

TEACHER'S GUIDE

**Wizard
Science**

Book

1 - 4

MAY 10, 2018
ALBAKIO INTERNATIONAL

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Chapter no. 1

Ourselves

Overview of Lesson

In Class I, children will learn to identify parts of the body such as the eye, ear, mouth, neck, arm, stomach, hand, leg, knee, and foot. They will be able to categorize these on the basis of certain characteristics and/or functions they know of each of these. They will name and spell the various parts of the body that have been learned by looking at their appearance. This will help them see all the people around them as equal to themselves.

Plan for Achieving the Objective

- Step 1:** Discuss features of various parts of body, and provide examples.
- Step 2:** Make students demonstrate parts of the body they have learned about with their friends
- Step 3:** Give crossword puzzle about names of different parts of body
- Step 4:** Discuss what health is and what constitutes a healthy diet
- Step 5:** Discuss and list down various foods
- Step 6:** Discuss importance of clean water

Answers to Exercise in Textbook

Talk it out

- 1. Name the people you know who are tall, short, fat and thin**
Students can name somebody in the classroom, or at home
- 2. Name the things that you can see around you**
Students can list any object that is present in their vicinity
- 3. Look at the pictures below. Which food do you like? Which food do you not like?**
Students can choose all or none. Many combinations can be made of foods they like, and those they don't

Checkpoints

Activity No. 1

Label the parts of the body

Using the image provided on page 2 label the image provided on this page appropriately

Activity No. 2

Match the pictures that use the given senses

1. Match nose with rose flower
2. Match ear with bell
3. Match eye with landscape
4. Match hand with clay



5. Match tongue with orange

Activity No. 3

Tick a happy face if it is a good habit and sad face if it is a bad habit

- | | |
|--|------------|
| • I brush my teeth daily after every meal. | Good habit |
| • I eat junk food all the time. | Bad habit |
| • I was my hands once a day. | Bad habit |
| • I take a bath every day. | Good habit |
| • I exercise and sleep on time. | Good habit |

Activity No. 4

A. Describe yourself by crossing out the incorrect word Students must choose correct option in the following.

- | | |
|----------------------------|-----------------------------|
| • I am a girl/boy. | I am tall/short. |
| • I have long/short hair. | I have curly/straight hair. |
| • I have black/brown hair. | I have black/brown hair. |

B. Fill in the blanks with the help of the word bank.

- We hear with our ear.
- We taste with our tongue.
- We touch and feel with the help of our skin.
- We smell with our nose.
- We see with our eyes.

Activity No. 5

A. Eyes help us recognize colours.

B. Write the items that belong to the right column.

Red: balloon, ball

Green: apple, leaf

Blue: sofa, gloves

Yellow: bulb, flower

Let's Do It

A. This is a graph of students in Class I. Use the information from the graph to answer the given questions.

- | | |
|---------------------------------|---|
| 1. How many students are tall? | 4 |
| 2. How many students are short? | 5 |
| 3. How many students are fat? | 3 |
| 4. How many students are thin? | 6 |

B. Let's take a closer look at what you ate last week. In the table, write what you ate for breakfast, lunch and dinner on each day.

Students must fill the chart in by the help of a teacher or parents.



Chapter no. 2
World Around Us

Overview of Lesson

In Class I, students will learn to understand the living and non-living things. They will learn about their features and will be able to classify them. Students will understand animals and plants as living things.

Plan for Achieving the Objective

- Step 1:** Discuss what a living and a non-living thing is
Step 2: Help students distinguish living and non-living things in the image provided
Step 3: Discuss the needs of living things and those of non-living things

Answers to Exercise in Textbook

Think Tank

An airplane is flying in the sky. Is an airplane a living or a non-living thing? Why?

An airplane uses fuel and a human to fly it. It is a non-living thing requiring a living thing to fly it.

Checkpoints

Activity No. 1

Use the word bank to fill in the blanks.

- Living things need food, water and air.
- Living things move by themselves.
- Living things grow as they get older.
- Plants make seeds which grow into new plants.
- Rocks and stones are non-living things.

Activity No. 2

Are these living things? Write yes or no.

Worm

- | | |
|--|-----|
| • Does it move? | Yes |
| • Does it breathe? | Yes |
| • Does it need food and water to live? | Yes |
| • Does it grow and change? | Yes |

Car

- | | |
|--|-----|
| • Does it move? | Yes |
| • Does it breathe? | No |
| • Does it need food and water to live? | No |
| • Does it grow and change? | No |



Ball

- Does it move? Yes
- Does it breathe? No
- Does it need food and water to live? No
- Does it grow and change? No

Dog

- Does it move? Yes
- Does it breathe? Yes
- Does it need food and water to live? Yes
- Does it grow and change? Yes

Sunflower

- Does it move? No
- Does it breathe? Yes
- Does it need food and water to live? Yes
- Does it grow and change? Yes

Laptop

- Does it move? No
- Does it breathe? No
- Does it need food and water to live? Yes
- Does it grow and change? Yes

Activity No. 3

Look at the living things in the picture and encircle plants and cross out the animals.

Circle: Tree, mushrooms, flower,

Cross: Bear, owl, fox, snail

Activity No. 4

Encircle the correct word.

Airplane: Non-living

Key: Non-living

Ice cream: Non-living

Telephone: Non-living

Baby: Living

Elephant: Living

Horse: Living

Sunflower: Living

Umbrella: Non-living

Chapter no. 3

Animal World

Overview of Lesson

In Class I, children will learn to classify animals on the basis of their habitat. They will also learn how different animals feed and move. The children will also identify animals as wild



or domestic, and what their homes look like.

Plan for Achieving the Objective

Step 1: Discuss the animals children see around them

Step 2: Discuss the different environments we find animals in

Step 3: Discuss the different ways in which animals move from one place to another

Step 4: Discuss the various foods animals consume for survival

Step 5: Discuss the types of animals: Pets, wild, birds, insects, fish

Step 6: Discuss the various young of various animals

Answers to Exercise in Textbook

Talk It Out

Can you name the animals?

1. Elephant
2. Rhinoceros
3. Turtle
4. Giraffe
5. Rat
6. Tiger
7. Rabbits
8. Squirrel

Think Tank

A polar bear can live in snow while a camel cannot. Why?

A polar bear has a thick layer of white fur that helps in live in snow. The fur on a camel protects it from the sun and so it would not be able to survive in snow.

Checkpoints

Activity No. 1

Fill in the blanks using the following words:

- | | |
|---|------------------|
| 1. I am one of the biggest animals in the forest. Who am I? | <u>Elephant</u> |
| 2. I have the biggest fins. Who am I? | <u>Fish</u> |
| 3. I have scales all over my body. Who am I? | <u>Crocodile</u> |
| 4. I live both on land and in water. Who am I? | <u>Frog</u> |
| 5. I have wings and feathers. Who am I? | <u>Birds</u> |

Activity No. 2

Some animal names got jumbled up, rewrite them correctly.

1. Kangaroo
2. Elephant
3. Horse
4. Zebra



5. Wolf
6. Rabbit
7. Tiger
8. Alligator
9. Camel

Activity No. 3

Name the animals that give us the following useful things.

1. Chickens give us eggs
2. Cows give us milk
3. Goats give us meat
3. Sheep give us wool
4. Bees give us honey

Activity No. 4

Look at the picture below. Point out the big animals and write their names. Hint: The first letter is given to you.

1. Elephat
2. Zebra
3. Giraffe
4. Lion

Activity No. 5

Name the following.

- | | |
|--|------------------------------|
| 1. Name two animals that eat plants only. | <u>Sheep and cows</u> |
| 2. Name two animals that eat meat only. | <u>Polar bears and lions</u> |
| 3. Name two animals that eat grains. | <u>Poultry and fish</u> |
| 4. Name two animals that eat plants and animals. | <u>Humans and apes</u> |
| 5. Two birds that live in nests: | <u>Eagles and sparrows</u> |
| 6. Two animals that live in a den: | <u>Foxes and bears</u> |
| 7. Two animals that live in a hole: | <u>Meerkats and beavers</u> |
| 8. Two animals that live in sheds: | <u>Cats and foxes</u> |

Activity No. 6

Many animals do not build their own houses. They live in caves, woods or trees. Some live in man-made homes. Match the animals to their homes and colour the pictures.

- | | |
|-------------------------|------------------|
| 1. Rabbit lives in sand | 2. Lion in cave |
| 3. Mouse in wall | 4. Dog in kennel |

Activity No. 7

Match animals to their food.

- | | |
|----------------------|------------------|
| 1. Rabbit to carrots | 2. Tiger to meat |
| 3. Horse to grass | 4. Shark to fish |
| 5. Monkey to bananas | |



Let's do it

There are many different animals around us, ranging from the biggest to the smallest. Place all the following animals that have common features into different groups. Give each group a name.

- | | |
|---------------|-------------------------------------|
| Land animals: | Dog, Rabbit, Kangaroo, Mouse, Tiger |
| Birds: | Eagle, Hen |
| Insects: | Cockroach, Fly, Snail, Caterpillar |
| Sea animals: | Shark, Crayfish, Duck, Prawn, Frog |

Chapter no. 4

Plants Around Us

Overview of Lesson

In Class I, children will learn to identify the parts of plants. They will also learn to identify how plants and its parts are used as a source of food, shade and shelter. Children will come to know what plants need to grow and explore how seeds grow into plants.

Plan for Achieving the Objective

- Step 1:** Discuss what plants are
Step 2: Discuss why plants are important to us
Step 3: Discuss the types of plants: small, big, climbers, creepers, water
Step 4: Discuss why plants are important to other animals
Step 5: Discuss the plants that are consumed by humans
Step 6: Discuss the requirements of plants to make them grow

Answers to Exercise in Textbook

Talk it out

Look at the picture below. Can you identify which is not fruit?

Cauliflower and carrots

Checkpoints

Activity No. 1

Number the pictures in the correct order from 1 to 4.

4, 1, 3, 2

Activity No. 2

Can you label the parts of a plant?

Use image on page 43 to do this.

Activity No. 3

Fill in the blanks choosing the right word.



1. Some flowers change into fruits
2. Fruits bear seeds
3. Plants grow from seeds
4. Seeds have baby plants inside them
5. Leaves are usually green in colour

Activity No. 4

Put (✓) for the correct answer and x for the wrong statement

- | | |
|--|---|
| 1. Most plants grow from flowers. | ✓ |
| 2. All seeds are of similar shape. | X |
| 3. A baby plant gets food from the seed. | X |
| 4. Fruits store seeds for the new plant. | ✓ |
| 5. Leaves make food for the plant. | ✓ |

Chapter no. 5

Materials Around Us

Overview of Lesson

In Class I, children will learn to recognize different types of materials in the environment. They will also classify materials by their simple properties. Children will learn to compare the properties of solid and liquid states.

Plan for Achieving the Objective

- Step 1:** Ask students to observe their surroundings
- Step 2:** Help students to differentiate between rough and smooth surfaces, light and heavy things.
- Step 3:** Discuss uses of materials with students
- Step 4:** Discuss the difference between solids and liquids

Answers to Exercise in Textbook

Think Tank

No one can survive without me. I can change my shape. I can be liquid or solid. My name starts with W and ends with R. What am I?

What

Checkpoints

Activity No. 1

Identify the materials as solid or liquid

- Liquid
Solid



- Liquid
Solid
Liquid
Solid

Activity No. 2

These are some objects given below.

Write the correct characteristic of each object in the table.

- | | |
|-------------|------------------------|
| 1. Balloon: | circle, small, light |
| 2. Cushion: | square, small, light |
| 3. Pyramid: | triangle, large, heavy |
| 4. Book: | rectangle, big, light |

Science skills

Observe the nature of milk, water, rubber ball, pen, pencil, juice. Are they liquid or solid?

- | | |
|-----------------|--------|
| 1. Milk: | liquid |
| 2. Water: | Liquid |
| 3. Rubber ball: | Solid |
| 4. Pen: | Solid |
| 5. Pencil: | Solid |
| 6. Juice: | Liquid |

Chapter no. 6

Forces and Sounds

Overview of Lesson

In Class I, students will recognize the pull and push movements as forces. They will learn to identify the role of different kinds of forces. Students will also learn to differentiate between different types of sounds. They will also learn to identify that sounds can be made in a multitude of ways.

Plan for Achieving the Objective

- Step 1:** Discuss what forces and movements are
- Step 2:** Use examples of various sports to demonstrate movement
- Step 3:** Discuss the various sounds we hear everyday
- Step 4:** Discuss natural and artificial sounds



Answers to Exercise in Textbook

Talk it out

1. Look at the picture. Identify which force is being used when the children are playing table tennis game?
Push
2. Identify which force is being used when people are playing a tug-of-war game?
Pull

Checkpoints

Activity No. 1

What type of force will be required for each of the following

- | | |
|-----------------------------------|-------------|
| 1. Opening a bag of crisps. | <u>Pull</u> |
| 2. Stapling papers together. | <u>Push</u> |
| 3. Typing on a computer keyboard. | <u>Push</u> |
| 4. Cutting food. | <u>Push</u> |
| 5. Scoring a goal in Football. | <u>Push</u> |
| 6. Opening a car door. | <u>Pull</u> |
| 7. Picking apples from a tree. | <u>Pull</u> |
| 8. Putting a pair of trousers on. | <u>Pull</u> |
| 9. Using the brakes on a bicycle. | <u>Push</u> |

Activity No. 2

Look at the pictures and identify which force will be used to do the activities by using the forces below

1. Slide
2. Pull
3. Bounce
4. Twist
5. Push
6. Roll

Activity No. 3

Look at the pictures below. Use the following objects and observe what will happen. Tick the objects that will roll down the ramp.

1. Cracker barrel
2. Mini syrup bottle
3. Small cylinder block
4. Plastic egg
5. Wooden Wheel
6. Roll of Tape
7. Round craft pompom



Chapter no. 7

Earth and Beyond

Overview of Lesson

In Class I, students will understand the planet earth. They will learn about the sun and the moon.

They will also understand different weather conditions and identify the four seasons.

Plan for Achieving the Objective

- Step 1:** Discuss the concept of night and day in terms of the earth and its relationship with the Sun.
- Step 2:** Discuss the importance of the moon
- Step 3:** Discuss the concept of weather and seasons
- Step 4:** Discuss the various symbols used to depict weather

Answers to Exercise in Textbook

Talk it out

There is a large planet. Most of its part is covered with water. Can you tell the name of this planet?

Earth

Checkpoints

Activity No. 1

Fill in the blanks.

1. Sun shines during the day.
2. The sky is blue during the day.
3. At night we can see many stars in the sky.
4. The sun is a big ball of fire.
5. When the moon looks thin and C shaped, it is called a crescent moon.

Activity No. 2

Identify the Sun and colour it yellow.

It is the round circle with flames coming out of it

Activity No. 3

Write down the name of the phases of the Moon.

Full moon, half moon, crescent moon

Activity No. 4

Sort out the things

Day: Sun

Night: Lamp post, bat, stars

What's the weather like and write about each of them

Sunny

Cold

Windy

Chapter no. 1

Ourselves

Overview of Lesson

In Class II, children will come to know the importance of the skeleton and joints in our body. They will learn about the sensory organs and identify the structure and functions of the eye.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss how our body consists of bones and the skeletal system.
Step 2: Discuss joints in our body.
Step 3: Discuss our sense of touch, and decipher hot from cold.
Step 4: Discuss our sense of sight through understanding parts of the eye.
Step 5: Discuss our sense of smell.
Step 6: Discuss our sense of hearing.
Step 7: Discuss health tips to keep our sensory organs healthy.
Step 8: Discuss the importance of healthy food

Answers to Exercises in Textbook

Think Tank

Ahmad and Sara came from school yesterday. Ahmad had some uncovered chips from the roadside vendor and Sara had a packed juice. The next day, Ahmad got ill and could not go to school. What do you think happened?

Uncovered chips were exposed to air pollution and possibly flies, causing them to be unhygienic. Sara's packed juice was safe from all such things make it more hygienic.

Checkpoints

Activity No. 1

Investigate our sense of taste and smell. What will be the taste of every food item? Choose from sweet, sour, bitter and salty.

Sugar:	<u>Sweet</u>	Lemon:	<u>Sour</u>
Bitter gourd:	<u>Bitter</u>	Potato chips:	<u>Salty</u>

Activity No. 2

Choose the correct answer.

- Potatoes are rich in carbohydrates
- Butter is a source of proteins
- Fruits help to fight against diseases
- Fruits are a good source of vitamins

Activity No. 3

Fill in the blanks.

- We have skin for the sensation of touch.
- Braille is developed for those who cannot see.
- Our tongue helps us to taste.
- We can move and bend our bodies due to joints.
- In our body there are 206 bones.

Activity No. 4

Fill in the blanks.

- Iris: regulates the amount of light entering the eye.
- Pupil: light enters from here.
- Lens: focuses light on retina
- Retina: converts light into electrical impulses.
- Optic nerve: transmits impulses to brain and back to eye.

Activity No. 5

Write 'G' for good habit and 'B' for bad habit.

- Sara eats burger for lunch every day. B
- Ahmad eats uncovered food from vendors. B
- Sara washes fruit before eating. G
- Anum eats slowly and chews her food well. G

Chapter no. 2

World Around Us

Overview of Lesson

In Class II, children will identify and compare different types of environments. They will also learn about the factors creating variations in the environment, and identifying factors that are damaging the environment. They will suggest ways to improve it.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss what an environment is and what its different types are
Step 2: Discuss factors creating variations in the environment as well as those damaging environment
Step 3: Discuss the concept of environment protection



Answers to Exercises in Textbook

Talk it out

Look at the picture and sort out the natural and man-made things in it.

The bridge is man-made, while the rest is natural.

Think Tank

Why should we use paper bags instead of plastic bags? Think.

Paper bags are more environmentally friendly than plastic bags because they are made from a renewable resource, can biodegrade, and are recyclable.

Checkpoints

Activity No. 1

Encircle the correct answer.

- What is the best thing to do with old newspapers?**
Do something fun with them, like make paper boats, or throw them in the bin for recycling.
- What is the best thing to do with litter?**
Take it to recycling centers where different things (plastic, paper, glass) go into different containers.
- How can you use less water?**
By closing the faucet and using a glass while brushing your teeth.

Activity No. 2

Answer the following questions.

- What are the three R's?**
Reduce: amounts of things we buy and use
Reuse: same things as many times as we can
Recycle: by finding new ways to use old things
- How can you improve the environment?**
We can improve the environment by planting more trees, taking care of animals. We can also avoid throwing things everywhere, using dust bins and not wasting water. Furthermore, we can do this by avoiding the use of plastic bags, using paper bags instead and not wasting paper.
- State three things you can do to save the environment.**
Pay attention to how you use water.
Leave your car at home.
Walk or ride your bike to work, school or anywhere else.
- Write about some human activities that are causing damage to the environment.**
Some human activities that are causing damage to the environment are cutting of trees, throwing of garbage everywhere, air pollution caused by factories,



vehicles, burning of wood and dumping of waste materials in water.

5. What is fertile soil?

Fertile soil is one which has the ability of a soil to sustain agricultural plant growth.

Chapter no. 3

Animal World

Overview of Lesson

In Class II, children will learn to identify different kinds of animals and recognize common vertebrates and invertebrates. They will list the animals that feed their young ones and look after them. They will also learn the main characteristics of insects and understand habitats by identifying features of different types of habitats and types of animals in them. Child will know the importance of life of animals and explain the importance of saving habitats. They will recognize the life cycle of different animals.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss the different kind of animals: invertebrates, and vertebrates.
Step 2: Discuss animals and their babies.
Step 3: Discuss animals in land, air and water.
Step 4: Discuss the habitats of animals.
Step 5: Discuss inheritance and variation.

Answers to Exercises in Textbook

Think Tank

I am a scary animal. I live in drains, washrooms, kitchens, etc. I have two antennae. I am dark brown. Who am I?

Cockroach

Which animal lives in both water and land? Name it.

Turtle

Checkpoints

Activity No. 1

Answer the following question.

- Differentiate between vertebrates and invertebrates.
Vertebrates are animals with an internal skeleton made of bone. Invertebrates are animals without backbones. Vertebrates have a highly developed brain. Invertebrates are multicellular organisms. Vertebrates are big in size. Invertebrates are small and slow moving.

**Activity No. 2**

Fill in the blanks.

1. Insects have two antennae.
2. Invertebrates do not have any backbone or spinal column.
3. Kangaroos have a pouch in their body.
4. Silkworms are used as the primary producers of silk.
5. Frog eggs first develop into tadpoles before turning into frogs.
6. In the life cycle of the butterfly, caterpillars develop into chrysalis.
7. Frogs and birds both lay eggs.

Activity No. 3

Write any two features of the following animals.

1. Insects Two antennae, three pairs of legs
2. Birds Feathers, beaks
3. Fish Gills, live in water

Activity No. 4

Fill in the blanks..

1. I have a very long neck. Giraffe
2. I am a big animal. I live in a den. Lion
3. I dig burrows. Rabbit
4. I have two humps. I live in the desert. Camel

Activity No. 5

Sort out the animals below as vertebrates and invertebrates. Write the answer in the proper column.

Vertebrates: Fish, parrot, whale, tortoise, duck, horse, cat, dog, lion

Invertebrates: Cockroach, grasshopper, starfish, spider, earthworm

Activity No. 6

Encircle the correct answer.

1. Which of the following animals live only in forests? Lion
2. All of the animals below live in ponds except dogs.
3. Birds live in nests.
4. A desert is typically an area that received extremely low amounts of rain.

Activity No. 7

Write down the names of the young animals

- Dog: puppies
 Lion: cubs
 Duck: ducklings
 Cat: kittens

**Activity No. 8**

Look at the picture below and tick the correct option.

1. Frogs have a tail.
2. It does not have a neck.
3. Its skin is wet.
4. It lives in both land and water.

Activity No. 9

Animals need shelter to live in. They need to protect themselves from the harmful effects of the environment. Write down the name of the shelter depicted in the picture below.

- Dog: kennel
 Lion: cave
 Hens: pen
 Cows: shed

Let's Do It

B. Look at the animals below and write their names in the relevant columns.

Land: honeybee, squirrel, ostrich, ladybird, snake, rabbit, alligator, horse, bird

Land & water: alligator

Water: fish

Chapter no. 4

Plant World

Overview of Lesson

In Class II, children will identify major parts of plants and know the functions of the root stem and flower. They will group plants as flowering and non-flowering plants and know how to care for plant. They will also learn that all fruits have seeds in them and recognize that some plants grow from seeds. Children will describe some of the uses of plants and process plant materials to make products.

Plan for Achieving the Learning Objectives

Step 1: Discuss plants around us

Step 2: Discuss flowering and non-flowering plants

Step 3: Discuss how plants grow and seed germination

Step 4: Discuss how to care for a growing plant

Step 5: Discuss benefits of plants



Answers to Exercises in Textbook

Think Tank

We get sugar from this plant. We drink its juice. It is very healthy and tasty. Name it

Sugarcane

I am a fruit of pink colour, I have seeds outside. I am very tasty. What is my name?

Strawberries

Checkpoints

Activity No. 1

Fill in the blanks.

1. Baskets are made from the jute plant.
2. Tea leaves are first dried before making tea from them.
3. Cereals and pulses are food grains.
4. We use oil in cooking food.

Activity No. 2

Tick the correct option

1. Mango has a single seed.
2. Apple has many seeds.
3. Seed has the baby plant inside it.
4. Beans, pulses and cereals are seeds.

Activity No. 3

Answer the following questions.

1. Name some fruits that have only one seed inside them.
Avocado, peach, plum, mango, gooseberry, litchi, cherry, marula, cashew, olive and almond
2. What is an embryo?
An embryo is a thing at a rudimentary stage that shows potential for development.
3. Where is the seed coat present?
The seed coat is present on top of the seed.
4. Does banana carry any seeds?
Yes, the banana carries seeds.
5. Name two things that plants need in order to grow.
Plants need water and correct temperature in order to grow.

Activity No. 4

Write the parts of the plants from where these food items come from.

Potato: root
Sugarcane: stem



Sweet potato: root
Eggplant: fruit
Carrot: root
Corn: fruit
Radish: root
Radish: root
Turnip: root
Strawberry: fruit
Pear: fruit
Banana: fruit

Activity No. 5

Encircle the correct answer.

1. Ropes and baskets are made from jute fiber.
2. Tyres are made from rubber.
3. Cloves are used in treatment of toothaches.
4. We get sugar from sugarcane.

Chapter no. 5

Materials Around Us

Overview of Lesson

In Class II, children will learn to identify natural and man-made materials. They will also learn to explain the uses of materials, and identify the properties of materials that make them useful for construction purposes. They will learn to identify different types of rocks and select suitable rocks for their appropriate use by exploring their properties. Children will investigate the ability of different materials to dissolve and identify the properties of metals.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss materials such as natural and man-made ones.
Step 2: Discuss different types of rocks and stones.
Step 3: Discuss different types of metals.
Step 4: Discuss the concept of solubility of materials.

Answers to Exercises in Textbook

Think Tank

You have seen a mortar and pestle at home. What rock is it made of?

A mortar and pestle is made of granite.



Checkpoints

Activity No. 1

Look at the pictures below. Write natural or man-made on the spaces given below.

- Glass: man-made
- Laptop: man-made
- Bottle: man-made
- Honey: natural
- Tea cup: man-made
- Sweater: man-made
- Diamond: natural

Activity No. 2

Fill in the blanks with correct answer.

1. Granite is a hard rock.
2. Gemstones are used in making jewelry.
3. Diamond is the hardest rock. It is used to cut glass.
4. Lead is used for making pencils.
5. Wool is a good insulator.
6. We make cooking utensils with metals.
7. Wood is insulator.
8. Glass is a man-made material.

Activity No. 3

Encircle the correct answer.

1. Marble is a hard rock.
2. Chalk is a soft rock.
3. Wool is a good insulator.
4. Ability of a material to soak up a liquid is called absorbency.
5. Wood cannot transfer the heat from one part to another.
6. The rubber or plastic on an electrical cord provides an insulation for the wires.
7. Granite is used for making kitchen slabs.
8. Badshahi Mosque in Lahore is made up of sandstone.

Activity No. 4

Look at the picture below and group the rocks on the basis of their similarities and also name the group.

- Soft rocks: chalks, slates, graphite, coal
- Hard rocks: diamond, rocks



Chapter no. 6
Forces, Sounds and Light

Overview of Lesson

In Class II, children will learn about the forces in the environment and sort out magnetic and non-magnetic materials by applying the magnetic force of attraction. They will understand friction and its importance in our life and understand air resistance. They will also understand that sound is produced due to vibration of the objects and recognize the role of an ear as an organ for the collection and hearing of sound. Children will also find out common sources of heat and light and their uses.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss the forces in the environment for example magnetism, friction and air resistance.
- Step 2:** Discuss sound and its relation with the ear.
- Step 3:** Discuss heat and light, and the natural and man-made sources of both

Answers to Exercises in Textbook

Think Tank

Throw a small pebble in the water. You will see rings spreading out. These are waves. Why can't you see waves in the air? Think.

Air is transparent in visible in light. This is why we cannot see waves in it.

Checkpoints

Activity No. 1

Choose the false statements and write F.

- 1. Sun is an artificial source of energy. F
- 2. Heat can be produced by rubbing two pieces of wood together. F
- 3. Heat and light are types of energy. T
- 4. Fire does not give us light. F
- 5. Coal is burnt to produce heat and light. T

Activity No. 2

Answer the following questions

1. **What is force of friction?**
Friction is a force that resists motion.
2. **Define air resistance.**
It is a force that slows down the movement of heavier objects.
3. **Why do we use a compass?**
We use a compass to find our way.

Activity No. 3

Fill in the blanks with correct word.

1. Things with lots of heat energy are warm.



2. Sun is a source of light.
3. Heat and light, both are types of energy.
4. Thermometer is used to measure temperature.

Activity No. 4

Sort the things given below in the right column.

Natural sources of light: Sun, lightning, firefly
 Artificial sources of light: Torch, burning wood, lamp post and bulb

Activity No. 5

Fill in the blanks with correct word.

1. South Pole of magnet will repel South Pole.
2. Magnets have invisible magnetic field.
3. Ear is the organ that helps us in hearing.
4. Sound waves can travel in space.
5. Magnetic force produces magnetic field.
6. South Pole of a magnet will attract North Pole.

Chapter no. 7

Earth and Beyond

Overview of Lesson

In Class II, children will learn to identify and compare the Sun, the Earth and the Moon. They will come to know the solar system and identify the factors which enable the earth to sustain life. They will also know the characteristics of all four seasons and of weather conditions in relation to a particular season.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss what space is, including the sun, the moon and planet earth
Step 2: Discuss what planets make up our solar system.
Step 3: Discuss the factors for sustaining life on earth.
Step 4: Discuss the weather and seasons.

Answers to Exercises in Textbook

Think Tank

Life exists only on Earth, why is it not in other planets? Think

Other planets do not have an atmosphere, climate, water or light to help life to exist on them.

Checkpoints

Activity No. 1

Answer the following questions.



1. **Define an orbit.**
An orbit is a circular shape, the rotation of one full circle or a range of experience.
2. **How long does the Earth take to go around the sun?**
 It takes the Earth 365 days to go around the sun.
3. **What is rotation?**
The movement of the earth on its own action is called rotation.
4. **In what direction does Earth rotate on its own axis?**
Earth rotates east to west on its own axis.

Activity No. 2

Encircle the correct answer.

1. How long does it take for the phases of the moon to start and finish? A month
2. How long does it take for the Earth to rotate around the sun? A year
3. What is the imaginary line that the Earth spins on called? Orbit
4. Where does the light of the moon come from? Sun
5. What are the changing shapes of the moon called? Phases
6. Day and night is created by the way the earth moves around the sun. What is this movement called? Rotation
7. Objects in space made up of hot gases, like the sun, are called stars.
8. Which is not a planet? Pluto
9. What is known for its rings? Saturn (options in book are all incorrect)

Activity No. 3

Read the statements below. Answer the appropriate box.

1. Earth completes its one rotation around its own axis in 365 days. No
2. Sun is a planet. No
3. Earth rotates from west to east. No
4. Earth revolves around a particular path that is called an orbit. Yes
5. Sun revolves around Jupiter. No
6. Neptune is known for its rings. No
7. Jupiter is the most massive planet in our solar system. Yes
8. Neptune is known for its strong winds. Yes
9. Venus is terribly hot. Yes

Activity No. 4

These are jumbled words. Arrange them and write down the names of the planet.

Neptune, Mars, Jupiter, Earth

Activity No. 5

Fill in the blanks.

1. Mercury is the closest planet to the sun.
2. Neptune appears blue due to methane gas.
3. Pluto is a dwarf planet.
4. Plants produce oxygen through a process called photosynthesis.
5. Earth is a water world.



Chapter no. 1

Ourselves

Overview of Lesson

In Class III, children will learn the characteristics and functions of the skeleton by comparing human and other vertebrae. They will understand the types of muscles and identify the sense organs and the role of the brain in the use of senses. They will also sort food into different groups and identify the importance of each food group by recognizing different types of teeth in a human denture.

Plan for Achieving the Learning Objectives

Step 1: Discuss the human body

Step 2: Discuss health and diet

Step 3: Discuss teeth and feeding

Step 4: Discuss good health

Answers to Exercises in Textbook

Think Tank

Why are there more bones in children as compared to adults?

As babies grow, some of their bones fuse together.

Talk it out

In supermarkets, food is sorted and organized in different sections. Have you ever visited the supermarket and observed different sections?

Yes

Checkpoints

Activity No. 1

Answer the following questions.

1. **How many bones are in an adult human body?**

There are 206 bones in an adult human body.

2. **What are the functions of sensory organs?**

Our eyes help us see. Our ears help us hear. Our nose helps us smell. Our tongue help us taste. Our skin makes us feel.

3. **How many muscles are there in the human body?**

There are over 700 muscles in the human body.

4. **Write down the functions of the bones and muscles.**

Bones provide a framework for the attachment of muscles and other tissues. The main function of the muscular system is movement.

5. **What are dentures?**

A denture is a removable plate holding artificial teeth.



6. **What are baby teeth and permanent teeth?**

Baby teeth are teeth that appear when a child is about 6 months old and are shed throughout childhood. They are replaced by permanent teeth that fully appear by the age of 21.

7. Write down the importance of Vitamin C.

You need vitamin C for the growth and repair of tissues in all parts of your body.

8. **Why are milk and dairy products important?**

Dairy products are important for building healthy bones and for maintaining a healthy weight.

9. Why are minerals important for our body?

Minerals are important for building strong bones and teeth, blood, skin, hair, nerve function, muscle and for metabolic processes such as those that turn the food we eat into energy.

4. **In what direction does Earth rotate on its own axis?**

Earth rotates east to west on its own axis.

Activity No. 2

Choose the correct answer.

1. Flat muscles are the muscles like your diaphragm or in your forehead.
2. Muscles are made up of fibers.
3. Calcium is necessary for bones.
4. Vitamin E slows the process of ageing.
5. The smallest bones are in the ear.
6. Fibers help in passing out of feces.
7. The pointed teeth on either side of your incisors are called canines.
8. There are more than 600 muscles in our body.
9. Potassium maintains the balance of water in our body.
10. Some muscles are under your control. These are called voluntary muscles.

Chapter no. 2

World Around Us

Overview of Lesson

In Class III, children will come to know about different habitats and learn how different animals adapt to different ones. They will identify the ways human activities affect the natural habitat of animals.

Plan for Achieving the Learning Objectives

Step 1: Discuss what habitat is

Step 2: Discuss how animals adapt to different surroundings

Step 3: Discuss the effects of human activities on natural habitats



Answers to Exercises in Textbook

Checkpoints

Activity No. 1

Answer the following questions.

1. Where can we find polar bears?

Antarctica

2. What are the adaptations that cacti have to survive in the desert?

The cactus has adapted its leaves into spines to prevent a loss of water. It has a thick and fleshy stem that stores lots of water. It is covered with a thick and waxy cuticle that prevents loss of water from small pores. It is deep rooted so that it can search for water underground.

3. What are the adaptations that enable fish to survive in water?

Fish have gills to breathe in water. They have fins for swimming and a streamlined body that reduces friction.

4. What is a habitat?

A habitat is a special place where plants or animals live.

Activity No. 2

Which animals live in different habitats? Can you match the animals below to their habitats? Draw a line from the animal to the place in the world where it lives:

- Penguins live in Antarctica
- Lions live in Africa
- Kangaroos live in Australia
- Eagles live in North America
- Polar bears live in Asia

Chapter no. 3

Animal World

Overview of Lesson

In Class III, children will learn about animals' teeth and their food. They will learn about animals on the basis of their eating habits and will compare the teeth of herbivores and carnivores. They will also know that living things reproduce and pass traits to their young ones. Children will differentiate between sanctuaries, safaris and the zoo.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss food and feeding
Step 2: Discuss life process of animals
Step 3: Discuss life cycles



Answers to Exercises in Textbook

Think Tank

Why does a giraffe have a long neck? Think!

Giraffes have long necks so they can reach the leaves on high trees.

Checkpoints

Activity No. 1

Answer the following questions.

1. Define omnivores.

An animal that eats a variety of food of both plant and animal origin is called an omnivore.

2. What is mastication?

Mastication is the process by which food is crushed and ground by teeth.

3. Describe the characteristics of carnivores.

Characteristics commonly associated with carnivores include organs for capturing and breaking down their prey (teeth and claws serve these functions in many vertebrates).

4. Define herbivores.

An animal that feeds on plants is an herbivore.

5. Describe the teeth of herbivores.

Herbivores have strong and flat molars that are made for grinding leaves and small or non-existent canine teeth.

6. Describe the characteristics of mammals.

Animals that give birth to their young ones are called mammals.

7. What are egg-laying animals?

Animals that lay eggs have offspring develop after eggs have been laid. The egg hatches after the complete development of the offspring.

8. What is an endangered species?

An endangered species is one that is a species of plant or animal that is seriously at risk of extinction.

9. Name some of the endangered species.

Tiger, polar bear, pacific walrus, magellanic penguin, leatherback turtle, Bluefin tuna, mountain gorilla, monarch butterfly, Javanese rhinoceros, giant panda

10. Differentiate sanctuaries from safaris.

A safari is a tour where one or more wildlife rangers take us for a trip through the jungle. A sanctuary is a protected forest where wild animals live without danger of human hunting.

**Activity No. 2**

- **Choose the correct answer.**
 1. Carnivores are called flesh-eating animals.
 2. Buffaloes and cows swallow food without chewing it. This is called mastication.
 3. Some animals eat both plants and animals. These animals are called omnivores.
 4. Which of the following animals does not have teeth for tearing or chewing?
Snake
 5. Which of the following is not an omnivore? Giraffe
 6. The process that removes waste products from the body is called excretion.
 7. Life cycle is a series of stages through which a living organism passes during its lifetime.
 8. Living things respond to changes that occur in the environment. This is called sensitivity.
 9. A biological process by which new individual organisms are produced from their parents is called reproduction.
 10. Animals need energy to grow and move.

Chapter no. 4

Plant World

Overview of Lesson

In Class III, children will identify plant parts and their functions. They will also learn about the benefits we get from plants.

Plan for Achieving the Learning Objectives

Step 1: Discuss the parts of a plant and its functions

Step 2: Discuss the benefits of plants

Answers to Exercises in Textbook

Think Tank

What is the main source of heat for plants? Think!

The sun is the main source of heat for plants.

If plants exhale oxygen then what do they inhale?

Plants exhale oxygen.

Checkpoints**Activity No. 1**

Encircle the correct answer.

1. All plants are living organisms.



2. An example of seeds which we all eat is wheat.
3. Furniture is made up of wood.
4. Excess amount of heat and water can destroy plants.
5. The stem is the support of the plant.
6. Pesticides are some special chemicals.
7. Plants also need gases.
8. Plants transpire to bring moisture.
9. Often we get medicines from plants.
10. Plants reduce pollution.

Activity No. 2

Answer the following questions.

1. What are the uses of hemp fibers?

Hemp fibers are used for making rope and cord, that are part of many woven furniture designs.

2. Which plant is used to treat kidney disorder?

The mayflower is used to treat kidney disorders.

3. What do we inhale during breathing?

We inhale oxygen during breathing.

4. What is the other common name of Indian pipes?

Indian pipes are also called ghost flowers.

5. How do plants help in lowering temperature?

Plants help in lowering temperature in the surroundings by retaining moisture. Plants exhale the moisture in a process called respiration, like when humans respire, their breath fogs up windows. This moisture cools the air and as sweat cools our bodies, it evaporates off of our skin similarly moisture cools the air.

Activity No. 3

Match the pictures with the name.

Pesticides – Picture 3

Soil – Picture 2

Stem – Picture 4

Plant – Picture 5

Roots – Picture 1



Chapter no. 5

Materials Around Us

Overview of Lesson

In Class III, children will learn about the materials around them and about their masses. They will also get to know about the instruments that compare masses and identify different properties of materials and their uses. Children will sort out rocks for their appropriate use on the basis of their permeability and identify and group rocks on the basis of their formation. They will also identify the properties of metals and learn about alloys and their uses. Children will compare the properties of different states of matter and learn about the water cycle.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss all sorts of matter
Step 2: Discuss selecting materials
Step 3: Discuss states of matter and its properties

Answers to Exercises in Textbook

Think Tank

This is a hard piece of stone. Is it permeable? If you pour water on it, would it soak through?

It is semi-permeable. Some water will soak through.

A scuba diver carries a cylinder when he goes for diving. What is contained in the cylinder? Think.

A scuba diver carried oxygen in a cylinder when he goes for diving.

Checkpoints

Activity No. 1

Answer the following questions.

1. Differentiate between elasticity and flexibility.

Elasticity is the ability of a material to stretch in different directions, returning to its original position. Flexibility is the ability of a material to bend easily without breaking.

2. What is the property of material that makes it withstand more weight?

Strength is the ability of a material to stand up to forces being applied without bending, breaking, shattering or deforming in any way.

3. What are the things that change the texture of the rocks by varying size colour etc.?

The grains of different minerals give rocks different sizes, colours or shapes.



4. Define permeability of rocks.

Permeability is a characteristic that allows the oil and gas to flow through the rock.

5. Which material gets attracted by the magnet?

Materials that are attracted by magnets are called magnetic materials.

6. Define matter and its properties.

Matter has mass and it takes up space. Its properties include strength, elasticity, flexibility, hardness, heat conductivity, magnetism, transparency, opaqueness, and absorbency.

7. Define insulators.

Insulators are materials that can't conduct heat or electricity.

8. Name some magnetic materials.

Iron, Cobalt, Nickel, Manganese and Aluminium.

9. Compare the properties of solids, liquids and gases.

Solids have a definite shape, definite mass, and definite volume. Liquids do not have a definite shape but have a definite mass and definite volume. Gases do not have a definite shape, definite mass and definite volume.

10. Differentiate between condensation and boiling.

When a liquid becomes a gas, it is called boiling or vaporization. The boiling point for water is 100 degrees Celsius. When the opposite occurs, a gas becomes a liquid, it is called condensation.

11. Name the steps of the water cycle.

Condensation, precipitation, collection and evaporation.

12. Write down the units to measure liquids.

We can measure the volume of liquids by using cylinders that are graduated. When water changes its state, then the volume changes but the mass does not change. We measure the volume of liquids in millimeters or liters.

Activity No. 2

Choose the correct answer.

- Which of the follow is an igneous rock? Granite
- When magma cools and solidifies, it forms igneous rocks.
- Texture of the rocks varies due to the presence of minerals.
- Extreme pressure and heat over time forms metamorphic rocks.
- Granite is impermeable.

Activity No. 3

Match the pictures with the name.

Solids: chair, purse, table

Liquids: water, juice, mercury

Gases: air, smoke, vapour

**Activity No. 4**

Fill in the blanks.

1. Anything that has mass and takes space is called matter.
2. Water boils at 100°C.
3. The cylinders that are used to measure water are graduated.
4. When a gas becomes liquid, it is called condensation.
5. Liquids do not have a definite shape.

Science Skills

B. What if I had a few pieces of stone with gaps in between them. Would they be permeable? How about soil? Is it permeable or impermeable?

Stones with gaps in between them are permeable. Soil is also permeable.

Let's Do It

B. Take two glasses of water. Put equal water in both of them and mark the level of water in the glasses. Now take two sheets, one of cotton and one of plastic paper. Roll both of them separately and put them in each glass. After 5 minutes, take out the rolls of paper and cotton. What have you observed? Is the level of water lesser in any of them or did it remain the same? What is your conclusion?

Conclusion: The glass which had cotton in it has lesser water than the one that had the plastic paper, because the cotton has been soaked with water. This means that cotton is permeable and plastic is impermeable.

Chapter no. 6

Forces, Light, Sound and Electricity

Overview of Lesson

In Class III, children will understand the force of gravity and air resistance as push and pull. They will investigate the role of a spring balance in measuring the amount of force and understand friction as an important force in our surroundings. They will also learn ways of reducing friction and classifying light sources as natural or artificial. Children will learn the properties of light and identify various sources and uses of heat, sound and electricity.

Plan for Achieving the Learning Objectives

- Step 1:** Discuss forces and motion
Step 2: Discuss light, shadow and colour
Step 3: Discuss sources and uses of heat, sound and electricity



Answers to Exercises in Textbook

Think Tank

Have you seen a heavenly body that is luminous and gives us light? Explain which heavenly body is luminous and non-luminous?

I have seen a heavenly body that is luminous and gives us light. The sun is a heavenly body is luminous and the moon is non-luminous.

Checkpoints**Activity No. 1**

Identify the statements that are false. Write F.

- | | |
|--|---|
| 1. Mass can never be zero. | T |
| 2. We apply brakes to speed up the cars. | F |
| 3. Astronauts are weightless in space. | T |
| 4. Weight is the quantity of an object. | F |

Activity No. 2

Choose the correct answer.

1. Light from the sun is necessary for plants to photosynthesize.
2. Bioluminescence is defined as the generation of light by living organisms like fireflies.
3. Heat can be generated by all of the above.
4. Heater is an artificial source of energy.

Activity No. 3

Fill in the blanks by choosing correct options.

1. Mass is measured in newton.
2. Air friction keeps the flying airplane in the air.
3. Wheels or ball bearings are used to decrease friction.
4. Spring balance is used to measure weight.

Activity No. 4

Identify the statements that are false. Write F.

1. **What is force of friction?**
Friction helps us in doing many tasks in our daily life. We can change the speed of moving objects by using this force. It helps us to stand. We can produce heat by rubbing our hands together.
2. **Give three ways to reduce friction.**
Use grease, Use smoother surfaces, and Use fluids of lower viscosity
3. **What are natural forces?**
Gravity, air resistance and running water are natural forces.



4. Write down the differences between mass and weight in a tabular form.

Mass	Weight
Quantity of an object	Force that earth's gravity uses to pull something towards itself
Depends on size of object	Measured in pound-force or Newtons
Truck has more mass than small vehicle	Zero where force of gravity is zero

5. What are artificial source of light?

Electrical appliances made by humans are artificial sources of light such as a bulb and a lantern.

6. What is a rainbow?

Rainbows are spectacular rays of colour. Sunlight looks white, but it's really made up of different colours such as red, orange, yellow blue, green, indigo and violet. The sun makes rainbows when white sunlight passes through rain drops which act like tiny prisms. It spread out into a band of colours.

7. What is the speed of light?

Light takes 8 minutes to reach the earth from the sun.

8. What is a sundial?

A sundial is a device that tells the time of day by the position of the sun.

9. Do heat and sound form energy? How?

Heat is produced when there is a transfer of heat from a warm object to a cool object. Sound is energy made by vibrations.

10. How is energy produced?

Energy is produced from the sun, the earth, by burning fuel, by electricity, sound systems, irons, heaters, and musical instruments.

11. What is solar energy?

Energy produced from the sun is called solar energy.

12. How is sound energy produced?

Sound energy is made by vibrations when any object vibrates. It causes movement in the air since the particles bump into each other. Continued bumping causes sound waves, which any voice can produce.

Activity No. 5

Identify the toys that are run by electricity or battery.

Bicycle, robot, piano and car



Activity No. 6

Fill in the blanks.

1. Light can be reflected from some surfaces like mirror or metals.
2. Sundial is a device that tells the time of day by the position of the sun.
3. Light travels in straight lines.
4. Light takes 8 minutes to reach the earth from sun.
5. Plants also use this energy to prepare food through photosynthesis.

Activity No. 7

Identify some situations where air resistance, a form of friction is being used or reduced.

Picture 1: Air resistance is being used/reduced

Picture 2: Air resistance is being used

Picture 3: Air resistance is being used/reduced

Science Skills

We will observe that light travels in straight lines.

Chapter no. 7
Earth and Beyond

Overview of Lesson

In Class III, children will understand the motion of the moon around the earth and know the phases of the moon. They will understand the weather and its types. They will also identify various weather symbols and identify different weather instruments.

Plan for Achieving the Learning Objectives

Step 1: Discuss the changing moon

Step 2: Discuss weather

Answers to Exercises in Textbook

Think Tank

The moon has two sides. One side is always away from the earth and it is called the dark side. Why does this side never come towards the earth? Think!

The moon rotates very slowly and so one side of its surface always faces away from planet earth.



Checkpoints

Activity No. 1

Answer the following questions.

1. What is a Synodic month?

Synodic month is the time it takes the moon from changing its phases and restarting them.

2. What is a Blue Moon?

A blue moon occurs when the moon appears bluish because of smoke in the atmosphere.

3. Why is there no life on the moon?

There is no life on the moon because there is no air over there.

4. What is a full moon?

A full moon occurs when the side of the moon that is lit up by the sun is facing the earth and the entire moon is lit up.

5. Define weather.

Weather is the condition of sunshine, clouds, rain and wind in a place at a specific time.

6. Why are the morning and evening cooler as compared to the afternoon?

The afternoon is much warmer as compared to the morning and evening because the sun shines directly overhead. In the morning and evening the rays of the sun are slanting.

7. Why do we use a rain gauge?

We use a rain gauge to measure the amount of rain that has fallen over a specific time period.

8. How can we determine the direction of wind?

A wind vane is an instrument that determines the direction from which the wind is blowing.

Activity No. 2

Fill in the blanks.

1. A thermometer is used to measure the temperature of air.
2. A rain gauge is used to measure the amount of rain.
3. A wind vane is used to know the direction of wind.
4. We should take some safety measures in extreme weather conditions like thunderstorms.

Activity No. 3

Fill in the blanks by choosing correct options.

1. The Moon is smaller than Earth.
2. The Moon does not have its own light.



3. The Moon is not visible when it is a new moon.

4. There are two sides of the Moon.

Activity No. 4

True or false.

- | | |
|--|---|
| 1. The entire Moon is lit up when it is a full moon. | T |
| 2. Waxing means to slowly get smaller. | F |
| 3. Waning crescent gets smaller by the minute. | F |
| 4. The side that is towards the earth is called dark side. | F |
| 5. There is no water on the moon. | F |

Activity No. 5

Match the columns.

- | | |
|--------------------|-----------|
| 1 New Moon: | Picture 7 |
| 2 Waxing Crescent: | Picture 5 |
| 3 First Quarter: | Picture 8 |
| 4 Waxing Gibbous: | Picture 3 |
| 5 Full Moon: | Picture 6 |
| 6 Waning Gibbous: | Picture 2 |
| 7 Last Quarter: | Picture 4 |
| 8 Waning Crescent: | Picture 1 |

Science Skills

Look carefully at the Moon; you will see some dark spots, holes etc. on the surface of Moon. What is it?

The dark spots and holes on the surface of the Moon are called craters.



Chapter no. 1

Ourselves

Overview of Lesson

In Class IV, children will identify major parts and functions of the human body. They will know that humans have bony skeletons inside their bodies and learn how bones and muscles work together. They will also identify the sources of common food and explain the properties of major food groups. Children will differentiate between balanced and unbalanced diets. They will identify common disorders of various parts of the body and their causes. They will also learn ways to keep the parts of the body healthy.

Plan for Achieving the Objective

- Step 1:** Discuss the human body.
Step 2: Discuss health and diet.
Step 3: Discuss common disorders of human body.

Answers to Exercise in Textbook

Checkpoints

Activity No. 1

Answer the following questions.

- What do bones contain in their innermost part?**
Bones contain marrow in their innermost part.
- How many lungs does the human body have?**
The human body has two lungs.
- The bones that make up your spine are called what?**
The bones that make up my spine are called vertebrae.
- The flow of blood through your heart and around your body is called?**
The flow of blood through my heart and around my body is called circulation.
- What is the outer layer of skin on the human body called?**
The outer layer of skin on the human body is called epidermis.
- Explain malnutrition in your own words.**
Malnutrition is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problems.
- What is hygiene? What are its basic principles?**
Any action that maintains one's health and prevents disease is considered hygienic. Food hygiene involves a clean workplaces and safe production of food. Its main purpose is to maintain good health by reducing the risk of producing harmful food, preventing infestations of pests and flies, mice etc.
- How does fiber help our bodies?**
Fiber is very important in our diet because it helps to move food through the stomach, helping to prevent constipation. Everybody needs some fiber in their diet.



- Why do we need carbohydrates?**
We need carbohydrates because they provide us with energy.
- Name the bacteria that cause acne.**
Propionibacterium acnes is bacteria that causes acne.
- What is indigestion?**
Indigestion is the feeling of discomfort in the upper belly or abdomen during or right after eating. It can be due to drinking too much alcohol, eating spicy, fatty foods, overeating, eating too fast, high fiber foods and smoking tobacco.
- What are the common disorders of the teeth?**
Most common disorders of teeth are tooth decay and tooth sensitivity.
- How can we avoid stomach disorders?**
Stomach disorders can be avoided by allowing enough time for meals, chewing food carefully and completely, avoid arguments during meals, avoid excitement or exercise after a meal, and a calm environment and rest may help relieve stress-related indigestion.
- What is tooth decay?**
Tooth decay occurs when plaque, the sticky substance that forms on teeth, combines with the sugars of food we eat.

Activity No. 2

Choose the correct answer.

- The study of how body parts function is called physiology.
- Molars grind the food.
- Ear converts the electrical sound waves to neural impulses that can be recognized by the brain for hearing
- Eyes detect light and allow us to see.
- Teeth can help us to pronounce accurately.
- Which of the following is a major source of protein? Meat
- All of the following are examples of the grains group except cheese.
- Fibers help in preventing constipation.
- Spices are used for flavouring, colouring or preserving food.
- Osteoporosis is caused by severe loss of calcium.
- Abdominal pain is related to disorder of which body part? Stomach
- Tooth decay is also known as cavities.
- Eating too much junk food can be a cause of abdominal pain.
- Inside the tooth, there are nerves and blood vessels.
- Dry skin often worsens in the winter.

Activity No. 3

Fill in the blanks.

- Skeletal muscles are voluntary because we can control them.
- The red bone marrow inside some larger bones produces new blood cells.
- There are around 2,000 plant species which are cultivated for food.



4. Protein food group includes poultry, fish, meat, dry beans, eggs and nuts.
5. We should eat very little from fat group.
6. Kwashiorkor is due to taking unbalanced diet.
7. We get Vitamin C from oranges that are good for healthy skin.
8. The study of the structure and the relationships among structures is called anatomy.
9. Skin is an important barrier to infections and diseases.
10. The human body is comprised of over 600 muscles.

Activity No. 4

Sort out the food and write it in the correct column to which they belong.

- | | |
|-------------------------|-----------------------------------|
| 1. Dairy: | Yoghurt, Cheese |
| 2. Grains: | Noodles, Cereals |
| 3. Fruits & vegetables: | Carrots, Pineapples |
| 4. Fats, oil, sweets: | Sugars, Cola drink, Potato crisps |
| 5. Meat: | Fish |

Chapter no. 2

World Around Us

Overview of Lesson

In Class IV, children will learn the components of environment and differentiate between different types of environments. They will classify animals on the basis of eating habits and learn about the basic food chain. They will also recognize the ways the human activities affect the environment and compare the physical characteristics of animals and plants.

Plan for Achieving the Objective

Step 1: Discuss the living things and their environment.

Step 2: Discuss the characteristics and needs of living things.

Answers to Exercise in Textbook

Checkpoints

Activity No. 1

Fill in the blanks.

1. Carnivores are flesh eating animals.
2. Herbivores are plant eating animals.
3. Decomposers break down materials and return nutrient to the soil.
4. Secondary consumers eat the primary consumers.
5. A predator is an organism that eats another organism.
6. Animals get oxygen from air to breathe.



7. Plants prepare their food by taking carbon dioxide and light from the air and water and minerals from soil.
8. Water is essential for life.
9. The body of a reptile is covered by scales.
10. Insects have 3 body sections: head, thorax and abdomen.

Activity No. 2

Answer the following questions.

1. What is environment?

Environment is defined as everything in the world around us that can affect our lives.

2. What is the difference between physical environment and biological environment?

A physical environment is made up of elements such as the atmosphere, climate, land and water. The biological environment includes animals, plants, and bacteria.

3. What is meant by a savannah?

In Africa, grassland with trees is called a savannah.

4. What are omnivores? Give examples.

An omnivore is an animal that feeds on both plants and other animals. Example: wolves, orangutans, swallows, armadillos, finches and humans.

5. Describe a simple food chain.

A simple food chain starts with grass, eaten by rabbits. Then the rabbits are eaten by foxes.

Activity No. 3

Choose the correct answer.

1. All are herbivores except birds.
2. All options mentioned are incorrect. Question must be redone in books.
3. What is the largest tropical rainforest of the world? Amazon
4. A carnivore means meat eater.
5. Grasslands are environment where grasses are the main type of vegetation.
6. Arachnids have 8 legs.
7. Birds are warm blooded.
8. Bodies of mammals are covered by hair or fur.
9. Roots absorb water from the soil.
10. Snakes are examples of reptiles.

Let's Do It

A. We are polluting the water and air in many ways. Think of some of them and write them below.

Water pollution: contamination of water and discharges from sewage plants

Air pollution: Ash from volcanic eruption, motor vehicles, paint etc.



Chapter no. 3

Animal World

Overview of Lesson

In Class IV, children will explain the characteristics that are inherited from parents and will compare the life cycles of different animals. They will know that animals with skeletons have muscles attached to their bones and know how muscles help in movement.

Plan for Achieving the Objective

Step 1: Discuss animal life cycles.

Step 2: Discuss animal's movements.

Answers to Exercise in Textbook

Checkpoints

Activity No. 1

Write true or false.

- | | |
|--|-------|
| 1. Ligaments connect muscles and bones. | True |
| 2. Heart is a muscle. | False |
| 3. Skeletal or voluntary muscles are the muscles that are under control. | True |
| 4. Involuntary muscles are under control. | False |
| 5. Muscles work in pairs. | True |

Activity No. 2

Compare the life cycles of a snake and a chicken. Write their differences and similarities in the form of a table.

- **Similarities**
Hens and snakes lay eggs. Chicks and baby snakes form in the eggs. Both animals look like their parents.
- **Differences**
Hens lay a single egg at a time while snakes lay many eggs.

Activity No. 3

Answer the following questions:

- Define the endoskeleton. Give examples of animals that have endoskeletons.**
Animals like vertebrates that have a skeleton inside their bodies, have an endoskeleton. Humans, cats, dogs, horses, cows and fish have an endoskeleton.
- Define exoskeleton. Give examples of animals that have an exoskeleton.**
Animals that have a skeleton outside their bodies have an exoskeleton. Grasshoppers, cockroaches, crabs, lobsters and snails have an exoskeleton.
- Differentiate between voluntary and involuntary muscles.**
Voluntary muscles are those that we have control over. Involuntary muscles are those we have no control over.
- What are ligaments?**
Ligaments attach skeletal muscles to bones.



5. How do muscles move?

Muscles move the joints. Muscles work in pairs, pulling it in different directions. One muscle pulls the joint one way and the other one pulls it back. Muscles are attached to bones by tendons.

Chapter no. 4

Plant World

Overview of Lesson

In Class IV, children will know that plants need energy from sunlight for growth and know that plants reproduce. They will know the types of plants and identify that some plants reproduce by seeds and some by spores. They will also classify kinds of seeds and learn different ways of seed dispersal. Children will also know about seed germination.

Plan for Achieving the Objective

Step 1: Discuss plants.

Step 2: Discuss classification of plants.

Step 3: Discuss plants life cycle.

Answers to Exercise in Textbook

Checkpoints

Activity No. 1

Choose the correct answer.

- Sepal protects the bud until it opens.
- Seeds can be dispersed by wind or water.
- A flower is pollinated when a pollen grain lands on its stigma.
- Grasses have no nectar or bright colours to attract the insects.
- Stamens make pollen.
- Garden beans have epigeous type of germination.
- In a germinating none of the above seed, no hypocotyl arch exists to push the leaf portions through the soil.
- The primary root system that develops from the radicle is temporary.
- Seed coat is also called testa.
- All are monocots except soybeans.

Activity No. 2

Answer the following questions.

- How are aquatic plants different from land plants?**
Terrestrial and aquatic plants have specialized structures. Aquatic plants are surrounded by water so they don't dry out. Land plants absorb water and minerals from soil using roots.



2. **Discuss the role of pollination in reproduction.**

Pollination causes pollen grains to germinate on the stigma. They go down the style to reach an ovule which is fertilized to develop into seeds.

3. **What is the difference between angiosperms and gymnosperms?**

An angiosperm is a plant that has flowers and produces seeds enclosed within a carpel. A gymnosperm is a plant that produces seeds that are not enclosed within a carpel.

4. **How many cotyledons are present in a bean seed?**

There are two cotyledons present in a bean seed.

5. **What is an endosperm?**

The endosperm is the tissue produced inside the seeds of most of the flowering plants following fertilization. It surrounds the embryo and provides nutrition in the form of starch, though it can also contain oils and protein.

6. **What is epigeous germination?**

Epigeous germination occurs when the hypocotyl of the embryo elongates and raises the plumule, epicotyl, and cotyledons through the soil surface and above the ground.

7. **Write down the composition of the embryo.**

The embryo consists of a plumule, epicotyl, cotyledons, hypocotyl and a radicle.

8. **Differentiate between monocots and dicots.**

Monocots possess a single cotyledon, whereas a dicot possesses two cotyledons.

Activity No. 3

Fill in the blanks.

1. Spores are very small and are formed in the sporangia.
2. Conifers or gymnosperms are examples of seed bearing plants.
3. Angiosperms are called as seed bearing plants.
4. The food supply of a seed is called endosperm.
5. Tiny root is also called as radicles.
6. Seeds are essential for the survival and continued existence of many plant species.
7. Seeds contain an embryo and have their own food supply.
8. The plumule includes the young primordial leaves and growing point of the stem.
9. The cotyledons are the seed leaves used for food storage.
10. In hypogeous germination, the hypocotyl of the embryo elongates and raises the plumule, epicotyl, and cotyledons through the soil surface and above the ground.

Activity No. 5

Match the columns.

Sepal:	protects the bud until it opens.
Petal:	makes pollen
Stamen:	male reproductive part of plants.
Carpel:	grows into fruits which contain the seeds.



Chapter no. 5

Materials Around Us

Overview of Lesson

In Class IV, children will learn the properties used to group and store materials. They will identify three states of matter with examples and compare solids, liquids and gases on the basis of shape and volume. They will also demonstrate and explain how matter changes its state on heating. Children will explain how one state of matter dissolves into another and predict and demonstrate how various materials mix with water. They will demonstrate separation of insoluble solids from water by decantation and filtration.

Plan for Achieving the Objective

Step 1: Discuss materials and objects.

Step 2: Discuss freezing.

Step 3: Discuss solids, liquids and gases.

Answers to Exercise in Textbook

Think Tank

Do liquids change their volume when they are poured into a different container? Think!

Liquids do not change their volume when they are poured into a different container. In fact, they take up the shape of the container they are poured into.

Think Tank

Have you ever left a glass of ice water out on the table? What happened to the ice? What happens to the amount of a substance if it is changed from a solid to a liquid?

When you leave a glass of ice water out on the table, the ice melts and disappears. The amount of a substance increases once it is changed from a solid to a liquid.

Checkpoints

Activity No. 1

Answer the following questions:

1. **Arrange the following according to the increasing order of the space between the particles they are made up of.**
Ice
Water
Oxygen
2. **Water can be changed into a solid. Do you know how?**
Water can be changed into a solid when it is frozen to form ice.
3. **Give three examples of each of the following and also give the name of the process.**
Liquid changes into solid: Freezing like liquid water freezing to solid ice



Liquid changes into gas: Boiling like when liquid water is boiled to release steam
 Gas changed into liquid: Condensation like when water vapour is collected and cooled

Solid changes into liquid: Melting like when solid ice is warmed to form liquid water

4. Differentiate between different states of matter.

Solids are often hard and brittle. Liquids are fluid at room temperature. Gases have molecules that are further apart.

5. What is the chemical and physical state?

The chemical state is the state of electrons in any matter. The physical state is characterized by solid, liquid and gas.

6. Why don't liquids have a definite shape?

Liquids do not have a definite shape because the particles in liquids are very close together (barely further apart than in solids) liquids do not easily compress, so their volume is fixed.

7. How does freezing occur?

Freezing or solidification is a transition phase in which a liquid turns into a solid when its temperature is lowered below its freezing point.

8. Why don't solids flow?

Solids are held tightly together by strong forces of attraction and are held in fixed positions. Since the particles don't move, solids have a definite shape and volume, and can't flow.

Activity No. 2

Choose the correct answer.

- Sedimentation is the process in which insoluble impurities allowed to settle down and the top layer of liquid is removed after it.
- Liquids are fluids at room temperature.
- Plasma state is made up of free electrons and elements like neon.
- Which of the following is the process in which filter paper is used to clean a liquid? Filtration
- Matter changes its physical state when it is being heated.
- The boiling point of water is 100 degree Celsius.
- The freezing temperature of water is 0 degree Celsius.
- When water is cooled it none of the above.
- Vapourization is also called boiling.
- Steam is gas.

Activity No. 3

Compare solids, liquids and gases on the bases of shape and volume.

Solid:	Shape:	fixed	Volume:	fixed
Liquid:	Shape:	not fixed	Volume:	fixed
Gas:	Shape:	not fixed	Volume:	not fixed



Chapter no. 6

Sounds, Heat and Electricity

Overview of Lesson

In Class IV, children will investigate the ways in which motion of an object can be changed and will demonstrate how force can change the position and the shape of an object. They will learn speed and give its relation with distance. They will also learn about simple machines and investigate that sound is produced by vibrating objects. Children will differentiate between low and high sounds. They will also learn about weather and seasons.

Plan for Achieving the Objective

Step 1: Discuss forces and movements.

Step 2: Discuss sound.

Step 3: Discuss heat and its measurement.

Step 4: Discuss electricity and magnetism.

Answers to Exercise in Textbook

Think Tank

Is there sound on the Moon? Can we hear sound on Moon? Think!

We cannot hear any sound on the Moon.

Checkpoints

Activity No. 1

Can you name the simple machines that make up this compound machine?

Wheel and axle, lever, and pulley. Screws. Inclined plane wheels of bike.

Activity No. 2

Name six simple machines.

1. Lever 2. Inclined plane 3. Wedge 4. Screw 5. Pulley 6. Wheel and axle

Activity No. 3

Choose the correct answer.

- A screw is not like a nail because it is not smooth. It has spiral ridges.
- A pulley is made up of a rope and a grooved wheel.
- Force is a push or pull.
- Speed is measured by meter per second.
- A lever works like a crane.
- Temperature is the average kinetic energy of the particles.
- Thermometer is an instrument used to measure temperature.
- Ice melts at 32 degrees Fahrenheit.
- The boiling of water is 100 degrees Celsius.
- Mercury in the bulb of a thermometer expands on rising of temperature.
- About what frequency range can the average human hear? 20 Hz to 20,000 Hz
- Which travels faster? Sound or light? Light



13. What cannot travel through a vacuum (space with no substance)? Sound
14. How fast does sound travel? 340 meters per second
15. Does sound travel faster through air or water? Water

Activity No. 4

Answer the following questions.

1. **How are sounds produced?**
Sound is a vibration that travels through matter (solid, liquid, or gas) and can be heard. Vibrating objects make sound when a mechanical action is performed on them.
2. **Name five things sound can travel through.**
Sound can travel through solids, liquids, gases, such as air and steel.
3. **Describe how we hear sound?**
Sound produced by a vibrating object is passed to our ears and this is how we hear.
4. **Ali rings a bell. Describe how the bell makes the sound.**
When the bell is rung, the bell makes the particles in the air vibrate. The louder the sound, the greater amount of particles vibrate. These vibrations create sound.
5. **Ahmed makes sounds by twanging a ruler on the edge of the table. Why does the ruler make a sound?**
The ruler makes a sound because it is a moving object producing vibrations in the space around it.
6. **Can sound travel underwater?**
Sound can travel underwater, but since water is liquid, it will take slightly longer for it to travel.
7. **What is the speed of sound?**
The speed of sound in air is 343 m/s.
8. **Sound travels through air at 1,120 feet (340 meters) per second.**
Sounds grow fainter as you get further away from the sound source.
9. **Define the following:**
 - a. **Kinetic energy**
Energy that is produced through movement
 - b. **Heat**
It is the degree of hotness
 - c. **Temperature**
Degree of hotness or coldness of a body or an environment.
10. **Write down the most common scales which we use in measuring temperature:**
Celsius Fahrenheit
11. **What is used to measure temperature?**
A thermometer is used to measure temperature.
12. **What happened to the liquid present in the bulb of the thermometer when the environment around is:**
 - a. **Cold**
The liquid present in the bulb of the thermometer would contract and drop
 - b. **Warm**
The liquid present in the bulb of the thermometer would expand and increase



Activity No. 5

Which of the following objects will attract the magnet?

Frying pan, fork and knife, screw

Chapter no. 7

Earth and Beyond

Overview of Lesson

In Class IV, children will compare and contrast the characteristics of the different types of soil. They will identify sources of water and its importance. They will also know the importance of the water cycle and learn the relation of spinning of the earth with the occurrence of day and night. Children will learn about the solstices and equinoxes. They will identify the components of weather and know the different types of clouds. They will also identify the use of weather instruments and learn about the weather forecasting.

Plan for Achieving the Objective

- Step 1:** Discuss soil
Step 2: Discuss water in the environment
Step 3: Discuss the earth and the sun
Step 4: Discuss weather and its components

Answers to Exercise in Textbook

Think Tank

Think about an example of something that revolves, and something that rotates.
A toy top revolves. People holding hands and moving in a circle is a rotation.

Checkpoints

Activity No. 1

Fill in the blanks.

1. The cycle of condensation, precipitation and evaporation is called the water cycle.
2. Water cycle is scientifically known as hydrological cycle.
3. The top layer of the earth's crust is called soil.
4. Gravels are much bigger than the size of the sand particles.
5. Our body contains almost 70% water.

Activity No. 2

Answer the following questions.

1. **List four ways in which you can save water at home.**
Use less water while bathing.
Don't leave water running while brushing teeth.
Not ignoring a running water tap.
Using less water in the kitchen.



2. Explain the term 'porosity' related to soil.

Porosity is the amount of space between the particles needed to supply oxygen and allow movement of water.

3. List some ways through which we can get underground water at our homes.

Water can come out of the ground due to pressure in the form of springs. Underground water can also be obtained by digging wells and sinking tube wells. Canals and tube wells can help bring water onto the surface of the earth.

4. What is humus?

Humus is a black or brown organic substance consisting of partially or wholly decayed vegetable or animal matter that provides nutrients for plants and increases the ability of soil to retain water.

5. What is the difference between rotation and revolution?

The earth rotates on its axis every 23 hours and 56 minutes. It takes the earth 365 days to travel or revolve around the sun once.

6. What kind of movement causes night and day?

Rotation causes night and day.

7. What kind of movement causes the change of seasons?

Revolution causes the change of seasons.

8. How long does it take to orbit the sun?

It takes 365 days to orbit the sun.

9. What are people called who study the planets and stars?

People who study the planets and stars are called astronomers.

10. What causes weather?

Weather is caused by the amount of solar energy received because of the latitude a place is on. It is also caused by the area's elevation or proximity to mountains. The relative temperature of land and water are also a factor. The number of storm systems (cyclones, hurricanes and thunderstorms) is also a cause of weather. Lastly, the distribution of air pressure over the land and nearest oceans affects weather also.

Activity No. 3

List the factors that affect the growth of plants.

Plants require oxygen and carbon from the air.

They obtain hydrogen from water in the soil.

Plants cannot survive without the smaller quantity of essential nutrients that they obtain from soil, such as nitrogen, phosphorus, potassium, calcium, magnesium and sulphur.

Activity No. 4

Choose the correct answer.

1. Clay has the smallest particle size.
2. Human body comprises of 70% of water.
3. 63% of domestic water is used in toilets and bathrooms.
4. The earth rotates on its axis every 23 hours and 56 minutes.
5. Middle cloud is called altostratus.