil formation, components and properties (Observation, Engaging in experiments, Group discussion)**
- This activity is designed to introduce students to the composition of soil, helping them understand Formation of Soil, components of soil, and properties of soil. The students are encouraged to do the experiments in groups and write their findings in "My science diary'. The practical record of the experiment should also be pepared.

Consolidation

- Soil is formed through the gradual breakdown of rocks and organic matter.
- Soil contains different layers, each with specific components such as gravel, sand, silt, and humus.
- Soil has several properties like percolation, water retention, and air content, which support plant growth and life.

Evaluation

- Participation in activities, experiments, observations, and discussions.

Working gallery - Answers

1. Answer the following:

a- (b) Nitrogen

b -(d) Humus

c. The purest form of water is rainwater.

- Water evaporates into water vapour. Water vapour condenses to water.

d - (d) Carbon dioxide

e - (c)Soil

- The atmosphere is the layer of gases surrounding the Earth, primarily composed of nitrogen, oxygen, argon, and trace gases, including carbon dioxide. It plays a crucial role in supporting life and regulating climate.
- Harvest rainwater: Collect and store rainwater to use for various purposes like irrigation, cleaning, and drinking (after purification). Fix leaks in pipes: Prevent water wastage by repairing leaks in water pipes and taps.
- Oxygen for breathing: Air provides oxygen, which is necessary for all aerobic life forms to breathe.Helps in flying: Air supports the flight of birds, aeroplanes, and other flying objects by providing the lift necessary for them to stay airborne.
- **2. Complete the table:**

Experiment	Observation	Conclusion
Cover a lighted candle with a glass tumbler.	Candle gets put out.	Oxygen is required for burning.
Heat some soil in a beaker.	Water vapour appears.	Soil contains water.
Add water into soil taken in a beaker and stir.	Air bubbles come out.	Soil contains air.

9 TINY FRIENDS

GRADE - 3

Introduction

♦ Our earth is full of creepy - crawly creatures. Different types of insects, worms, snails, spiders and reptiles can be found everywhere. They are found in gardens, in houses, in plants, in the soil and in the water bodies. They are our creepy crawly and flyer friends. This unit focuses on these tiny friends.

Previous knowledge

The child knows about the

- Insects, worms, snails, spiders and reptiles around him.
- uses of some of these creepy crawly and flyer animals.

Learning Outcomes

The learner

♦ identifies the creepy, crawly, flyer friends around him.
♦ identifies the body parts of insects.
♦ explains the peculiarities of various insects.
♦ compares between snails and snakes.
♦ identifies the nature of reptiles.
♦ explains the importance of earthworm, silkworm.
♦ describes the harmful effects of creepy, crawlies and flyers.
♦ develops an attitude to keep the surroundings clean.

Major concepts

♦ Insects are small animals.
♦ The body of insects is divided into three parts – Head, thorax and abdomen.
♦ The peculiarities of ant, cockroach, mosquitoes, butterflies and honey bee.
♦ Spider is an eight legged animal that lives on the web.
♦ Snails are small animals with soft bodies.
♦ Earthworms are long, thin creatures with no bones or legs.
♦ Chameleon, lizards and snakes are reptiles.
♦ Creepy crawlies and flyers are useful to us.
♦ Creepy, crawlies and flyers are also harmful to us.

UNIT FRAME

Name of Unit: 9. Tiny friends Total Time: 6 periods of 40 minutes each

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESMENT
♦ Identifies the creepy, crawly, flyer friends around him. ♦ Identifies the body parts of insects. ♦ Explains the peculiarities of various insects.	♦ Insects are small animals. ♦ The body of insects is divided into three parts – Head, thorax and abdomen. ♦ The peculiarities of ant, cockroach, mosquitoes, butterflies and honey bee.	♦ Picture observation, discussion, description analysis, drawing and labelling the picture, Observing insects, table completion	♦ Picture of butterfly sucking nectar and honey bee buzzing around beautiful flowers of different plants, descrption in text book. Hand lens, Table in text book for completion	♦ Writing in 'MY science Diary', participation in group activity. Labelled diagram, Observation notes in 'MY science Diary', participation in group activity, Completed table.

♦ Compares between snails and snakes.	♦ Spider is an eight legged animal that lives on the web. ♦ Snails are small animals with soft bodies.	♦ Conversation analysis, picture observation, discussion	♦ Picture in the text book, description	♦ Writing in 'MY science Diary', participation in group activity.
♦ Identifies the nature of reptiles. ♦ Explains the importance of earthworm, silkworm	♦ Earthworms are long, thin creatures with no bones or legs. ♦ Chameleon, lizards and snakes are reptiles.	♦ Conversation analysis, observation of earthworm, discussion, picture observation	♦ Picture and conversations in TB, Hand lens	♦ Writing in 'MY science Diary', participation in group activity.
♦ Describes the harmful effects of creepy, crawlies and flyers. ♦ Develops an attitude to keep the surroundings clean.	♦ Creepy crawlies and flyers are useful to us. ♦ Creepy, crawlies and flyers are also harmful to us.	♦ Description analysis, picture analysis, poster making, poster analysis, short note preparing	♦ Posters and description in in TB	♦ Posters prepared in the classroom and the posters in 'MY science Diary', Short notes in in 'MY science Diary', participation in group activity, preparation of poster

Insects (2 periods)

- **Activity 1 (picture observation, description analysis)**
- This activity aims to provide an introduction to the world of insects and identify their general features. It involves analyzing conversations and pictures from a textbook in a group setting, based on the indicators provided below. Afterward, each student will write their findings individually in their 'My Science Diary'. The use of ICT (Information and Communication Technology) is preferable for classroom instruction.

Indicators

- Social insects.
- Action of butterfly.
- ction of honey bee.
- General features of insects.

Consolidation

- Ants and honey bees live in colonies. So they are called social insects.
- Butterfly sucking nectar from the flower.
- Honey bee buzzing around beautiful flowers to collect nectar from the flower.
- Insects have two pairs of wings and six legs.

Evaluation

- Writing in 'My Science Diary', participation in group activity.

- **Activity 2 (picture observation, drawing and labelling the picture, description analysis)**
- This activity aims to identify the major body parts of insects. Through observing and analyzing pictures in the textbook (Group activity), students will write down the main parts of insects in 'My Science Diary'. The use of ICT is preferred for classroom instruction.

Additionally, the teacher will provide directions for students to draw and label the picture of an insect in 'My Science Diary' as an individual activity.

Consolidation

- Insects are small animals.
- The body of insects is divided into three parts – Head, thorax and abdomen.

Evaluation

- Writing in 'My Science Diary', participation in group activity, Labelled diagram.

- **Activity 3 (Illustration observation observing insects, description analysis, table completion)**
- This activity aims to familiarize students with the unique characteristics of certain insects. Students will observe the features and feeding habits of houseflies and mosquitoes using a hand lens. Then, they will write their findings in 'My Science Diary'. In a group activity, students will analyze observation notes and descriptions in the textbook. Afterwards, they will individually complete a table in the textbook and record their responses in 'My Science Diary'.

Consolidation

Insect	Peculiarity
Ant	Lives in ant nests, eats everything.
Cockroach	Found in moist places such as drains and gutters. Eats decaying organic matter and household items.
Mosquitoes	Female mosquitoes bite and suck the blood of humans. They spread many diseases.
Butterflies	Have four wings that are colourful and attractive. They collect nectar from flowers.
Honey bee	Live together in colonies or hives. They collect honey from flowers.

- Any other relevant points found by students during their observation can be included in the table.

Evaluation

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

To the teacher

- The insects make up the largest group of animals, constituting about 75 percent of all animal species. They evolved on Earth long before humans did. Currently, there are approximately 1 million known species of insects. Butterflies, beetles, ants, flies, grasshoppers, silverfish, and bees are all examples of insects. They are adaptable and can survive in various environments where food is available, such as cold regions, hot rainforests, deserts, mountains, caves, and freshwater habitats. Some insects even thrive in saltwater environments. In terms of size, insects vary greatly, with most being small, usually less than 0.2 inches (6 millimeters) long. However, certain species, like walking sticks, can grow to lengths exceeding 12 inches (30 centimeters). Insects exhibit diverse social behaviors; some live solitary lives, while others form organized societies. Social insects, such as ants, bees, wasps, and termites, have structured colonies where one or a few females are responsible for egg-laying, while other members of the colony, typically sterile females, gather food and perform other tasks.

Spiders, Snails (1 period)

- **Activity 1 (conversation analysis, picture observation, discussion)**
- This activity is designed to learn about spiders. It starts with observing pictures of spider webs in the textbook. If possible, the teacher should create a situation for students to observe spiders and their webs.
- In a group activity, students will analyze conversations and pictures in the textbook

using provided indicators. Afterwards, each student will write their findings individually in 'My Science Diary'. The use of ICT is preferred for classroom transactions. Additionally, the teacher encourages students to observe how spiders make their webs.

Indicators

- General features of spider.
- Making of spider web.
- Use of spider web

Consolidation

- Spider is an eight legged animal. It makes spider web and live there.
- Spider has silk glands in their abdomen. From this it makes the web of sticky thread.
- Spiders use webs to catch other animals, to protect their offspring and to wrap up prey.

Evaluation

- Writing in 'My Science Diary', participation in group activity.

To the teacher

- If you've ever observed a spider moving across its web, you might have noticed it doesn't get trapped like its prey. Instead, spiders move swiftly and skillfully around their webs as if the web isn't sticky at all. How do they manage that?
- Unlike unsuspecting prey, spiders don't touch their webs entirely at once. Instead, they delicately maneuver along the strands of their webs, with only the tiny hairs on the tips of their legs touching the sticky threads. This greatly reduces the likelihood of them getting ensnared in their own trap!
- To avoid getting stuck, spiders groom themselves meticulously. They regularly clean their legs, removing any bits of silk or debris that could cause them to become trapped on their webs. Furthermore, not all webs are uniformly sticky. Many spiders only apply adhesive "glue" to specific parts of their webs. Other areas, particularly where the spider might rest, are constructed without any adhesive to facilitate easier movement for the spider.

- **Activity 2 (conversation analysis, picture observation, discussion)**
- This activity is intended to learn about snails. It starts with observing pictures in the textbook. The use of ICT is preferable for classroom transactions. In a group activity, students will analyze conversations and pictures in the textbook based on provided indicators. Afterwards, each student will individually write their findings in 'My Science Diary'.

Indicators

- General features of snail.
- Movement of snail

Consolidation

- Snails have soft body. Snails have thick shells which they use for their shelter. The body can be withdrawn into the shell.
- Snails slither slowly to move from one place to another.

Evaluation

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

Earthworm, Reptiles (2 periods)

- **Activity 1 (conversation analysis, observation of earthworm, discussion)**
- This activity is designed to learn about earthworms. The teacher should arrange a situation for students to observe earthworms and heaps of black soil made by earthworms in the school garden, if possible. Alternatively, ICT can be utilized to familiarize students with the situation.
- In a group activity, students will analyze conversations based on provided indicators. Afterwards, each student will individually write their findings in 'My Science Diary'.

Indicators

- Formation of black soil
- Absence of earth worms on the surface of land.
- Feeding of earthworm

Consolidation

- Black soil is produced by the earthworm after consuming organic matter in the soil.
- Earthworms need to stay moist. They would lose water from their body, if they move above ground.
- Earthworms feed on dead roots, leaves, grasses, manure and soil.

Evaluation

- Writing in 'My Science Diary', participation in group activity.

- **Activity 2 (conversation analysis, picture observation, discussion)**
- The aim of this activity is to learn more about reptiles, particularly focusing on observing a picture or video of a chameleon catching prey in the garden. Utilizing ICT is preferable for classroom transactions.
- In a group activity, students will analyze the picture or video and engage in conversations based on provided indicators. Afterwards, each student will individually write their findings in 'My Science Diary'.

Indicators

- Prey catching of Chameleon.
- Advantage of change in colour of Chameleon.
- Compare lizards and snakes

Consolidation

- Chameleon catching the prey using its long tongue.
- The change in colour of Chameleon helps them to hide from other animals that want to prey on them.
- Lizards live both on trees and land. They eat insects.
- Snakes have long body. They slither to move. Many of the snakes are poisonous.

Evaluation

- Writing in 'My Science Diary', participation in group activity.

Creepy Crawlies and Flyers - Friend and foe (1 period)

- **Activity 1 (description analysis, picture analysis, poster making)**
- The aim of this activity is to understand the beneficial and harmful aspects of Creepy Crawlies and Flyers. The class will be divided into six groups. Three groups will create posters focusing on 'Creepy Crawlies and Flyers as Friends', while the other three groups will work on posters depicting 'Creepy Crawlies and Flyers as Foes'. They will base their posters on the analysis of descriptions and pictures provided in the textbook.
- Once completed, the groups will display their posters in the classroom. As a follow-up, each student will be tasked with preparing a poster in 'My Science Diary' at home, focusing on the topic 'Creepy Crawlies and Flyers - Friend and Foe'.

Consolidation

- Creepy crawlies and flyers are useful to us.
- Creepy, crawlies and flyers are also harmful to us.

Evaluation

- Posters prepared in the classroom and the posters in 'My Science Diary', participation in group activity

- **Activity 2 (poster analysis, short note preparing, poster preparing)**
- The aim of this activity is to raise awareness about preventing diseases spread by insects. After observing the posters, students are instructed to write short notes in 'My Science Diary' regarding precautions against diseases spread by insects. The teacher also encourages

students to create more posters related to the topic.

Consolidation

- Cockroaches are found in kitchen which is not kept clean.
- Houseflies carry germs and transfer it to uncovered food.
- Mosquitoes pass germs from one animal to another. They breed on stagnant water.

Evaluation

- Short notes in 'MY science Diary', participation in group activity, preparation of poster.

Working Gallery

1.
- (B) Butterfly
- (B) Spider, others are insects.
- (D) Mosquito
- (B) Cholera
- Statement (i) and statement (ii) correct
- Houseflies spread diseases like dysentery, cholera, typhoid. Houseflies carry germs of these diseases and transfer it to uncovered food.
- Honey bees provide honey and wax.
- Dengue fever is spread by mosquitoes. Mosquitoes breed on stagnant water. So do not let water collect in areas around homes, schools and parks.
- The body of insects is divided into three parts – Head, thorax and abdomen.
- Earthworms are farmers' friends because they improve the quality of the soil like water holding capacity, moisture, and nutrient content by burrowing into the soil. The soil becomes loose and porous. Also, the worm castings improve the distribution of organic matter in the soil. Earthworms improve the quality of the soil as it recycles the organic waste into humus. This makes the soil fertile and helps the crops to grow. That is why earthworms are regarded as farmers' friends.

2. Insects
- Are small animals, which have six legs.
- Their body is divided into three parts – Head, thorax and abdomen.
- Worms
- Are long, thin creatures with no bones or legs.
- Earthworm is an example.
- Snails
- Small animals that have soft bodies.
- They have thick shells which they use for their shelter.

3. Honey bees provide honey and wax.
- Silkworms produce silk fibres. Silk is used to make clothes.
- Earth worms help the farmer to make soil fertile. It helps the growth of plants.

4.Match the following

A	B
Honey bees	Provide us with honey and wax.
Silkworm	Gives us silk.
Lizard	Eats insects.
Earth worm	Make healthy soil for plant growth.
Houseflies	Spread diseases.

Additional activity.

- Prepare a wall magazine about these tiny friends.

edufy publications

Semester 2

TEACHERS RESOURCE MANUAL

SCIENCE
Grade 4

GRADE - 4

6 ADAPTATION OF ANIMALS

Introduction

- In the natural world, every organism has a specific place where it lives, grows, and reproduces. This place is called its habitat. Habitats are diverse, ranging from forests and oceans to deserts and grasslands, and they provide the necessary resources for organisms to survive. However, human activities, such as filling up ponds or destroying natural habitats, can disrupt the lives of these organisms. The following activity helps us understand the importance of habitats and how organisms adapt to their surroundings.

Previous Knowledge

- Before engaging in the activity, students should have a basic understanding of the following concepts:
- Habitat: The environment where an organism lives, grows, and reproduces.
- Adaptation: Special features or behaviours that help organisms survive in their habitat.
- Types of habitats: Forests, deserts, aquatic environments, etc.
- Diversity of organisms: Different species live in different habitats and exhibit unique adaptations to thrive in those habitats.

Learning Outcomes

The learner

- Classify different habitats (such as polar, terrestrial, aquatic, and arboreal) and the organisms that live in them, understanding the unique features of each habitat.
- Compare the features of various habitats with those of forests, analyzing the similarities and differences in their environments and the organisms that inhabit them.
- Comprehend and explain the concept of adaptation in animals, including their special characters that help them survive in their specific habitats.
- Classify animals based on their respiratory organs (lungs, gills, trachea) and explain how these organs help them in breathing in their respective environments.
- Participate in a discussion on the significance of habitat conservation and the protection of organisms' living places, contributing to activities that promote awareness and action.
- Develop an attitude of responsibility toward protecting the habitats of living organisms, understanding that changes to the environment can lead to the extinction of species and disrupt ecological balance.
- Compare the feeding habits and dental adaptations in herbivores and carnivores, understanding how their teeth are suited to their diet.
- Identify and analyze the body coverings of various animals, such as feathers, scales, and spines, and explain how they protect animals in their habitats.
- Develop an understanding of the locomotion styles of animals, comparing the movement strategies of various species, such as walking, crawling, jumping, or swimming.
- Participate in an exploration of migratory animals, learning about their long-distance travel and the factors that influence migration patterns.
- Develop an appreciation for the biodiversity of organisms and their adaptations, recognizing the importance of maintaining balanced ecosystems for the survival of species.
- Comprehend and explain the interrelationship between organisms and their habitats, understanding that each organism has evolved specific traits that enable it to survive and thrive in its environment.

Major concepts

- Habitats and Adaptations:
- Human Impact on Habitats:
- The need to protect natural habitats is crucial for preserving biodiversity.
- Organisms develop specific adaptations based on their habitat, such as webbed feet for swimming (ducks), scales for protection (fish), or feathers for flying (birds).
- Types of Habitats.

Diversity in adaptations (4 periods)

- **Activity 1: (Illustration observation, analysis, table completion, Comparison)**
- The aim of this activity is to understand the relationship between organisms and their habitats. Through a picture analysis, students will identify the concerns of organisms when their habitat is being destroyed. Conduct a discussion with the students about the picture, focusing on the following indicators:

Indicators:

- What is the demand of the creatures in the procession?
- Respond to their demand: The pond is being filled with soil from somewhere else. What about the creatures that lived there?
- How are the creatures impacted when their habitat is disturbed?
- After the discussion, direct students to analyse the situation and write their findings in 'My Science Diary'.
- What is the demand of the creatures in the procession?

Consolidation

- The creatures in the procession are demanding that their habitat, the pond, should not be destroyed. Their placards with the message "Don't spoil our living place" indicate that they want to protect the pond from being filled with soil, as it threatens their home and survival.
- The creatures' demand is valid, as the pond serves as their natural habitat. It is important to preserve such environments to maintain the balance of the ecosystem. Filling the pond with soil disrupts the habitat of the creatures living in it, making it difficult for them to survive. The response should be to stop the filling of the pond and to find a sustainable solution that does not harm the creatures' living space.
- The creatures that lived in the pond, such as the snake, frog, fish, crab, and snails, depend on the water and the natural resources it provides. If the pond is filled with soil, these animals will lose their home and may struggle to find a new habitat. The filling of the pond disrupts their lives, and they might face difficulties in finding food, shelter, and breeding grounds. Some creatures, like fish and frogs, cannot survive without water. Therefore, the destruction of the pond poses a serious threat to their survival.

Evaluation:

- Students will be evaluated based on their participation in the class discussion, their analysis in 'My Science Diary',

- **Activity 2: (Picture observation, analysis, table completion, Comparison)**
- Introduce various habitats (e.g., desert, polar, ocean, river) and their features. Use of ICT is effective for this situation. Ask the students to compare the features of these habitats with the forest habitat, noting key differences in environment and organisms. After this the students are directed to complete the table (page 168). Add more to this table using the information collected by the students.

Consolidation:

- Desert: Hot and dry with little water, animals and plants are adapted to survive in extreme heat and water scarcity.
- Polar Region: Very cold with ice and snow, animals are adapted to freezing temperatures and have special body coverings.
- Ocean: Salty water with varying temperatures and high pressure at the base, aquatic animals are adapted to these conditions.

- River Habitat:Fish (e.g., Salmon, Trout), Frogs, Crabs, Snails, Water Birds (e.g., Ducks, Herons)
- Ocean Habitat: Fish (e.g., Shark, Clownfish),Whales, Seals, Jellyfish, Octopus
- Desert Habitat: Camels, Snakes (e.g., Rattlesnake), Lizards (e.g., Geckos), Cacti, Scorpions

Evaluation:

- Students will be evaluated based on their participation in the class discussion, their comparison and completed table in 'My Science Diary'.

- **Activity 3 (Illustration observation, Discussion, Activity Completion)**
- This activity aims to understand the differences in the dentition of herbivores and carnivores and explore the function of various types of teeth. The teacher introduces the activity by students, "How many teeth do you have? Feel them with your tongue. Are they similar? Do all teeth have the same function?"
- Guide students to realize that teeth serve different functions depending on the type of food an organism consumes. Introduce the concept that the arrangement of teeth in an organism is called dentition. Show pictures of the mouth of a cow (herbivore) and a carnivore (lion) (on page 168)
- Ask students to compare the characteristics of the teeth in both animals.
- Point out the different types of teeth and their functions and direct them to write their observations in the 'My Science Diary.'
- Show pictures of a mosquito sucking blood and a butterfly sucking nectar from a flower) (page 168).
- Ask students, "What are these insects doing?"
- Guide them to compare the mouth parts of the mosquito and the butterfly, focusing on the long tube-like structure known as the proboscis. Explain why both insects have a similar structure despite feeding on different substances:
- Insects such as mosquitoes and butterflies have tube-like structures (proboscis) to suck liquid food, even though they consume different liquids (blood and nectar).

Consolidation:

- Discuss how different organisms have adapted their teeth and mouthparts according to their diet:
  - Herbivores: Incisors are more prominent for biting plants, and molars are broad for grinding plant matter.
  - Carnivores: Canines are more prominent for tearing flesh, and their back teeth are broad and flat for chewing meat.
  - Insects: They have specialized mouthparts (proboscis) for sucking liquid food.

Evaluation:

- Participation in the group discussion Completion of the activity in 'My Science Diary,' where students record their observations and compare herbivore and carnivore dentition.

- **Activity 4 (Illustration, Observation, Discussion, Table matching, Activity Completion)**
- This activity aims to understand the functions of body coverings in different organisms and how they help in survival. The class begins with asking the students, "How are bodies protected?" Then guide them with questions like, "How do the feathers help a bird? How do the scales of fish help them?" Explain that organisms have different types of body coverings, which help them survive in their respective habitats. After analysing the data the students are directed to match the table individually.

Consolidation

- Feathers keep birds warm.
- Scales of Fish prevent water from entering the skin.
- Scales of Snake aid in movement and water retention.

- Spines of Porcupine serve as protection from predators.
- Shell of Tortoise offers protection from danger.
- Matching Activity
  - Bird - Feathers, Fish - Scales, Snake - Scales, Porcupine - Spines,Tortoise - Shell

Evaluation:

- Completion of the activity in 'My Science Diary,' where students record their findings and understand the purpose of different body coverings. Assess their understanding based on how well they match the organisms with their respective body coverings.

- **Activity 5 (Illustration observation, Illustration Completion)**
- This activity aims to understand the organisms are grouped into terrestrial, aquatic , amphibians, arboreal and aerial. The illustration is completed individually and shared for peer evaluation.

Consolidation

- Terrestrial : Live on land
- Arboreal: Live on tree.
- Aerial : Mostly stay in air.
- Aquatic : Live in water.
- Amphibians : Live both land and water.

Evaluation:

- Completion of the activity in 'My Science Diary,' Peer evaluation.

Activity 6 (picture observation)

- This activity aims to understand the different respiratory organs in organisms and the pathway of oxygen and carbon dioxide. Start by discussing the basic concept of respiration: "All organisms breathe in oxygen and give out carbon dioxide." Explain that different organisms have different respiratory organs suited to their environments. By observing pictures guide the students to compare the respiratory organs of man, fish, and grasshopper. Discuss the pathway of oxygen and carbon dioxide in each of these organisms:
- In humans (Lungs): Oxygen enters through the nose, travels down the trachea, and into the lungs where gas exchange occurs (oxygen in, carbon dioxide out).
- In fish (Gills): Oxygen from water passes through the gills, and carbon dioxide is expelled into the water.
- In grasshoppers (Trachea): Oxygen enters through small openings called spiracles and travels through the tracheal tubes to various parts of the body. Carbon dioxide is released through the same system.

Consolidation:

- Lungs are the respiratory organs of humans.
- Gills are the respiratory organs of fish.
- Trachea are the respiratory organs of insects.

Evaluation:

- Check participation in the discussion. Notes in 'My Science Diary.' Review how well students understand the respiratory organs and the pathway of oxygen and carbon dioxide in different organisms.

- **Activity 7 (Observation, Discussion, Table Completion)**
- The activity aims to identify and compare the locomotory structures and styles of movement in various animals based on their habitats. Show pictures of different animals and their locomotory structures, such as legs, wings, or body segments. Use of ICT makes transaction more effective. Explain to students that animals need to move from one place to another, mainly to search for food. Their locomotion style and structures vary according to the habitat they live in. Discuss how some animals walk, some jump, and others crawl or hop. After discussion the teacher asks students to fill in the table below by observing the animals and identifying their style of locomotion and the number of limbs used

Consolidation:

Animal	Number of Limbs Used for Locomotion	Style of Locomotion (Walk/Jump/ Hop/Crawl)
Man	2	Walk
Ant	6	Walk
Lizard	4	Crawl
Snake	0 (No limbs)	Crawl
Kangaroo	2	Jump
Rabbit	4	Hop
Grasshopper	6	Jump

- Duck - Webbed feet , Tortoise - Flippers , Fish - Fins

Evaluation:

- Check the completion of the table in 'My Science Diary.'

Migration in Animals (1 period)

- **Activity 1 (Poster observation, Album preparation)**
- This activity aims to learn about migratory patterns in animals and understand why certain species travel over long distances. The class begins with the question, "Why do you think some animals travel long distances? What might be the reason for these journeys?" and consolidates some animals migrate over vast distances to breed or escape unfavourable conditions. This long-distance movement is called migration. After observing the posters the teacher encourages students to collect and present information (as an album) on various migratory animals and understand their diversity in locomotion.

Consolidation:

- Some animals migrate over vast distances to breed or escape unfavourable conditions. This long-distance movement is called migration.

Evaluation:

- Prepared album.

To the teacher

1. Wildebeest

- Peculiarity: In Africa, wildebeest engage in a circular migration covering over 1,000 miles, following seasonal rains across Tanzania and Kenya. This journey is essential for grazing and access to fresh water, and it supports the ecosystem by transporting nutrients across regions.

2. Sockeye Salmon

- Peculiarity: Salmon are known for their upstream migration, where they return to the exact freshwater rivers where they were born to spawn. They navigate thousands of miles from the ocean back to freshwater, using a remarkable sense of smell and homing instincts.

3. Bar-headed Goose

- Peculiarity: This goose species migrates over the Himalayas, flying at altitudes of 5,000 to 7,000 meters. Bar-headed geese have specialized haemoglobin to efficiently use oxygen at high altitudes, allowing them to endure extreme conditions during their migration from Central Asia to India.

Working Gallery- Answer

1. Answer the following.

- (B) Webbed feet
- Grasshopper
- Frog, others are terrestrial organisms
- Camel - Bushy brow and long eyelash.
- (D) Freshwater fish - Presence of scales
- Answer: (A) Statement (i) and statement (ii) are correct.
- Terrestrial organisms: Live on land, have adaptations to breathe air (lungs or trachea), and often have limbs suited for walking or running.
- Aquatic organisms: Live in water, often have gills to breathe dissolved oxygen, and may

have fins or flippers for swimming.

- Blubber is a thick layer of fat beneath the skin of whales, which insulates them from cold water and provides an energy reserve, helping them survive in polar or deep-sea habitats.
- Carnivores have sharp, pointed teeth at the front to tear flesh, and broad, flat teeth at the back to chew flesh well. These adaptations help them consume and process meat efficiently.
- This statement is incorrect. Camels are adapted to live in desert environments, with features like long eyelashes, bushy eyebrows, and the ability to conserve water, which make them well-suited for arid conditions rather than aquatic habitats.
- Ocean Habitat: Contains saltwater, has greater depth, supports marine organisms with adaptations for buoyancy and saltwater tolerance, and experiences tides and waves.
- River Habitat: Freshwater, usually has a continuous flow, supports species adapted to flowing freshwater, and provides a rich source of food and shelter for diverse organisms.

2. Migration of Birds

- Migration is a seasonal movement of birds from one place to another, mainly for breeding or in search of favourable climates. Birds such as the Arctic tern and the Monarch butterfly travel great distances, sometimes thousands of miles. The Arctic tern, for example, migrates from the Arctic to the Antarctic, covering nearly 30,000 kilometres in a round trip. This migration allows them to enjoy continuous summer conditions and abundant food. Migratory birds are guided by the earth's magnetic field, sun position, and even stars. These journeys are vital for breeding, feeding, and escaping extreme climates. Conservation of migratory paths and habitats is crucial for their survival.

3.

Name of Animal	Herbivore/ Carnivore/ Omnivore	Terrestrial/ Aquatic/ Arboreal/ Aerial/ Amphibians
Cow	Herbivore	Terrestrial
Dog	Carnivore	Terrestrial
Crow	Omnivore	Aerial
Fish	Omnivore	Aquatic
Frog	Carnivore	Amphibian
Parrot	Herbivore	Aerial
Cat	Carnivore	Terrestrial
Monkey	Omnivore	Arboreal
Ant	Omnivore	Terrestrial
Duck	Omnivore	Aquatic

7 WE TOO LIVE

Introduction

♦ Have you ever wondered how plants survive in different environments? Well, that's where adaptations come in! Just like animals, plants have special features and behaviours that help them thrive in their surroundings. From prickly cacti in the desert to giant trees in the rainforest, each plant has unique adaptations that make it perfectly suited to its habitat. So, let's dive in and discover the amazing ways plants have adapted to their environments.

Previous knowledge

The child knows about the

♦ plants in their area.
♦ knows some members of grass family.
♦ knows some plants seen in pond.

Learning Outcomes

The learner

♦ compares the adaptation of plants in plains and hilly area.
♦ describes the features of mangroves.
♦ compares the features of various water plants
♦ familiarises the members of grass family.

Major concepts

♦ Floating plants are plants that float on the water.
♦ Fixed plants that have their roots fixed to the bottom of a pond.
♦ Underwater plants grow completely under the water surface.
♦ The plants that grow in marshy areas are called mangroves.
♦ Mangroves have breathing roots.
♦ The plants have many adaptations to live in coastal area.
♦ The plants show many adaptations to live in hilly area.
♦ The trees that shed their leaves in autumn or winter is called deciduous trees.
♦ The trees do not shed their leaves and remain green throughout the year is called evergreen plants.
♦ Plains are large areas of almost flat lands.
♦ The trees seen on deserts have many adaptations for collecting and saving water.
♦ The members of Grass family have a number of adaptations that allow them to survive.
♦

UNIT FRAME

Name of Unit: 7. We Too Live *Total Time: 8 periods of 40 minutes*

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESMENT
♦ identifies and explains the adaptations in plants. ♦ compares the features of various water plants.	♦ Floating plants are plants that float on the water. ♦ Fixed plants that have their roots fixed to the bottom of a pond. ♦ Underwater plants grow completely under the water surface.	♦ picture observation, conversation analysis, table completion.	♦ ICT, Pictures, conversation and description in the text book, table in the text book for completion	♦ Description in 'My Science Diary'. Completed table.

♦ describes the features of mangroves.	♦ The plants that grow in marshy areas are called mangroves. ♦ Mangroves have breathing roots.	♦ picture observation, conversation analysis	♦ Pictures, conversation and description in the text book,	♦ Description in 'My Science Diary'.
		♦ Conversation analysis, observation of earthworm, discussion, picture observation	♦ Picture and conversations in TB, Hand lens	♦ Writing in 'MY science Diary', participation in group activity.
		♦ Description analysis, picture analysis, poster making, poster analysis, short note preparing	♦ Posters and description in the TB	♦ Posters prepared in the classroom and the posters in 'MY science Diary', Short notes in 'MY science Diary', participation in group activity, preparation of poster

Plants in pond (2 periods)

- **Activity 1 (picture observation, conversation analysis)**
- This activity aims to explore the peculiarities of floating plants. The class begins with a discussion on the distinctive characteristics of places visited by the students. Through this conversation, the teacher redirects their attention to Sinu and Sana's visit to their uncle's village. Students are then presented with a picture of a pond and prompted to identify the plants visible in the image. Next, they are tasked with identifying the plants that float on water. Upon observing a picture of water hyacinth, showing its stem with air pockets and roots, students are asked to write down the features of the plant that help it float on water. These findings are recorded in their 'My Science Diary'. Additionally, students are instructed to investigate the features of other floating plants such as water lettuce and duckweed, and document their findings in the diary as well. To further familiarize students with the characteristics of these plants, the teacher may consider bringing an actual plant into the classroom or utilizing ICT resources.

Consolidation

- Peculiarity of stem of hyacinth plant – The spongy stem have air pockets. This helps the plant to float in water.
- Peculiarity of the root of hyacinth plant- hang loosely in water and do not touch the soil. This helps them into float on water.
- Lettuce and duckweed have reduced weight, air pockets within their leaves or stems, have typically fine and hair-like roots, specialized leaf Structure (Water lettuce leaves are thick and leathery, helping them to stay afloat, while duckweed leaves are small and round, further reducing weight and increasing surface area for photosynthesis.)

Evaluation

- Description in 'My Science Diary'.

To the teacher

- Floating plants are those that reside on the surface of bodies of water, either partially or entirely. They have various adaptations that allow them to thrive in this habitat:
- Buoyant Structures: Floating plants typically have structures that help them stay afloat on the water's surface. These structures may include air-filled tissues, specialized cells, or buoyant leaves that reduce the overall density of the plant.
- Reduced Root Systems: Many floating plants have minimal root systems or roots that dangle freely in the water. These roots serve primarily to anchor the plant rather than to absorb nutrients from the soil, as floating plants obtain most of their nutrients directly from the water.
- Rapid Growth: Floating plants often exhibit rapid growth rates, allowing them to quickly cover the surface of bodies of water. This rapid growth helps them compete for sunlight, nutrients, and space, particularly in nutrient-rich environments.
- Leaf Adaptations: The leaves of floating plants are typically adapted to their aquatic environment. They may have waxy coatings to prevent waterlogging, or they may be broad and flat to maximize surface area for photosynthesis.
- Reproductive Strategies: Many floating plants reproduce prolifically through vegetative propagation or by producing specialized structures such as stolons or runners. This enables them to rapidly colonize new areas of water and form dense mats on the surface.
- Common examples of floating plants include water lilies, water hyacinths, duckweed, water lettuce, and water ferns. These plants play important roles in aquatic ecosystems by providing habitat, oxygenation, and food for various aquatic organisms, while also helping to regulate nutrient levels and water quality.

- **Activity 2 (picture observation, conversation analysis, table completion)**
- This activity aims to explore the peculiarities of fixed plants. The teacher introduces the topic and facilitates an open discussion. No consolidation is needed at this stage. After observing the picture of pond and the picture of a lotus rooted in the soil at the bottom of the pond, along with its peculiarities, the children document their findings about the peculiarity of fixed plants in 'My Science Diary'. Following this, the students complete a table in the textbook comparing the hyacinth plant with the lotus. Peer group assessment can be incorporated at this point. After completing the table, students write the finalized version in 'My Science Diary'. To further familiarize students with the characteristics of the plants, the teacher may consider bringing an actual plant into the classroom or utilizing ICT resources.
- The teacher tries to find the reason for the dancing of water drops on lotus leaves by doing the simple experiment in the classroom. And they write their findings in 'My Science Dary'.

Consolidation

- Lotus plant - Rooted in the soil at the bottom of the pond. Has hollow stem and waxy leaf.

	Hyacinth	Lotus
Peculiarity of root	Do not touch the soil. They hang loosely in water	Rooted in the soil at the bottom of the pond.
Peculiarity of stem	They have thick, spongy stems with air pock-ets.	Are flexible and have hollow stems that have air spaces
Peculiarity of leaf	Seen in clusters.	Broad leaf floats on water

- Lotus has waxy coating on their leaves. It helps to keep the surface clean of dust.

Evaluation

- Description in 'My Science Diary'. Completed table.

To the teacher

- Fixed aquatic plants, also known as rooted aquatic plants or macrophytes, are a vital component of aquatic ecosystems. Here are some of their key peculiarities:
- Rooted Growth: Fixed aquatic plants have specialized root systems adapted for anchoring them firmly in the substrate of the water body. These roots provide stability and support, allowing the plants to withstand water currents and waves.
- Adaptations for Submersion: Unlike terrestrial plants, fixed aquatic plants have adaptations to thrive in submerged conditions. They have evolved mechanisms to absorb nutrients and gases directly from the water column through their roots and leaves.
- Photosynthetic Adaptations: Fixed aquatic plants have adapted to perform photosynthesis underwater. They often have thin, flexible leaves that maximize light absorption and chloroplast distribution to efficiently convert sunlight into energy.
- Buoyancy Control: Some fixed aquatic plants have specialized air-filled tissues or structures that help them maintain buoyancy. These structures allow the plants to float or remain suspended at specific depths in the water column.

- **Activity 3 (picture observation, conversation analysis, table completion)**
- This activity aims to explore the peculiarities of underwater plants. After observing the picture of pond, the children write the names of underwater plants. After this they complete the peculiarities of underwater plants and write in 'My Science Diary'. To further familiarize students with the characteristics of the plants, the teacher may consider bringing an actual plant into the classroom or utilizing ICT resources.
- Each student completes the table related to aquatic plants given in the textbook. After peer assessment and corrections they write in 'My Science Diary'.

Consolidation

- Plants like hydrilla and pond weed are underwater plants.
- Underwater plants grow completely under the water surface.
- Underwater plants use the oxygen dissolved in water through their body surface.

Type of plant	Peculiarity	Examples
Floating plants	Plants float on the water	Hyacinth and duckweed
Fixed plants	Rooted in the soil at the bottom of the pond. Leaves and flower float on water.	Lotus and water lily
Underwater plats	Grow completely under the water surface.	Hydrilla and pond weed

Evaluation

- Description in 'My Science Diary'. Completed table.

To the teacher

- Underwater plants, also known as submerged aquatic plants or hydrophytes, have unique adaptations to thrive in aquatic environments. Here are some common characteristics and peculiarities of underwater plants:
- Root Systems: Underwater plants typically have specialized root systems that anchor them in the substrate (bottom) of the water body. These roots absorb nutrients and water from the surrounding water.
- Flexible Stems and Leaves: Many underwater plants have flexible stems and leaves that allow them to bend and sway with water currents. This flexibility helps them avoid damage from waves and currents.

- Adaptations for Photosynthesis: Despite being submerged, underwater plants have adapted to capture sunlight for photosynthesis. They often have thin, translucent leaves that allow light to penetrate, or they may have chloroplasts concentrated near the surface of their leaves.
- Buoyancy Control: Some underwater plants have air-filled tissues or structures that help them maintain buoyancy. These structures allow the plants to float or remain suspended at specific depths in the water column.
- Reproduction: Underwater plants employ various strategies for reproduction, including both sexual and asexual methods. Some plants produce flowers and seeds, while others reproduce through fragmentation or the formation of specialized reproductive structures.
- Oxygen Exchange: Underwater plants release oxygen into the water through photosynthesis, which is essential for supporting aquatic life. They also absorb carbon dioxide from the water, helping to regulate water chemistry.

Mangroves (1 period)

- **Activity 1 (picture observation, conversation analysis)**
- This activity aims to explore the peculiarities of marshy areas and learn about mangroves. By analyzing the pictures and conversations in the textbook (in groups) by using indicators, the students will write their findings in 'My Science Diary'.

Indicators

- Environmental conditions in marshy area.
- Mangroves
- Adaptation

Consolidation

- Marshy areas are generally found near the lakes, rivers and seas. These places have clayey soil and plenty of water .
- The plants that grow in marshy areas are called mangroves.
- Usually the roots use oxygen from the soil. The oxygen content in the soil of water -logged areas are less. The conditions are difficult for the plants to grow as air cannot reach the roots. Therefore, the plants growing here have roots above the ground. These roots are called breathing roots. They absorb air, water and minerals for photosynthesis.

Evaluation

- Description in 'My Science Diary'.

To the teacher

- Mangroves are incredibly fascinating ecosystems, and their adaptations are critical to their survival in the harsh conditions of coastal environments. Here are some key adaptations of mangroves:
- Salt Tolerance: Mangroves thrive in saline environments where freshwater is scarce. They have specialized roots called "pneumatophores" or "breathing roots" that stick out of the water or mud to absorb oxygen. These roots also help in excluding salt from their systems, allowing them to survive in high salinity conditions.
- Aerial Root Systems: Mangroves often have complex root systems that help them anchor in unstable muddy substrates and provide stability against tidal forces and waves. These roots also aid in nutrient uptake and can store oxygen, facilitating respiration in waterlogged soils.
- Vivipary: Unlike most plants, mangroves typically germinate while still attached to the parent tree. The seedlings, called propagules, develop in a protected environment until they are ready to root in the sediment below. This adaptation helps mangroves disperse and establish themselves in new areas before being swept away by tidal currents.
- Thick Waxy Leaves: Mangrove leaves often have thick waxy coatings that help reduce water loss through evaporation and protect them from the harsh sun and salt spray.
- Tolerance to Anaerobic Conditions: Mangroves frequently experience waterlogged soils with low oxygen levels. They have adaptations to

cope with these anaerobic conditions, such as specialized tissues that can conduct oxygen to their submerged roots and adaptations in their metabolism to survive with reduced oxygen availability.

- These adaptations collectively enable mangroves to thrive in environments where few other plants can survive, providing crucial ecological services such as coastal protection, habitat for diverse marine life, and carbon sequestration.

At the beach (1 period)

- **Activity 1 (picture observation, conversation analysis)**
- This activity aims to learn about the plants in coastal areas. The class begins with sharing experiences in coastal areas and discussing the peculiarities of the plants seen there. By analyzing the pictures and conversations in the textbook (in groups), the students will complete the table provided in the textbook. After completion, the students are directed to write in 'My Science Diary'.

Consolidation

Features of coastal area	Possible adaptations
Strong Wind	Have thick fleshy leaves that can hold water. Leaves some times curl under at the edges , so the salty water runs off them.
Salty wind	Water proof leaves protect the plants from drying out.
Moving water	Seed dispersal through water to new places.

Evaluation

- Completed table in the textbook.

Plants in hilly area (2 period)

- **Activity 1 (photo observation, diary analysis)**
- This activity aims to learn about the plants in hilly (cold climate) areas. By observing the photos (showing hills covered with snow and plants with conical shapes, as well as needle-shaped leaves), and reading the diary entries, we will write down inferences about the adaptation of plants in hilly areas in 'My Science Diary' (a group activity).

Consolidation

- The hills are covered with snow.
- Pine, fir, deodar, cedar and spruce are seen in plenty in hilly area. The plants are conical shaped. This shape may help the trees to slide off the snow.
- The leaves of these plants are needle - like. This helps to reduce water loss during winter.
- These plants have cones instead of flowers.

Evaluation

- Description in ‘My Science Diary’.

To the teacher

- Cones are a distinctive feature of conifers and play a crucial role in their reproduction. Conifers produce two types of cones: male (pollen) cones and female (seed) cones. Here's an overview of each:

- **Male cones (pollen cones):**
  - Male cones are smaller and often more numerous than female cones.
  - They typically produce pollen, which is rich in male gametes (sperm cells).
  - Male cones are usually located on the lower branches of the tree.
  - When mature, they release pollen grains into the air, which are carried by the wind to female cones for fertilization.

- **Female cones (seed cones):**
  - Female cones are larger and more conspicuous than male cones.
  - They contain ovules, which are the female gametes (egg cells).
  - Female cones are typically found on the upper branches of the tree.
  - Each scale of a female cone usually bears

one or more ovules.
- After pollination, the ovules develop into seeds within the cone.
- Female cones may take several months or even years to mature, depending on the species.
- When mature, female cones release seeds, either by opening their scales or by the entire cone disintegrating.

♦ The life cycle of conifers involves the transfer of pollen from male cones to female cones, fertilization of ovules within the female cones, and the development of seeds. These seeds are then dispersed, often by wind or animals, allowing the conifer species to propagate and colonize new areas.

♦ It's worth noting that the size, shape, and structure of cones can vary significantly among different conifer species. Additionally, some conifers may produce both male and female cones on the same tree (monoecious), while others have separate male and female trees (dioecious).

♦ **Activity 2 (comparing pictures)**

♦ This activity aims to compare the differences between the plants in hilly areas and plants in the plains. By comparing the pictures and using the provided indicators, the students are directed to write their inferences in 'My Science Diary'.

Indicators

- Shape of plants
- Branches
- Leaf
- Shade

Consolidation

	Plants in hilly area	Plants in plains
Shape of plants	The plants are conical shaped.	Broad, rounded canopy with dense foliage. The shape of the canopy is often irregular.
Branches	Sloping or spreading branches	Have lots of branches.
Leaf	They have needle - like leaves.	
Shade	Comparatively small shade.	Large shade.

Evaluation

♦ Description in 'My Science Diary'.

♦ **Activity 3 (conversation analysis, description analysis)**

♦ This activity aims to compare the differences between deciduous trees and evergreen plants. By analyzing the conversation and descriptions using provided indicators (as a group activity), students are directed to write their inferences individually in 'My Science Diary'.

Indicators

♦ Examples for plants seen on plains
♦ Deciduous trees.
♦ Examples for deciduous trees
♦ Evergreen plants.
♦ Examples for evergreen plants

Consolidation

♦ Neem, Mango, Teak, Sal, Banyan tree
♦ The trees that shed their leaves in autumn or winter are called deciduous trees.
♦ Sandalwood, Sissoo (Indian rosewood), Flame-of-the-Forest
♦ The trees that do not shed their leaves and remain green throughout the year are called evergreen plants.

Evaluation

♦ Description in 'My Science Diary'.

Plants in deserts (1 period)

♦ **Activity 1 (picture analysis)**

♦ This activity aims to learn about the adaptations of desert plants. The class begins by discussing the adaptations of camels to live

in the desert. By observing picture of the desert in the textbook, analyzing them using provided indicators, and writing down the inferences about the adaptations of desert plants in 'My Science Diary'.

Consolidation

- Leaf - Leaves are modified into spines to prevent the loss of water.
- Root - Roots are long that spread over a large area below the ground. This helps to absorb as much water as they can.
- Stem - They store water in stem which becomes fleshy. The green stem carried out photosynthesis.

Evaluation

- Description in 'My Science Diary'.

- **Activity 2 (identify the habitat plants based on statements)**
- This activity aims to identify the habitat of plants. Based on indicators, students individually identify the habitat of plants and write in 'My Science Diary'.

Consolidation

- Breathing roots are seen. - Plants in marshy areas
- Trees have needle - like leaves. - Plants in hilly areas
- Evergreen trees are seen. - Plants in coastal areas
- Leaves are modified into spines. - Plants in deserts
- Trees have flat leaves with many stomata on the lower surface.- Plants in the plains
- Roots are long that spread over a large area. - Plants in deserts
- Trees are deciduous. - Plants in the plains
- Trees are cone shaped. - Plants in hilly areas
- Waterproof leaves protect them from drying out due to salty winds. - Plants in coastal areas

Evaluation

- Answers in 'My Science Diary'.

Plants of Grass family (1 period)

- **Activity 1 (picture identification, illustration analysis, poster preparation)**
- This activity aims to help students learn about the plants in the grass family. The grass family can be introduced by identifying its members through pictures provided in the textbook (such as grass, bamboo, sugarcane, rice, and wheat). Students are directed to observe the illustrations and draw inferences related to the uses of the members of the grass family, which they then record in their 'My Science Diary'. After completing this individual work, students are divided into groups of six members and instructed to prepare posters about the grass family for display on a bulletin board. The best posters are selected through peer group evaluation.

Consolidation

- Rice, wheat, millet, sugarcane - They provide food
- Bamboo - Are used to make furniture, mats, baskets. Young bamboo shoots are used to prepare food items.
- Papyrus - are used to make paper. Paper was first made in Egypt from the grass papyrus.
- Lemon grass -Used for preparing medicines.
- Grass - It has fibrous roots which hold the soil and protect against soil erosion.

Evaluation

- Description in 'My Science Diary', participation in group activity, completed posters

Working Gallery

1. Answer the following.

- (C) Hilly area
- Hydrilla, others are plants in plains.
- Plants in marshy area
- (c) Statement (i) is wrong statement (ii) is correct
- They have breathing roots.
- The plants that grow in marshy areas are called mangroves.

- Do not touch the soil. They hang loosely in water.
- Hydrilla and pond weed.
- (a) Desert area
- (b)Root - Roots are long that spread over a large area below the ground. This helps to absorb as much water as they can.

♦ Stem - They store water in stem which becomes fleshy. The green stem carries out photosynthesis.

- The root of lotus is rooted in the soil at the bottom of the pond. Leaves and flower float on water.

2.

A Plant	B Area where they seen
Mango	Plains
Babool	Desert
Palm	Coastal
Mangroves	Marshy
Pine	Hilly

3.

Plants in marshy area	Plants in deserts	Plants in plains
(a) The plants growing here have roots above the ground.	(c) Roots are long that spread over a large area below the ground.	(b) They have flat leaves with many stomata on the lower surface.
(e) Are difficult for the plants to grow as air cannot reach the roots.	(f) Leaves are modified into spines.	(d) Some trees shed their leaves in autumn or in winter.

4. Label these adaptive peculiarities

♦ The root of lotus is rooted in the soil at the bottom of the pond. Leaves and flower float on water. Has waxy leaf.

5. Rice, wheat, millet, sugarcane

♦ They provide food

♦ Papyrus - are used to make paper.

♦ Lemon grass -Used for preparing medicines.

8 HOW ORGANISMS LIVE ON

Introduction

- The living organisms and the environment are inseparably linked together. Organisms can exist only in suitable environments by interacting among themselves and with a set of environmental factors. The growth, distribution and development of all organisms are determined by the interactions with the environment. Ecology is the branch of Biology which deals with the study of interactions among organisms and also with their environment. The activities included in this chapter aimed to understand about nature, its biodiversity and ecological sustainability. Based on the chapter necessary learning activities should be planned to inculcate and express the values and attitudes regarding the importance of plants on earth.

Previous Knowledge

The learner knows:

- The plants and animals
- Functions of each part of a plant
- Need of food
- Photosynthesis
- Light, air and water are needed for organisms to live
- Food of different animals

Learning outcomes

The Learner..

- defines ecosystem
- discriminates abiotic and biotic factors
- re-arranges and constructs food chain
- infers the importance of plants as producers
- generalizes that organisms other than green plants are consumers
- separates micro-organisms as decomposers
- classifies ecosystems
- illustrates food web
- participates and contributes to the movements of plant protection

Major concepts

- All the living and nonliving things in a geographical area together constitute an ecosystem.
- All the living things in an area are called biotic factors.
- All the non living things in an area together are called abiotic factors.
- Food chain is a kind of food relationship between organisms
- Only the green plants can synthesize their own food and are producers
- Other organisms depend on plants for their food and are consumers
- Microbes like bacteria and fungi degrade the dead organic matter and are decomposers.
- Types of ecosystems
- Food web is the network of food chains in an area
- There are 'People Movements' for plant protection

UNIT FRAME

Unit -8 HOW ORGANISMS LIVE ON Total Time: 5 Periods of 45 Minutes

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESMENT
♦ Defines ecosystem ♦ Discriminates abiotic and biotic factors	♦ Ecosystem - definition ♦ Biotic and abiotic factors	♦ Open discussion ♦ Fills TB blanks	♦ TB and TB Fig.8.1	♦ Participation, prepared notes and responses to simple questions
♦ Re-arranges and constructs food chain	♦ Food chain is a kind of food relationship between organisms	♦ Completes the table in the TB. Referring to the TB. Fig.8.2. Constructs food chain using the organisms given in the TB Fig.8.4	♦ TB and TB Fig.8.2 & 8.4	♦ Completed table and food chain and My Science Diary
♦ Infers the importance of plants as producers ♦ Generalizes that organisms other than green plants are consumers ♦ Separates micro-organisms as decomposers	♦ Only the green plants can synthesize their own food and are producers ♦ Other organisms depend on plants for their food and are consumers ♦ Microbes like bacteria and fungi degrade the dead organic matter and are decomposers.	♦ Analysing the TB Fig.8.5, group discussion and defines producer, consumer and decomposer. Then discuss the importance of plants	♦ TB and TB Fig.8.5 ♦ Discussion points	♦ Prepared notes, MCQs and My Science Diary
♦ Classifies ecosystems	♦ Types of ecosystems	♦ Group discussion ♦ Prepares a seminar topic. Then presents the seminar. Writes seminar report	♦ TB Fig.8.6 and discussion points. Instruction to prepare seminar	♦ Preparation, participation, and presentation of seminar. Seminar report

♦ Illustrates food web	♦ Food web is the network of food chains in an area	♦ Completion of TB works and comparison with TB.Fig.8.7	♦ TB and TB Fig.8.7	♦ Completed TB works and My Science Diary
♦ Participates and contributes to the movements of plant protection	♦ Movements for plant protection	♦ Open discussion and prepares a seminar topic. Then presents the seminar. Writes seminar report	♦ TB and instruction to prepare seminar	♦ Preparation, participation, and presentation of seminar. My Science Diary and seminar report

Ecosystem

Activity – 1

- TLM
- TB and TB Fig.8.1
- Time : 1 Period

Process

♦ Open discussion using TB and indicators and complete the table in the TB
- definition
- abiotic factors
- biotic factors
- role of abiotic factors

Consolidation :

♦ The living organisms are called biotic factors.
♦ The non-living organisms are called abiotic factors.
♦ An ecosystem is a geographic area where plants, animals, and abiotic factors like air, water, etc. work together to form a bubble of life.

Assessment :

- Completed TB works and My Science Diary
- Food chain

Activity – 2

- TLM
- TB-Fig 8.2 and figures of organisms
- Time : 1 Period for activities 2 and 3

Process

♦ (1)Group discussion using TB-Fig 8.2 and completes the table given in the TB
♦ (2) Using the figures of organisms, constructs food chain by referring the TB.Fig.8.4 and flowchart given in the TB.

Consolidation :

♦ Food chain is a kind of food relationship between organisms through eating and being eaten process.
♦ To the Teacher :
♦ Teacher should facilitate then and there.
♦ Teacher can give assignment to collect more examples

Assessment :

- Completed TB works and My Science Diary
- Levels of organisms in a food chain

Activity – 3

- TLM
- TB - Fig.8.5

Process

- (1)Analyse the given figure in the TB (Fig.8.5)-(group wise)
- (2) Group discussion using indicators like

- Food of plants
- Food of animals
- Dependence of animals on plants
- Role of micro-organisms

♦ The students should write their inference individually

Consolidation :

- Only the green plants can synthesize their own food and are producers
- Other organisms depend on plants for their food and are consumers
- Microbes like bacteria and fungi degrade the dead organic matter and are decomposers.

Assessment :

♦ Completed TB works and My Science Diary
♦ Types of ecosystems

Activity – 4

- TLM
- TB Fig.8.6 and discussion points.
- Time : 2Periods

Process

♦ **Seminar**
♦ (1)Group discussion based on the figures given in the TB(Fig.8.6)
♦ Students are asked to form different group based on each ecosystem and are given indicators and figure of respective ecosystem.

Indicators like

- Climatic condition
- Availability of water
- Nature of temperature
- Plants and animals seen there

♦ (2)Students prepare seminar paper and present it in the class. Group wise presentation, they write seminar report individually.

Consolidation :

♦ Based on the climatic condition and availability of water there are different types of ecosystems
♦ **Forest Ecosystem :**

- Forests are characterised by warm temperatures and adequate rainfall.
- Dominated by trees and other woody vegetation.
- Jungle cats, leopards, monkeys, flying squirrels, snakes, centipedes, millipedes, many snakes, snails, etc.

♦ **Grassland Ecosystem:**

- Limited annual rainfall.
- Dry climate throughout the year.
- Lack of nutrients in the soil.
- Frequent fire
- Poor vegetation growth dominated by grasses.

♦ **Pond Ecosystem**

- Temperature varies in ponds seasonally.
- Fishes, Snails, frogs, salamanders and turtles are animals
- Examples of plants are: water lilies, arrowhead, and curly pondweed, Floating plants, such as water hyacinths,

♦ **Desert Ecosystem.**

- Arid environment.
- Extreme temperatures.
- High wind velocity.
- Absence of water vapour in air.
- The desert plants like succulents, prickly pear cactus, yucca, golden barrel cactus, brittlebush, etc.
- Animals include Camels, hyenas, jackals, foxes, scorpions, numerous assortments of snakes and reptiles

♦ **Tundra Ecosystem**

- Frost-molded landscapes
- Extremely low temperatures
- Little precipitation
- Poor nutrients
- Short growing seasons
- Mountain goats, sheep, marmots, and birds and insects are animals.
- Hardy flora like cushion plants, Arctic Moss, Arctic Willow, Caribou Moss, Labrador Tea, Arctic Poppy, Cotton Grass,

Lichens and Moss are plants.

To the Teacher :

- Teacher should follow the instructions already given in the introductory pages and facilitate then and there.
- Teacher should supply characteristic features of each ecosystem to respective groups

Assessment :

- Preparation, participation, and presentation of seminar. Seminar report
- Food web

Activity – 5

- TLM
- TB-Fig 8.7
- Time : 1 Period

Process

- Group discussion based on TB-Fig 8.7 and textual questions as indicators
- Use running matter in the TB also.
- Group wise presentation, write comparative notes individually.

Consolidation :

- There are more than one food chain in an area
- Food web is the network of food chains in an area.

Assessment :

- Completed TB works and My Science Diary
- Movements to protect plants

Activity – 6

- TLM
- TB
- Time : 1 Period

Process

- **Seminar**
  - Group discussion based on the TB
  - Students are asked to form different groups. Students prepare seminar paper and present it in the class.
  - Group wise presentation, they write seminar report individually.

Consolidation :

- Plants are the only producers on earth
- Other organisms including man depend upon green plants for their food
- Plants are the major biotic factor in the ecosystem
- Make our environment green for life on earth

To the Teacher :

- Teacher should follow the instructions already given in the introductory pages and facilitate then and there.

Assessment

- Preparation, participation, and presentation of seminar. Seminar report
- Completed TB works and My Science Diary

Working gallery – Answers

- (C) Water
- (B) Producers
- (B) Grass - Insect - Frog - Snake - Hawk
- (B) Bacteria, others are consumers.
- (C) Statement (i) is wrong; statement (ii) is correct
- (d) Producer, herbivore, and carnivore
- (a)Grass
  (b) Grass - Insect - Frog - Snake
- Green plants are the first link in any food chain because they are producers. They create their own food through photosynthesis, providing the foundation of energy for all other organisms in the food chain.

- **Match the following:**

LEVEL OF ORGANISM	EXAMPLE
Consumer	Deer
Decomposer	Fungi
Producer	Plants

- Anu's statement is correct. A food chain represents a single pathway of energy flow,

where each organism is linked to only one other organism for food. In contrast, a food web is a network of interconnected food chains, showing multiple relationships between different organisms in an ecosystem. This complexity in food webs reflects the interdependence and biodiversity within ecosystems.

9 REST AND MOTION

Introduction

- In this chapter, you'll explore the fascinating world of movement, known as motion, and when things stay in one place, called rest. Have you ever watched rides in an amusement park and noticed how some spin, others go up and down, and some even swing back and forth? All of these rides show different types of motion! By the end of this chapter, you'll understand how to describe and identify various types of motion, such as circular, oscillatory, and uniform motion.

Previous Knowledge

- Before learning about rest and motion, the students should already know:
- Basic concepts of up, down, left, right, and straight paths.
- Familiarity with objects moving differently, like cars on a road or swings in a playground.

Learning Objectives

The learner

- Define and differentiate between rest and motion.
- Understand and explain different types of motion: rectilinear, circular, oscillatory, translatory, rotatory, and periodic motions.
- Use the concept of a reference body to describe motion and rest.
- Recognize examples of uniform and non-uniform motion in real-life situations.

Major Concepts

- **Rest**: When an object's position does not change relative to a reference body.
- **Motion**: When an object's position continuously changes relative to a reference body.
- **Translatory Motion**: An object moves from one position to another as a whole.
- **Rectilinear Motion**: The motion of an object in a straight line.
- **Circular Motion**: Motion along a circular path.
- **Oscillatory Motion**: Motion that moves to and fro along the same path.
- **Rotatory Motion**: Movement around an axis within the object.
- **Periodic Motion**: Repeats after regular intervals (e.g., rotation of Earth around the Sun).
- **Non-Periodic Motion:** Does not repeat regularly (e.g., motion of wind).
- **Uniform Motion**: Covers equal distances in equal intervals of time.
- **Non-Uniform Motion:** Covers unequal distances in equal intervals of time.
- Rides in an amusement park (e.g., Giant Wheel, cable car, pendulum clock) demonstrate different motions.
- Everyday examples like the movement of a car, swing, clock pendulum, and Earth's rotation/ revolution.

Motion (2 period)

- **Activity 1: (picture observation, analysis, table completion)**
- The aim of this activity is to help students understand the concept of rest and motion, including how motion is relative to a reference body and to explore different types of motion through engaging activities and real-life examples. Introduce the concept of motion with a relatable scenario of observing picture. The use of ICT is a better option. Here the teacher familiarises some type of motions. The teacher asks the question - Have you observed your Dad walking with a mobile phone in his pocket?

- Ask them to think about whether the phone is in motion.
- Is the mobile phone in motion if we compare its position to Dad's pocket?
- How would it be different if we compare it to the ground?
- After discussion the students realize that motion or rest depends on the point of reference. Discuss objects that are in continuous motion (e.g., a flying bird, a falling apple) and classify them based on whether they are at rest or in motion with respect to various reference bodies.
- This structured approach should help students understand the fundamental concepts of rest and motion, engage in critical thinking, and apply their knowledge to practical examples. Present different scenarios, asking students to identify if an object is at rest or in motion relative to specific reference bodies.
  - Example: Trees, chairs, and pillars seem at rest when we choose the ground as the reference. However, with respect to the Sun, they are in motion.
- Following this the students are directed to complete the table on page 208 individually and evaluate among peers.

Consolidation

- A body is in motion if its position is continuously changing with respect to another object.
- A body is at rest if its position is not changing relative to a chosen reference body.
- Explain that the object we compare another object's position to is called the "reference body."

Situation	Rest	Motion	Reference Body
A student in a moving car - With respect to the car	At rest	In motion	car
A student in a moving car - With respect to the road	In motion	In motion	Road
A student in a ship - When compared to the ship	At rest	In motion	Ship
A student in a ship - When compared to the ground	In motion	In motion	Ground
A chair under a tree - With respect to the tree	At rest	In motion	Tree
A chair under a tree - With respect to the sun		In motion	In motion

Evaluation

- Description in 'My Science Diary'. Completed table.

Different types of motion (4 period)

- **Activity 1: (picture observation, analysis, table completion)**
- The aim of this activity is to understand the different types of motion (translatory, rectilinear, circular, oscillatory, rotatory, revolution, uniform and non-uniform motion)
- By discussing the situations, the different types of motion (translatory, rectilinear, circular, oscillatory, rotatory, revolution, uniform and non-uniform motion) are discussed. Life time examples and class room examples are given to understand this content.

Consolidation

- **Translatory motion**: A body shifting from one position to another as a whole.
- **Rectilinear motion**: Motion along a straight line.
- **Circular motion**: Motion along a circular path.
- **Oscillatory motion**: To and fro motion along the same path.
- **Rotatory motion**: Motion about its own axis.
- **Revolution**: Motion of a body around another object.
- **Uniform motion**: Equal distances covered in equal intervals of time.
- **Non-uniform motion**: Unequal distances covered in equal intervals of time.
- Examples:
  - **Translatory Motion**: A car moving along a straight road. A person walking from one room to another.
  - **Rectilinear Motion**: A train moving on straight tracks. A free-falling object dropped from a height.

- **Circular Motion**: A child swinging on a merry-go-round. The motion of the hands of a clock.
- **Oscillatory Motion**: The motion of a pendulum in a clock. A child on a swing moving back and forth.
- **Rotatory Motion**: The rotation of the Earth on its axis. A rotating wheel of a bicycle.
- **Revolution**: The Earth revolving around the Sun. The Moon revolving around the Earth.
- **Uniform Motion**: A car moving at a constant speed on a straight road. A person walking at a steady pace on a treadmill.
- **Non-uniform Motion**: A bus accelerating or decelerating on a road. A car moving in traffic with varying speeds.

Examples of Motion	Type of Motion
NCC cadets in a march past	Oscillatory motion
An athlete running a 400 m race	Non-uniform motion
Movement of the wheel of a cycle	Rotatory motion
Motion of the pendulum of a clock	Oscillatory motion
Motion of an ant along the wheel of a cycle	Rotatory motion
Motion of the leaves of a fan	Rotatory motion

Evaluation

♦ Completed table, Recordings in 'My Science Diary'.

Working Gallery – Answers

Select the correct answer.

♦ (a) A building in the school compound is at Rest when compared to the sun.

♦ (b) A car going along a road is in Motion with respect to the road.

♦ (c) The motion of the second hand of a wristwatch is in Uniform motion.

♦ (d) The motion of an apple falling down from an apple tree is Non-uniform motion.

♦ (e) The motion of a swing is Oscillatory.

2. Write the different types of motion and one example for each.

♦ Rectilinear motion: The motion of an ant moving along a straight line.

♦ Circular motion: The child swingin on a merry – go - round.

♦ Oscillatory motion: The motion of a pendulum.

♦ Rotatory motion: The motion of a bicycle wheel.

♦ Translatory motion: The motion of a bus moving along a straight road.

3. What is translatory motion? Give two examples.

♦ Translatory motion is the motion of a body that shifts from one point to another along a path, either straight or curved. In translatory motion, the body moves as a whole from one position to another.
- Example 1: A car moving along a straight road.
- Example 2: A bird flying from one tree to another.

4. What is rotatory motion? Give two examples.

♦ Rotatory motion refers to the motion of an object that revolves around its own axis.
- Example 1: The rotation of the Earth around its own axis.
- Example 2: The rotation of a wheel.

5. What is oscillatory motion? Give two examples.

♦ Oscillatory motion refers to the to and fro motion of an object along the same path, typically around a central point or axis.
- Example 1: The motion of a pendulum.
- Example 2: The motion of a swing.

6. Define

♦ a) Motion: The continuous change in the position of an object with respect to a reference body.

♦ b) Rest: A state in which an object does not

change its position with respect to a reference body.

- c) Reference body: The object with respect to which the motion or rest of another object is observed.

- **7. Give two examples of each of the following.**
- a) Rectilinear motion:
  - The motion of a car moving along a straight road.
  - The motion of a falling stone.
- b) Non-uniform motion:
  - The motion of a bus when it starts or stops.
  - The motion of a falling apple.

- **8. Complete the table.**

Picture	Type of Motion
Fig of pendulum	Oscillatory motion
Fig of motion of a car along a straight road	Rectilinear motion
Fig of the leaves of a fan	Rotatory motion

- **9. Match the following.**

A	B
1. Rotatory motion	3. Movement of the Moon around its own axis
2. Translatory motion	4. Motion of a boy from home to school
3. Vibratory motion	1. String of a guitar
4. Oscillatory	2. Motion of a swing

10 CIRCULATORY SYSTEM IN OUR BODY

Introduction

- Circulation of blood is essential for the transportation of nutrients and oxygen to various parts of the body. It also transports waste for removal from the body. The circulatory system is made up of blood, blood vessels and heart. The blood circulation in human heart is called double circulation because the blood passes through the heart twice in one complete cycle of the body. Once through the right half in the form of deoxygenated blood to lungs (pulmonary circulation) and next through the left half in the form of oxygenated blood to all body. As this chapter is one of the most important one in the organ systems, extreme care should be taken to transact the concepts. The learning activities should be planned so as to internalize the concepts by students. A wilful effort is expected from the part of teacher to conceive the contents. Teacher can plan and adopt more effective and divergent forms of learning activities to improve various skills in students. Teacher can also use split models of heart, working models of circulatory system, etc to ease the learning process.

Previous Knowledge

The learner knows:

- The important organs in our body
- Functions of each organ
- We have heart and blood
- We can hear heart beat
- Blood comes out from wounds
- Heard about blood donation

Learning outcomes

The Learner..

- identifies the parts of blood circulatory system.
- creates role play about parts of circulatory system
- locates the position of heart
- explains the structure of heart
- appreciates the functioning of heart.
- compares arteries and veins
- analyses the composition of blood
- classifies blood cells
- demonstrates blood circulation
- develops attitude towards blood donation
- practises exercise daily

Major concepts

- Our blood circulatory system consists of heart, blood vessels and blood
- It helps to carry oxygen and nutrients to various organs in the body
- Heart is the important part of circulatory system
- It is situated in the chest portion and has a size of our folded fist
- Heart is protected by fluid covering and ribs
- Heart has 4 chambers to receive and pump blood
- Arteries carries blood from heart and veins carry blood to heart
- The rhythmic movement of heart is heartbeat.
- Blood is the fluid portion which carry different substances to organs
- Blood contains blood cells, water, nutrients and wastes
- RBCs carry oxygen and WBCs help in immunity
- Platelets help in blood clotting.
- Importance of blood donation
- Importance of exercise

UNIT FRAME

UNIT -11 CIRCULATORY SYSTEM IN OUR BODY Total Time: 4 Periods of 45 minutes

LO's	CONCEPTS	TEACHING-LEARNING PROCESS	TLM	ASSESMENT
♦ creates role play about parts of circulatory system	♦ The importance of circulatory system ♦ Parts of circulatory system ♦ Heart- position, structure and function ♦ Blood vessels- arteries and veins and their difference ♦ Composition of blood	♦ Open discussion and Role-play	♦ Screen play and placards	♦ Screen play, performance, and MCQs.
♦ demonstrates blood circulation	♦ Blood circulation	♦ Making short notes	♦ TB.Fig.11.7 and TB.	♦ Prepared notes and My Science Diary
♦ develops attitude towards blood donation	♦ Importance of blood donation	♦ Open discussion	♦ TB.- Notice and discussion points	♦ Participation and My Science Diary
♦ practise exercise daily	♦ Importance of exercise	♦ Observation of video of exercise and General discussion	♦ Video of exercise	♦ Responses of simple questions

Parts of Blood Circulatory System

Activity - 1

- TLM
- Screen play and placards and TB(Fig. 11.2)
- Time : 2 Periods

Process

- Role-play

♦ **Preparation Steps(a trial) :**

♦ General discussion on blood circulation and parts of blood circulatory system. Teacher can use figures and content in the TB(Fig. 11.2)

- Students form three groups basically(4+4+12) based on the parts of blood circulatory system like (Group-1) Heart, (Group-2)Blood vessels and (Group-3)Blood
- Prepare a screen play (Group wise) using TB

♦ **SAMPLE**

- The whole group of students come together with a banner 'BLOOD CIRCULATORY SYSTEM' and say " We are all together is blood circulatory system"

♦ **Group-1** : (Four members together come forward)

- One of the 4 members says : (with a placard 'HEART' also with large Fig.L.S.) "I am the heart situated between the lungs slightly oblique to left and below the ribs". "I pump

blood to the blood vessels to transport."

- Second member : (Pointing the heart) "He has four chambers. Two atrias upper and two ventricles lower."
- Third member : (Pointing the heart) " From atria, arteries start and from ventricles, veins start."
- Fourth member : (Pointing the audience) "Can't you hear your heart beat? (After a pause)Yea, it's using muscles to beat as Lub….dub….. Do you know how many times it beats in a second?"(Pause 1 minute for audience response) "It is an average of 72 times per minute in a healthy adult person."
- (Group-1 return from stage)

♦ **Group-2** : (Four members together come forward with a placard 'BLOOD VESSELS' and say): "We carry blood from heart and to heart. You can call us as Blood Vessels."

- Two members come forward with a placard 'ARTERIES'and say : "We are the channels to flow blood from heart to various organs/ parts. (After a pause) Yea, we are arteries.
- Other two members with a placard'VEINS' : " We are veins. We carry blood from organs to heart."
- (Group-2 return from stage)

♦ **Group-3:** Consists of two sub-groups (I and II)with 5+7 members respectively. Again first sub-group sub-divided in to three as A, B & C(1+2+2). Second one consists of two groups, P and Q(2+5).

- All group members come forward with a placard 'BLOOD' and say "We flow through blood vessels and heart. (After a pause) Right, we together form Blood."

♦ **Sub-Group-I**

- Microgroup-A : with a placard 'WATER' "I am the major portion of blood, my name is water."
- Microgroup -B : with a placard 'PLATELETS' "We help to clot the blood on wounds and there by stop bleeding."
- Microgroup -C : with a placard 'WASTES' "We are wastes of cellular activities going to excretory organs."

♦ **Sub-Group-II:**

- come forward with a placard 'BLOOD CELLS' then disperse to two groups P and Q (2+5).

♦ **Microgroup -P : with a placard 'RBC' :**

- One member says"I am red in colour. I can carry oxygen to cells."
- Second member: (Pointing to RBC) "His colour is due to me. My name is haemoglobin. It is me carry oxygen really.
- I need iron to function properly. (Pointing the audience)So you should include Iron containing food in your diet, don't you?"

♦ **Microgroup -Q:**

- with a placard 'WBC': We are the soldiers of blood commonly called White Blood Corpuscles. Our name contains colour white but we are actually colourless. We give resistance against some diseases and germs."
- Again the whole group of students come together with a banner 'BLOOD CIRCULATORY SYSTEM' and say " We are all together is blood circulatory system.", 'THANK YOU ALL'

♦ Group wise presentation.

Consolidation:

♦ Our blood circulatory system consists of heart, blood vessels and blood
♦ It helps to carry oxygen and nutrients to various organs in the body
♦ Heart is the important part of circulatory system
♦ It is situated in the chest portion and has a size of our folded fist
♦ Heart is protected by fluid covering and ribs
♦ Heart has 4 chambers to receive and pump blood
♦ Arteries carry blood from heart and veins carry blood to heart
♦ The rhythmic movement of heart is heartbeat.
♦ Blood is the fluid portion which carry different

substances to organs

- Blood contains blood cells, water, nutrients and wastes
- RBCs carry oxygen and WBCs help in immunity
- Platelets help in blood clotting.

To the Teacher :

- Teacher should continue activities given in the TB and follow learning activities to ensure the students got a clear-cut awareness about the circulatory system.

Assessment :

- Screen play, performance and My Science Diary
- Blood Circulation

Activity – 2

- TLM
- TB and Fig. TB.11.7
- Time : 1 Period for activities 2 and 3

Process

- Making short note on the basis of TB and Fig. TB.11.7
- The students should write notes individually

Consolidation :

- The blood from heart flows to lungs and various organs through arteries.
- From lungs and different organs, blood is brought to heart by veins
- The flow of blood through blood vessels is maintained by the pumping of heart.

Assessment :

- Prepared notes and My Science Diary
- Blood Donation

Activity – 3

- TLM
- TB-Notice
- Time : 1 Period for activities 2 and 3

Process

- Open discussion with reference to TB-Notice

Indicators like:

- Definition
- Situations of blood transfusion
- Quantity of blood taken

Consolidation:

- It is a practice of donating one's blood to people in certain critical conditions.
- Some blood donating situations are
  - a) Major Surgical Operation.
  - b) Accidents resulting in considerable blood loss.
  - c) Women in childbirth and new-born babies in certain cases.
  - d) Patients of hereditary disorders like Haemophilia.
- For a whole blood donation, approximately 0.5 L of blood is collected.

Assessment :

- Prepared notes and My Science Diary
- Importance of exercise

Activity - 4

- TLM
- Exercise - video
- Time : 1 Period

Process

- Video observation and general discussion

Consolidation:

- Exercise improves strength, balance and flexibility.
- Exercises increase and improve blood circulation.
- It helps the flow of oxygen in our body.

Assessment

- Prepared notes and My Science Diary

Working Gallery – Answer

- **Answer the following:**
  - (D) Four
  - Five
  - (C) Possesses valves
  - (C) Helps to resist diseases
  - Statement (i) and statement (ii) are correct
  - Yes, this is correct. Oxygenated blood from the lungs is carried to the heart through the pulmonary vein, while arteries generally carry blood away from the heart to other body parts.
  - Blood donation is allowed for those between 18 and 60 years old. Since the person is only 15, they are not eligible to donate blood yet.
- **–A -Left Atrium, B - Left Ventricle**
  - Left Atrium: Receives blood from the lungs.
  - Left Ventricle: Pumps blood to the whole body.
- Arteries: Have thick walls and carry blood from the heart to organs.
- Veins: Have thinner walls and carry blood from organs to the heart.
- **Match the following:**

Blood Components	**Function**
WBC	Immunity
Platelets	Blood clotting
RBC	Oxygen transportation

edufy publications

Semester 2

TEACHERS RESOURCE MANUAL

SCIENCE
Grade 5

GRADE - 5

6 SLOW AND FAST

GRADE - 5

Intoruduction

♦ All of us know about motion. An object is said to be in motion only if its position changes with respect to time and surroundings. The point from where the body starts its motion is the initial position. The point where the body ends its motion is the final point. A body may be in motion along a straight line or in a path of any other shape. The actual length of the path covered by a body in motion is the distance and distance per unit time is the speed. The straight-line distance from the initial point to the final point is the displacement. Distance and speed are scalar quantities while the displacement is a vector quantity.

Previous Knowledge

The learner

♦ knows about
- length
- unit of length
- time and its units
- rest
- motion

Learning outcomes

The learner

♦ comprehends the distance and its unit
♦ comprehends displacement and its unit
♦ develop an awareness about scalar quantities and vector quantities
♦ understands what speed is and what its unit is.

Major concepts:

1) Distance
2) Displacement
3) Scalar quantity
4) Vector quantity
5) Speed

UNIT FRAME

Name of Unit: SLOW AND FAST Total Time: 5 periods of 40 minutes each Theme: Motion

Sub Theme	CONCEPTS	TLM	Materials required	Assessment	Values	Time in minute
Dis-tance and dis-placement	♦ Distance is the actual length of the path covered.	♦ Analysis of figure ♦ Discussion	♦ Picture of road, school and different roads connecting them	♦ Involvement ♦ Diary notes ♦ Ability to understand	♦ importance of travel	♦ 40
	♦ Displacement	♦ Discussion ♦ Situation analysis	♦ Pictures ♦ Projector	♦ Diary notes	♦ Way of analysis	♦ 40
	♦ Comparing distance and displacement	♦ Discussion ♦ Situation analysis	♦ Pictures ♦ Projector	♦ Diary notes	♦ Travel	♦ 40

Vector and Scalar quantities	♦ Vector quantities	♦ Discussion	♦ Projector	♦ Observation note in the diary		♦ 20
	♦ Scalar quantities	♦ Discussion	♦ Projector	♦ Observation note in the diary		♦ 20
Speed	♦ Speed	♦ Discussion ♦ Other videos ♦ Calculation	♦ Projector	♦ Observation note in the diary	♦ Speed thrills but kills	♦ 40

♦ **Ask the children to complete 'Working Gallery' in the class itself and assess it at the end of the lesson to give marks for CCE (one period)**

Process:

♦ In all activities try your level best to make the children say the answer. We will say the answer only in the last minute, that too only if it is unavoidable.

♦ **Distance**: When the position of a body changes with respect to time and surroundings we say that the body is in motion. The teacher can show the diagram given in the text(page 181) and ask from where did the child start the journey and where did she end it? Then the teacher can explain that the point from where the motion starts is the initial point and the point where the motion ends is the final point. Here the initial point is the home and the final point is the school if the children are going from home to school. It is just the opposite when they return. If they are opting the path A then the actual length of the path travelled is 500 m. So distance is 500 m. Now the teacher can conclude that the actual length of the path travelled is the distance. If path B is opted the distance is 800 m. Here metre is the unit of distance while 500 or 800 is the magnitude. The symbol of metre is m.

♦ **Displacement**: Now the teacher can instruct the children to consider the journey from home to school. The children can opt the path A or the path B. Now the teacher can ask what is the initial point if you opt the path A? What if you opt the path B? Isn't it the home? What is the final point if you opt the path A ? What if you opt the path B? Isn't it the school? We can see that the initial point is the same in both cases. So also the final point. Now the teacher can again ask what is the straight-line distance from the initial point to the final point? Isn't it 120 m? This shortest distance from the initial point to the final point along a straight line is the displacement.

♦ The table i2 page 183

Situation	Distance travelled by the ball	Displacement of the ball
When the ball reaches the topmost position	10 m	10 m
When the ball falls back in to the hand	20 m	zero

♦ Analysis of fig 1 page 183

♦ On reaching C from A through B

♦ Distance = AB + BC = 60 m + 40 m = 100 m

♦ Displacement = AC = 50 m from A to C

♦ Analysis of fig 2 page 184

♦ Total distance travelled = AC = AB + BC = 60 m + 40 m = 100 m

♦ Displacement = AC = 100 m from A to C

♦ In the case of fig 1 magnitude of distance and displacement are not equal and the journey is not along a straight line.

♦ In the case of fig 2 magnitude of distance

GRADE - 5

and displacement are equal and the journey is along the same straight line in the same direction.

- Hence we can conclude that the magnitude of distance and displacement are equal only if a body moves along the same straight line in the same direction.

Vector quantity and Scalar quantity

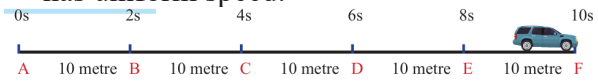
- In the case of displacement we said that it is 100 m along AC. Here 100 m is the magnitude while along AC is the direction. That is displacement is a physical quantity having both magnitude and a constant direction. That is why it is referred to as a vector quantity. But in the case of speed there is magnitude but no direction along a straight line. Hence speed is a scalar quantity. Mass, time, distance, speed etc., are examples for a scalar quantity. Weight is another example for a vector quantity. (It is the force with a body is attracted towards the centre of the earth)
- Now you can bring out the differences between distance and displacement.

Distance	Displacement
1. It is the length of actual path travelled by the object in a certain time. 2. It can be more than or equal to the magnitude of displacement.	1.It is the straight line path travelled by the object in a certain time. 2. The magnitude can be less or equal to the magnitude of distance.
3 Scalar quantity	3 vector quantity

- **Speed**: Now the teacher can ask, If a person runs 100 m distance in 10 s, how much he covers in 1 s? Subject it to discussion to make the children say that it is 10 m. Then the teacher can ask, how they got it? If no one is giving a scientific answer, then the teacher can say that it is 100 m /10 s =10 m/s . The teacher can conclude that this is the speed. It is the distance travelled in unit time and is calculated as distance / time = speed .
- Completing the table in page 186

Distance (m)	Time (s)	Speed (m/s)
64	8	8
45	3	15
800	10	80

- Analysis of figure in the page 187
- On completing the calculation, we can see that the body covers equal distance in equal interval of time. If so, we will say that the body has uniform speed.



Distance travelled		Time	Speed
A to B	10 m	2 s	5 m/s
B to C	10 m	2 s	5 m/s
C to D	10 m	2 s	5 m/s
D to E	10 m	2s	5 m/s
E to F	10 m	2 s	5 m/s

- On completing the table using the given fig we can understand that the body covers unequal distance in equal intervals of time. If so ,we will say that the body has non-uniform speed.
- Now the teacher can discuss and conclude that the average speed is the total distance / total time.Then the teacher can work out the qn on page 189 as
- Total distance = 400 m
- Total time = 10 s
- Average speed = total distance / total time = 400 m/ 10 s = 40 m/s

1 km/h = 1000 m/3600 s = 5/18 m/s Hence to convert km/h into m/s multiply with 5 /18. To convert m/s into km/h divide with 5 /18 (Hence multiply with 18 /5)

Consolidations:

- Distance is the actual length of the path travelled
- Displacement is the shortest distance from one point to another along a straight line. It has both magnitude and direction. Its unit is metre (m)
- When a body travels along a straight line in the same direction, the magnitude of its distance travelled and displacement will be equal
- The Physical quantities having only magnitude are called scalar quantities Differences between distance and displacement
- Physical quantities having both magnitude and direction are the vector quantities
- Physical quantities having magnitude alone

are the scalar quantities

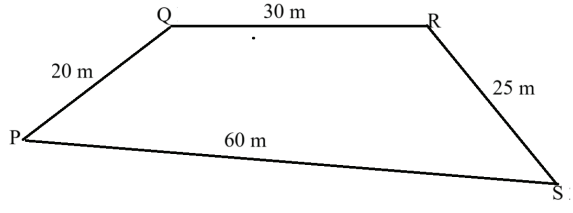
- Speed is the distance travelled in unit time. Speed = Distance / Time
- If a body in motion covers equal distances in equal intervals of time, the body is said to have uniform speed
- If a body covers unequal distances in equal intervals of time, the body is said to have non-uniform speed

Assessment:

- We can make the assessment using different tools. We can assess using the following
  - Entries in the diary.
  - The attention of children in the activities
  - The participation in activities
  - By asking simple questions
  - By making the children do the activities in the TLM
- Simple test paper (sample question paper and valuation key is attached)
- Products of experiments

Extended activities

1. Make some worksheets of your own like those suggested in the text book
2. Find the distance and displacement in the following figure if a body starts from P goes to Q then to R and then to S and back to P



3. Find two examples for scalar quantities
4. Bring out the differences between vector quantities and scalar quantities

Answers to 'Working Gallery'

1.

- Displacement
- m/s
- the speed
- total distance / total time
- direction
- 90 m/s = 90 x 18 /5 = 324 km/h
- Speed = distance / time = 3600 m/ 10 s = 360 m/s = 360 x 18 /5 = 72 x18 km/h =1296 km/h
- 1. Speed of light 2. A vehicle going at the rate of 5 m/s 3. A vehcilce going at the rate of 10 m/s

Distance	Displacement
1. It is the length of actual path travelled by the object in a certain time. 2. It can be more than or equal to the magnitude of displacement.	1.It is the straight line path travelled by the object in a certain time. 2. The magnitude can be less or equal to the magnitude of distance.
3 Scalar quantity	3 vector quantity

- The child reached back at the starting point covering a distance of 300 m.

- 2. Speed of Bus A= 90 m / 5s = 18 m/s
- Speed of Bus B= 195 m / 13 s = 15 m/s
- Bus A has a greater speed than Bus A

- 2. Distance = 5 km +12 km = 17 km

Displacement = 7 m

7 THE LIFE CONTINUES

Introduction

- In this unit, students are introduced to the fascinating world of flowers and their crucial role in the plant life cycle. Set in a vibrant garden filled with colourful flowers and fluttering butterflies, this lesson follows Sonu, Sana, and their friends as they learn about the structure and functions of flowers with guidance from a gardener. Through observation, hands-on activities, and engaging illustrations, students explore the different parts of a flower, such as the petals, sepals, androecium, and gynoecium.
- They will delve into the concepts of pollination, reproduction, and seed dispersal, discovering how flowers contribute to the formation of seeds and the growth of new plants. Activities like dissecting flowers, observing pollen grains, and comparing different flower types make this journey interactive and educational.

Previous Knowledge

- Students should already be familiar with basic plant parts, such as roots, stems, and leaves, and understand that plants are living organisms that grow and reproduce. They may also have a basic understanding of how plants use sunlight and water for growth.

Learning Outcomes

The learner

- identifies and label the different parts of a flower.
- understands the functions of each part of the flower.
- describes the process of pollination and the role of pollinating agents such as bees and butterflies.
- differentiate between bisexual and unisexual flowers.
- understands the role of pollen grains and ovules in reproduction.
- describes the process of seed germination and what conditions are necessary for it.
- understands the methods of seed dispersal and why it is essential for plant survival.
- recognizes how some plants reproduce through body parts like stems, roots, and leaves.

Main Concepts

- **Pedicel**: The stalk that connects the flower to the plant.
- **Calyx**: Consists of sepals that protect the flower in its bud form.
- **Corolla**: Made up of petals that attract pollinators like insects and birds.
- **Gynoecium**: The female reproductive part, made up of carpels.
- **Androecium**: The male reproductive part, made up of stamens.
- **Thalamus**: The tip of the pedicel, which holds all the parts of the flower together.
- **Bisexual Flowers**: Flowers that have both androecium and gynoecium in the same flower.
- **Unisexual Flowers**: Flowers where the androecium and gynoecium are in separate flowers.
- The transfer of pollen from the anther to the stigma, which is facilitated by pollinating agents like bees, butterflies, birds, and the wind.
- The process by which a seed develops into a seedling. It requires the right conditions such as water, air, and warmth.
- The scattering of seeds to new locations, allowing plants to grow in different areas. Seeds can be dispersed by wind, water, animals, or bursting fruits.
- Some plants can reproduce through their stems, roots, or leaves, a process that does not

require seeds.

Parts of Flower (1 period)

- **Activity 1: (Picture Observation, Description Analysis, redraw and label the diagram)**
- This activity introduces students to the structure and importance of flowers in plants. Through an interactive conversation and observation of illustrations, students will learn to identify and label different parts of a flower. The activity involves group discussion and individual analysis based on indicators provided below. Students will document their observations in 'My Science Diary.' The use of ICT (Information and Communication Technology) is encouraged to enhance understanding. After this redraw the diagram on page 192 into 'My Science diary' and label its parts. The activity of counting the sepals and petals of different flowers can be given as home assignment.

Indicators

- Importance of flowers in a plant.
- Structure and functions of flower parts.
- Environmental role of flowers in attracting insects and birds.
- Different parts of a flower.

Consolidation

- Flowers are essential parts of plants, not just for beauty but for reproduction.
- Petals are brightly coloured to attract insects, birds, and other pollinators.
- Different parts of a flower include:
  - **Pedicel**: Connects the flower to the plant.
  - **Calyx:** Protects the flower in bud form.
  - **Corolla**: Brightly coloured petals that attract pollinators.
  - **Gynoecium**: Female reproductive part, made up of carpels.
  - **Androecium**: Male reproductive part, made up of stamens.
  - **Thalamus**: The tip of the pedicel, holding various flower parts.

Evaluation

- Students will label flower parts in illustration and write their observations in 'My Science Diary,' reflecting on the function and importance of each part of a flower. Participation in group discussions and observations will also be assessed.

Bisexual and Unisexual flowers (3 periods)

- **Activity 1: (Picture Observation, comparing flowers, Description Analysis, Engage in practical)**
- This activity aims to understand the parts of a flower, such as the stamen (filament and anther) and carpel (ovary, ovule, style, stigma), and to differentiate between bisexual and unisexual flowers. By observing a longitudinally dissected flower using a hand lens, students will identify the stamen and carpel parts by comparing them with the picture in the textbook (page 193). After identifying the androecium and gynoecium observe different types of flowers, such as Hibiscus, Pumpkin (male and female flowers), Brinjal, Tomato, Mango, Coconut, and Cucumber (male and female flowers). Identify the distinct parts of the flowers and their characteristics. Classify them based on - Flowers having both androecium and gynoecium in a single flower (Bisexual Flowers). Flowers having androecium and gynoecium in separate flowers (Unisexual Flowers) and write it in the table on page 193. Try to find more examples of unisexual and bisexual flowers and record them in your 'My Science Diary.'

Consolidation

- Androecium is the male reproductive part of flower. Its parts are stamen and filament.
- Gynoecium is the female reproductive part of flower. Its parts are style, stigma, ovule and ovary.
- Flowers having both androecium and gynoecium in a single flower are bisexual flowers.

- Flowers having androecium and gynoecium in separate flowers are unisexual flowers.
- Bisexual Flowers (Flowers that have both androecium and gynoecium in the same flower): Hibiscus, Brinjal, Tomato
- Unisexual Flowers (Flowers that have androecium and gynoecium in separate flowers): Pumpkin (Male and Female flowers are separate).Mango (Male and Female flowers are separate), Coconut (Male and Female flowers are separate), Cucumber (Male and Female flowers are separate)

Evaluation

- Engaging in classification, Completed table

- **Activity 2: (Picture Observation, engage in practical, Prepare practical record)**
- This activity aims to observe pollen grains and ovule by engaging in practical. The teacher should provide all facilities to do the practical individually and write the practical record in "My Science Diary'.

Consolidation

- Sample of practical recording
  - Aim
  - Materials needed
  - Procedure
  - Observation
  - Inference

Evaluation

- Engaging in classification, Completed table

- **Activity 3: Description analysis)**
- This activity aims to understand about Male sex cells, Female sex cells, Formation of seed, Reproduction. Analysing the description in page 197 by using indicators and write the findings in 'My Science Diary'. The possibility of peer evaluation can be used here.

Consolidation

- Male Sex Cells – Found in the pollen grains.
- Female Sex Cells – Located within the ovule.
- Formation of Seed – Happens when male and female sex cells fuse in the ovary.
- Reproduction – The process of creating new plants, ensuring the survival of plant species

Evaluation

- Writing in 'My Science Diary', Peer evaluation

Pollination (2 period)

- **Activity 1: (Picture Observation, Conversation analysis)**
- This activity aims to help students understand pollination and the role of pollinators in nature. Begin with a discussion prompted by observing butterflies and bees in a garden setting. After conducting a discussion on the conversation between Sonu, Sana, and the gardener, the term pollination should be introduced. Observe the following pictures and identify the pollinating agents. Record your observations in My Science Diary.
- As an extended activity, students are directed to collect examples from their surroundings that represent different types of pollination and add them to My Science Diary.

Consolidation

- Pollination is the transfer of pollen grains from the anther to the stigma.
  - Picture 1: Coffee plant with bees around flowers.
  - Picture 2: Hibiscus plant with birds around flowers.
  - Picture 3: Paddy plants swaying in the wind.
  - Picture 4: Pepper plant with raindrops on flowers.
  - Picture 5: Rose plant with butterflies around flowers.
- Factors that help pollination are called pollinating agents.
  - Pollinating agents – Wind, water, bees, butterflies, birds etc

Evaluation

- Writings in 'My Science diary', Participation

in group activity.

To the teacher

- **Pollination is a crucial ecological process that sustains biodiversity and supports ecosystems. Here are some key points highlighting its ecological importance:**
- **Reproduction of Plants** : Pollination enables the reproduction of flowering plants by facilitating the transfer of pollen from the male part (anther) of a flower to the female part (stigma), leading to seed and fruit production.
- **Biodiversity Maintenance** : Pollination supports a wide variety of plant species, which in turn provide habitats, food, and shelter to countless organisms. This interdependence fosters biodiversity in ecosystems.
- **Food Chain Support** : Plants that rely on pollination produce fruits, seeds, and nectar, which serve as food for herbivores, insects, birds, and other wildlife. This sustains the food web.
- **Genetic Diversity**: Cross-pollination promotes genetic diversity in plants, making them more resilient to diseases, pests, and environmental changes.
- **Stabilization of Ecosystems** : Pollination contributes to the stability of ecosystems by ensuring the continuous growth of plants, which help in soil stabilization, water cycling, and air purification.
- **Carbon Sequestration** : Pollination supports forests and grasslands, which play a significant role in capturing carbon dioxide, thereby mitigating climate change.
- **Aesthetic and Cultural Value** : Flowering plants add beauty to landscapes and hold cultural and spiritual significance for many communities, often relying on pollination for their blooms.

- **Activity 2: (Illustration analysis and table completion, Group discussion)**
- This activity aims to help students understand the concepts of self-pollination and cross-pollination. Begin with a discussion prompted by Sana's question, and encourage students to share their opinions. Ask them to write their thoughts in 'My Science diary'.
- Next, present the following illustrations to the students and guide them in observing the transfer of pollen grains. Ask students to complete a table in 'My Science diary' based on these illustrations to identify self-pollination and cross-pollination.
- As an extended activity, direct students to observe flowers in their surroundings and collect examples representing self-pollination and cross-pollination. They should document their findings in 'My Science diary'.

Consolidation

- Self-Pollination - Transfer of pollen grains from the anther to the stigma of the same flower.
- Cross-Pollination Transfer of pollen grains from the anther to the stigma of a different flower on the same plant or transfer of pollen grains from the anther of a flower on one plant to the stigma of a flower on another plant of the same kind.

Evaluation

- Writings in "My Science diary', Completed table, Participation in group activity.

Seed germination (2 period)

- **Activity 1: (Illustration analysis)**
- This activity aims to help the children understand about seed germination. By analysing the illustration in groups the students note down their findings individually in 'My Science Diary'.

Consolidation

- Life cycle of plant: Plant – flowers - fruits - seed - seed germination - germinating plant.
- The process by which a seed develops into a seedling is called germination.

Evaluation

- Writings in 'My Science diary', Participation in group activity.

- **Activity 2: (Illustration observation, Engage in activity)**
- This activity aims to help students understand the conditions required for seed germination. After completing the activity, students should write their findings in My Science Diary.

Consolidation

- Seeds in bowl A do not get water. No germination occurs.
- Seeds in bowl B do not get air as they were immersed in water. No germination occurs.
- Seeds in bowl C do not get warmth as they were kept in refrigerator. No germination occurs.
- This activity proves that water, air, warmth are the essential conditions for seed germination.

Evaluation

- Findings in 'My Science diary', Participation in activity.

Seed dispersal (2 periods)

- **Activity 1: (Conversation analysis, Illustration analysis, Table completion)**
- This activity aims to help students understand seed dispersal. Through analyzing the statements, students are guided to identify the need for seed dispersal. Following this, they are instructed to individually analyze the illustrations and complete the table in the textbook. After peer evaluation, students are directed to copy the completed table into My Science Diary.
- The students are directed to collect more examples for each type of dispersal of seed from their surroundings as an extended activity.

Consolidation

- Provides space, water, air, nutrients, and sunlight for growing plants. Promotes survival of plants. Helps in the spread of plants to new places.

Plant	Mode of Dispersal of Seed
Hiptage seed	Wind
Mango fruit	Animals (eaten by birds or other animals)
Cotton seed	Wind
Coconut seed	Water
Xanthium seed	Animals (attached to fur or hair)
Water lily	Water (floating seeds)
Balsam seed	Explosion (bursting of fruits)
Berries	Animals (eaten by birds or other animals)

Evaluation

- Completed table in 'My Science diary', Peer assessment

Reproduction through body parts (1 period)

- **Activity 1: (Conversation analysis, picture observation)**
- This activity aims to help students understand reproduction in plants through different body parts. By analysing the conversation and observing the picture, students are directed to write their findings about reproduction through body parts in 'My Science Diary'.
- The students are directed to collect more examples for plants that reproduce through body parts from their surroundings as an extended activity.

Consolidation

- The plants also reproduce through stem cuttings, root tubers and leaves.

Evaluation

- Findings in 'My Science diary'

Working Gallery – Answers

1.

- Pedicel
- (C) Carrot, others reproduce from stems.
- (B) Water
- (B) Statement (i) and statement (ii) wrong
- (C) Bryophyllum, others grow from root tubers.

♦ Provides space, water, air, nutrients, and sunlight for growing plants. Promotes survival of plants by spreading them to new areas. Reduces competition among plants for resources.

♦ Hibiscus: Bisexual flower with both androecium and gynoecium in the same flower.

♦ Pumpkin: Unisexual flowers; separate male and female flowers.

♦ Birds eat fruits and later drop seeds while flying, spreading them to different locations.

♦ Dispersed by wind. Hair-like structures reduce weight, enabling the seed to float in the air.

♦ Yes, self-pollination occurs in flowers of the same plant, and cross-pollination occurs between flowers of different plants, depending on pollination agents.

2.

(a) Corolla, Identify and label
(b) Androecium, Identify and label
(c) Calyx, Identify and label
(d) Pedicel, Identify and label

3. Match the following:

A	**B**
Hiptage seed	Dispersal by wind
Water lily	Dispersal by water
Balsam	Dispersal by explosion
Berries	Dispersal by birds
Xanthium	Dispersal by grazing animals

4. Pedicel - Connects the flower with the plant.
Calyx -Protects the flower in bud condition.
Corolla - Attracts pollinators with bright colours.
Thalamus - Holds different parts of the flower.
Gynoecium - Female reproductive part of the flower.
Androecium - Male reproductive part of the flower.

8 EXPLORING FORCE AND GRAVITY

Introduction

- Aren't we familiar with push and pull? A push or a pull is a force. We also know that a magnet can attract a piece of iron. That is also a force. But there the force comes into play without any contact between the magnet and iron. But when we are pushing a table, there is a contact between us and the table. Thus we can say that there are contact forces and non-contact forces. Have you ever thought why a mango detached from a mango tree comes downwards only and never upwards? This is because there is an attractive force on the mango from the earth. Similarly there are many other forces. Let's explore some of them.

Previous Knowledge

The learner

- knows about
  - push and pull
  - rest
  - motion
  - speed
  - magnets etc

Learning outcomes

The learner

- comprehends what force is and that its unit is newton.
- identifies that push pull etc., are forces.
- develops an awareness about the impact of forces like changing rest into motion, changing the shape, speed etc.
- understands about contact and non contact forces and can cite examples.
- can understand the secret of objects falling down from trees
- can understand about muscular force
-

Major concepts:

1. Force
2. Impact of force
3. Force can change the shape of objects
4. Force can change rest into motion and motion into rest.
5. Force can change speed of a body in motion
6. Contact forces
7. Non-contact forces
8. Muscular forces
9. Friction
10. Electrostatic force
11. Gravitational forces

UNIT FRAME

Name of Unit: 8 . EXPLORING FORCE AND GRAVITY Total Time: 5 periods of 40 minutes

Theme: FORCE

Sub Theme	CONCEPTS	TLM	Materials required	Assessment	Values	Time in minute
Force	♦ Push or a pull	♦ Discussion ♦ Practical of pushing or pulling anything	♦ Table or chair, ♦ Diagrams ♦ Projector	♦ Diary notes ♦ Involvement in the activity	♦ Anything can change at any time	♦ 40
	♦ Force can change rest into motion or change speed of a moving object.	♦ Discussion ♦ Practical `of rolling a ball, bringing it to rest, changing speed etc.	♦ Ball	♦ Diary notes ♦ Involvement in the activity	♦ Anything can change at any time	
	♦ Force can change the shape and size	♦ Discussion ♦ Situation analysis	♦ Pictures ♦ Projector	♦ Diary notes	♦ Nothing is permanent	♦ 40
Contact force	♦ Push, pull, friction etc., comes into play only when two bodies are in contact. Hence they are contact forces.	♦ Discussion, demonstration of friction, push, pull etc. ♦ Analysis of figures.	♦ Projector ♦ Two wooden blocks, one of which can be made to slide over the other. One surface of each must be polished and the other rough	♦ Observation note in the diary	♦ Friction opposes but we can overcome	♦ 20
Non-contact force	♦ Magnetic force, gravitational force	♦ Discussion ♦ Other videos ♦ Demonstration using magnets.	♦ Projector ♦ Bar magnets, round pencils or round rollers	♦ Observation notes in the diary	♦ Force will affect us even without contact.	♦ 40

♦ **Ask the children to complete (working gallery) page no. 217 in the class itself and assess it at the end of the lesson to give marks for CCE (one period)**

Process:

♦ In all activities try your level best to make the children say the answer. We will give the answer only in the last minute, that too only if it is unavoidable.

♦ Force: In our daily life there are many occasions

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in which we have to do pushing or pulling. The pushes and pulls are capable of changing the position of a body, rest into motion or motion into rest or change the speed etc. Hence, a push or a pull is a force.

Push	Pull
Pushing a car	Pulling the door
kicking a foot ball	pulling a trolley
pushing a hand cart	pulling a bucket of water from a well

Sl No	Description of the situation	Action can be grouped as push or pull
1.	Drawing water from a well	pull
2.	A football player taking a penalty kick	push
3.	Opening drawer of a table	pull
4.	Repulsion between the similar poles of a magnet	push

Now the teacher can explain,

- If we are kicking a ball it starts moving . Here force changes the state of rest into motion.
- If we are catching a moving ball we change the state of motion into the state of rest.
- When a ball is moving, we can increase its speed by applying a force in the direction of motion.
- When a ball is in motion we can reduce its speed by applying a force in the direction opposite to that of motion.

Write down 3 examples to show that increasing in the force increases the speed of motion.
Write them down in **'My Science Diary'**

1. kicking a moving foot ball in the direction of its running
2. applying accelerator in moving vehicles
3. pushing a swing in the direction of its motion

Write down 3 examples that show the decreasing in force decreases the speed of motion.
Write them down in **'My Science Diary'**

1. applying brakes in a moving vehicle
2. a rolling ball coming to rest
3. catching a moving ball

Write down 3 examples that show a force can change the direction of motion. Write them down in **'My Science Diary'**

1. bating while playing cricket
2. hitting a volley ball
3. kicking a moving foot ball

Write down 3 examples to show that a force can change the shape and size of the object.
Write them down in **'My Science Diary'**

1. squeezing a lemon
2. pressing an inflated balloon
3. cutting a fruit

Activity	Result
1. Applying force on a rolling ball, slowly pushing it in the opposite direction with the foot.	1. The ball comes to rest.
2. Pushing a wall	2. The wall has a tendency to move.
3. beating a ball with a bat	3. the ball changes its direction
squeezing a sponge	the sponge changes its shape

Different types of forces:

1. NON – CONTACT FORCES

- **Magnetic force**
- Bring two like poles of two magnets. (Place the magnets on round pencils on a table) We can see they moving away due to repulsive force. Now place the bar magnets in such a way that the unlike poles are facing each other. We can see them coming closer to each other due to attractive force. In both these cases is there a contact between the magnets? No. Still the magnets are exerting a force. Hence this is a non-contact force.
- Electrostatic force: Rub a dry comb on your hair. Then bring it near very small pieces of paper. You can see the paper being attracted. This is because the comb develops a charge on rubbing. As a result, the paper pieces are being attracted. This force is known as electrostatic force. This attraction is also without any contact. Hence this is a typical example for non-contact force.
- Gravitational force: All the objects in the earth are being attracted by the earth towards its centre. Not only that, any two objectes in the universe will attract each other. This is without any contact. Hence this force known as gravitational force is also a non-contact force.

2. CONTACT FORCES:

- We know that it is difficult to drag any object across any floor. Isn't it because of the friction? It arises due to the contact between two objects. Hence it is a contact force.
- All types of pushes and pulls are also contact

forces.

Contact force	Non contact force
• Pushing a table • pulling a trolley drawing water from a well friction dragging a wooden plank on a surface	• The earth attracting an apple magnet attracting an iron piece magnet repelling another magnet attraction between a pen and a pencil electrostatic force

Sl No	Situation	Force	
		Due to contact between objects	With no contact between objects
1	Pushing a trolley	Yes	
2	A magnet attracting a nail	.....	yes .....
3	Drawing water from a well	..... yes	.....
4	A plastic scale rubbed on hair attracts pieces of paper	.....	yes .....
5	An apple falling from an apple tree	.....	yes .....
6	A ball coming to rest after being rolled on a levelled ground.	yes	.....

Consolidations:

- When an object is pushed or pulled, a force is being applied on it
- A body at rest may start moving, when a force is applied on it.
- The speed of a body increases when a force acting on it is in the direction in which it is moving
- If a force is applied on a body in the opposite direction of its motion, the speed of the body decreases
- A force acting on a moving body changes its direction of motion
- A force can change the shape and size of an object
- Force is that which changes or tends to change the shape, size, volume, state of rest or state of motion of a body. The SI unit of force is newton. It is denoted by the letter "N."
- A magnet has the property of attraction and repulsion. This force applied by a magnet is magnetic force
- Electrostatic force is the force of attraction or repulsion between two charged objects.
- When a body moves or tends to move on the surface of another body, a force is experienced parallel to the surface which opposes the relative motion between them. It is called friction
- The force applied by the muscles of a human or animal body is called Muscular force
- The force applied by the contact between objects is known as contact force.
- The force applied on an object without contacting it, is non contact force
- The earth has a characteristic property of its own to pull every object towards it. This pull is known as the force of gravity or gravitational force.

Assessment:

- We can make the assessment using different tools. We can assess using the following
  - Entries in the diary.
  - The attention of children in the activities
  - The participation in activities
  - By asking simple questions
  - By making the children do the activities in the TLM
  - Simple test paper (sample question paper and valuation key is attached)
  - Products of experiments

Extended activities

1. List out various forces in nature and classify them into contact and non contact forces
2. Find out the merits and demerits of friction

Answers to Working gallery (Page: 217)

1.
- An apple falling down
- Force
- newton
- electrostatic
- repel each other
- a) increases b) decreases
- Force can change the shape, can change the volume, change the speed etc.
- a) friction b) electrostatic force
- Contact force a push, a pull Non contact force electrostatic force, gravitational force
- The force applied by the contact between objects is known as contact force. Push,

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pull, friction

- The force applied on an object without contacting it, is non contact force: magnetic force, electrostatic force, gravitational force

2.

A	B
Non Contact Force	Gravitational Force
Unlike Poles	Attracts
Like Poles	Repels
Opposes the motion	Frictional Force
Push or Pull	Force

3.

Picture	Name of the Force
	electrostatic force
	magnetic force
	gravitational force

9 FOOD FOR HEALTH

Introduction

- In this chapter, students will explore the importance of a balanced diet and how various food groups contribute to health. The conversation between Sana, Sonu, and their mother in the kitchen sets the stage to discuss the need for variety in the foods we consume and the nutrients our body requires to stay healthy. Through practical activities, students will learn how food contains essential nutrients like carbohydrates, proteins, fats, vitamins, and minerals, and how these nutrients impact our body's growth, development, and functioning. This chapter encourages students to think critically about their food choices and understand the science behind healthy eating

Previous Knowledge

- Students are familiar with basic food items like rice, wheat, vegetables, and fruits.
- They have some knowledge of healthy eating habits and may have encountered concepts like energy, growth, and health in previous lessons.

Learning Outcomes

- **The learner**
- identifies the major nutrients in food and understand their functions.
- recognizes the importance of a balanced diet for good health.
- demonstrates the ability to test for the presence of nutrients like starch, protein, and fat in different food items.
- understands the role of vitamins and minerals in maintaining health and preventing deficiency diseases.
- appreciates the significance of non-nutrient factors like fibre and water in a healthy diet.
- applies the concept of a balanced diet to create a food menu for different needs.

Main Concepts

- Nutrients in Food:
  - Carbohydrates: Provide energy for physical activities.
  - Proteins: Help in body growth and repair.
  - Fats: Provide energy and support body functions.
  - Vitamins and Minerals: Vital for the proper functioning of the body.
- Nutrient Deficiency Diseases: Diseases caused by the lack of specific nutrients (e.g., night blindness due to vitamin A deficiency).
- Balanced Diet: A diet that contains all essential nutrients in the right proportions to maintain good health.
- Non-Nutrient Factors: The importance of water and fibre in the diet.
- Healthy Eating Habits: Recognizing and adopting good food habits for overall well-being.

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Nutrient Factors (6 periods)

- **Activity 1: (Picture Observation, Description Analysis, illustration analysis, Table completion)**
- This activity introduces students to the importance of eating a variety of foods for maintaining good health. Through an interactive conversation and observation of illustrations, students will learn about the different nutrients our body needs. The activity involves group discussion and individual analysis. Students will document their observations in 'My Science Diary.' Following this the students are directed to complete the table in the text book individually after observing the illustration.

Consolidation

- Eating only one type of food is not healthy because it lacks the variety of nutrients our body needs.
- Carbohydrates (found in rice, wheat) provide energy.
- Proteins (found in fish, pulses) are important for growth and repair of tissues.
- Fats (found in oil, ghee) give us energy and help in absorbing vitamins.
- Vegetables and fruits provide essential vitamins and minerals for overall health.
- Carbohydrate, protein, fat, vitamins and minerals are the nutrients we get from food.
- Nutrients are the substances in the food which provide nourishment to our body.
  - Rice, Wheat - Carbohydrates
  - Fish, Pulses - Proteins.
  - Oil, Ghee - Fat.
  - Vegetables and fruits - Mineral salts and vitamins

Evaluation

- Completed table, Writings in 'My Science Diary'. Participation in group discussions and observations will also be assessed.

- **Activity 2: (Picture Observation, Description Analysis, Table analysis)**
- This activity aims to understand the importance of nutrient factors like carbohydrates, proteins, and fats. By analysing the description, picture, and table in the textbook, students will write the importance and function of these nutrient factors in 'My Science Diary' individually.

Consolidation

- Carbohydrates are energy giving foods.
- Sportsmen and labourers need more energy. So they must eat more carbohydrate containing food.
- Proteins help the development and growth of the body.
- Fats also provide us energy, like carbohydrates.

Evaluation

- Writings in 'My Science Diary'.

- **Activity 3: (Debate)**
- This activity aims to conduct a debate on the "More fat and healthy food". To control the over use of fat in food.
- Debate Topic: "More Fat and Healthy Food"
- Objective: This debate will encourage students to explore the relationship between fat consumption and health. Students will learn to express their opinions, gather evidence, and think critically about nutrition and its impact on the body.
- Instructions for the Debate:
  - Divide the Class into Two Teams:
  - Team 1: Proponents of More Fat in Diet
  - Team 2: Opponents of More Fat in Diet
- Preparation:
  - Each team will gather points for their argument. Encourage students to consider what types of fat are healthy (e.g., unsaturated fats) and the importance of balance in a diet.
  - Ask students to research or think about foods that contain good fats (avocados, nuts, seeds) and unhealthy fats (fried foods, junk food).
  - Have students think about how fat affects energy levels, growth, and the body's functions.
- Debate Structure:
  - Opening Statement (2 minutes per team):
  - Team 1 will start with their argument supporting more fat in a healthy diet, while Team 2 will present why too much fat can be harmful.
  - Rebuttal (1 minute per team):
  - Teams will counter the points made by the opposing team.
- Closing Statement (1 minute per team):
  - Teams summarize their arguments and emphasize key points.
- Guidelines for Discussion:
  - Encourage students to support their points with examples, facts, and reasoning.
  - Remind them to be respectful while addressing opposing views.
- Judging and Evaluation:

- Evaluate students based on the strength of their arguments, use of facts, and ability to express their thoughts clearly.
- Consider their teamwork and how well they engage in the discussion.

Consolidation:

- After the debate, have a class discussion about the role of fats in the diet. Emphasize the importance of eating a balanced diet with healthy fats, and explain how fats are essential for energy and growth but must be consumed in the right amounts.

Evaluation

- Students will reflect on their learning and write a brief summary of their own views on fat in a healthy diet in their 'My Science Diary.'
- Participation and ability to construct logical arguments will be assessed.

To the teacher

- Why Should We Use Less Fat in Our Food?
- Using less fat in our food is important for maintaining a healthy body. Here are some reasons why we should be mindful of fat consumption:
- Prevents Weight Gain: Fats are high in calories, and consuming too much fat can lead to weight gain. Excess body weight can lead to health issues such as obesity, which increases the risk of heart disease, diabetes, and other health problems.
- Maintains Heart Health: Eating too much unhealthy fat, especially trans fats and saturated fats (found in fried foods, junk food, and fatty meats), can raise cholesterol levels and increase the risk of heart disease. Healthy fats like unsaturated fats (found in nuts, seeds, and fish) are better for the heart.
- Improves Digestion: Foods high in fat can make digestion slower and harder. By reducing fat intake, digestion becomes easier, and the body can use the nutrients from food more efficiently.
- Supports Healthy Skin and Hair: While fat is important for healthy skin and hair, too much unhealthy fat can lead to skin problems like acne. A balanced amount of healthy fats helps maintain good skin and hair without overloading the body.
- Reduces Risk of Chronic Diseases: A diet too rich in unhealthy fats can increase the risk of chronic diseases like type 2 diabetes, certain cancers, and fatty liver disease. Eating less fat and focusing on a balanced diet with whole grains, fruits, vegetables, and lean proteins can reduce these risks.
- Better Energy Levels: Consuming a balanced diet with less fat and more complex carbohydrates and proteins helps maintain stable energy levels throughout the day. Too much fat can cause sluggishness and low energy.

- **Activity 4: (Practical record analysis, conducting tests, Preparing practical record, Table completion)**
- This activity aims to conduct tests to detect starch, protein, and fats in food items. After observing the practical records of Sonu, Sana, and Midhun, students will be directed to perform the experiments in groups and write their findings individually in 'My Science Diary'. The teacher should ensure that the necessary materials for the tests are arranged in advance.

Consolidation

Food Item	Starch (present)	Protein (present)	Fat (present)
Rice water	Yes	No	No
Milk	No	Yes	No
Banana	Yes	No	No
Tapioca	Yes	No	No
Egg white	No	Yes	No
Raw potato	Yes	No	No
Groundnut	No	Yes	Yes
Rice flour	Yes	No	No

Dry coconut	No	Yes	Yes
Uncooked tuar dal (powder)	No	Yes	No
A slice of any vegetable	Yes	No	No
A slice of any fruit	Yes	No	No

- Carbohydrates (Red Crayon): Rice, Wheat, Potato
- Proteins (Blue Crayon): Pulses, Fish, Egg (Green Crayon): Ghee, Oil

- **Activity 5: (Slide Observation, Description Analysis, Table analysis, Table completion, Illustration analysis)**
- This activity aims to understand the importance of nutrient factors like vitamins and minerals. By analysing the slide, description, table, picture, in the textbook, students will write the importance and function of vitamins and minerals. The cause and symptom of deficiency disease is also discussed here and write description in 'My Science Diary' individually.

Consolidation

Vitamin	Sources	Function
Vitamin A	Carrot, Amaranthus, Milk products, Liver, Papaya	Needed for the health of eyes, skin, and hair.
Vitamin B	Bran of cereals, Egg, Milk	Needed for proper functioning of the nervous and muscular system; Formation of red blood cells
Vitamin C	Citrus fruits, Gooseberry, Moringa leaves, Papaya	Maintains skin, teeth, gums; Helps in healing wounds.
Vitamin D	Synthesized in the body from sunlight, Milk products	Helps in making bones and teeth healthy.

- Essential Minerals and Their Functions
- **Calcium**
  - Function: Strengthens bones and teeth, helps in muscle and nerve function.
  - Sources: Milk products, banana, leafy vegetables.
- **Iron**
  - Function: Aids in the formation of blood.
  - Sources: Leafy vegetables, jaggery, beetroot.
- **Sodium**
  - Function: Helps retain water in the body.
  - Sources: Common salt (use in required quantities).
- **Iodine**
  - Function: Essential for thyroid gland function.
  - Sources: Seafood, iodized salt.
- Vitamins and minerals play a crucial role in maintaining our health, and deficiencies can lead to various health problems. Vitamin A deficiency can cause night blindness, where it becomes difficult to see in dim light. Vitamin C deficiency leads to scurvy, characterized by pus and bleeding of gums. A lack of Vitamin D can result in rickets, causing bones to become brittle and bend. Iron deficiency can cause anaemia, which is marked by a lack of blood and paleness. Finally, a deficiency in Iodine can lead to goitre, a condition where the thyroid gland swells in the throat. It's essential to ensure we get the right amount of these vitamins and minerals for proper health.

Non - nutrient Factors (1 period)

- **Activity 1: (Picture Observation, Description Analysis,)**

- This activity aims to know the importance of non-nutrient factors. After observing the picture, and description (group) write about the importance of non nutrient factors in 'My Science Diary' individually.

Consolidation

- Importance of water
- Importance of fibres
- Non-nutrient factors like water and fibre are also to be included in the diet.

Evaluation

- Writings in 'My Science Diary'.

Balanced diet (1 period)

- **Activity 1: (Picture Observation, Description Analysis, Activity completion)**
- This activity aims to know the importance of balanced diet and to prepare a healthy menu. After observing the picture, and description (group) write about the importance of balanced diet in 'My Science Diary' individually. The students are directed to prepare a healthy menu based on balanced diet for each student. Following this the students are directed to complete the activity in the text book based on healthy food habits and evaluate among peers.

Consolidation

- Food that contains all nutrients in required quantities is termed as balanced diet.
- Here's sample food menu for a week, incorporating a variety of Kerala foods that provide a balanced diet, ensuring all nutrients are included. The menu also considers different age groups and activity levels by offering meals that can be adjusted based on physical activity.

- **Monday**
  - Breakfast: Puttu with Kadala Curry (Carbohydrates from puttu, Protein from kadala)
  - Lunch: Rice with Sambar, Avial, and Fish Curry (Carbohydrates, Protein, Vegetables, and healthy fats)
  - Snack: Banana and Buttermilk (Potassium and protein)
  - Dinner: Chapati with Vegetable Kurma (Carbohydrates, protein, and fibre)
- **Tuesday**
  - Breakfast: Appam with Stew (Carbohydrates, protein from vegetables, and healthy fats)
  - Lunch: Rice with Thoran (Vegetable stir-fry), Kootu Curry, and Chicken Curry (Protein, fibre, and minerals)
  - Snack: Fresh Pineapple or Papaya slices (Vitamins)
  - Dinner: Idiyappam with Coconut Milk (Carbohydrates, fats)
- **Wednesday**
  - Breakfast: Dosa with Sambar and Coconut Chutney (Carbohydrates, Protein)
  - Lunch: Rice with Rasam, Kerala-style Fish Fry, and Cabbage Thoran (Protein, fibre, and fats)
  - Snack: Cucumber and Carrot Salad (Minerals and fibre)
  - Dinner: Oothappam with Onion and Tomato (Carbohydrates, vitamins)
- **Thursday**
  - Breakfast: Kozhukatta with Jaggery (Carbohydrates and fibre)
  - Lunch: Rice with Sambar, Beetroot Thoran, and Mutton Curry (Proteins, vitamins, and minerals)
  - Snack: Coconut Water and a handful of nuts (Electrolytes and healthy fats)
  - Dinner: Chapati with Vegetable Kurma (Carbohydrates, protein, and fibre)
- **Friday**
  - Breakfast: Upma with Vegetables (Carbohydrates and fibre)
  - Lunch: Rice with Pulissery, Fish Moilee, and Pumpkin Thoran (Proteins, healthy fats, and vitamins)
  - Snack: Fruit Salad (Vitamins and fibre)
  - Dinner: Chapati with Paneer Butter Masala (Protein and healthy fats)
- **Saturday**

- Breakfast: Kerala Parotta with Beef Curry (Carbohydrates, protein, and healthy fats)
- Lunch: Rice with Dal, Cucumber Salad, and Egg Curry (Proteins and vitamins)
- Snack: Boiled Egg and Lemonade (Protein, vitamins)
- Dinner: Vegetable Biryani with Raita (Carbohydrates, fibre, and protein)

♦ **Sunday**
- Breakfast: Idli with Sambhar and Coconut Chutney (Carbohydrates and Protein)
- Lunch: Rice with Prawn Curry, Mixed Vegetable Thoran, and Kootu Curry (Proteins, vitamins, and minerals)
- Snack: Papaya or Mango (Vitamins)
- Dinner: Chapati with Vegetable Gravy (Carbohydrates, protein, and fibre)

♦ Healthy food habits
- Have the right quantity of food at the right time.
- Chew food well before swallowing.
- Have more freshly cooked food and less preserved food.
- Include a balanced diet with carbohydrates, proteins, fats, vitamins, and minerals.
- Include fruits and vegetables in your diet.
- Use sugar and salt in limited quantities.
- Do not be addicted to bottled drinks, packet food, and fast foods.
- Drink 8-10 glasses of water per day.

Evaluation

♦ Writings in 'My Science Diary'. Food menu, Peer evaluation, Activity in the text book.

Working gallery – Answers

- (B) Protein
- (B) Rice, others are sources of protein.
- (D) Calcium
- (B) Statement (i) and statement (ii) are wrong.
- (C) Vitamin C
- The symptom of scurvy is pus and bleeding of gums.
- Vitamin C is essential for the health of skin, teeth, and gums, and it helps in the healing of wounds.
- The deficiency of Iodine causes Goitre, which is the swelling in the throat.
- Though fibre is not a nutrient, it plays a major role in digestion because it aids in the absorption process and eases defecation, promoting digestive health.
- No, people of different ages have varying nutritional needs. For example, children, teens, and pregnant women need more proteins and vitamins for growth, while adults require a balanced diet with appropriate energy levels to maintain their health. Elderly individuals may need less energy but more focus on vitamins and minerals for bone and overall health.

♦ 2.

A	B
Vitamin A	Night blindness
Vitamin B	Mouth sore
Vitamin C	Scurvy
Vitamin D	Rickets

♦ 3. A recipe for a Kerala-style Curry with Pulses and Carbohydrates, which combines the goodness of pulses (dal) and carbohydrates (rice). This dish is known as "Parippu Curry" (Dal Curry) and is commonly paired with rice in Kerala cuisine.
- Ingredients:
- For the Curry:
- Toor dal (pigeon peas) – 1 cup
- Water – 3 cups
- Coconut oil – 2 tbsp
- Onion – 1 medium-sized, finely chopped
- Tomato – 1, chopped
- Green chilies – 2, slit
- Ginger – 1-inch piece, grated
- Garlic – 3 cloves, crushed
- Curry leaves – A few sprigs
- Turmeric powder – 1/2 tsp
- Chili powder – 1 tsp
- Coriander powder – 1 tsp
- Salt – As per taste
- For Tempering (Tadka):
- Coconut oil – 1 tbsp
- Mustard seeds – 1/2 tsp

- Dry red chilies – 2
- Curry leaves – A few sprigs
- Asafoetida (Hing) – A pinch (optional)
- For Serving:
- Steamed rice – As required

♦ **Instructions:**

- Cook the Toor Dal:
- Wash the toor dal thoroughly and add it to a pressure cooker.
- Add 3 cups of water, a pinch of turmeric powder, and cook for 3-4 whistles or until the dal is soft and well-cooked.
- Prepare the Curry Base:
- In a large pan, heat 2 tbsp of coconut oil. Add finely chopped onions and sauté until they turn golden brown.
- Add the chopped tomatoes, green chilies, grated ginger, crushed garlic, and curry leaves. Sauté for a few minutes until the tomatoes become soft.
- Add turmeric powder, chili powder, and coriander powder. Stir well for 2-3 minutes until the spices release their aroma.
- Combine Dal with Curry Base:
- Once the dal is cooked, mash it lightly with a spoon and add it to the curry base.
- Stir everything together, add salt, and let it simmer for 5-10 minutes, adjusting the consistency by adding water if needed.
- Tempering (Tadka):
- In a small pan, heat 1 tbsp of coconut oil. Add mustard seeds and let them splutter.
- Add dry red chilies, curry leaves, and a pinch of asafoetida (optional). Fry for a few seconds until fragrant.
- Pour this tempering over the cooked dal curry and let it infuse for a minute.

♦ **Serve:**

- Serve the hot Parippu Curry with steamed rice for a wholesome Kerala meal.
- Notes:
- Rice provides the carbohydrates in this meal, while toor dal (pulses) gives the necessary protein and fibre.
- Coconut oil enhances the taste and aroma, which is typical in Kerala cuisine.

10 ENJOY THE WORK AND CONSUME ENERGY WISELY

Introduction

- What is energy? It is the capacity to do work. Is there any one of us who are not doing any work? Definitely no! What is needed for doing work? But in this chapter the work we mention is not about the work we do but about the WORK DONE BY A FORCE. So do not mix it with our daily life works. We know that energy is divided mainly into two types as Kinetic energy and Potential energy. The children should know details of green energy and brown energy as well because they are related to pollution. Let's approach all these in detail

Previous Knowledge

The learner

- knows about
  - Energy
  - Work
  - Force
  - Displacement
  - Motion
  - joule
  - energy conversion
  - Mechanical energy
  - Potential energy
  - Kinetic energy

Learning outcomes

The learner

- comprehends the work and the factors affecting it.
- comprehends the unit of work
- develops an awareness about energy, forms of energy and the types of energy
- understands what speed is and what its unit is.
- Apply the law of conservation of energy

Major concepts:

1) Force
2) Displacement
3) Work done
4) Energy
5) Kinetic energy
6) Potential energy
7) Mechanical energy
8) Forms of energy
9) Law of conservation of energy

GRADE - 5

UNIT FRAME

Name of Unit: 10. ENJOY THE WORK AND CONSUME ENERGY WISELY

Total Time: 6 periods of 40 minutes Theme: WORK

Sub Theme	CONCEPTS	TLM	Materials required	Assessment	Values	Time in minute
Work	♦ Work and factors affecting it	♦ Analysis of figure ♦ Discussion	♦ Picture of people doing work, carrying load and walking on a level road , climbing a vertical ladder with a load on the head etc.	♦ Involvement ♦ Diary notes ♦ Ability to understand	♦ importance of work	♦ 40
	♦ The quantity of work done	♦ Discussion ♦ Situation analysis ♦ Mathematical interpretation W = FD	♦ Pictures ♦ Projector ♦ Numerical problems	♦ Diary notes ♦ Problem solving	♦ Importance of work	♦ 40
	♦ Unit of work	♦ Discussion ♦ Arriving at conclusion	♦ BB work	♦ Diary notes		♦ 20
Energy	♦ Energy changes	♦ Discussion of examples	♦ Chart showing energy changes	♦ Observation notes in the diary		♦ 20
	♦ Kinetic energy and Potential Energy	♦ Discussion ♦ Citing examples	♦ Pictures	♦ Observation notes in the diary	♦ Energy is anything in everything.	♦ 80
	♦ Law of conservation of energy	♦ Discussion ♦ Citing examples	♦ Pictures	♦ Observation notes in the diary	♦ Energy saved is equivalent to energy produced	♦ 40

♦ **Ask the children to complete the working gallery in the class itself and assess it at the end of the lesson to give marks for CCE (one period)**

Process:

- In all activities try your level best to make the children say the answer. We will give the answer only in the last minute, that too only if it is unavoidable.
- Work: The term work is related to everyday life very strongly. But as said in the introduction, here we are going to see the work done by a force. This idea must be said very well. Otherwise, children will compare the work with that we do in our daily life.
- There are two conditions to say that work is done (1) A force must act on the body (2) The body must a have a displacement (movement) in the direction of the force. For eg., When a man is climbing a vertical ladder with a load on his head , both force and displacement are in the same direction. Hence, we say that the force has done a work. Now consider a man walking on a level ground with a load on his head. Here the force is vertically up and the displacement is horizontal. Are they in the same direction? No. Hence no work is done by the force. It may be remembered that work is said to be done by a force if the displacement in a direction exactly opposite to that of the force.

- **Additional things needed to fill the table on page 236**

1. Beating a ball with a bat. There is a displacement in the direction of force. Hence work is said to be done.
2. A child pushing a trolley. There is a displacement in the direction of force. Hence work is said to be done.
3. Man walking on a level ground with a load: Though there is a displacement, it is not in the direction of force. Hence no work is done.
4. A child walking on a level road with a bag in his hand. Though there is a displacement, it is not in the direction of force. Hence no work is done

Situation	Work is said to be done/ Work is not said to be done	Reason
A student Pushing a brick	Work is said to be done	Displacement in the direction of the applied force
Pushing a wall	Work is not said to be done	No displacement
Carrying bag on his head	Work is not said to be done	displacement is not in the direction of force.
Pulling a trolley	Work is said to be done	Displacement in the direction of the applied force
Moving of a cricket ball when hitting	Work is said to be done	Displacement in the direction of the applied force

- Now teachers can enter into discussion and ask if I am applying LESS force is the work done more or less? if I am applying MORE force is the work done more or less? If I am giving a SMALL DISPLACMENT only, is the work done more or less? If I am giving MORE DISPLACMENT only, is the work done more or less? Now what are the factors deciding the work? If so, how can we calculate the work done? Through such discussions we can make the children reach the idea that work done depends on the force and displacement. Then we can make the children reach the equation W = FD.
- Now we an give a problem like if 5 N force gives a displacement of 12 m, what is the work done? W= FD = 5 N x 12 m = 60 Nm . Now children will say that the unit of work done is Nm. Now the teacher should say this Nm is named as joule (not Joule) in memory of scientist James P Joule. (tell them that Joule is the scientist Joule and joule is the unit of work – see the change in the first letter)

Energy:

- We all eat food. This food will give us energy by digestion. That is why we are able to do work. That is the reason for saying that energy is the capacity to do work. When we play or run for a long time we get tired because our energy is completely used up to do such works.
- Now we have to explain that there is energy change in many devices.
- For eg.,
- In a fan Electrical energy is converted into Mechanical energy.
- In a Generator Mechanical energy is converted into Electrical energy

- In an electric bulb Electrical energy is converted into light energy (in some bulbs, heat energy may also come. But it is not considered due to the reason that it is not a useful form of energy)
- Here children familiarise mechanical energy. The teacher should say it is classified into two types (1) Kinetic energy (2) Potential energy
- Now discuss some examples which involves motion like running water in a river, movement of carrom coins, a flying bird, a running horse etc. In all these motion is involved. Hence, we can say that their energy is by virtue of its motion. Such an energy is what we call as Kinetic Energy. Now consider the following

Situation	Energy is due to
Mango in a mango tree	Position
A wound spring	Strain
A ball at a height	Due to position
Stretched rubber band	Due to strain

- You can quote more examples. Now we can say that in all these cases the energy is possesses due to position or strain or due to condition. Such an energy is what we call as potential energy.

Law of Conservation of Energy

- We can recall the energy changes we have already discussed. Please remind that we need consider only the useful form of energy in the energy conversion.

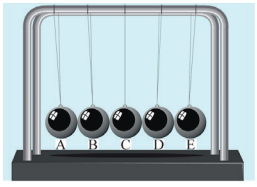
Equipment	Energy Change
Generator	Mechanical energy to electrical energy
Fan	Electrical energy to - mechanical energy
Bulb	electrical energy into light energy (neglect the heat)
Iron box	Electrical energy to - heat energy
Cell (charging)	chemical energy to Electrical energy
Loud speaker	Electrical energy to - sound energy
A torch or flash light	Electrical energy to - light energy

- After filling in this table we can say in all these devices we are converting one form of energy into another. We are not creating any energy and we cannot destroy any energy. Now you can present the Law of Conservation of Energy.

Write down in **My Science Diary.**

1. The energy possessed at A.....potential energy.....(Kinetic/Potential)
2. The energy possessed at B.....potential energy.....(Kinetic/Potential)
3. The energy possessed at C.....(Kinetic/Potential)

kinetic energy(at the instant of hitting the ground alone)



Pull back A and release it to hit on B. What do you observe?.....

Energy possessed by A when it hits B is kinetic energy.

Now, the energy possessed by E is kinetic energy

Pull back both A and B and release them. What do you observe? D and E will be knocked away

Energy possessed by A and B when they hit C is..... away

Now, the energy possessed by D and E is kinetic energy

Pull back A,B and C together and release. What do you observe? D and E will be knocked away

Energy possessed by A,B and C when they hit D is.. kinetic energy

Now, the energy possessed by C, D and E is...kinetic energy

3. The energy of a stretched catapult is due to strain (position, strain)
4. The energy of a stretched bow is due to ....strain.... (position, strain)
5. Energy of a rubber band in a stretched form is due to strain (position, strain)
6. Energy of a brick kept in a height due to....position.....(position, strain)
7. Energy of an apple in an apple tree is due to..position.....(position, strain)

SOURCES OF ENERGY

- We can explain that we need energy for various works. Anything that will provide us energy continuously is referred to as a source of energy. Now we can ask the students to list sources of energy. Let them list it out as
  - The sun
  - Petrol
  - Diesel
  - Generator etc

- **Completing the table in page 244**

1. Solar energy

- Solar energy changes into electrical energy
- It can be used again and again for a longer period.

2. Wind mill

- Wind energy (mechanical energy) changes into electrical energy
- It can be used again and again for a longer period

3. Petroleum

- Chemical energy changes into mechanical energy
- It cannot be used again and again for a longer period

4. Hydroelectric power stations

- Mechanical energy changes into electrical energy
- It can be used again and again for a longer period

GRADE - 5

Renewable Energy

- The sources like solar energy, wind energy, energy of flowing water et., will not become extinct. These sources can be used again and again .Hence thay are referred to as RENEWABLE SOURCES of energy. The energy which can be replenished as it is being used up is the renewable source of energy. The natural sources of energy obtained from sunlight, wind, rain, high tide etc. can be replenished
- But petroleum, nuclear enrgy etc., cannot be replenished as they are being used up. Hence they are referred to as NON RENEWABLE SOURCES of energy. The energy which cannot be replenished as it is being used up is the non renewable source of energy. Petroleum, Coal, Natural gas, Nuclear energy etc. are non renewable sources of energy
- GREEN ENERGY When we use solar energy, energy of running water etc., there is no environment pollution. Such sources of energy which will not pollute air as they are being used up are referred to as GREEN ENERGY. Green Energy is the energy produced from natural sources that do not cause environmental pollution, so it is also called Clean Energy.
- But when we use petrol, diesel, coal etc., it causes a large environment pollution. The energy obtained from such sources is called BROWN ENERGY . The energy produced from non renewable sources are called Brown Energy. It causes pollution

Sources of Energy	Causes Pollution or not	Green Energy/Brown Energy
Petroleum	YES	BROWN ENERGY
Energy from sea waves	NO	GREEN ENERGY
Nuclear energy	YES	BROWN ENERGY
Natural gas	YES	BROWN ENERGY

Classify the sources of energy as green energy or brown energy.
Solar cell, diesel, kerosene, flowing water, wind mill, thermal power station, tidal energy

Green Energy	Brown Energy
Solar cell	Thermal power station
DIESEL	FLOWING WATER
KEROSENE	WIND MILL
THERMAL POWER STATION	TIDAL ENERGY

Working gallery

- **1.**
- Force and displacement
- Work is not said to be done
- Light energy
- Brown
- Renewable
- The energy possessed by a body by virtue of its position or strain or condition is the Potential Energy. The energy possessed by a body by virtue of its motion is the Kinetic energy.
- a) Kinetic energy to mechanical. b) Mechanical energy to Kinetic
- a) No displacement for the wall b) due to higher mass
- a) electric lamps b) battery while charging c) Generator

2.

A	B
1. Work	A boy climbing a stair
2. Potential energy	A stone kept on a height
3. Kinetic energy	A moving car
4. Green energy	Solar energy
5. Brown energy	Petroleum

11 Give Relief … Save a Life

Introduction

- This unit deals with the situations at school and home where accidents may happen, and the first aid that we should give to the victims. The common accidents are bleeding through wounds, fracture, dislocation, burns, insect bite etc. we must help others who meet with accidents. This unit intends to inculcate this attitude, all the learning experiences should be consolidated to the importance of giving relief to the victims of the accidents. We intend to make the students aware about the importance of first aid before getting medical assistance. The unit provides a lot of experiences from their day today life. As a part of this unit, students should get opportunities for observation, classification, analysis etc. Kindness, empathy sympathy etc are the attitudes to be developed among the children through this unit. The learners will develop process skills, attitudes and values to help others in danger.

Learning Outcomes:

The learner:

- Gets idea about various situations at home and schools where accidents occur.
- Understands the importance of first aid, to give relief to the people who meet with accidents.
- Understands the aims and steps and procedure involved in first aid.
- Gets idea about steps in first aid given to bleeding, fracture, burns, sprain, harmful chemicals, fainting etc.
- Gets awareness on different safety rules at home, roads.
- Develops positive attitude to help people who are in danger and the need to be ready to give first aid and be ready to save a life.

Major concepts

1. There are some situations where accidents can happen, at home and school.
2. There are simple first aid techniques for wounds, nose- bleeding, simple fracture before taking the victims to the hospital.
3. The aims of First aid- to preserve life, to prevent illness or injury becoming worse, to promote recovery, to provide pain relief, to protect the unconscious.
4. We should keep certain steps in the procedure of first aid.
5. There is first aid for harmful chemicals.
6. We should take first aid for dog bites immediately.
7. We should obey all safety rules at home, school for our own safety.
8. Among road safety rules. There are Mandatory signals, Caution signals, and information signals.
9. We should keep a good first aid box at home and school.
10. We must be ready to help all who are in danger, be ready to give first aid, be ready to save a life.

Learning Experiences:

- **Activity:1 Introducing the unit**
- Teacher presents the situations and conversation given in the text.
- Teacher asks: What did the mother do to Sonu, when he fell down?
- Students respond one by one
- Teacher megaphones and writes their responses on the BB.
- Let students write in their diary.
- Teacher raises the questions
- Which are the steps she followed?

GRADE - 5

- **Teacher consolidates:**
- Wash the wound with clean water.
- Take a piece of cotton socked in antiseptic lotion.
- Clean the wound using cotton
- Let the bleeding stop by raising the wounded part a little high.

Assessment:

- Entries in the Note book.

Activity 2 Short Drama

- Let the students read the dialogue. Prepare to present as a short drama. (How to give first aid to Nose-bleeding?)
  - Group work
  - Let each group read the dialogue..
  - Group's presentation
  - Teacher's version
- **Assessment: First aid to Nose - bleeding**
- Entries in the note book .

Activity 3. Steps of first aid to a fracture

- **Group work**
- Observe the pictures on page 250.
- Let each group fill up the table.
- Teacher provides necessary help.
- **Assessment: Entries in the Note book – Filled table.**

Activity 4 : Aims of first aid

- Have you seen any posters at any hospital?
- What did Sonu and Sana see in that poster?
- Now read and write in your Science Diary
- **Assessment: Entries in the Note Book- Aims of First aid (Page 251 Text book)**

Activity 5 First Aid Awareness class Paper Presentation

- Group work : Prepare a paper on First Aid
- Let the groups refer the content given in the text book.
- Let them collect more information on first aid
- Let each group prepare a paper for –
  - Procedure for burning
  - Procedure for sprain
- Help students for collecting the steps of first aid.
- Group Presentation in the whole class
- Let them clarify their doubts
- Teacher should give necessary content addition
- **Assessment: Paper on First Aid**
- Entries in the note book.

Activity: 5 First Aid for Harmful Chemicals.

- Picture observation
- Group discussion – Identify and write the items in each picture.
- Teacher gives support to identify.
- Teacher says : All these items are made of chemicals. If we swallow or breathe such chemicals, it will affect our health badly.
- Now write the name of the first aid items that can be given to such accidents.
- **Assessment : Write up – First aid – Harmful Chemicals.** (Refer Page No. 253 Text book)

Activity 6 First aid to Snake- bite

- Let them read the details given in the text.
- Teacher should consolidate.
- Let the students write in the Science Diary

Activity 7 First Aid to Animal Bites

- Teacher asks : Have you ever been bitten by a dog? or a cat?
- Did you get any first aid before going to the hospital?
- What was it?
- Now read the matter Notice (Page 253)
- Make a note on First aid to Animal Bites.
- **Assessment : Notes in Science Diary**

Activity 8 Steps of First Aid to Fainting

- Group work
- Picture Observation 1, 2, 3,4 (Page 254)
- Write down the steps
- **Assessment : Steps of first aid to fainting**

Activity 9 Safety Rules at home and road

- Group work
- Observe the pictures
- Identify the situations
- Read the dialogue

- Make notes on the safety rules.
- Collect more instructions like- Don't play with fire!
- **Assessment: Safety Rules on road and home (Notes in Science diary)**

Activity 10 Accidents and solutions

- Look at the Picture and answer
- Let students observe the picture and write the situations and solutions.
- Then let them sit in 5 member groups.
- Let each one share the findings.
- Make a group product through discussion
- Presentation by groups.
- **Assessment: Accidents and solutions Entries in the Note book.**

Activity 10 Traffic Signals

- Group work
- Make a table

Three Types of Traffic Signals

Mandatory	Caution	Informative

- **Assessment: Filled up table, Entries in the Science diary**

Activity 11 : Safety Rules in the kitchen

- Pair work
- Let the children sit in pairs
- Let each pair read the dialogue between Sonu and Sana.
- (assuming the roles)
- After the dialogue presentation, let them write
- The Safety Rules in Kitchen
- **Assessment: Entries in the Note book**

Activity 12 Good behaviour… Bad behaviour

- Group work
- Let each group read the text
- Write the good behaviour and the bad behaviour mentioned in the text. Afterwards, let them add more.
- **Assessment : Science Diary entries.**

Activity 13 Materials for First Aid Box

- Teacher leads a general discussion
- Which are the materials we should keep in the First Aid box?
- Brainstorm the students
- Write their responses on BB
- Consolidates,
- Materials to be kept in First Aid Box

Activity 14 Be ready to give Relief… Be ready to save Life

- By completing the unit the students must develop an attitude
- to save any one in danger.
- Discussion
- Present certain situations where we can test their attitude.
- Sum up the discussion
  - All are important
  - We must help the people who are in danger
  - Be ready to give relief to the people who met with accident
  - Be ready to give relief to others.
  - Be ready to save a life

Working Gallery

- Informative
- 2 nd picture
- ii B is correct A is wrong
- Zebra crossing
- D. use crepe bandage on affected area.
- Anti-venom
- Keep all doors and windows open. Make the

gas cylinder off.

- Informative.
- Wash the wound with clean water and soap.
- Apply an antiseptic cream.
- Items for First Aid Box (Refer internet)
- 2 Keep left, Dip Ahead, Use foot path
- 3. Don’t leave soap and shampoo on the floor.
- Don’t switch on electric devices with wet fingers.

edufy publications

EVS

Semester 2

TEACHERS RESOURCE MANUAL

EVS
Grade 1

7 FROM HERE TO THERE

Introduction

- This handbook is designed to help teachers introduce first-grade students to the concept of vehicles. It includes various engaging activities and lessons that promote understanding of different types of vehicles, their purposes, and safety.

Learning Objectives

- By the end of this unit, students will be able to:
  - Identify different types of vehicles.
  - Understand the basic functions of vehicles.
  - Recognize the importance of vehicle safety

- **Knowledge:**
  - Identify different types of vehicles (cars, buses, trucks, trains, airplanes, boats, etc.)
  - Understand the basic functions of different vehicles
  - Recognize the sounds and appearances of various vehicles

- **Skills:**
  - Develop vocabulary related to vehicles
  - Enhance fine motor skills through drawing and colouring
  - Foster creativity and imagination through role-play and storytelling

- **Attitudes:**
  - Develop curiosity and interest in the world around them
  - Appreciate the role of vehicles in our daily lives
  - Cultivate a sense of responsibility and safety when using vehicles
  - Activity-Based Strategies

Introductory Activities

1 Vehicle Parade:

- Encourage children to bring their favourite toy vehicles to school.
- Organize a parade where children can showcase their vehicles and talk about them.
- Categorize the vehicles based on their mode of transportation (land, water, air).

2 Vehicle Sounds and Soundscapes:

- Play sound clips of different vehicles (horn sounds, engine noises, etc.) and ask children to identify the vehicle.
- Create a soundscape using various sound effects and instruments to represent different vehicles.

3. Vehicle Art and Crafts:

- Encourage children to draw and colour pictures of their favourite vehicles.
- Create vehicle collages using recycled materials.
- Make paper airplanes or paper boats.

4.Vehicle Role-Play:

- Set up a play area with different vehicle props (steering wheels, hats, etc.).
- Encourage children to role-play as drivers, passengers, pilots, or captains.
- Act out scenarios like going on a road trip, flying an airplane, or sailing a boat.

5.Vehicle Field Trips:

- Organize a field trip to a local transportation hub (airport, train station, bus depot).
- Observe different types of vehicles and their functions.
- Talk to transportation workers and learn about their jobs.

6.Vehicle Songs and Rhymes:

- Recite rhymes and poems about vehicles.

7 Vehicle Construction and Engineering:

- Use building blocks to construct different types of vehicles.
- Design and build simple vehicle models using recycled materials.
- (By incorporating these activities into your lesson plans, you can create a fun and engaging learning experience for your first-grade students while fostering their understanding of vehicles and their importance in our world.)

- **Page 181 TB**
- Who Am I?
- Before doing this activity in T B, do the following Engaging activities.

Introduction to Vehicles

- *Duration: 30 minutes*
- *Materials: Picture cards of various vehicles, chart paper.*
- **Activities:**
  - Begin with a discussion on what vehicles are. Ask students to share their experiences with different vehicles.
  - Show picture cards and have students name the vehicles.
  - Create a classroom chart listing all identified vehicles.

- **Types of Vehicles**
- *Duration: 45 minutes*
- *Materials: Vehicle type worksheets, crayons/ markers.*
- **Activities:**
  - Divide vehicles into categories: land, water, and air.(Provide cut-out images of vehicles and have students sort them into categories (land, water, air).
  - Students will colour a worksheet featuring different vehicles and categorize them.
  - Discuss the function of each type of vehicle.
- Let the Children complete all the activities in the lesson individually

Assessment and Evaluation

- Observe participation in discussions and activities.
- Evaluate the completed worksheets and group projects.
- Conduct a simple quiz with pictures of vehicles for recognition.

Conclusion

- Encourage students to share their knowledge about vehicles with their families. Reinforce the lessons learned through continuous discussions about vehicle safety and environmental consciousness.
- In addition to these activities, teachers can develop other activities that are appropriate for their students' interests and needs.
- The important thing is to give students opportunities to explore the concepts in this chapter and develop their own understanding.

Key Points:

- Discuss the goals of each activity before starting.
- Provide clear instructions to students.
- Encourage students to share their thoughts and ideas.
- Help students reflect on what they have learned after completing the activities.

8 WE PROTECT YOU

Introduction

♦ This handbook is designed to help teachers introduce first-grade students to the concept of clothes. By following these guidelines, you can create engaging and informative lessons on the topic of clothes for your first-grade students.

Learning Objectives

♦ By the end of this unit, students will be able to:
- Understand different types of clothing and their uses.
- Develop vocabulary related to clothing.
- Foster an understanding of how to care for clothes.
- Understand the idea of animal coverings as natural clothing.

Concepts

♦ **What are clothes?**
- Explain that clothes are items we wear to cover our bodies.
- Show pictures of different types of clothes (dresses, shirts, pants, etc.)

♦ **Why do we wear clothes?**
- To keep ourselves warm in cold weather
- To protect our bodies from the sun, rain, and wind
- To look good and feel comfortable
- Why do animals have coverings like feathers, scales, fur ?
- Idea of animal coverings as natural clothing. (Feathers and fur serve as natural clothing for animals, protecting them from the elements and helping them regulate their body temperature.)

Types of Clothes

♦ **Everyday Clothes:**
- Casual clothes we wear daily (T-shirts, jeans, shorts)
- Special Occasion Clothes:
- Clothes we wear for special events (party dresses, suits)

♦ **Seasonal Clothes:**
- Clothes we wear in different seasons (winter coats, summer shorts)

Taking Care of Clothes

♦ **Washing Clothes:**
- Explain the importance of washing clothes to keep them clean and fresh.

♦ **Folding Clothes:**
- Demonstrate how to fold clothes neatly to save space.

♦ **Ironing Clothes:**
- Explain the purpose of ironing and how to iron clothes safely.

Activity Ideas

1. Dress-Up Day:
- Encourage students to dress up in their favourite clothes.
- Discuss the different styles and colours.

2. Clothes Sorting Game:
- Sort clothes into categories (everyday, special occasion, seasonal).

3. Clothes Matching Game:
- Match tops with bottoms, shoes with socks.

4. Drawing Clothes:
- Have students draw pictures of themselves in different outfits.

5. Clothes Vocabulary:
- Introduce vocabulary words related to clothes (shirt, pants, dress, hat, shoes, etc.)

Activity-Based Strategies
Introductory Activities
Introduction

Materials:

- Pictures of various clothing items (dresses, shirts, pants, hats, shoes, etc.)
- Real clothing items (if possible, like a hat, scarf, or a pair of gloves)
- Colouring sheets of clothing items
- Crayons or markers

Procedure:

♦ **(A) Introduction (10 minutes):**
- Warm-up: Sing a song about clothes or play a game like "Simon Says" using clothing-related actions (e.g., "Simon says, put on your hat").
- Introduce the topic: Ask students, "What do we wear to cover our bodies?"
- Show pictures: Display pictures of different clothing items and ask students to name them.

♦ *Think aloud.*

♦ *Why do they have these beautiful feathers and fur?*

♦ *Is it just for beauty? (T.B Page 188)*

1. Introduce the concept:

♦ Explain that animals have their own special "clothes" to keep them warm, dry, and safe.

♦ Show pictures of animals with different types of coverings (feathers, fur, scales, etc.)

♦ Discuss how these coverings help animals adapt to their environments.

2. Compare and contrast:

♦ Compare human clothing to animal coverings.

♦ Discuss how both serve similar purposes (protection, warmth, style).

3. Activity: Animal Fashion Show:

♦ Have students create animal costumes or drawings.

♦ Encourage them to explain how the animal's "clothing" helps is survive.

♦ By incorporating this additional information, you can deepen your students' understanding of the natural world and the amazing adaptations of animals.

♦ *Do you always wear the same kind of clothes? (T.B Page 192)*

Activity: Clothing Categorization (1 hour)

♦ **Objective: To categorize clothes into every day, special occasion, and seasonal wear.**

♦ **Materials:**
- Pictures of various clothing items (dresses, suits, t-shirts, jeans, raincoats, swimsuits, etc.)
- Labels for each category (everyday, special occasion, seasonal)
- Chart paper or whiteboard

♦ **Procedure:**

1. Introduction:
- Begin by reviewing the concept of different types of clothing.
- Ask students to share examples of clothes they wear for different occasions.

2. Categorization Activity:
- Divide the class into small groups.
- Distribute a set of picture cards to each group.
- Ask each group to sort the pictures into three categories: everyday, special occasion, and seasonal.
- Provide labels for each category and ask students to place the pictures under the appropriate label.

3. Class Discussion:
- Bring the class together to discuss their categorizations.
- Ask each group to share their choices and explain their reasoning.
- Facilitate a discussion to clarify any misconceptions and reinforce correct categorizations.

4. Charting the Categories:
- Create a chart on the board or chart paper

with the three categories: everyday, special occasion, and seasonal.
- As a class, discuss each picture and decide which category it belongs to.
- Write the name of the clothing item under the appropriate category.

Extension Activity:

1.Create a Clothing Collage:

♦ Provide students with magazines or newspapers. Ask them to cut out pictures of different clothing items and create a collage representing the three categories.

2.Caring for Clothes

♦ Washing Clothes: Explain the importance of washing clothes to keep them clean.
♦ Folding Clothes: Demonstrate how to fold clothes neatly.
♦ Hanging Clothes: Show how to hang clothes to dry.

3.Activity: Clothing Colouring (15 minutes):

- Distribute colouring sheets of clothing items.
- Encourage students to colour the clothes creatively.

4.Wrap-up (5 minutes):

- Review the key points of the lesson.
- Ask students to share what they have learned about clothes.

5.Dress-Up Day:

- Encourage students to dress up in their favourite clothes.

6.Clothing Design:

- Have students design their own clothing items.

7.Clothing Store Role-Play:

- Set up a pretend clothing store and let students role-play as customers and shopkeepers.

♦ Let the Children to complete all the activities in the lesson individually

Assessment and Evaluation

♦ Observe participation in discussions and activities.
♦ Evaluate the completed worksheets and group projects.
♦ Conduct a simple quiz with pictures of dress for recognition.

Conclusion

♦ In addition to these activities, teachers can develop other activities that are appropriate for their students' interests and needs.
♦ The important thing is to give students opportunities to explore the concepts in this chapter and develop their own understanding.

Key Points:

- Discuss the goals of each activity before starting.
- Provide clear instructions to students.
- Encourage students to share their thoughts and ideas.
- Help students reflect on what they have learned after completing the activities.

9 Pillars Of Life

Introduction

- This unit deals with the basic components that living things we need to live, such as air, water and soil. We intend to make the students aware of rain, how does rain form? Importance of water, uses of water. Here, we discuss the formation of soil, soil erosion, and how to prevent soil erosion. Try to provide maximum opportunities to children to observe, analyse, and experiment. There are 4 experiments. Let the students do the experiment in class, at home etc. The unit also deals with the importance of air. There are also provisions for simple experiments related to air. The major concepts we intend to impart are- We breathe air. There is air around us. Air contains many gases. The learners will develop process skills, attitudes and values to keep water, air and soil clean and tidy, preserve water, conserve soil and not to pollute air. They should develop an eco- friendly attitude and keep certain environmental values.

Learning Outcomes:

The learner:

- Gets idea about how rain forms.
- Lists out different uses of water.
- Appreciates different uses of water.
- Understands the different uses of soil.
- Conducts different experiments related to soil.
- Gets awareness on how soil erosion is caused.
- Identifies that air in motion is wind, and we can feel air.
- Gets idea that air contains gases like nitrogen, oxygen, and carbon di oxide.

Major concepts

1. Formation of rain
2. Uses of water- drinking, washing, cooking, cleaning etc.
3. Plants need water to grow
4. Soil has different uses.
5. Plants grow in soil.
6. Soil is used to make bricks- bricks are used to construct buildings
7. Soil is used to make pots, toys, show case items etc.
8. Formation of soil
9. Washing away of soil is soil erosion.
10. We must prevent soil erosion
11. Wind is air in motion.
12. We can feel air.
13. Air needs space.
14. Air contains many gases like oxygen, nitrogen, carbon dioxide etc.
15. When we breathe, we take in oxygen.
16. We need oxygen to live.

Learning Experiences:

Activity:1 Introducing the unit

- Teacher reads the conversation loudly.
- Teacher asks: Why does grand pa ask to take umbrella?
- Students interact “Umbrella protects us from rain”.
- Let the students read slowly the dialogue.

Activity 2: How does the rain form?

- Teacher reads the dialogue of grandpa loudly. Explains the content statements one by one.
- **Teacher consolidates**
  - Rain comes from clouds.
  - Cloud is water vapour.
  - When water vapour cools, it becomes water.
  - Water drops are heavier.
  - So they fall down. Thus it rains
- **Assessment**
- Entries in the note book.

Activity 3. Where do we get water from?

Teacher explains-

- Where does the rain water go?
- Where do we get drinking water from?

♦ Teacher explains the statements given in the text book.

♦ **Assessment: Entries in the Note book**

Activity 4 : Uses of water.

- What do we drink?
- What do we use for cooking?
- How do we wash clothes?
- What do we use for cleaning?

♦ Teacher takes out response one by one.

♦ **Assessment: Uses of water- Entries in the note book.**

Activity 5 Soil for growth

♦ Help sonu.

♦ Observe the pictures

- What do we use to construct buildings?
- Where do plants grow?

♦ **Teacher consolidates.**

- Soil is used to make bricks
- Bricks are used to construct buildings
- Soil (clay) is used to make pots, show case items.
- Plants grow in soil

Activity 6 How is soil formed?

♦ Experiment

♦ **Materials: four rock pieces, paper**

♦ **Procedure:**

- Let two or three students rub two pieces of rock over a paper.
- Let them observe what is collected on the paper.
- Teacher consolidates.
- Rocks are crushed to form soil.

♦ **Assessment:**

♦ Record of experiment

♦ How is soil formed?

♦ Aim: To find out how is soil formed?

♦ Materials: 4 pieces of rocks

♦ Procedure:

- Took two pieces of rocks
- Rubbed them against each other over a paper
- Observation: Small particles fell on the paper
- Conclusion: Soil is formed by the crushing of rocks.

Activity 7 How is soil formed?

♦ Teacher explains the content. (refer page 203)

♦ Let students write the points in their note book

♦ **Assessment: Entries in the note book**

Activity 8 Air around us

♦ Let children breathe out to their palm.

♦ Let them observe what they feel?

♦ Lead a discussion

♦ What is wind?

♦ What do you feel when we breathe out?

♦ What happens to a balloon when we blow into it?

♦ **Teacher consolidates**

- Wind is air in motion.
- Air is present all around us.
- We feel air around us, when we switch on a fan.
- We can feel air when we breathe out into the palm

♦ **Assessment: Notes in the note book (Porfolio)**

Activity: 8 Let's blow up a balloon

- Distribute balloons among the children
- Let each one blow up
- Let them observe what happens

♦ **Teacher asks:**

- What happens to the balloon?

♦ When we blow, air comes out and fills in the balloon. So balloon blows up.

♦ **Assessment: Entries in the Science Diary**

Activity 9 What does air contain?

♦ Let children read the text book content.

♦ Let them make notes.

♦ **Assessment : Entries in the note book**

WORKING GALLERY

♦ **Answers.**
- Oxygen
- Soil
- Wind
- Water
- Soil erosion
- Plants grow in soil. Soil is used to make bricks.
- Soil is used to make pots, show case items like cups, tea pots, trays etc.

♦ Who am I?
- Wind

♦ Answers for questions.

1. Rain water goes to river, soil, pond, lakes ,well etc.
2. Water is used for cleaning, cooking, washing etc.
   Plants need water to grow.
3. Make bunds.
   Plant trees. Roots hold soil.

♦ Colour the picture in the text book. (Home assignment)

♦ Match the following.

Air in motion : wind
Necessary for breathing : oxygen
For washing : water
Minimising soil erosion : trees

♦ Classify the following as statements related to air, water and soil

Air
- Everywhere around us.
- Oxygen is a component.

Water
- Rain comes from here
- River, lake, well etc.

Soil
- Plants grow in it
- Comes from rock.

10 My Food My Fuel

Introduction

- This unit deals with the items we use as food. We intend to make the students aware about the importance of eating a variety of food. The unit provides a lot of experiences from their day to day life. At kitchen, at fruit stall, at vegetable market, fish market, meat shops they come across many food items. Some of them have kitchen garden or vegetable garden at their home. As a part of this unit, students should get opportunities for observation, classification, analysis etc. Plants provide us with the major food items. We depend on animals also for food. So we should protect plants and animals. These are the major concepts and attitudes to be developed among the children through this unit. The learners will develop process skills, attitudes and values to protect plants, animals. They should develop a nature - friendly attitude, love plants and animals, and protect them. Apart from that, they develop attitudes to that encourage growing vegetables at home and helping elders with household works etc.

Learning Outcomes:

The learner:

- Gets idea about variety of food items like fruits, vegetables, nuts, pulses, fish, meat, milk, rice etc.
- Classifies fruits and vegetables.
- Understands that we can grow certain vegetables and fruits at home.
- Classifies food items as raw and cooked.
- Gets awareness on different benefits of food.
- Develops positive attitude towards cultivating plants for fruits and vegetables.
- Develops attitude to help elders in house hold duties.

Major concepts

1. There are a variety of food items- rice, nuts, pulses, fruits, vegetables, egg, meat, milk etc.
2. We need food for energy to do work, to grow, to protect ourselves from diseases.
3. We should eat all types of food properly to be more active.
4. We should wash and clean fruits and vegetables before keeping them in refrigerators.
5. There are different types of fruits and vegetables.
6. We should help parents and elders in different house hold duties.
7. We can grow some fruits and vegetables in our home kitchen gardens.
8. Food benefits us in many ways- gives us energy, helps us grow, protects us from diseases.

Learning Experiences:

Activity:1 Introducing the unit

- Teacher presents the conversation given in the text.
- Teacher asks: Which are the major food items that we eat?
- Students say one by one
- Teacher megaphones and writes on the BB.
- Let students to write in their diary.
- Teacher raises the questions
- What are the uses of food? (Why should we eat food?)

Teacher consolidates:

- We get energy from food
- Food helps us to grow
- So we should eat a variety of food.
- Take all kinds of food to keep us healthy and more active.
- **Assessment:**
- Entries in the Note book.
- Let the students read the dialogue. Prepare to present as a short drama

Activity 2: Classify the food items in the picture.

- Group work
- Let each group identify each food item in the picture.
- Group's presentation
- Teacher's version

Assessment:

- Entries in the note book. Ensure all food items are listed.

Activity 3. Let's sort out vegetables and fruits-

- (Help Sonu and Sana) – Group work
- Teacher helps the groups to classify the food items as Vegetables and Fruits
- **Assessment: Entries in the Note book – Proper classification**

Activity 4 : Discussion – Do you help your parents at home?

- Let them respond to each question.
- Teacher may consolidate and write on the BB
- Teacher says:
- We must help our parents at home in different works like-
- Cleaning, washing, growing vegetables in the garden.
- Help parents in different kitchen works like cleaning, washing plates, sorting fruits and vegetables, cleaning them etc.
- **Assessment: Entries in the note book.**

Activity: 5 Fruits are vegetables also!

- Group discussion
- Teacher cites example of banana.
- Is banana a vegetable?
- Which are other fruits which can be used as vegetables also?
- Groups list
- Teacher consolidates.
- Banana, papaya, tomato, olive, cucumber, brinjal, jackfruit etc.
- **Assessment: Entries in the note book**

Activity : 6. Setting up of a vegetable garden at home and school

- Teacher let the children listen to teacher's reading of the text (page no.214)
- Discuss the importance of setting up of vegetable garden in school/home.
- Teacher gives some instructions on how to set up a vegetable garden. Seek the help of PTA and MPTA. Take a leadership role to set up a vegetable garden.
  - Preparing the land
  - Selection of plants
  - Planting
  - Watering
  - Manuring
  - Weeding
  - Harvesting
- **Assessment: Involvement in setting up of the garden.**
- Entries in the Note book.

Activity 7 Classification of vegetables eaten - raw and cooked.

- Group work
- List the food items first
- Then let the groups to classify as Raw and Cooked
- Teacher consolidates
- **Assessment: Table of vegetables eaten Raw and Cooked.**

Activity 8 Let's read Kid's Magazine

- Teacher reads the matter in the text (Page 215)
- Students read the text, writes the concepts in the note book.
- **Assessment: Entries in the Note book.**

WORKING GALLERY

- **Find the odd one out - Answers**
  - Banana
  - Lady's finger
  - Peas
  - Cashew
  - As the students' responses

- Grid
- Tomato , brinjal, apple, nut, orange,guava, lemon, etc.
- Draw and colour
- Student's choice
- Proper drawing and colouring
- Food items we get from animals.
- Cow -milk, Hen- egg. Sheep - meat

11 FESTIVALS OUR PRIDE

Introduction

♦ This handbook is designed to help teachers introduce first-grade students to the concept of Festivals. By following these guidelines, you can create engaging and informative lessons on the topic of festivals for your first-grade students.

Learning Objectives

♦ The primary objectives of teaching this topic to first-grade students are:

1. Cultural Understanding:

- To introduce students to diverse cultural traditions and festivals celebrated around the world.
- To foster respect for different cultures and religions.
- To encourage children to appreciate the beauty and significance of cultural diversity.

2. Emotional Development:

- To promote positive emotions like joy, happiness, and gratitude.
- To help children understand the importance of family, friends, and community.
- To develop empathy and compassion towards others.

3. Cognitive Development:

- To enhance children's vocabulary and language skills.
- To develop critical thinking skills by analysing the reasons behind celebrations.
- To improve their understanding of cause-and-effect relationships.

4. Social Skills:

- To encourage cooperation, sharing, and teamwork during activities.
- To promote effective communication and listening skills.
- To foster a sense of belonging and community.

♦ By exploring the topic of festivals, young learners can develop a deeper understanding of the world around them and cultivate a sense of global citizenship

Concepts

♦ Here are some key concepts that can be introduced to first-grade students about festivals:

♦ **Core Concepts:**

♦ What is a Festival?

- A special day or time for celebration.
- A time to enjoy with family and friends.
- A way to express culture and traditions.

♦ Why We Celebrate Festivals

- To express gratitude.
- To celebrate special occasions (birthdays, holidays).
- To mark seasonal changes (harvest, new year).
- To honour religious beliefs.

Supporting Concepts:

♦ **Different Types of Festivals**

- Religious festivals (Diwali, Christmas, Eid)
- Cultural festivals (Holi, Chinese New Year)
- Seasonal festivals (Thanksgiving, Harvest Festival)

♦ **Festival Traditions**

- Special foods
- Decorations
- Clothing
- Music and dance
- Rituals and ceremonies

♦ By understanding these concepts, first-grade students can develop a deeper appreciation for cultural diversity and the joy of celebration.

Activity-Based Strategies

Introductory Activities

Introduction

♦ Here are some engaging activities to help first-

grade students learn about festivals:

1. Festival Parade:

- Materials: Construction paper, markers, crayons
- Activity: Have students create their own festival parade. They can draw or cut out figures of people, animals, and objects related to their favourite festival.
- Learning Outcome: Encourages creativity, fine motor skills, and understanding of cultural symbols.

2. Festival Food Fair:

- Materials: Pictures of various festival foods, playdough
- Activity: Show pictures of different festival foods. Let students identify the food and use playdough to create their own versions.
- Learning Outcome: Introduces students to diverse culinary traditions and sensory exploration.

3. Festival Storytime:

- Materials: Storybooks about festivals, puppets
- Activity: Read stories about different festivals, using puppets to act out the story. Encourage students to retell the story in their own words.
- Learning Outcome: Develops listening skills, comprehension, and oral language skills.

4. Festival Dance and Music:

- Materials: Music, simple dance moves
- Activity: Play music from different cultures and teach simple dance moves. Encourage students to move and express themselves through dance.
- Learning Outcome: Promotes physical activity, rhythm, and cultural appreciation.

5. Festival Art Project:

- Materials: Paint, markers, construction paper
- Activity: Have students create art pieces inspired by festivals. They can paint or draw symbols, patterns, and colours associated with their favourite festival.
- Learning Outcome: Encourages creativity, self-expression, and understanding of cultural aesthetics.
- By incorporating these activities into your lesson plans, you can make learning about festivals fun and engaging for your first-grade students.
- Let the Children to complete all the activities in the lesson individually
- Page No.220 (How about making our National Flag too...)
- Making our national flag is a great way to instill patriotism and pride in our students. Here's a simple activity to make the Indian flag:
- **Materials:**
  - White, orange, and green coloured paper
  - Blue paper or paint
  - Scissors
  - Glue
  - A stick or dowel (for the flagpole)
- **Instructions:**

1. Cut the paper: Cut the white paper into a rectangle. Divide it into three equal horizontal strips: orange, white, and green.
2. Create the Ashok Chakra: Cut a blue circle from the blue paper. Draw or paint the 24 spokes of the Ashok Chakra on the blue circle.
3. Assemble the flag: Glue the orange, white, and green strips together. Glue the blue circle with the Ashok Chakra in the center of the white strip.
4. Attach the flagpole: Glue the flag to the stick or dowel.

Additional Activity:

- Flag Hoisting Ceremony: Organize a small flag-hoisting ceremony in your classroom. Sing the national anthem and explain the significance of the colours and the Ashok Chakra.
- Flag Quiz: Conduct a quiz about the Indian flag, its colours, and their meanings.

- By making and hoisting the national flag, you can create a memorable learning experience for your students and foster a sense of national pride.

CULTURAL FESTIVAL

- A cultural festival is a celebration of the traditions, customs, and heritage of a specific group or region. These festivals often include a variety of activities such as:
  - Parades: Colorful processions showcasing cultural themes, costumes, and music.
  - Culinary experiences: Tasting traditional dishes and learning about local cuisine.
  - Music and dance performances: Showcasing traditional and contemporary music and dance styles.
  - Art exhibitions: Displaying traditional and contemporary art forms.
  - Religious ceremonies: Celebrating religious beliefs and traditions.
  - Cultural workshops: Offering opportunities to learn traditional skills like crafts, music, or dance.
- **Cultural festivals are important for several reasons:**
  - Preservation of culture: They help to preserve and promote cultural heritage.
  - Community building: They bring people together and foster a sense of community.
  - Economic benefits: They can attract tourists and boost the local economy.
  - Educational value: They provide opportunities to learn about different cultures and traditions.
- By attending cultural festivals, you can experience the diversity of human culture and gain a deeper appreciation for different traditions and customs.
- India is a land of diverse cultures and traditions, reflected in its myriad festivals. Here are some of the most significant Indian cultural festivals:

Major Religious Festivals:

- Diwali: The "Festival of Lights," celebrated with colourful lights, fireworks, and the exchange of sweets.
- Holi: The "Festival of Colours," marked by vibrant colours, joyous celebrations, and the spirit of forgiveness.
- Dussehra: Celebrates the victory of good over evil, often marked by the burning of effigies of Ravana.
- Ganesh Chaturthi: A ten-day festival honouring Lord Ganesha, the god of wisdom and prosperity.
- Krishna Janmashtami: Commemorates the birth of Lord Krishna, with elaborate decorations, devotional songs, and a midnight celebration.
- Eid-ul-Fitr: Celebrates the end of Ramadan, a month of fasting.
- Eid-ul-Adha: Honours the willingness of Ibrahim (Abraham) to sacrifice his son as an act of obedience to God.

Regional Festivals:

- Pongal: A harvest festival celebrated in South India, particularly in Tamil Nadu and Andhra Pradesh.
- Onam: A harvest festival celebrated in Kerala, marked by boat races, colourful attire, and elaborate feasts.
- Bihu: A major Assamese festival celebrated thrice a year, with traditional music, dance, and feasting.
- Durga Puja: A major Bengali festival honouring the goddess Durga.
- Lohri: A Punjabi harvest festival celebrated with bonfires, folk songs, and the sharing of sweets.

Other Notable Festivals:

- Kumbh Mela: A massive Hindu pilgrimage held every 12 years at one of four holy river sites.
- Maha Shivratri: A Hindu festival dedicated to Lord Shiva, celebrated with all-night prayers and fasting.
- Guru Nanak Jayanti: Commemorates the birth of Guru Nanak Dev, the founder of Sikhism.
- These are just a few of the many cultural festivals celebrated in India. Each festival has its unique customs, traditions, and significance, reflecting the rich cultural tapestry of the country.

Assessment and Evaluation

- Observe participation in discussions and activities.
- Evaluate the completed worksheets and group projects.
- Conduct a simple quiz with pictures of dress for recognition.

Conclusion

- In addition to these activities, teachers can develop other activities that are appropriate for their students' interests and needs.
- The important thing is to give students opportunities to explore the concepts in this chapter and develop their own understanding.

Key Points:

- Discuss the goals of each activity before starting.
- Provide clear instructions to students.
- Encourage students to share their thoughts and ideas.
- Help students reflect on what they have learned after completing the activities.

edufy publications

GRADE - 2

Semester 2

TEACHERS RESOURCE MANUAL

EVS
Grade 2

7 To see Things

Introduction

- This unit deals with the various substances around us. We intend to make the students aware about the objects which pass light through them, and which do not allow light to pass through. They are called respectively as transparent and opaque objects. Students can do simple experiments related to light using mirrors. The unit provides a lot of experiences from their day to-day life. As a part of this unit, students should get opportunities for observation, classification, analysis, experiment etc. The students will get interesting experiences with the objects around us.

Learning Outcomes:

The learner:

- Gets idea about different objects which give us light.
- Classifies objects like opaque, transparent and translucent.
- Takes part in different simple experiments related to light.
- Understands that the size of the image formed in a plane mirror has the same size as that of the object.
- Understands Lateral inversion.
- Develops positive attitude to conduct simple magical experiments using light.

Major concepts

1. There are objects which spreads light.
2. We need food for energy to do work, to grow, to protect ourselves from diseases.
3. There are objects that permit light to pass through them- transparent objects.
4. Some objects do not allow light to pass through them- opaque objects.
5. Some objects pass light partially through them- translucent objects.
6. The size of the image formed in a plane mirror has the same size as that of the object.
7. Left side of the image will appear as the right side of the image. This is called lateral inversion.
8. Mirrors can have different shapes. Mirror can be a part of a sphere also.

Learning Experiences:

Activity:1 Introducing the unit

- Teacher presents the conversation given in the text.
- Teacher asks: How does light help us to see?
- Students say one by one
- Teacher raises the question once again.
- Explains the points given in the text.
- Let students write in their note book.
- **Assessment:**
  - Entries in the Note book.

Activity 2: List the objects that give us light.

- Group work
- Let each group identify each food item in the picture.
- Group's presentation

Teacher's version

1. Lighted torch
2. Lighted candle
3. Sun
4. Stars
5. Light house

- **Assessment:**
- Entries in the note book. Ensure items are listed.

Activity 3. Let's make a shadow (Let's do an activity)

- Refer the activity given in the text book –page 192
- Teacher explains at each stage.

- Transparent objects.
- Opaque objects.
- Translucent objects.

♦ After completing the experiment, let students write the Record of experiment in the following format
  - Record of experiment
  - Title
  - Aim
  - Procedure
  - Observation
  - Conclusion

♦ **Assessment: Entries in the Note book – Proper classification**

♦ Record of experiment

Activity 4 : Discussion- Why do opaque objects give shadow?

♦ Let's do the experiment

♦ Refer the experiment given in the text- page 194.

♦ Let them do the experiment in class or at home

♦ Ask them to write the Record of experiment

♦ **Assessment: Entries in the note book. Record of experiment .**

Activity: 5 Next day morning:

♦ Experiment: Can all surfaces reflect light?

♦ How we can see our image in a mirror?
  - Group work
  - Discussion
  - Making notes

♦ **Assessment: Entries in the note book, Discussion notes.**

♦ **Activity: 6 -Image formed by a plane mirror**

♦ Experiment
  - Stand before a mirror
  - Raise your right hand
  - Observe the image formed in the mirror.
  - Which hand is seen raising?
  - Observe the size of the object.
  - Write in the note book.

♦ Teacher consolidates:
  - Left side of the image will appear as the right side of the image. This is called lateral inversion.
  - The size of the image formed in a plane mirror has the same size as that of the object.
  - Distance of the object from the mirror is equal to the distance of the image.

♦ Mirrors can have different shapes. It can be a part of a sphere also.

♦ **Assessment:**
  - Entries in the Note book.

Activity 7- Let's have fun

♦ Demonstrate the experiment in the class.

♦ Let students observe.

♦ Let the students write down their observations in the diary.

♦ **Assessment : Observation notes of the experiment**

WORKING GALLERY

♦ **Fill up the blanks- Answers**

a. transparent
b. translucent
c. opaque
d. reflect light

♦ 2. plane mirror

♦ 3. shadow

♦ 4. Arrange two plane mirrors in conical position.

♦ Keep a lighted candle in between.

♦ 5 No. shadow is formed by light only.

♦ 6 To see the outer side through the window.

Complete the following

a. Light
b. Sun
c. Same
d. Same
e. Opaque

8 More About Vehicles

Introduction

- The child has acquired some basic understanding of the vehicles around us, from the first grade. Firstly, let's check what concepts they already have.
  - Before the invention of wheels, people travelled on foot.
  - Automobiles came with the invention of wheels.
  - We have different types of vehicles for different purposes.
  - Land, water and air are three means of transport.
- The spiralling method is adopted in this lesson which deeply reiterates the above mentioned concepts. Different types of vehicles, their means of transportation, different uses of vehicles etc. are re-entered in this lesson as new experiences.
- In addition to this, modern travel systems like metro rail, various vehicles that help us to ease our work, are introduced in this lesson in more detail.
- Concepts like, unique names for the stops where different vehicles halt and the names of the employees in the vehicles etc are also introduced here.
- However, the important emphasis in this chapter is on creating awareness about road rules. Care must be taken to provide children real experiences related with acquiring rules on the road. Concepts related with road safety rules shall be generated in the class, keeping in mind the consequences of not obeying them. The classroom experiences we provide should lead the children to the strong awareness that by following the road rules properly, we are ensuring our own SAFETY. We need to consider this chapter as first step towards our broader concept of 'Democracy on the Road'.

Learning Outcomes

- Provides experiences on road safety rules along with different types of travel and non-travel vehicles, their uses, halting points, and those who work on them.

a) Conceptual

- Identifies the unique names for the stops where different vehicles halt.
- Identifies the names of the employees in the vehicles
- Recognizes that the different types of vehicles are used for different purposes.
- Identifies the different information related with the transport system.
- Recognizes road safety rules.

b) Skills

- Develops Skill to assess that the motor accidents are the results of our carelessness and violations of road rules.
- Enables children to record data in an organized manner.
- They can compare characteristics of different vehicles.
- They are able to act their role in plays.
- Develops skill in making models of various vehicles.
- Skill in making posters.
- Skill to mimic the sounds of vehicles.
- Develops social skills through different group activities.

c) Attitudinal

- Develops a positive Attitude to follow road rules properly.
- Awareness is being gained about the need to reduce the pollution generated by vehicles.
- Getting awareness about road safety.
- Develops a sense of Democracy which is to be kept on the road.
- Develops positive attitude to be a responsible citizen in the society.

- **Approximate time envisaged for the transaction of the unit**

Indoor interactions :
Outdoor Activities :

Activities

- **First sight..**
- *What do you see in the picture?*
- *What are they talking about?*
- Reading the picture, let the children share their perceptions.
- Then the Teacher narrates the context.
- *Marriage function of Shaji's close friend Kiran at Kochi – Invited them all – They reached one day before the programme – Sana and Sonu's first trip to Kochi -Along with the wedding, they also planned to visit various places there – They came by car- Children were happy to see the sights along the way..What sights can you see on a car trip to kochi? (Let the children respond)*
- *Back waters*
- *Rivers*
- *Paddy Fields*
- *By noon, they reached Kochi and parked their car in front of a hotel. While they were moving towards their hotel room Sana called it out….*
- Teacher continues the narration in the text.

My 'Metro Experiences'

- *How many of you have seen metro train? Where did you see it?*
- *Have you travelled in it? What are its features?*

- Each child can be given an opportunity to share his/her experiences. Let the teacher also share his/her own experience. From the discussion that follows, ideas about metro transportation should be elicited.

So many Vehicles

- Teacher continues the narration.
- "Dad, I want to take a metro ride", Sonu hung on Shaji's finger and said.
- "Sonu, Don't be in a hurry, of course we can get into it." -Had their lunch and rested in the hotel room. In the evening, moved towards the nearest metro station -They reached Ernakulam South Station - They took tickets to Aluva.
- Sana and Sonu were intrigued by the facilities and systems of the station.
- *What facilities are there in metro train and in metro station?*
- (Let the children say)

Vehicles Vehicles

- Have each child write the names of the vehicles he/she knows, in the notebook. Find and congratulate the pupil who has written the highest number. Let them circle the names of vehicles they travelled. We can find out who is ahead in number.
- After this, ask them to complete the activity in the TB (Page 201)

Which is more?

- *Which vehicle is most likely to be on the road?*
- Teacher raises a question.
- Let each child say his/her guess and write it in the note book. Then take them outside to do a light project.

- Let the children count the number of vehicles passing by the nearby road in 10 minutes. After that, we can take them back to class and share the data and come to conclusions. Check how many pupils guessed correctly.

Vehicle mimicry

- How we can imitate the sounds of different vehicles? Let everyone practise in basic groups. Then present to the class individually or in group.

Wheel and Vehicle

- Children are asked to walk casually, (without bumping into each other) through the class. While walking, children call out "Which vehicle, Which vehicle, Say Say Which vehicle."
- The teacher who controls the game blows a

whistle and says the name of a vehicle. Then the children have to form groups according to the number of wheels on that vehicle. And the sound of that vehicle should be imitated.

- (Eg: If Teacher says Auto rickshaw, they should be in groups of 3 and if bus, groups of 6)
- Those who make mistakes will be out. The game continues. When the teacher says train, all the children should hold their shoulders and run in a row making a sound like a train.

Card board Vehicles

- Let the children make models of the vehicles using cardboard boxes, cardboard, scrap materials etc. This can be given as a group activity.

Home of Vehicles

- *Can you tell where Sonu's family is?*
- *What can you see in the picture?*
- *What could Sana and Sonu be talking about?*
- Let the children give their perceptions on the picture (Page 201)
- *After travelling by metro, they went straight to Kochi port.*
- Teacher then narrates the story in the TB.

Listen and tell

- Teacher plays audios of some announcements (First at the bus stand, then at the Railway Station and finally at the Airport).
- After listening to each one, the teacher asks, Did you hear this announcement?
- Where have you heard it? What can be seen there?

Videos Videos

- Videos are shown in the class explaining the activities in bus station, railway station, airport and boat jetty. Then discusses with children what they have seen.

Let's talk

- Teacher asks children to share their experiences at Bus stand, Railway station, Air port and Boat jetty.

Where to stop?

- Four children are placed in different corners of the class holding boards of bus stand, railway station, airport and boat jetty.(They can move in the class)
- Some slips are written (names of vehicles) and placed on the table. Children play the game of 'Passing the Hat' standing in the circle. When the teacher whistles, who has the hat in his hand should come and take one of the slips on the table. He/she has to read it aloud and move into the suitable halting point. (For example, if it's a train, then to railway station). Those who fail,go out from the game. The game continues.

Identify the picture

- Teacher shows various pictures of different employees related with transportation (Eg- Loco pilot, Conductor, Air hostess, TTE etc) and asks pupils to identify them.

All are not Drivers!

- The children of the class are divided into four groups (Bus, Train, Ship, Aeroplane).
- Each group is given one chart. Using the concepts on the page 203, a Concept Map is prepared and presented after discussion in the group. At the time of presentation, the teacher makes necessary additions.

Uses of Vehicles

- *Sana and Sonu are very happy -They toured all the places in Kochi for two days*
- *- Did a boat trip - Went to the park - Tasted new foods…*
- The teacher continues the narration.

- *What are the tourist spots to visit in Kochi?*
- *Mattancheri*
- *Marine Drive*
- *Fort Kochi*
- ……..
- (Let the children respond)
- Then teacher goes into the narration of the text

(Page 204)

World of unusual vehicles

- How many vehicles do you know that are not useful for travel but are used for other purposes?
- Let the children discuss in groups and write in their notebooks.
- After this activity, A video showing the operation of these vehicles can be shown to the class.
- Finally ask the pupils to do the work in the TB (Page 204).

Making Magazine

- Discuss in class, the history, characteristics etc. of the vehicles in detail. Advantages of electric vehicles should be brought into the discussion.
- Newspaper cuttings, pamphlets, videos etc. can be used for generating ideas.
- Text book content on the page 205 (V- Info) are intended to elicit from the discussion.
- Lastly, ask the children to prepare a Class Magazine about 'World of Vehicles' Road Rules
- After the wedding party Sana and her family were going back to their home.
- The teacher continues the narration in the Text.

Accidents we witnessed

- Let the children talk about motor accidents they have seen or heard about. Let them present the reasons why it happened. Children's attention can be drawn to the causes of accidents by reading newspaper cuttings.
- From these discussions, elicit the road rules which are given in TB (Page 206)

Role Play

- Divide the children into groups of four or five. Let each group role play how to follow the road rules properly.

Road Safety Posters

- Create posters illustrating road safety rules. Let the children put these posters in the appropriate places.

'Safety First'

- Invite a traffic policeman to the class to talk about road safety.

9 Flying Information

Introduction

- The child grows up, knowing and experiencing the rapid changes in the field of information and communication. This is one of the important things to consider in the transition of the child from the past to the present. The child arrives at school with a fairly good understanding of the
- Internet-based world. Taking this fact into account, this lesson on 'the world of communication' has been prepared.
- The lesson begins with modern communication facilities that the child is familiar with. After its detailed deliberations. It goes back to the old days
- of communication. This is done to maintain the child's interest to explore the history of how we have arrived at today's amazing age of communication, with curiosity.
- This chapter provides an essential understanding of the postal system and print media, which were an integral part of our social life in the past.
- The child will also be aware of the sudden changes taking place in the world of communication. Let the child realize the fact that increasing systems and facilities in this field will make our life easier and more comfortable. And the child needs to recognize the problems that are happening in human life immersed in technological facilities. As it is Grade 2, in-depth discussion of this is not necessary, but activities to redirect the child's thinking in that direction should be part of the classroom activities.

Learning Outcomes

- Provide experiences to understand different media platforms and to explore their potential and possibilities in the society and also open opportunities for digging the history of our communication system.

a) Conceptual

- Identifies the concept of communication.
- Identifies different icons related with internet.
- Recognizes the importance and potential of internet.
- Identifies various ways of internet based communication.
- Distinguishes different media platforms as internet dependent and non-internet dependent.
- Evaluates the services and potential of various social media platforms
- Gain an understanding about the growth and development of communication systems.
- Recognizes different services of our Postal system.
- Identifies the differences between Audio, Audio Visual and Print media.
- Identifies the problems created by excessive use of mobile phones.
- Distinguishes different communication platforms as shared to one person and shared to many.
- Identifies different popular News papers, News Channels and other Printed Magazines.

b) Skills

- Skill to assess the problems of excessive mobile phone usage.
- Enable children to evaluate different activities in a Post office
- Develops skill to frame suitable questions and ask them in relevant contexts.
- Enable children to put incidents in the chronological order.
- They can compare characteristics of different social media platforms.
- They are able to act in different roles.
- Develops skill in making Email ID.
- Develop skill in making logical arguments.
- Develop skill in making collage.

c) Attitudinal

- Develops awareness of using social media platforms securely.
- Awareness is formed that mobile phones are to be used with restrictions.
- Develops awareness about the problems of excessive phone usage.
- Develops positive attitude in using the internet.
- Develops awareness about the sensible usage of media.

- **Approximate time envisaged for the transaction of the unit**
  - Indoor interactions :
  - Outdoor Activities :

Activities

Birthday Wishes

- The teacher inquires about the children's birthday and they respond to it. Children are asked to describe their experiences on their birthdays. Then let them say the greeting words they used on that special day.
  - Warmest birthday wishes to you dear
  - Wishing you a wonderful day
  - Have a fantastic birthday

Sana's birthday

- The teacher takes the children to the continuation of Sana's story. Tomorrow is Sana's birthday. They decided to make it a grand celebration. Even grandfather and grandmother are happy with that. Many friends and relatives have been invited to the party. The family members were on the preparations to make the function a grand event. What preparations have they made for the birthday party?
- (Let the children say)
  - Decorating with balloons
  - Give order for the cake
  - Arrange Dining hall
  - Plan entertainment activities
- After all the preparations, the birthday dawned. Sana and Sonu were very happy. Even before the birthday function, Sana has received many birthday wishes.
- See those messages in the Textbook.. (Picture reading Page 211)
  - Who sent these greetings to Sana?
  - What greeting sentences are there?
  - By what means did Sana get these messages?
- Teacher consolidates different internet based media, through which we are communicating today.

Media we use

- Which of these communication methods are familiar to you? (Each child is given an opportunity to share their experiences)

World of Internet!

- Children are asked to identify the icons in the text one by one (Page 212). Then asks where they have seen it. Shares children's perceptions about the Internet. The discussion leads to the benefits of internet.
- Finally teacher elicits a definition of Internet, from the class.

Internet Vocabulary

- Ask to write as many words as possible related with the Internet, individually. Then they consolidate these words in groups.
- Ask each group to prepare sun-word in the chart and to display it in the class.

- Let the children make their guesses about how the Internet came to us. Then children can be shown illustrations and videos that briefly describe the journey and services of the Internet.
- We can use either a story or examples to illustrate how the internet helps us to communicate.

One thing, Many uses

- The teacher presents the narration in the

text relating to Sana's birthday wishes. Then discusses the activities in the text book (Page 214)

Let's act

- Let the children list the new media platforms they know.
  - Whatsapp
  - Facebook
  - Instagram
  - Youtube
  - Podcast
- Then they can be grouped according to the number of new media platforms. The groups should discuss the benefits of media they have got. They have to prepare the logo of the medium on the card board. Then wear that logo and act as the medium describing the merits of it.
  - (Eg: I'm Whatsapp. Through me, you can send videos..) Let all the groups present like this.

E-mail Directory

- With the help of the teacher, create an email address for all the children. You can also prepare an E-mail directory with the e-mail addresses of their friends and teachers.

Need control

- Discuss about the mobile phone usage at home.
  - Does everyone in your house use mobile phones?
  - How many hours will the phone be used?
  - Does mobile phone usage hinder social interaction at home?
  - Is it restricted in its use?
- Through discussion, teacher elicits the problems created by excessive use of mobile phones.
  - Causes health problems like obesity
  - Reduce social relationships
  - Makes us lazy
  - Eye strain and vision problems
  - Causes head ache and sleep disturbances
  - Isolate us socially
  - May lead to addiction
- When and how to use New media
- Teacher discusses the precautions we should take while using the Internet and the new media.
  - Operate them in the presence of your parents
  - Dont share your personal info to strangers
  - Use these media only for learning and references
  - Don't copy or share others work without permission
  - Don't stay online too long
  - Use kid-friendly websites only
  - Don't download unknown files
  - Don't share passwords and secrets

Talks with grandparents

- After the picture reading (Page 215) teacher narrates the story part in the text.

What is communication?

- Children are asked to list out different ways we use to know and inform one another.
  - Radio
  - Television
  - Telephone
  - Telegram
  - E-mail
  - Letters
  - News papers
  - Magazines
- From these, teacher elicits the definition of communication.

Exchanging ideas and information from person to person is called Communication

History of Communication

- By understanding these things, children will be naturally curious to know how the communication system has grown to the present level. To explain this, we can invite a Guest Faculty (Any suitable person who is related with communication system) into the class.

- Before the interview, children should be instructed to prepare apt questions about what they need to know.

Let's visit a Post Office

- Take your children on a field trip to the nearest post office to get them direct experiences about the operations of a post office. After the visit discuss their experiences in the class and consolidate the information.

A Post Office in the class

- A post office can be set up in the classroom to give children experience of sending and delivering letters. Firstly, we are to make a post box. A child should be selected as the Post man. Then let each child write a letter to their close friend. Address should be written on the letter. Then the children should deposit the letter in a Post box placed somewhere in the class. Let the postman open the box and find the addressees and deliver the letters.

Media Time line

- After recognizing the history of the communication system, ask the children to create a chronology (Time line) of its development.
  - Messages were sent using birds
  - Letters were delivered on foot
  - Letters were delivered on horseback
  - Postal Service
  - Print media
  - Telegram
  - Fax
  - Radio
  - Television
  - Internet

Media collage

- Make paper collages at the group level by collecting pictures related with the field of communication

10 Appear Smart

Introduction

- This unit deals with the various types of dresses, clothes of modern and ancient man, materials used for making clothes, type of clothes, clothes that we wear on different occasions and in different seasons. We intend to make the students aware about the importance of clothes. They will appreciate the efforts of many people work for making their clothes etc. students will develop process skills like observation, comparison, classification, analysis, creative thinking etc. moreover they are expected to enjoy the variety and diversity in clothes in terms of season, periods, occasions, jobs or professions etc.

Learning Outcomes:

The learner:

- Gets idea about the dresses of men, women, boys and girls.
- Classifies dresses – wearing at school, wearing at home.
- Compares clothes of ancient and modern man.
- Understands the importance of clothes.
- Collects data related to the sources from which we get raw materials for making clothes.
- Understands and appreciates the people and their effort to make clothes for us.
- Gets idea about types of clothes that we wear on different occasions.
- Collects information about different types of uniforms for different jobs or professions.

Major concepts

1. There are different types for men, women, boys and girls.
2. Ancient men wore leaves and animal skins as their dresses
3. Clothes make us to appear smart, cover and protect our body and keeps the body warm.
4. We wear different types of dresses.
5. Clothes are made of different raw materials- fibres from plants, fibres from animals and artificial fibres.
6. The dresses we wear are the product of efforts of many people.
7. We wear different dresses on different occasions.
8. Professionals and work men have different uniforms.
9. We wear different clothes in different seasons.

Learning Experiences:

Activity:1 Introducing the unit

- Teacher presents the opening situation given in the text.
- Teacher says: Observe the picture and make the list of dresses.
- Students write one by one.
- Father……. Mother…….. Sonu…… Sana……
- Let students write in their note book.
- **Assessment: Entries in the Note book.**

Activity 2: Dress at School Dress at home

- Group work
- Let each group discuss and write.
- Group's presentation
- **Teacher consolidates.**
- We wear casual dress at home and we wear uniform at school
- **Assessment: Entries in the note book.**

Activity 3. Compare the dress of Ancient man and Modern man

- Picture observation
- Complete the table on page no.225
- **Assessment: Entries in the Note book – Completed table.**

Activity 4 : Discussion- why do we wear clothes?

- Teacher asks to read the points given in the text book.
- Students write in their note book.
- **Assessment: Entries in the note book**

Activity 5 Make a list of dresses we wear.

- Teacher generates a discussion.
- Students list out
- Teacher consolidates.
- **Assessment: Entries in the note book.**

Activity 6 How clothes are made?

- Illustration analysis. Writes under each title of the table given on page 228.
- Fibres from plants Fibres from animals Artificial Fibres
- **Assessment: Completed table properly**

Activity 6 Our Dress- Effort of many

- Group work
- Picture observation-identify the people involved in work in each picture.
- Teacher explains the various people's contribution to make our dress. Students should appreciate the hard work and effort of all people to make our dress.
- **Assessment : Entries in the note book**

Activity 7 Types of clothes

- Individual activity (Can be given as home assignment.)
- Check the assignment of each child and make corrections if any..
- **Assessment : Matching the pictures correctly.**

Activity 8 Traditional clothes

- Let them identify the traditional dresses with the respective countries.
- **Assessment: Entries in the note book- identified correctly**

Activity: 9 Casual wear

- **Teacher says:**
- Which are the types of dress we wear at home?
- Group work
- Discussion
- Making list of dresses that we wear at home.
- **Assessment: Entries in the note book,**

Activity 10 Uniforms

- Individual activity
- Let each student identify the uniform in each picture
- Teacher provides help those in need to any one.
- Teacher consolidates.
- Uniforms are special clothes to show that a group of people belong together.
- **Assessment: What are uniforms? Identified the uniform in each picture**

Activity 11 Seasons Change Clothes too.

- Teacher says
- Look at the illustrations
- Identify the pictures
- Group work
- Let each group read the matter.
- Make notes on Seasons and Clothes.
- Teacher explains the matter given in the text. Let them read it and write in their Note book.
- **Assessment: Notes in the Note book**

WORKING GALLERY

1, Aneesh - Picture 3 Wear Warm woolen clothes.
2. Vivek - Picture 1 Wear rain coats.
3. Ameen – Picture 2 Wear light cotton clothes.

2. Demonstrate how to make doll using used clothes.
Let them observe each step and prompt them to make a doll

3. Let each child colour all three dresses. Give as home assignment)

4. Make Picture album of traditional clothes of different countries.(Home assignment)

11 Keeping our Environment Clean

Introduction

- This unit deals with the situations around us where wastes are accumulated. These situations lead to air pollution, water pollution, etc. These types of pollution cause many hazardous effects to people. We intend to make the students aware about the importance of reducing pollution in all possible ways. Let them understand the basic ideas about how air, water are getting polluted. They should develop an attitude to keep the environment clean and tidy and reduce pollution. The unit provides a lot of experiences from their day to-day life. As a part of this unit, students should get opportunities for observation, classification, analysis and experimentation and an environment -friendly attitude to be developed among the children. Plan and implement the learning experiences to enable each learner to achieve the above-mentioned concepts, process skills, attitudes and values.

The learner:

- Gets idea about various situations that lead to pollution.
- Identifies what is pollution.
- Understands how air gets polluted.
- Classifies pollution- Air pollution, water pollution, soil pollution etc.
- Gets awareness that polluted air causes diseases.
- Understands that plastic is harmful and causes severe dangers.
- Develops positive attitude to keep our surrounding clean.
- Understands and practises the various ways to minimise plastic pollution.

Major concepts

1. There are a variety of situations that lead to pollution.
2. The wastes from different sources make the rivers polluted.
3. Pollutants make air, water, soil dirty and unhealthy.
4. There are many factors which make the air polluted.
5. We can minimise pollution by many simple ways
6. Air is the breath of life.
7. Plants and animals need fresh air to live.We must keep air clean
8. Water is said to be polluted when it contains harmful things. Things that pollute water are called water pollutants.
9. Plastic will not break down in the soil. Hence it pollutes the earth.
10. We can minimise Plastic pollution by- Reuse, Reduce, Reject, Recycle.
11. Water, air, soil are highly needed for life. Pollution of these affects the life.

Learning Experiences:

Activity:1 Introducing the unit -Picture Observation

- Teacher asks: Observe the pictures carefully.
- Which are the situations that affect the people?
- Sit in groups
- Reads the content in the text
- List down the situations.
- Group presentation
- Teacher consolidates: The different situations that affect people
- **Assessment: Entries in the note book.**

Activity 2 Factors leading to the situations of pollution

- Let students read the points in the text.
  - Teacher seeks for more points
  - Elicits responses
  - Writes on BB

- **Teacher consolidates.**
  - Throwing of wastes.
  - Draining of wastes into rivers
  - Smoke from vehicles.
  - Bathing of animals in rivers
  - Washing vehicles in rivers
  - Animal wastes

Activity 3 Pollution…. Pollutants

- Teacher explains: What is Pollution? What are pollutants?
- Pollutants make air, water and soil dirty and unhealthy.
- **Assessment: Entries in the Note book.**

Activity 4 Air Pollution

- Picture Observation
- Individual Activity
- Let the students observe the picture
- Ask them to read the points given in the text.
- Let each child add more points
- Teacher consolidates.
- **Assessment: Situations that lead to Air Pollution – Notes**

Activity 5 : Listing of Air pollutants

- Individual activity
- List the factors that pollute air
- **Assessment : List of Air pollutants Note Book entries.**

Activity 6 How can we minimise Air Pollution?

- Group work
- Let each group read the content given in the text
- Teacher explains each point
- Students make notes.
- **Teacher consolidates.**
  - Air is the breath of life. Plants and animals need fresh air to live.
  - We must always keep it clean.
- **Assessment: Entries in the Note book**

Activity 7 : Water pollution

- Let the students go through the dialogue.
- Focus on the question
- What will happen if the water in the tank gets polluted?
- Let them find out the answer from the text.
- Ask them to write in the note book
- **Assessment: Write up in the note book.**

Activity 8. Let's do an experiment.

- Does water contain air?
- How can we find out
- Teacher explains the procedure.
- What all materials we need?
- A beaker, lamp tripod stand, match box
- Then teacher demonstrates the experiment.
- Let students observe.
- They repond: Air bubbles are forming
- Teacher concludes.
- Yes. water contains air.
- Now, let them write the Record of experiment.
  - Title
  - Aim
  - Materials required
  - Procedure
  - Observation
  - Conclusion
- **Assessment : Record of experiment -Does water contain air?**

Activity 9 How does the water gets polluted?

- Group work
- Let each group read the textual content
- Let them find out how water gets polluted?
- Teacher consolidates.
- Water is said to be polluted when it contains harmful things. Things that pollute water are called Water Pollutants.
- **Assessment : Notes in the book**

Activity 10 : Methods to reduce water pollution

- Group work
- Let each group read the content given and

make notes
- Teacher gives proper additons.
- Teacher consolidates the Importance of water (Given in the text)
- **Assessment: Entries in the Note book**

Activity 11 Plastic – a terror

- Listing of plastic materials we use everyday. Individual activity
- Then let them sit in groups and share the items and extend the list.
- Let the same group list out the damages caused by Plastics.
- Let them read the textual content and make notes
- Teacher consolidates the damages.
- Plastic will not break down in the soil. Hence it pollutes the earth.
- **Assessment: write up Plastic – a terror**

Activity 11 What can we do to minimise the Plastic Pollution

- Group work
- Let the group observe the 4 R cycle.
- Teacher explains what each word means.
- Let the students read the matter given in the text, associated symbols.
- Teacher consolidates the matter given in the box.
- **Assessment : 4 R cycle and write-up**

Activity 12 : Let's Prepare Placards

- Draw their attention to the placard sentences given in the text.
- Explain it.
- Give the task as home assignment
- Display the Placards in the class
- Select the best one by discussing each placard.
- **Assessment: Placards against Pollution.**

WORKING GALLERY

1. Answers
   - Carbon monoxide
   - Plastic
   - Burning plastics
   - LPG

Complete the statements.
- Carbon dioxide
- Oxygen
- Smoke, Fine particles from cement factories
- Bathing cattle in rivers, throwing wastes to rivers.
- Make compost. Avoid accumulation of wastes.
- No. plastic is useful in our day to-day life. But Re use, Reduce, Reject, Recycle

Match the following

Smoke : Air pollutant
Plastic : Will not decay
Sewage : Water pollution
LPG : Smokeless fuel

- Arrange the following words suitably in the table given below
- Meat, plastic, paper, glass, metal, food waste, vegetable waste, tiles, concrete

Those that will decay	Those that will not decay
Meat Paper Food waste Vegetable waste	Plastic Glass Metal Tiles Concrete

- Prepare speech- Bad effects of using plastic. Home assignment
- Prepare Placards:

Pollution Kills

Kill Pollution

SAY NO

TO PLASTIC

edufy publications

SOCIAL SCIENCE

Semester 2

GRADE - 3

TEACHERS RESOURCE MANUAL

SOCIAL SCIENCE
Grade 1

4 Keep Clean and Go Green

Introduction

- Pollution is the introduction of harmful substances or energy into the environment that causes adverse effects on living organisms. It's like littering our planet.
- The chapter' Keep Clean and Go Green' will help the learners to understand, the ill effects of pollution and different types of pollution. They get ideas on sustainable energy and how it is important. It also explains different types of sustainable energy and how to save energy effectively.

Learning out comes

a) Knowledge based

Learner will be able to

1. Define pollution and its different types (air, water, land).
2. Identify the primary sources of pollution (e.g., industrial activities, transportation, agriculture).
3. Explain the harmful effects of pollution on human health, ecosystems, and the environment.
4. Understand the concept of environmental impact.
5. Recognize the global and local impacts of pollution.

b) Skill based

1. Assess the role of individuals, communities, and governments in addressing pollution.
2. Propose innovative solutions to reduce pollution and promote sustainable practices.
3. Communicate effectively about pollution issues to diverse audiences.

c) Attitude and Value based

1. Develop a sense of environmental responsibility and stewardship.
2. Appreciate the importance of clean air, water, and land.
3. Embrace a proactive approach to environmental conservation.
4. Cultivate a positive attitude towards sustainable living and green technologies.
5. Promote pollution reduction and sustainable practices within their communities.

- Approximate time envisaged for the transaction of the unit
  a) Indoor class room interaction:
  b) Out door activities :

TO THE ACTIVITIES

Introductory Activity

- The teacher shows the picture of a polluted pond and ask them whether they have seen such water bodies. Elicit responses.
- Then the teacher begins the lesson by telling them that Balu and his friends saw such a pond on the way back from the field. Enters the text and discusses on the waste items people usually dump to the water bodies.
  - ? Why do people do such activities.
- **Elicit responses.**
  - ? What other activities might lead to water contamination.
- Let the learners find and write individually. Then discussion and betterment can be done in groups. Later on, group presentation and editing.

Other Activities

- Teacher continues with the lesson and asks them whether they can give an explanation on how dumping waste affect the environment?
- **Elicit responses**
- After that, the teacher explains how oxygen level will decrease when waste materials are dumped in water bodies and how it will affect the living beings in water.
- Teacher continues with the lesson and asks whether they think dumping waste in water

bodies will affect other living beings, if so how? Elicit responses.

- Then leads them to the idea that the after effect of dumping is levelling off water bodies.
- Teacher also explains that people have other reasons for the levelling of water bodies.
  - "Can you guess those reasons and what are the after effects?"
- Let them write their opinions and then discuss in groups and present it.
- Then let the teacher fill the gaps.

- Here the teacher can ask the learners to talk to the elders about the number of water bodies that had got filled over the years and encourage them to make a project on the same.
- Now the teacher asks them about the other landscapes which have pivotal part in water conservation.
- **Elicit responses.**
- How do they help in water conservation? Group discussion and presentation.
- The teacher continues with Aman's and Balu's story and asks about the other types of pollution they know.
- **Elicit and records the responses.**
- Here the teacher leads them to the concept natural resources and gives an explanation on the same.
- Importance of air, water, soil and sunlight can be discussed and explained here.
- The teacher can show the picture of solar panels and ask what it is.
- She also asks why solar energy is very important now a days.
- Explains the concept of sustainable energy.
- The teacher continues with the story and asks the learners to write down how soil is polluted, what are the aftereffects and how can we stop soil pollution.
- Individual writing, group discussion and presentation.
- Here the teacher can do the activity 'treasure hunt' from 'the working gallery'
- Let them find out the other types of pollution and record them in the same way.
- After that the teacher asks them to check the table, given in their textbook, ' pollution and environmental effects' and asks them to write down how these activities affect the living beings.
- Discussion on, how these pollutions can be reduced. Let them do it in groups. Presentation of group findings and editing can be done after that.
- The activity 'Recycled craft' should be done in the class, and an exhibition can be conducted in the school.
- Other working gallery activities can be done after the unit

5 Public Institutions and Their Services

Introduction

♦ Imagine a world without schools, hospitals, or police stations. It would be chaotic, wouldn't it? That's why we have public institutions! These are special places that help us live better and those who work in public institutions make our community better.

Learning outcomes

a) Knowledge based

Learners will be able to

1. Identify the key public institutions in the community (schools, hospitals, libraries, fire stations, police stations etc).
2. Explain the primary functions of each institution.
3. Understand the role of public servants in providing services to the community.
4. Recognize the importance of public institutions in maintaining safety, health, and education.

b) Skill based

1. Classify public institutions based on their primary functions.
2. Compare and contrast the roles of different public servants.
3. Communicate effectively about the benefits of public institutions.
4. Collaborate with peers to create projects related to public institutions.

c) Attitude and Value based

1. Appreciate the work of public servants.
2. Develop a sense of civic responsibility and community involvement.
3. Embrace cooperation and respect for others.
4. Cultivate a positive attitude towards public institutions.

TO THE ACTIVITIES

Introductory Activity

♦ The teacher shows some pictures of different public institutions and ask the learners to identify them.

♦ Let them write down the names in their notebook.

Other Activities

♦ Then leads them to Balu's and Aman's story. Here Balu has visited the post office. Have you ever been to a post office?

♦ Ask some questions like:
- Which is your nearest postoffice?
- Why did you go?
- What did you observe?
- How many people were working there?
- What were they doing ? Etc.

♦ to those who claim they had visited.

♦ Now explains them the functions of a post office.

♦ Here the teacher can arrange a visit to the nearest post office. She can encourage the learners to prepare a questionnaire to ask to an official and get information on the working of the post office .

♦ Back to the story with Greeshma's question,"Do we have other institutions that provide services to the public?"

♦ Let them write their responses individually, followed by group discussion and presentation.

♦ The teacher says that school is a public institution and asks the questions in TB page 243. Elicit responses.

♦ After that she asks them to fill the table in the same page. Group discussion would be preferable.

♦ Back to the unit
- Aman's father is going to attend the 'Grama Sabha '.
- Have you heard about 'Grama Sabha '?

- From your family who usually attends 'Grama Sabha '?
- What do people discuss in 'Grama Sabha '?

♦ **Elict responses. Explains more about 'Grama Sabha'.(TB page245)**

- Let them complete the activities in TB page 246.
- The teacher goes to TB page 247 and explains the importance of a public library and computer centre in each ward.
- Next, the teacher can ask the learners, which public institutions would they think is essential for future in their society.
- Let them discuss in groups and give their opinion.
- List those institutions and ask them, why are they important.
- After that, let them complete the activities in Page 249&250

6 NORMS! RULES! AND LAWS!

Introduction

- Norms, rules and laws are like guidelines that help us behave in a way that's kind, fair, and safe. They're like the traffic lights for our lives, helping us know what to do and what not to do.
- By following these, we show that we care about others and want to make the world a better place. So, let's all be good rule followers and make our lives more peaceful and enjoyable!

Learning outcomes
learner will be able to

a) Knowledge based

1. Define norms, rules, and laws.
2. Identify examples of norms, rules, and laws in different settings (home, school, community).
3. Explain the purpose of norms, rules, and laws.
4. Understand the consequences of breaking norms, rules, and laws.

b) Skill based

1. Classify different types of rules and laws.
2. Analyze the impact of rules and laws on individual behavior and society.
3. Evaluate the fairness of rules and laws.
4. Communicate effectively about the importance of following rules and laws.

c) Attitude and Value based

1. Appreciate the role of rules and laws in maintaining order and safety.
2. Develop a sense of responsibility and accountability.
3. Embrace cooperation and respect for others.
4. Cultivate a positive attitude towards following rules and laws.

TO THE ACTIVITIES
Introductory Activity

- The teacher plays a video on traffic lights
  - https://youtu.be/I2guwOzXDIM?si=24S55JmlKbxlqIv6

- Then the teacher continues with the story of Balu and Aman and asks the learners some questions like:
- Why did Aman's father stop his vehicle at the zebra crossing?
- **Elicit responses.**
- After that asks to list out the rules we must follow on roads.

- Individual writing, consolidation in groups, let them segregate it as rules for commuters and for drivers. presentation.
- What happens if the travelers put their heads or hands out side, discuss and write the findings in the given space in TB page 254.
- Continues with the details on traffic light. As the learners have already seen the video it would be easy for them to answer the questions about traffic lights.
- For example,
  - When should the driver stop his vehicle? What is green light for?
  - What does yellow light indicate?
- Here the teacher can make them perform a role play on traffic lights. Let them complete the activity on TB page 256 also.
- The teacher continues with the following part of the unit and asks about the rules they must follow in their school.
- Individual writing, consolidation in groups, presentation. Then discusses on the responsibilities as learners.

- Continues with the same process as the previous one.
- The teacher then explains the topic 'rules for betterment'.
- After that they are encouraged to fill the columns on TB page 259.
- Learners can do the activities in the working gallery and paste those posters in class rooms and school premises.

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Semester 2

TEACHERS RESOURCE MANUAL

SOCIAL SCIENCE
Grade 4

GRADE - 4

4 BEYOND BORDERS

Introduction

- The unit Beyond Borders invites students to see maps not merely as fixed divisions but as a starting point to explore the wider, borderless world. While students will learn about the states and boundaries of India, this unit offers them something far more enduring: the chance to question the true significance of borders and discover the common humanity we share beyond them.
- Instead of conventional map study, students will engage with Google Maps, uncover connections through jigsaw puzzles, and read a poem that whispers, "wind has no boundaries, birds have no boundaries." These elements encourage students to reflect on the natural world's disregard for man-made borders. By showing that boundaries may define space but not spirit, this unit encourages empathy, curiosity, and a sense of global citizenship.
- As teachers, you have the opportunity to bring this vision to life by guiding students to explore the world with both a critical eye and an open heart. In Beyond Borders, map learning becomes a journey in understanding that while lines on a map might separate us, the values of kindness, respect, and shared human experience are boundless. Let this unit be a powerful reminder that the world is more interconnected than divided, and that it is our connections, not boundaries, that truly define us.

Learning Outcomes

a) Conceptual

1. Identifying the names, location, and some basic geographical features of Indian States
2. Understands the location and borders of our country
3. Understands some basic geographical features of the country

b) Skill based

1. Map reading Skills like locating, calculating distances etc.
2. Map making/drawing skills
3. Skills in using modern geographical applications

C) Attitudinal

- Discovering the common humanity we share beyond borders.
- Innovative Mapping techniques
- The unit begins with an episode related to a school study tour. Google Mapping technique, very useful for locating places, identifying the most suitable route and details of this routes is introduced in the beginning. You must have been familiar with this application. Our students also have to be familiar with the use of such modern mapping techniques. Also try to introduce more digital mapping applications according to the comprehension capacity of the Grade 4 children. Here are some examples.
  - Waze
  - Google Earth
  - Earth 3D
- The first task assigned to the students is to find out the route map from their home location to a destination. You can demonstrate this by opening google map app on your mobile phone, type a destination and take the screen shot of the map appearing. Let the children repeat the exercise at home with the mobile phone of their parents. Let us help those who are not able to complete the task at home. Also help them to draw the map on page 233 or taking a print out of the screen shot and pasting it in the place mentioned in the TB

Know our States

- Activity on Page Number 234 and 235 is meant for developing a deeper understanding about

the location of Indian States. The activity can be done as a group task. Let each group fill up the table on a piece of paper and share it in the class. After discussing the mistakes if any, the students can complete the table on page number 235. More items can also be added in the table

Quiz time

- As explained on page number 236 a group quiz can be conducted in the class which will be an exciting experience. Let the children prepare questions regarding the geographical features of Indian States and conduct quizzes themselves. This can be used as an assessment activity.

The Indian Jigsaw

- The jigsaw activity can also be conducted in a healthy competitive mood. This also can be used as a learning cum evaluation activity.

Indian Borders

- The next two pages discuss the borders of India. These include our neighbouring countries sharing borders, the imaginary border lines between two of our neighbouring nations. The video clip in the following Q R code may help the children to have a clear picture about o u r neighbouring countries.

Beyond Borders

- Along with all the discussions about borders our focus is on the universal brother hood and humanity lying across borders. The brief history of Indian Sub-Continent and the little poem in the boxes (Page 239) do emphasis on this point of universal love beyond borders. The meaninglessness of borders and value of love beyond borders have to be inculcated among our children.

Working Gallery and Unit Assessment

- As in the earlier chapters, activities in the working gallery can be utilized for unit assessment also. For remediation of academic gaps if any

5 "Our Power, Our Rules"

Introduction

- Instilling Civic Responsibility and Community Awareness Introduction
- The unit "Our Power, Our Rules" in the Grade 4 Social Science textbook introduces young learners to one of the foundational aspects of our democracy – the local self-government. Through this unit, we have the opportunity to foster civic responsibility, teaching children not only about governance structures but about their role as active, thoughtful members of their community. By understanding the three-tier system of local bodies—panchayats, municipalities, and corporations—students will grasp how each plays a crucial part in addressing the immediate needs of society, like maintaining clean water, good roads, and accessible healthcare.
- At its heart, this unit aims to make civic sense an integral part of a child's awareness from an early age. This is not just a lesson in social science; it's a chance to connect children to real-life community issues. Topics such as pollution, road maintenance, public health, and resource availability are introduced to help children recognize these as areas where change can and should happen. Students are encouraged to see themselves as voices of the community, capable of identifying these concerns and engaging with local bodies for solutions.
- For teachers, this unit presents a valuable moment to inspire. It's about helping children understand that governance is not distant or abstract but something that has direct impacts on their daily lives. By teaching "Our Power, Our Rules," we guide students to take pride in their community and show them that their voices matter. In doing so, we empower the next generation with the knowledge, skills, and sense of duty necessary to become responsible citizens. This unit is not just a lesson but a starting point for lifelong civic engagement and social awareness.

Learning outcomes

a) Conceptual

1. Duties and Responsibilities of Local Self Governments
2. Three tier system of local self-government
3. Importance of local self-governance

b) Skills

1. Conducting interviews with structured questionnaires and extracting information

c) Social Attitude

1. Awareness about the local issues
2. Positive attitude towards solving local issues with the help of local self - governments

- The unit begins with a discussion on the responsibilities of local self -governments subsequent to an incident in which the teacher required a permission from the local self-government to construct a house. The box with the title 'We are governed by us' gives some basic information about the structure of the local self-government.

Address Card

- The questions below the box are to be answered by each child and an address card is to be prepared by all.
- In the table below number of corporations, municipalities and grama panchayaths are to be written and their names can be written in the note book

Details of Block Panchayaths and District Panchayath

- On Page number 246, children are required to

fill up details of Block Panchayath and District Panchayath. They may be given the freedom to fill up the details of their own Block Panchayath and District Panchayath

Duties and Responsibilities of LS Gs

- Important duties and responsibilities of local self-governments are detailed on pages 246 and 247. But this is the crux of this unit. Hence a representative of the local body has to be invited to the school and an interview has to be conducted in this regard. For making the interview systematic, a questionnaire can be prepared in advance and details of the interview process can be determined by discussions. Care should be taken to ensure that the outcome of the interview are systematically documented.

Dream of Mahatma

- This section has to be discussed so that a positive awareness and activistic attitude should be created among the children to be sensitive about local issues and be prepared to bring them before the authorities.

6 "The Festive Palette"

Introduction:

- India is a land where art, dance, music, and festivals come alive, each state adding its unique hues to a vivid tapestry of traditions. From the intricate paintings of Madhubani in Bihar to the vibrant Kathakali performances of Kerala, and the soulful sounds of the sitar to the beats of the Tabala, our cultural expressions are as diverse as the people who create them. This rich artistic heritage is not just a series of facts to remember—it is a story of who we are and what binds us together as a nation.
- This unit, "The Festive Palette" on the artistic heritage of India, goes beyond memorizing names and places. It is designed to awaken a sense of pride in our students, allowing them to see themselves as part of this living tradition. Through activities that encourage students to explore, share, and discuss, we aim to make cultural learning a joyful experience.
- One of the unique methods introduced here is the creation of a virtual WhatsApp community where children from different parts of India can share and celebrate the festivals, customs, and art forms of their regions. This approach not only brings learning into a space they find exciting but also builds connections across states, helping students experience the beauty of diversity firsthand.
- As teachers, your role in this unit is to be both a guide and a storyteller. Encourage your students to appreciate the diversity of Indian culture, inspiring them to take pride in their heritage. Help them see beyond the information and recognize the joy, artistry, and human stories that each cultural expression holds. Through this journey, let's instill in our young learners a deeper respect for India's cultural wealth and a lifelong curiosity to explore it further.

Learning Outcomes

a) Conceptual

1. Understanding the important features of traditional Indian art forms like Madhubani, Rangoli, Warli etc
2. Understands a brief history of Indian Painting Mohenjo-Daro, Pichwari, Mughul miniature paintings, Cave paintings in Ajanta and Ellora, South Indian Paintings etc
3. Able to point out examples for the excellent architectural heritage of India- Dravidian Temple architecture, Mogul architecture- Gupta architecture and Buddhist architecture
4. Understands some basic details about different festivals being celebrated in different Indian States and different sections of people
5. Identifies some important dance forms of India popular in different regions and among different social groups
6. Recognises some important musical instruments of India

b) Skill based

1. Utilising social media for exchanging information
2. Distinguishing different art forms , architectural monuments and musical instruments on the basis of their salient features

C) Attitudinal

- Fostering pride and reverence towards rich artistic heritage of our country

Colours of Tradition

- The unit begins with an activity drawing some pictures given in the T B on a piece of paper with crayons. Let it be an engaging activity with enthusiasm and competitive spirit. Later let the children watch the videos in the QR codes below and be proud to recognize that they were recreating some of the traditional

Indian art forms. Pictures and the description in the box (Page No252), provide some hints to the artistic tradition of India in the field of Painting and Architecture

- Now can we attempt creating an educational video on Indian painting and Architecture? you might consider a visual journey that spans various influential periods and styles. Here's a potential outline for each period, based on historical context and major artists and styles:

1. Indus Valley Civilization (circa 2500 BCE): Begin with prehistoric rock art from Bhimbetka and simple terracotta sculptures from the Indus Valley, which showcase early human and animal forms and patterns.
2. Buddhist and Hindu Art (circa 3rd century BCE to 7th century CE): Explore the narrative-rich cave paintings at Ajanta and Ellora, with their intricate depictions of Jataka tales and religious iconography. These works demonstrate early mastery in fresco and mural painting and reflect the spiritual themes of the era.
3. Medieval Miniatures (circa 16th-18th centuries): Move to the Mughal miniature style, a blend of Persian and Indian art traditions, emphasizing intricate detail and vibrant colour. Highlight examples from artists like Basawan, who brought life to historical and royal scenes, illustrating daily life, legends, and courtly life.
4. Pichwai Painting: Originating in Rajasthan, this style is dedicated to the worship of Lord Krishna, known for its depiction of lush landscapes and scenes from Krishna's life.
5. Colonial and Post-Independence Influence: Introduce artists like Raja Ravi Varma, who integrated European techniques and Indian subjects, making art accessible to a wider audience. This section can show how Indian art evolved under colonial influence, adapting Western techniques while maintaining Indian themes.
6. Bengal School and Modern Indian Art: End with the Bengal Renaissance and modern artists like Abanindranath Tagore and Nandalal Bose, whose work was instrumental in reclaiming Indian identity and promoting swadeshi art. Tagore's and Bose's work reflect a nationalist spirit with influences from Japanese and traditional Indian styles.

- For producing video clips, you could use a mix of high-quality images of artwork, close-up details, animations to show stylistic changes over time, and short narrations on each style's cultural and historical significance. Many educational resources, art databases, and museums provide licensed images or public domain works you can use for educational purposes. Please watch the videos in the following Q R codes

- The videos will definitely be helpful in assisting the children to fill up the worksheet on page number 253. Now let us prepare for the art exhibition as suggested on page 253.

Festivals on the class room walls

- It would be interesting for the children to participate in the activity 'Celebrating Diversity' mentioned on Page number 253. We have only to collect some pictures of festivals of India and also some sticky notes. Try it

Festival Fun Club

- The WhatsApp chat about festivals of Indian States is a novel activity which would attract the children. You may consider this as a new strategy for using social media platform for pedagogic purposes. Try to replicate this

strategy by forming a similar WhatsApp group including children from different regions. At least , it will not be difficult to form a similar group with children from other districts of your own state.

- Worksheet on page 260 has only some sample questions on the topic. You may add more items and make it a comprehensive evaluation activity.

Beauty of Visuals and Sounds

- From Page 260 to 266 there are short descriptions of many classical and other artforms of India. These descriptions will not help the children to identify the basic features and beauty of these artforms. Let the children experience them with the help of videoclips available in YouTube etc. Some samples are there in the T B. Find out more appropriate clippings. Add more questions to the activity on page number 266.

The Sonic Harmony

- The message in the box highlighting the amalgamation of cultures and contributions of different sections of people in creating Indian Composite culture should be retained in the minds of children even after the completion of the unit

Musical Instruments of India

- Here in the case of Musical Instruments of India also, mere black and white descriptions will not make our children to recognise and appreciate these instruments.
- Let them listen to these instruments and make them capable of identifying them. The following video in the Q R code may help you

Working Gallery and Unit Assessment

- Activities in the working gallery can be appropriately made use of as unit assessment activities.

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Semester 2

TEACHERS RESOURCE MANUAL

SOCIAL SCIENCE
Grade 5

GRADE - 5

4 DEMOCRACY DYNAMICS

Introduction

- In a democratic nation like India, understanding the principles and functioning of governance is crucial for young learners. This unit, "Democracy Dynamics," introduces Grade 5 students to the core institutions that uphold democracy and ensures they grasp the fundamental roles of the legislature, executive, and judiciary. Through this unit, students will explore the responsibilities at both the central and state levels, as well as the balance of power and accountability between these pillars of government.
- Our approach in this unit emphasizes experiential learning: students are encouraged to engage in activities that illuminate how laws are made, enforced, and interpreted, and how each branch interacts with the others to maintain a balanced and fair governance system. This teacher resource book aims to empower educators to confidently navigate these topics, providing tools, strategies, and insights to make this complex subject accessible and engaging for young minds. Together, we will guide students towards not only understanding the structure of their government but also valuing their role in a democratic society.

Learning Outcomes

a) Conceptual

1. Understands the major duties and responsibilities of State and Central Government
2. Able to separate state list, central list and concurrent list
3. Separating the roles of legislature, executive and judiciary
4. Understands the concepts 'checks and balances' and 'separation of powers'

b) Skill based

1. Conducting an interview for drawing out information with pre designed questionnaire
2. Role Playing, Skit making etc

c) Attitudinal

1. For the success of democracy all the three branches should work together as a team
2. There should watch over each other to keep things fair

TO THE ACTIVITIES

- This unit is an extension of 'Our Power Our Rules', a unit in Grade 4 which discusses the duties and responsibilities of local bodies. Please go through that small unit before beginning this unit.
- The unit begins with an interesting episode of two school children visiting the president of the local body for the repair of a public road. You can make use of this discussion for encouraging our students to be aware of their public responsibilities and social commitment.
- Along with the discussion let the children find out the names of national highways and state highways of the districts and complete the worksheet on page 262.
- The discussion leads to an interview with MLA. If possible, you can replicate this activity in your school. Even if MLA is not available somebody who can explain the duties of members of legislative assembly and ministers can be invited to the school for a talk or interview, which definitely will be a variety experience. We will discuss this in detail later.

Filling the Table of Ministers

- This exercise on Page 263 is a simple task which can be given as a home assignment for avoiding a break in the interview with the MLA and also to save time. But let some of the students share their table contents randomly in the class next day.

The discussion continues…..

- Let us come back to the text for continuing the discussions. The strategy used here is to lead students to some explorations and activities in between the textual narration. As you can observe, the query made by Sumi about the role of MLA leads to the filling of another worksheet regarding the assembly constituencies. This worksheet can also be given as a home assignment but should be shared in class randomly.
- On Page number 264, it is narrated that the MLA shows some media reports about the laws passed in the assembly. We can replicate this activity by asking children to collect some news regarding the law-making exercises of the legislative assembly. We can also show some such reports in the class. The intention of these activities is to provide some ideas about the role of state assemblies.

Legislature, Executive, Judiciary

- The small box on page number 264 briefly says about the three branches of democracy. But it is a little complicated concept so far as our grade 5 children are concerned. Let us try some concrete experiences related to class room rules. Let us create some rules regarding cleanliness, punctuality through general discussions. Let some leaders selected by the class to implement the norms and you yourself can act as rule interpreter when disputes arise.

Mix and Match

- This activity in Page 264 is supposed to be an evaluation activity. Ask the children to draw an arrow from the items on the left column to the baskets on the right. We can convert this activity in to an interesting game by writing the items on the left on some cards and ask the children to put the cards in appropriate paper baskets made with labels.
- The video clip in the following Q R code may help the children to understand the concepts
- Separation of Power and Checks and Balances in Democracy
- The two boxes in Page Number 265 is the soul of this unit and is the main attitudinal value to be inculcated among children for training them for democratic citizenship. The concepts may not be clearly understood by our grade 5 children but a seed of this thought has to be sown in their minds using class room examples.

Let us do

- The 'Let us do' exercise on page 265 can be utilized again for assessment of the achievement of concepts learned so far regarding the role of different branches of democracy.

Central Government

- The second part of the unit deals with the same concepts about the central government. Here also the task on page number 267 can be given as home assignment. There are descriptions about items in the Central List, State List and Concurrent Lists. Don't insist upon learning this list by heart. Meanwhile children should be capable of identify the governments responsible for making laws in certain important areas like foreign affairs, defence, police, public health education, etc

Laws in the Class room

- 'Laws in action' is a class room activity meant for internalising the process of law making, law enforcing and law interpreting, Such activities can be repeated with other areas.

Working Gallery

- The items in the working gallery can be made use for unit assessment.

5 India: The Cultural Kaleidoscope

Introduction

- Welcome to a journey through the vibrant mosaic that is Indian culture—a heritage as ancient as it is inclusive, forged over centuries of interaction among diverse peoples and ideas. This unit, India: The Cultural Kaleidoscope, invites teachers to help students see India not merely as a land confined by boundaries but as a legacy of countless exchanges, where each thread of culture and tradition has contributed to the nation's unique identity.
- Starting with the words of Rabindranath Tagore, "Our culture is the co- mingling of races of mutual influences and interaction," the unit encourages students to think beyond maps, borders, or regions. It celebrates the contributions of Vedic philosophy, Buddhist compassion, Jainist ethics, Mughal artistry, and European innovations—all of which have interwoven to create a dynamic cultural tapestry.
- For teachers, this unit is an opportunity to ignite wonder and pride in students for their country's rich diversity. Here, history comes alive not as a static record of the past, but as a living legacy—a kaleidoscope in which every colour, every pattern, reflects the timeless spirit of inclusion and unity in diversity that defines India. Let this be a chapter where students learn to see India in its fullest sense, appreciating how mutual respect and collaboration across different groups have been the foundation of a truly extraordinary culture.

Learning Outcomes

a) Conceptual

1. Territories/ Regions annexed to and separated from our country during course of time
2. Contributions of Indus Valley Civilization
3. Contributions of Vedic Period
4. Principles of Buddhism and Jainism
5. Contributions of Gupta Period
6. Mughal Contributions
7. Major contributions of Chera, Chola, Pandya, Vijayanagara and Bhamini kingdoms
8. Positive influence of Europeans in India

b) Skill based

1. Map reading skills-Comparing and Contrasting Maps
2. Extracting information from digital sources

c) Attitudinal

1. Indian culture is a mixture of different cultures and it has the contributions of different sects of people. This diversity is the strength of our nation

Begins from Tagore and Ends in Gandhiji

- The journey starts from the quoting of Rabindra Nath Tagore which indicates the inclusive nature of Indian culture which is a blending of many cultural streams and ends in the words of Gandhiji which also highlight our culture, as a synthesis of all the cultures of the world .Contributions of different sects of people to the Indian cultures which make it composite are interwoven in between these two quotes.
- The questions below Tagore's quote, ("India has never had a history in the European sense of the term…. always, even when we were politically subject to other countries... Our culture is a product of the co- mingling of races, of mutual influence and interaction, in which …… have blended to make what is India.") are meant for ensuring that the children imbibe the basic essence of the quote and must not insist on same response from all students.

Possible Answers are

- We have had a creative past

- Our culture is a product of the co- mingling of races
- Our culture has mutual influence of Aryan, Dravidian, Tibetan, Persian, Arab, and European element
- Many cultures have been blended to the Indian composite culture

♦ Enduring Culture beyond borders and boundaries

♦ There are 5 Maps and some questions below this title. Let children answer the questions by examining the maps. The questions can be divided and given to groups and later let the group share the answers in the whole class. The expected answers are

♦ South India was not a part of either Mauryan or Gupta Empire.

♦ Only a part of South India was part of the Moghul Empire in 1605

♦ Regions now in Pakistan, Afghanistan, Bangladesh, Myanmar etc were once part of ancient Indian Empires

♦ On the eve of Independence, Regions now in Pakistan and Bangladesh were part of India

♦ When India became independent on August 15, 1947, several princely states and regions were not initially part of the Union of India. Some notable examples are:

1. **Hyderabad** - A large princely state in central India, Hyderabad was ruled by the Nizam, who initially chose not to join either India or Pakistan. It was incorporated into India in 1948 through "Operation Polo," a military operation.
2. **Jammu and Kashmir** - The Maharaja of Jammu and Kashmir initially wanted to remain independent but eventually acceded to India in October 1947 after the Pakistani tribal invasion. This accession led to the first Indo-Pakistani war.
3. **Junagadh** - A small princely state in modern-day Gujarat, Junagadh's ruler wanted to join Pakistan. India integrated Junagadh after a plebiscite in 1948.
4. **Travancore** - In southern India, the princely state of Travancore initially declared intentions to remain independent. However, it acceded to India in 1949.
5. **Manipur and Tripura** - Located in the northeast, these princely states acceded to India in late 1949 after initial resistance.
6. **Goa, Daman, and Diu** - These were Portuguese colonies until 1961, when India liberated them through a military operation.
7. **Sikkim** - Sikkim was a protectorate of India after 1947 but was not fully integrated as a state until 1975.
8. Mahe was not originally part of independent India in 1947. It was a French colony and remained under French control along with the other French settlements in India: Pondicherry (now Puducherry), Karaikal, and Yanam.

♦ Mahe was incorporated into India in 1954 following a series of negotiations and a local referendum in which the people expressed their desire to join India. However, it was only in 1962, after formal agreements between India and France, that Mahe and the other French territories were officially ceded to India. These territories now collectively form the Union Territory of Puducherry.

♦ *The above questions can only be answered by examining the maps sharply. Our children may not be able to identify all the regions annexed and separated from ancient times to the present days. Such accuracy is not expected, but there should be enough experience in reading the maps and finding out data, by comparing and contrasting maps. The main purpose of this exercise is not only developing map reading skills but also creating an attitude that*

Regions may be annexed or separated during course of time but the culture continues to evolve inclusively-

♦ Focus the discussion on this point. The following pages of the text books are the testimony of the diverse cultural element added to our composite Indian Culture

♦

Indus Valley Civilization

- The objective of this section is to identify the major contributions of Indus Valley civilization
- The Indus Valley Civilization (c. 3300–1300 BCE), one of the world's earliest urban civilizations, made several major contributions that influenced subsequent cultures and civilizations. Here are some of the key contributions.

1. Urban Planning and Architecture

- The Indus cities like Harappa and Mohenjo-daro were built with an advanced understanding of urban planning. Streets were laid out in a grid pattern, with designated areas for residential, commercial, and public spaces.
- Their buildings were made with standardized baked bricks, which demonstrated their architectural knowledge and use of durable construction materials. Cities had sophisticated drainage systems, with covered sewers and waste disposal, indicating an emphasis on public health and hygiene.

2. Water Management and Sanitation Systems

- The civilization had an advanced water management system, including wells, public baths, and reservoirs. The Great Bath in Mohenjo-daro is one of the earliest examples of a public water facility

3. Agricultural Advancements

- The people of the Indus Valley practiced advanced agriculture. They cultivated wheat, barley, peas, and cotton, making it one of the first places to cultivate cotton for textiles.

4. Trade and Economy

- Indus Valley people engaged in extensive trade, both locally and with distant civilizations such as Mesopotamia. They traded goods like pottery, metals, beads, and textiles.
- They developed a system of weights and measures for fair trade practices, with standardized weights made from chert, indicating a regulated economy.

5. Art and Craftsmanship

- Indus Valley artisans were skilled in various crafts, including bead-making, pottery, metalwork (especially in bronze and copper), and terracotta figurines.
- Their intricate jewellery and finely made seals with animal motifs and inscriptions reflect their high artistic and cultural achievements.

6. Writing System

- The Indus script, though not yet fully deciphered, represents one of the earliest writing systems. It was used primarily on seals, which may have served as identifiers for goods or people.
- *The YouTube Videos in the QR codes in page274 also contains some interesting information about Indu Valley Civilization. Please don't insist our children to learn all these facts in Grade 5 itself. They are supposed to learn only the most important contributions of Mohenjo-Daro and Harappa.*

The age of Philosophies

- This section begins with quotes from Rigveda, Upanishad, and Mahabharata. Please bring the attention of our children to the major highlight of the three quotes. Underlying unity, that connects the whole humanity. Only a focus upon this point is expected and don't force the children to learn the quotes bye heart. This focus is highlighted in the box below. This is very important as far as the present national and international scenario is concerned

The gospel of Non-Violence

- In this section, it is only mentioned about some historical monuments related to Buddhism and Emperor Ashoka. Actually the major contribution of Buddhism and Jainism is that both teach us to be kind, peaceful, and caring. The following explanation may help you to conduct a discussion on the values of Buddhism and Jainism

Buddhism

- Who started it? Buddhism was started by a kind prince named Siddhartha Gautama, who later became known as the Buddha.

Main Ideas:

- **Be Kind and Peaceful**: Buddha taught that we should be kind to everyone and everything, including animals. We shouldn't hurt others.
- **Don't Be Greedy**: Buddha said we should be happy with what we have and must not wish for too much.
- **Help Others**: Being helpful and kind to others can make the world a better place.

Jainism

- Who started it? Jainism was taught by a wise man named Mahavira.

Main Ideas:

- **Non-violence**: Mahavira taught that we shouldn't harm any living creature—not even tiny insects! Jain people are very careful not to hurt anyone.
- **Being Honest and Truthful**: Mahavira said it's important to always tell the truth and not take things that don't belong to us.
- **Simplicity**: We don't need a lot of things to be happy. Jain people believe in living simply and sharing what they have with others.
- **Respect for All Life**: In Jainism, people are taught to love and care for all living beings.

- *Serious discussions about cultural contributions and philosophies might be a little boring. Isn't it? Here's a simple story from the Jataka Tales a Buddhist text that highlights kindness, non-violence, and caring for others:*

The Story of the Kind Elephant

- *Once upon a time, in a big green forest, there lived a gentle elephant named Good Heart. Good Heart was known for being very kind and helpful. He had large, soft eyes and always wore a warm smile. All the animals in the forest loved him because he never hurt anyone and was always ready to help.*
- *One day, Good Heart heard a loud cry from the bushes. When he went closer, he saw a tiny mouse stuck in a hunter's trap. The little mouse was very scared and thought the big elephant might hurt him. But Good Heart gently said, "Don't be afraid, little one. I'm here to help you!"*
- *With his strong trunk, Good Heart carefully broke the trap and set the mouse free. The mouse was so happy and grateful. He thanked Good Heart and promised to always be his friend.*
- *A few days later, Good Heart himself was caught in a trap set by hunters. He tried to break free but couldn't. Just when he was feeling hopeless, he saw the little mouse and other animals coming towards him. Together, they chewed on the ropes until Good Heart was free!*
- *The elephant was so thankful to his tiny friend and the other animals. They had all helped him because he had shown them kindness first.*

Golden Age

- Under this title, we are discussing the contributions of Guptas which has been marked in Nation's history s Golden Age. Why such a title has been provided to that particular period? The video clippings in page number page number 277. attempt to answer this question by providing more information about the Gupta period and their contributions. Children need not learn all these information. You can filter them according to the interest and learning capacity of the students in general.
- The worksheet in the same page can be filled up easily by having a general understanding of the period.
  - Sushrutha- Ancient Indian Physician and author of Sushrutha Samhitha, often regarded as the Father of Surgery
  - Kalidasa wrote the poem Shakuntala
  - Aryabhatta Mathematician and Astronomer lived during the Gupta Period

- The concept of Zero was discovered by Brahmagupta an Indian Mathematician

Mogul Marvels

- Children must be familiar with the architectural wonders created by the Mughul Emperors. So they will be interested to go through the virtual tours in the video clips in the Q R Codes. Also encourage children to explore the other contributions of the Mogul period and let them complete the note making exercise in page 278., Children are only expected to prepare a very brief note.
- **For your information**

1. Akbarnama

- Author: Abu'l-Fazl, a close advisor and historian to Emperor Akbar.
- Description: The Akbarnama ("Book of Akbar") is a three-volume chronicle of Akbar's reign. It covers Akbar's life, his conquests, administration, and policies.
- Significance: The third volume, Ain-i-Akbari, is especially famous for detailing the administration, society, economy, and culture of Akbar's empire. This work serves as an essential historical source for the Mughal period.

2. Tuzuki Jahangiri Author: Emperor Jahangir.

- Description: Also known as Jahangirnama, this is the autobiography of Jahangir, Akbar's son and successor. It covers his personal life, thoughts, and events during his reign.
- Significance: The memoirs offer a detailed insight into Jahangir's personality, interests in art and nature, and his views on governance. It is unique for its personal reflections compared to other Mughal texts.

3. Mirza Ghalib

- Lifespan: 1797–1869.
- Description: Mirza Ghalib was a renowned poet of the Mughal period, famous for his ghazals in Urdu and Persian that delve into themes of love, loss, philosophy, and existential thought.
-
- Significance: Ghalib's works reflect the complexities of the declining Mughal empire and its cultural richness. He is celebrated for his profound and introspective poetry, which has had a lasting influence on Urdu literature.

4. Translation of Sanskrit Texts in to Persian during Mughal Period

- Under the Mughals, , many classical Sanskrit texts were translated into Persian to bridge cultural and religious understanding.. These translations promoted intellectual exchange, allowing Persian-speaking Muslims to learn about Indian philosophy, literature, and scientific advancements, fostering a shared cultural heritage.These translations exemplified the Mughals' efforts to create a synthesis of knowledge from both Hindu and Islamic traditions, promoting mutual respect and intellectual enrichment.
- Here are some notable Sanskrit works that were translated:

1. Mahabharata

- Persian Title: Razmnama (Book of War)
- Translated by: A team of scholars under Akbar's supervision.
- The epic was translated with a focus on its ethical and philosophical aspects, providing insights into Hindu culture and values.

2. Ramayana

- Translated by: Badauni and others under Akbar's patronage.
- The translation made this iconic story accessible to Persian readers, presenting the ideals of Rama and Sita as models of virtue.

3. Atharva Veda

- The Atharva Veda, one of the four Vedas, contains hymns, spells, and incantations, as well as philosophical and medicinal knowledge. Parts of it were translated to introduce Persian-speaking scholars to Vedic traditions.

4. Bhagavad Gita

- Translated by: Prince Dara Shikoh, the eldest son of Shah Jahan, who was deeply interested in Hindu philosophy.
- The Bhagavad Gita was translated along with Dara Shikoh's other philosophical pursuits and formed part of his efforts to harmonize Sufi and Hindu thought.

5. Yoga Vashishta Translated by: Dara Shikoh.

- This philosophical text, attributed to the sage Valmiki, discusses the nature of reality, liberation, and meditation practices.

6. Upanishads

- Persian Title: Sirr-e-Akbar (The Greatest Mystery) Translated by: Dara Shikoh.
- Dara Shikoh's translation of the Upanishads into Persian was groundbreaking, as it introduced Islamic scholars to Hindu metaphysics, significantly influencing Sufi and later Western thought.

7. Rajatarangini

- This historical chronicle of Kashmir, written by Kalhana, was translated to give Persian readers an understanding of Indian historical literature and regional history.

8. Harivamsa

- An appendix to the Mahabharata, the Harivamsa details the life of Krishna. It was translated to familiarize Persian-speaking audiences with Krishna's role and significance.

9. Panchatantra

- This collection of animal fables, originally written to teach political and moral wisdom, was translated to make its instructive stories available to Persian audiences.

10. Lilavati

- This is a Sanskrit treatise on mathematics written by Bhaskara II. Its translation introduced Persian scholars to Indian advances in mathematics.

European Legacies

- Even Europeans who had exploited our country in many ways have positively influenced our daily food by bringing many crops those are very popular in India. The Pictures of some such crops are in page 279. Let the children find out the who had brought these crops to India.
- **For your information**

1. **Cashew** – Originally from Brazil (South America). The Portuguese brought cashew to India in the 16th century, where it became widely cultivated, especially in coastal regions.
2. **Green Chillies**: Green chillies also have their origins in the Americas, specifically Central and South America. Portuguese explorers introduced chillies to India around the 15th or 16th century. Since then, green chilies have become integral to Indian cuisine.
3. **Potato** – Originated in the Andes Mountains of South America (present-day Peru and Bolivia). It was introduced to India by the Portuguese in the early 17th century.
4. **Papaya** – Native to Central America and southern Mexico. The Spanish and Portuguese brought papaya to India in the 16th century.
5. **Tapioca** – Also from Brazil and other parts of South America. It was introduced to India by the Portuguese, and it became popular in Kerala as a staple crop.
6. **Tea** – Though tea plants are indigenous to parts of Assam, commercial cultivation in India was established by the British in the 19th century using tea varieties from China.
7. **Coffee** – Originated in Ethiopia (Africa). It was introduced to India by Baba Budan, a Sufi saint, who is believed to have brought coffee beans to Karnataka in the 17th century.
8. **Sweet Potato**: This crop originated in Central and South America and was brought to India by the Portuguese in the 16th century. They introduced it alongside other crops from the Americas.

Blended Heritage and Gandhiji's Words

- We began the chapter with Rabindra Nath

Tagore's words and ends it with Gandhiji's words. Both highlight that our culture is synthesis of all the cultures of the world. That is true message of this unit. All the information about contributions of different sects of people are only testimonies to that basic concept.

Working Gallery

- As in the previous chapters, activities in the Working Gallery are meant for Unit assessment.

6 THE SECRET OF SEASONS

Introduction

- This unit is an extension of the unit Falling Ice, Burning Sun which we have discussed in Sem 1. Reminding the major concepts already discussed in that unit may be helpful before beginning the unit 'The secret of Seasons' Children will definitely be curious to know the reasons for climatic changes they experience. We can spark this curiosity starting with a relatable question or engaging scenario.
- Start with an intriguing questions, such as:
  - "Have you ever wondered why it's winter in one part of the world while it's summer in another?"
  - "What would happen if Earth stopped moving? Would seasons still change?"
- We can also show pictures or videos that tells how people in different parts of the world experience seasons differently.

Learning outcomes

a) Conceptual

1. Importance of the lean of the earth in the occurrence of seasons
2. Understanding the basic features of all seasons
3. Understanding how seasons are occurring in both hemispheres
4. Understanding concepts like solstice, equinoxes etc

b) Skill

1. Interpreting diagrams involving geographical phenomena
2. Draws and explain diagrams involving geographical phenomena

- Learners of Grade 5 may have a little difficulty in understanding certain concepts in this unit especially the relation between position of earth and changing of season in both hemispheres. To make clear the abstract concepts discussed in the chapter, a video demonstration may be helpful
- Try the video clips in the following Q R codes. It can be used if useful and when you.

- The unit begins with a narrate an exhibition regarding geographical phenomena. Similarly if possible try to conduct a study trip to a planetarium where movements of earth and occurrence of seasons are demonstrated.
- Through the conversation of students and the exhibition guide, the unit tries to explore the specific features of the earth, its inclined axis, equator, etc. Use the video clip in the Q R code to clarify the concepts.

Symphony of seasons

- The purpose of this section is to make sure that our children have no difficulty in identifying the names of seasons and the characteristics of them. By completing the table in page number 285 the learners will understand the concepts.

Autumn

- The blue box below the table contains an additional information about autumn. and not part of the essential learning outcomes.

Summer

- The Pictures in Page 286, explains the earth's position and how sun rays are falling on both hemispheres during summer season in the N Hemisphere. Each student should be able,not only to explain this with the help of diagrams but also draw their own diagram illustrating the position of sun and earth. The QR code contains a video which clearly narrates how

seasons are being occurred. The green box in page number

- 287 is the consolidation of discussions about northern summer (Summer in the Northern hemisphere).

Southern Hemisphere

- Position of the earth and falling of sunrise, while there is summer in the Southern Hemisphere are not explained in the text in detail. Only a sentence' In the southern hemisphere, the positions and effects are reversed' is given in page 287. But the video in Q R code in page 286 explains the occurrence of seasons in both hemispheres and children will not face difficulty in understanding how summer occurs in Southern Hemisphere. However ask children to illustrate it with diagrams and explain.

South North Opposites

- This exercise in page 287 is an evaluation activity. Individual performance of children has to be evaluated while completing the task

Winter

- Pages 288 to 291 explain how winter, spring and autumn occur. As the children have already learned about how summer occurs and they will not face much difficulty in learning similar things about winter.

Working Gallery

- Activities in the working gallery are suitable for unit assessment. Children may be asked to complete it as home assignment.