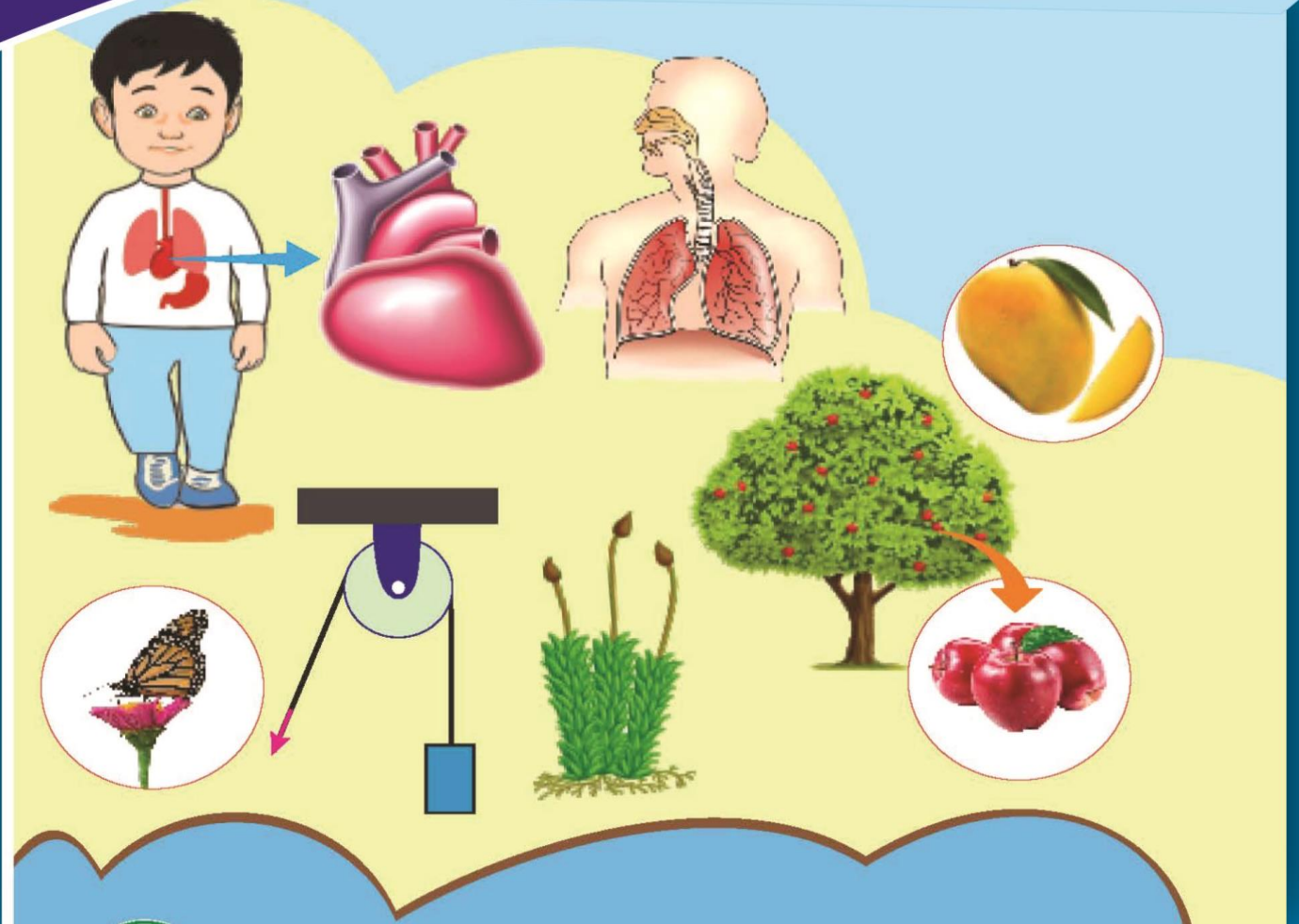


PROFESSIONAL DEVELOPMENT FOR QUALITY EDUCATION

Science Teachers' Guide Lesson Plans

Grade **4**



Quaid-e-Azam Academy for Educational Development, Punjab
Wahdat Road, Lahore





PREFACE

There are many reasons why English Language learning has always been considered an essential skill. Approximately four hundred million people worldwide speak English as their first language, whereas English is listed as one of the official languages in more than a quarter of the world. It allows a person to communicate with new people and helps them to see things from a different perspective or get a deeper understanding of another culture. Moreover, it is the language of the media industry, internet, business, and higher education. The Single National Curriculum (SNC) 2020 also highlights its importance as "individual development, international communication and making better career choices". With its implementation, the Quaid-e-Azam Academy for Education Development (QAED), Government of Punjab, through its Material Development Wing, was entrusted with the task of developing teacher guides with the help of education experts and teachers from government and non-government institutions. This task was supervised by the English Language team of the Material Development Wing. The team not only critically reviewed the entire guide but also ensured the incorporation of its recommendations.

While developing this guide, the team recognized that instructional settings and availability of resources vary significantly in the province of Punjab. Therefore, keeping in mind, the important aspects of SNC and active learning, a contextually relevant teaching process has been devised to ensure student learning outcomes.

On behalf of Quaid-e-Azam Academy for Education Development, Government of Punjab, I am deeply grateful to all involved in creating this guide. I hope that this book will be helpful for teachers to teach English effectively and enable them to perform their duties properly.

Thank you,
The Director General
Quaid-e-Azam Academy for Educational Development,
Government of Punjab



Science – Teacher Guide

Introduction

The Government of Punjab School Education Department notified Single National Curriculum (SNC) in 2021. To ensure its effective execution, Quaid-e-Azam Academy for Educational Development has taken the following initiatives:

1. Organized a professional development program for teachers to enhance their understanding of SNC
2. Develop teacher guides to improve instructions at the school level.

Through these initiatives, the teachers will be able to:

- Observe the alignment between SNC, Academic Calendar & Textbooks.
- Ensure the achievement of student learning outcomes given in SNC
- Equip themselves with new teaching techniques.
- Create an interactive learning environment.

Active Learning promotes students to learn by doing through collaborative activities such as problem-solving, role-playing, watching others, arguing, and many more.

Students will not passively acquire material owing to engaging activities and several types of evaluation. The objective is to improve students' capacity to think critically and creatively via the application of innovative instructional strategies and flexible evaluation techniques.

Using this form of instruction, students' knowledge will develop, their social skills will blossom, and their feeling of community will grow.

Increasing the population's familiarity with and comfort with science is a primary goal of science education in Pakistan. Although the scientific method and the process of inquiry are fundamental to teaching and learning in the scientific disciplines, all decisions are ultimately grounded in the active learning process.

We hope to encourage people's innate inquisitiveness by emphasizing the significance of thinking critically about their surroundings and then formulating questions, hypotheses, and experiments to test them.

To encourage the independence and self-confidence of students as learners, a range of instructional strategies are deployed to create an environment conducive to attaining the desired results.

SNC recommends that teachers utilize a range of materials, not simply the prescribed textbooks and teacher's guides.





Brief Overview of SNC

SNC emphasizes developing analytical, critical, and creative thinking through a more activities-based approach rather than static teacher-centric learning. Furthermore, it focuses on equipping learners with principles and attributes such as truthfulness, honesty, tolerance, respect, peaceful coexistence, environmental awareness & care, democracy, human rights, sustainable development, global citizenship, personal care, and safety (SNC 2020).

- The SNC is standards, benchmarks, and outcomes-based across all subjects.
- The components of the curriculum are given below:
 - Competency: A key learning area involving applied skills and knowledge enabling learners to perform successfully in educational, professional, and other life contexts.
 - Standard: It defines competency by broadly specifying the knowledge, skills, and attitudes to be acquired by students in a particular key learning area during the first five years of schooling.
 - Benchmarks: Further elaborate the expectations about what learners know under each standard, indicating what the students will accomplish at each developmental level to meet the standards.
 - Student Learning Outcomes (SLOs): These are built upon the descriptions of the benchmarks and describe (in key points) what students will accomplish at the end of each unit.

Along with standards and benchmarks, the curriculum also provides a progression matrix containing SLOs grade-wise. For further detail, please refer to the SNC 2020 for the specific subject. In addition, this guide includes lesson plans based on student learning outcomes and textbook content developed by Punjab Textbook Board.





Key Components of Lesson Plan:

TEMPLATE FOR LESSON PLAN

Topic

Lesson plan No.

Grade:

Time:

SLO:

Material / Resources required:

Information for Teachers:

- New concepts
- New ideas
- Teaching tips

Introduction:

- Warm up
- Brainstorming
- Elicitation
- Mind map etc.

Development:

Activity1

Activity2 (Minimum two activities)

Conclusion / Sum up / Wrap up:

Assessment: Focus will be on formative assessment

Follow up:

- home work
 - written work
 - project
- oral assignment etc.



List of Selected Students Learning Outcomes (SLOs)	
General Science-IV	
Sr. No	Students' Learning Outcomes
Unit 1: Characteristics and Life Process of Organisms	
1.	<ul style="list-style-type: none">• Compare and contrast characteristics that distinguish major groups of living things (plants and animals).• Classify animals in terms of vertebrates and invertebrates with examples and analyze differences and similarities in vertebrates and invertebrates.• Classify plants in terms of flowering and non-flowering plants with examples and analyze the differences and similarities in flowering and non-flowering plants.• Identify major parts and organs in animals (teeth, bones, lungs, heart, stomach, muscles and brain).• Identify parts of a plant body (leaves, stem, flowers, seeds, roots).• Relate the structures of plants to their functions i.e., roots absorb water and anchor the plant, leaves make food, the stem transports water and food, flowers produce seeds, and seeds produce new plants.
Unit 2: Ecosystems	
2.	<ul style="list-style-type: none">• Recognize an ecosystem e.g., forests, ponds, rivers, grasslands, deserts.• Explain biotic (plants, animals and humans) and abiotic (light, temperature, soil and water) factors and their linkages.• Analyze the way these biotic and abiotic constituents create a balance within an ecosystem.• Recognize the value of a balanced ecosystem.• Describe a few food chains and analyze their structure to understand their function.• Describe the role living things play at each link in a simple food chain (e.g., plants produce their own food; some animals eat plants, while other animals eat the animals that eat plants).• Identify and describe some common predators and their prey.• Recognize and explain that some living things in an ecosystem compete with each other for food and space.• Interpret that human activities such as urbanization, pollution and deforestation affect food chains in an ecosystem.• Identify various actions and roles that humans can play in preserving various ecosystems.
Unit 3: Human Health	
3.	<ul style="list-style-type: none">• Differentiate between contagious diseases (hepatitis, TB, flu) and non-contagious (cancer, diabetes) diseases.• Relate the transfer of common communicable diseases (e.g., touching, sneezing, coughing) to human contact.• Explore a few ways that can help make water clean and suitable for drinking (water filtration and boiling).
Unit 4: Matter and Its Characteristics	
4.	<ul style="list-style-type: none">• Describe characteristics of each state of matter with examples.• Compare and sort objects and materials on the basis of physical properties (e.g., mass, volume, states of matter, ability to float or sink in water).





	<ul style="list-style-type: none">• Explore the properties of metals (e.g., appearance, texture, color and density).• Identify properties of metals (conducting heat and electricity) and relate these properties to the use of metals (i.e., a copper electric wire and an iron cooking pot).
Unit 5: Forms of Energy and Energy Transfer	
5.	<ul style="list-style-type: none">• Relate familiar physical phenomena (i.e., shadows, reflections and rainbows) to the behavior of light.• Describe and demonstrate that electrical energy in a circuit can be transformed into other forms of energy (e.g. heat, light, sound).• Explain and provide reasoning that a simple electric circuit requires a complete electrical pathway.
Unit 6: Force and Motion	
6.	<ul style="list-style-type: none">• Describe force and motion with examples from daily life.• Provide reasoning with evidence that friction can be either detrimental or useful under different circumstances.• Recognize that simple machines (e.g. levers, pulleys, gears, ramps) help make motion easier (e.g. make lifting things easier, reduce the amount of force required, change the distance or change the direction of the force).
Unit 7: Earth and Its Resources	
7.	<ul style="list-style-type: none">• Identify some of Earth's natural resources (e.g., water, wind, soil, forests, oil, natural gas, minerals) that are used in everyday life.• Recognize that some remains (fossils) of animals and plants that lived on the Earth a long time ago are found in rocks, soil and under the sea.• Investigate the impact of human activities on the Earth's natural resources.• Suggest the ways to conserve the natural resources.
Unit 8: Earth's Weather and Climate	
8.	<ul style="list-style-type: none">• Relate the global changes in weather patterns to the geological locations.• Recognize that the average temperature and precipitation can change seasons and locations.
Unit 9: Solar System and Our Earth	
9.	<ul style="list-style-type: none">• Describe and demonstrate the solar system with the sun at the center and the planets revolving around the sun.• Recognize that the earth has moon that revolves around it, and from Earth the moon looks different at different times of month.• Investigate and describe how day and night are related to earth's daily rotation on its axis.• Describe how seasons in the earth's northern and southern hemispheres are related to the earth's annual movement.• Illustrate and explain how solar and lunar eclipses occur.
Unit 10: Technology in Everyday Life	
10.	<ul style="list-style-type: none">• Design paper bags, envelopes, cards, face masks. I• Design models of sphere, cube, prism, cylinder, and cone with clay or play dough.• Operate tablets /mobile phones for the use of calculator, alarm, clock and calendar.• Recognize the items of a first aid box.• Use digital and clinical thermometer externally to measure body temperature.



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CHARACTERISTICS AND LIFE PROCESS OF ORGANISMS



Characteristics of Living Things

**Duration:** 40 Minutes**Students Learning Outcome:**

- Compare and contrast characteristics that distinguish major groups of living things (plants and animals).

**Materials:**

- Pictures/ flashcards of living and non-living things, chart with characteristics of living things. Picture of an animal (goat) and a plant (mango tree) from the textbook.

LIVING AND NON-LIVING	
	
Living Things <ul style="list-style-type: none">Can growCan moveCan feelCan breatheCan reproduceNeed water and food to surviveDie	Non-Living Things <ul style="list-style-type: none">Cannot growCannot moveCannot feelCannot breatheCannot reproduceNeither eats nor drinksDon't die, either break or get damaged

<https://www.youtube.com/watch?v=Cu0-><https://www.youtube.com/watch?v=c92lrUE3Fp4><https://en.wikipedia.org/wiki/Goat>https://commons.wikimedia.org/wiki/File:Thotaui_Mango_Tree_in_Kalya_IDC**Information for Teachers:**

- **Living things** are organisms that possess properties like breathing, moving, growing, reproducing, need food to live and have senses like animals and plants
- **Non-living things** are those that cannot move on their own will, cannot grow or reproduce like cup, bottle, road, book etc.
- **Comparison** is the act of evaluating two or more things and then determining which characteristics of each are similar to the other and which are different.

- **Characteristic** is a feature or quality belonging typically to a person, place, or thing and serving to identify them. e.g., a zebra has white and black lines on its body.



<https://www.dkfindout.com/us/animals-and-nature/horses/zebras/>

- **Breathing** is the process of moving air into and out of the lungs.
- **Reproduction** is the biological process by which new individual organisms are produced from their "parents".
- **Growth** is the process of increasing in size.



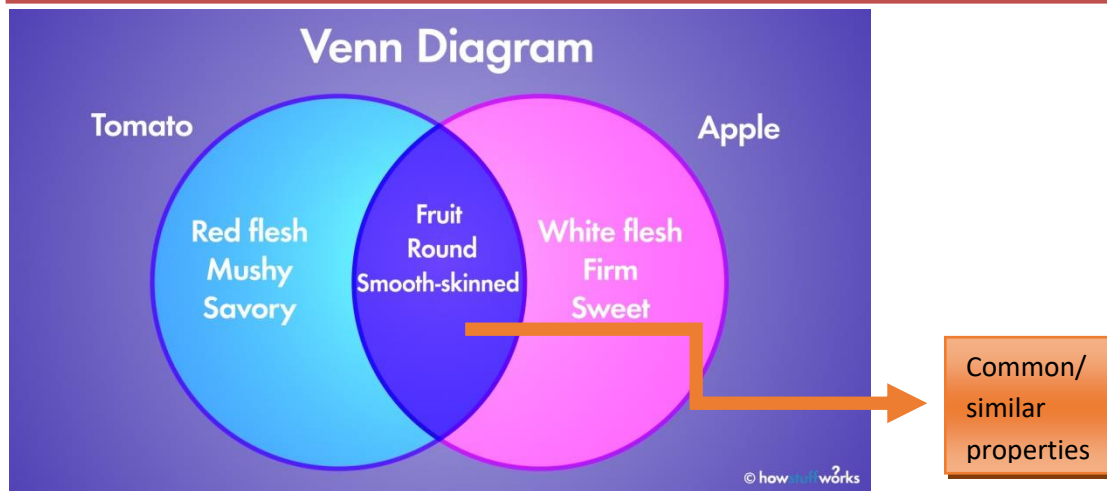
<https://www.inc.com/rhett-power/3-things-you-can-do-to-boost-your-companys-growth.html>

- There are five basic human **senses**: touch, sight, hearing, smell and taste.



<https://www.freepik.com/free-photos-vectors/five-senses>

- **Similarity** is a quality or state of having something in common.
- **Venn diagram** is an illustration that uses circles to show the relationships among things or finite groups of things. Circles that overlap have a commonality while circles that do not overlap do not share those traits. Venn diagrams help to visually represent the similarities and differences between two concepts.



<https://science.howstuffworks.com/math-concepts/venn-diagram.htm>

Introduction:

1. Recall students' previous knowledge about the living and non-living things by showing them the pictures.
2. Ask the students how do they identify a living thing?
3. Inquire from the students do plants grow?
4. Ask the students if they can move from one place to another?
5. Can a stone or pot move by itself?

Development:

1. Tell the students that they see many living and non-living things every day.
2. Briefly define living and non-living things and give examples.
3. Divide the students in two groups and ask one of them to make a list of living things and the other one will list down non-living things (Students can get help from the chart or pictures)

Activity1:

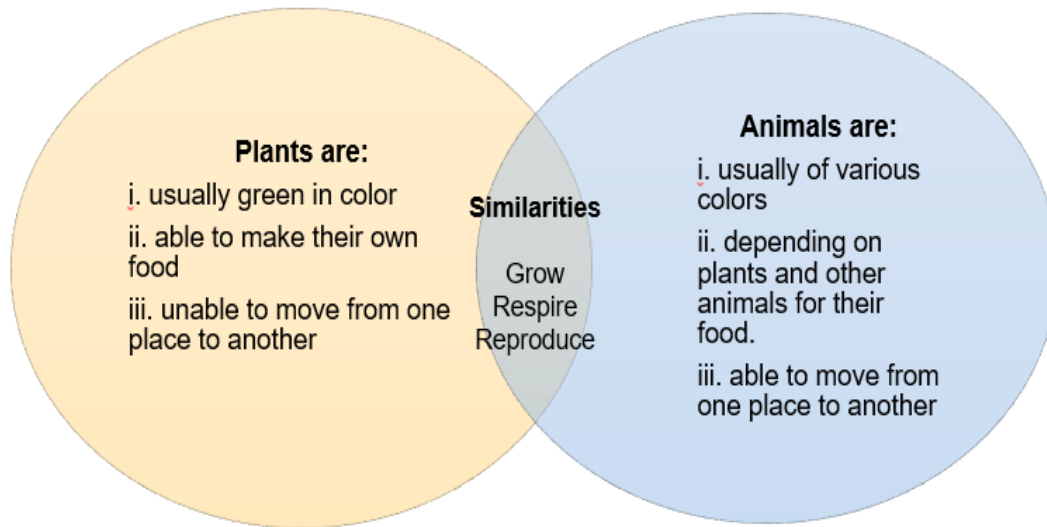
Living things investigation

1. Display the chart with characteristics of living things in the classroom or use the pictures given in the textbook.
2. Elaborate the term 'characteristic' to the students that it means some distinguishing or prominent feature.
3. Tell the students about characteristics of living things
 - i. Living things need food to remain alive.
 - ii. Living things can breathe. They inhale or absorb oxygen from the air.
 - iii. Living things can walk or run on their own.
 - iv. They can reproduce. They can produce living things of their own kinds.
 - v. They can grow.
 - vi. Living things can sense. They can feel the heat, coldness or hardness of things.

Activity 2: Comparing plants and animals

1. Explain to the students, the concept of comparing things.
2. Tell them about the Venn diagram, its significance and show them how to draw it.
3. Ask them to give examples of different plants and animals.

- Draw a Venn diagram on the board and explain the similarities and differences between plants and animals (both are living things) with the example of a goat and a mango tree.



- Revise the entire methodology of comparing plants and animals by using the Venn diagram.

Sum Up:

- Living things can be differentiated from non-living things by characteristics like growth, breathing and reproducing etc.
- Plants and animals are both living things. They have similarities and differences.
- A Venn diagram can be drawn to compare the similarities and differences of two or more living things.

Assessment:



To assess the students' knowledge ask the following questions.

- Give two characteristics of living things?
- Which characteristics of a vehicle are also found in living things?
- Give two similarities between plants and animals.
- What does the overlapping area of circles in a Venn diagram show?

Test 1:

- Draw a table on the board and paste pictures of characteristics of living things in a random manner in column A.
- Ask the students to identify and write them correctly in column B.

Column A	Column B

<http://smallfan.weebly.com/characteristics-of-living-things.html>

Follow up:

Ask the students to draw a Venn diagram in their notebooks and write comparison of a cow and an apple tree.

CHARACTERISTICS AND LIFE PROCESS OF ORGANISMS

Classification of Animals

**Duration:** 40 Minutes**Students Learning Outcome:**

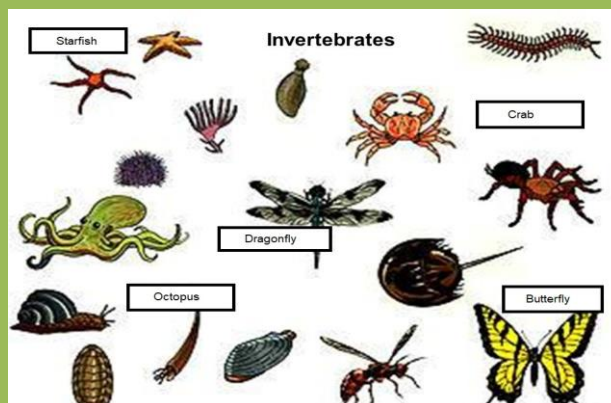
- Classify animals in terms of vertebrates and invertebrates with examples and analyze the differences and similarities in vertebrates and invertebrates.

**Materials:**

Pictures and charts of vertebrates (fish, frog, tortoise, parrot, dog and cat etc.) and invertebrates (cockroach, honeybee, wasp, dragonfly, butterfly, starfish, crab, millipede, octopus, etc.)



<https://slideplayer.com/slide/1703186/>



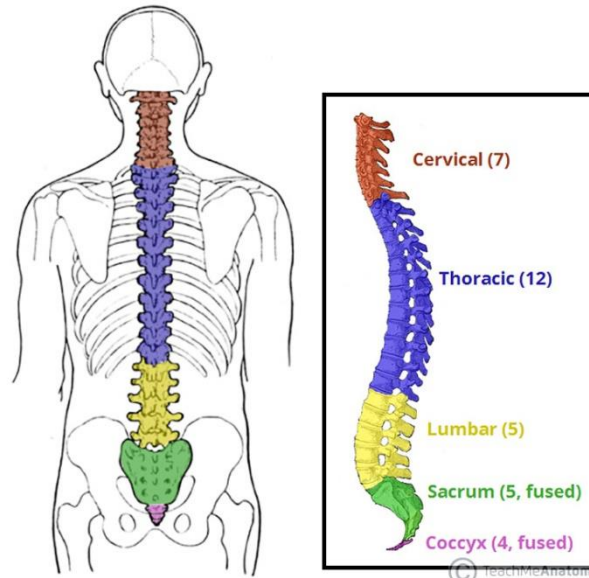
<https://www.animalspot.net/category/invertebrates>

During teaching, also consult the textbook as and when required.

Information for Teachers:

Vertebral column, also known as the spinal column, is the central axis of the skeleton in all vertebrates. The vertebral column provides attachments to muscles, supports the trunk, protects the spinal cord and nerve roots.

The average person is born with 33 individual bones (the vertebrae) that interact and connect with each other through flexible joints called facets. By the time a person becomes an adult most have only **24 vertebrae** because some vertebrae at the bottom end of the spine fuse together during normal growth and development.















<https://teachmeanatomy.info/back/bones/vertebral-column/>

Worksheet for activity:

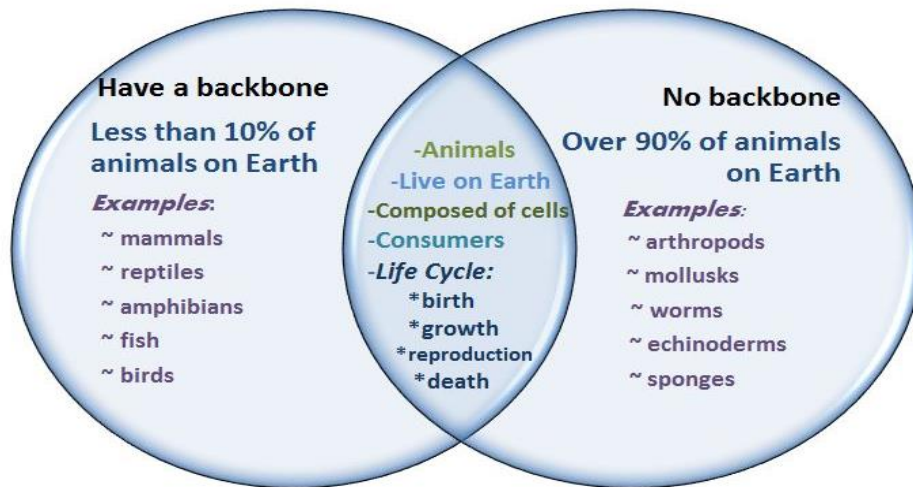
1. Prepare a worksheet for classroom activity of the students.
2. Students can also do the worksheet individually live on internet (<https://www.liveworksheets.com/sz2954864rr>)

ANIMALS WITHOUT A BACKBONE

Select invertebrate animals.

 Lizard	 Beetle	 Worm
 Crab	 Jellyfish	 Frog
 Ant	 Rabbit	 Scorpion
 Grasshopper	 Snail	 Snake

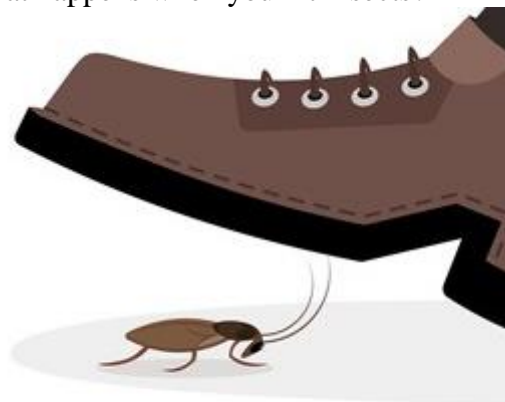
Venn Diagram for similarities and differences

VertebratesInvertebrates

<http://learningideasgradesk-8.blogspot.com/2011/08/venn-diagram-vertebrates-and.html>

Introduction:

1. Recall students' previous knowledge about the backbone.
2. Ask the students what is the bone at back of their neck called?
3. Ask the students what happens when you hit insects?



shutterstock.com · 154734653

<https://image.shutterstock.com/image-vector/shoe-trample-cockroach-260nw-154734653.jpg>

Development:

1. Tell the students animals are divided in two major groups on basis of vertebral column or backbone.
2. Show pictures or chart of animals with backbone to the students.
3. Explain to the students, animals with backbone are called vertebrates.
4. Show pictures or chart of animals without backbone to the students.
5. Explain to the students, animals without backbone are called invertebrates.

Activity1:

1. Write names of some vertebrates and invertebrates on the board.



2. Draw a table and ask the students to identify and write the names correctly in Column A for vertebrates and Column B for invertebrates.

Activity 2: Pair and Share

1. Divide the students in pairs.
2. Distribute the worksheet among the students and ask them to select/tick or circle the animals correctly.
3. Ask the pairs of students to exchange the worksheets.
4. Write the answer key on the board and ask the students to mark accordingly.

Sum Up:

1. Vertebrates are defined as animals with backbone.
2. Invertebrates are defined as animals without backbone.
3. Backbone or vertebral column provides support to the body.

Assessment:

To assess the students, ask the following questions.

1. Where is the vertebral column located in the body?
2. Give examples of vertebrates.
3. Define invertebrates.

Follow up:

Ask the students to write differences write differences vertebrates and invertebrates on their note books and make a list of both vertebrates and invertebrates present around you commonly.

CHARACTERISTICS AND LIFE PROCESS OF ORGANISMS

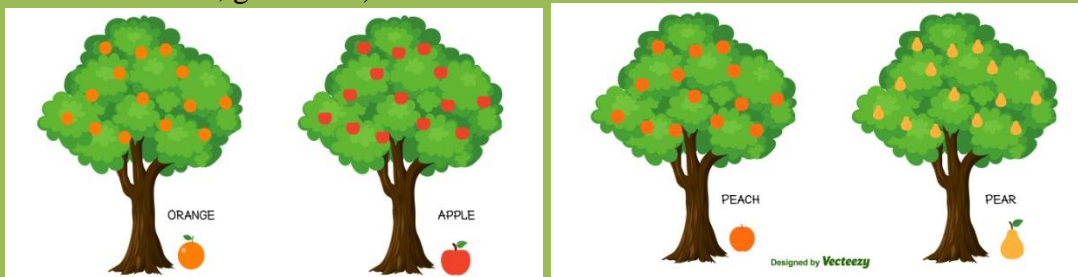
Classification of Plants

**Duration:** 40 Minutes**Students Learning Outcome:**

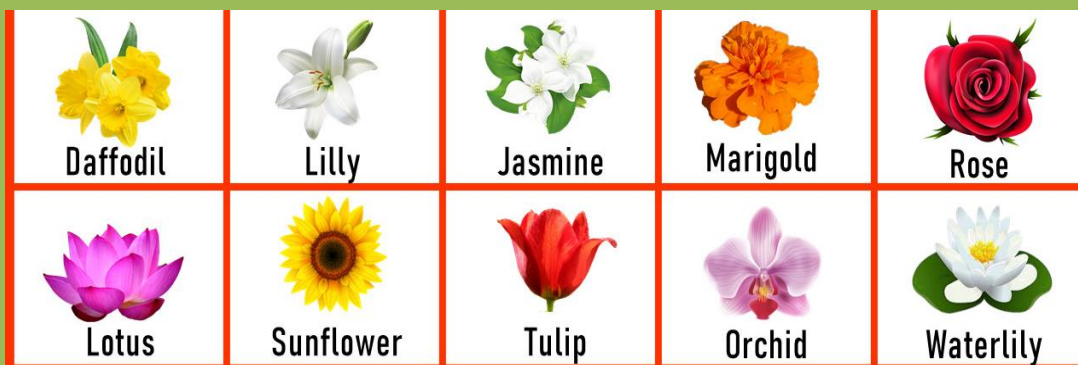
- Classify plants in terms of flowering and non-flowering plants with examples and analyze the differences and similarities in flowering and non-flowering plants.

**Materials:**

- Pictures, flash cards or charts of flowering plants (mustard, rose, sunflower, apple, lemon, guava etc.)






<https://www.vecteezy.com/vector-art/169214-cute-vector-fruit-trees-collection>



<https://engdic.org/flower-names/>

Pictures, flash cards or charts of non-flowering plants (moss, fern, pine, juniper, thuja and sago palm etc.)








Moss	Fern	Pine
		
Juniper	Thuja	Sago palm

<https://www.yourinfomaster.com/what-are-two-major-classification-of-plants/>

Working chart for activity during development of lesson

Flowering or Non-flowering


Choose the correct answer.

 Hibiscus	 Aloe vera
 Snake plant	 Sunflower
 Rose	 Cactus
 Fern	 Orchid

LIVEWORKSHEETS

https://www.liveworksheets.com/worksheets/en/Science/Plants/Flowering_or_Non-flowering_oy2110137qr

Teacher can use the same (as given in textbook) or different plants.









Moss	Fern	Pine
		
Juniper	Thuja	Sago palm

<https://www.yourinfomaster.com/what-are-two-major-classification-of-plants/>

Working chart for activity during development of lesson

Flowering or Non-flowering

Choose the correct answer.

 Hibiscus	 Aloe vera
 Snake plant	 Sunflower
 Rose	 Cactus
 Fern	 Orchid

LIVWORKSHEETS

https://www.liveworksheets.com/worksheets/en/Science/Plants/Flowering_or_Non-flowering_oy2110137gr

Teacher can use the same (as given in textbook) or different plants.

Worksheet for follow up

Cut and paste the pictures in correct groups given below.



Moss



Daisy



Pine Tree



Fern



Tulip



Sunflower



Snake plant



Rose



Conifer



Orchid

Flowering Plants	Non-flowering Plants

<https://www.liveworksheets.com/dl2321529cy>

During teaching, also consult the textbook as and when required.

Information for Teachers:

Classification is categorizing something or someone into a certain group or system based on certain characteristics.

For example: classifying is assigning plants or animals into a kingdom and species.

Herb is a plant that does not produce woody stem. e.g., parsley, thyme, coriander etc.



<https://www.youtube.com/watch?v=eMLYeeHi8Wk>

Shrub is small-to-medium-sized perennial (long time living) woody plant. e.g., rose, marigold and lemon etc.



<https://www.backyardgardenlover.com/red-flowering-shrubs/>

Tree is a perennial plant with an elongated stem, or trunk, usually supporting branches and leaves. e.g., apple, guava, coconut etc.



<https://www.pinterest.com/pin/136937644907182605/>

Moss typically forms dense green clumps or mats, often in damp or shady locations.

Fern is a member of a group of vascular plants that reproduce via spores and have neither seeds nor flowers.

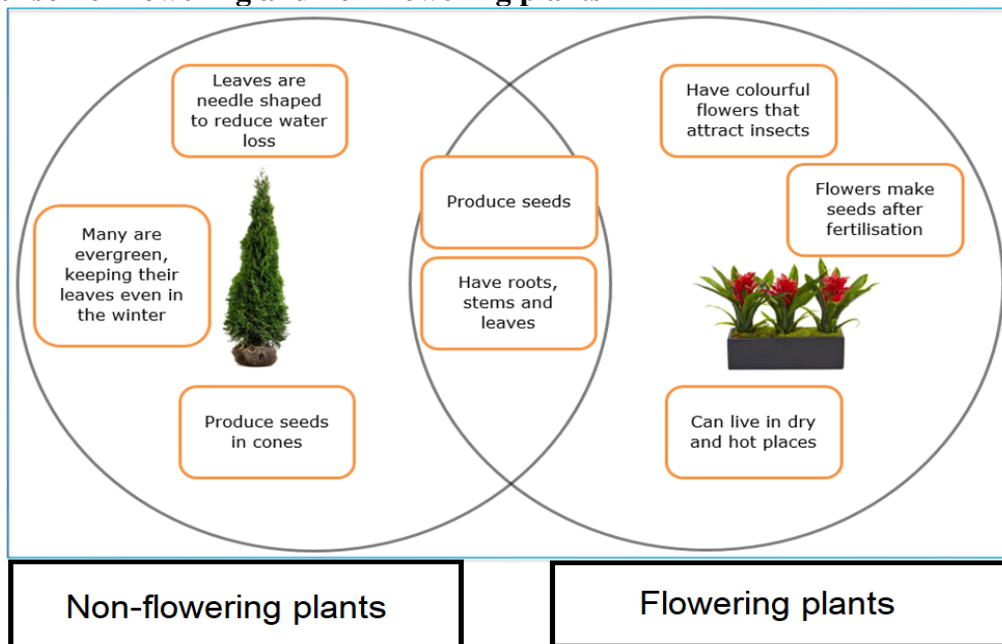
Pine is an evergreen coniferous tree which has clusters of long needle-shaped leaves.

Juniper has evergreen, prickly, small, blue-green needles with a central white stripe, stiff, arranged in clusters of three. The strength of the juniper tree is seen in its capacity to survive in harsh and bare climates.

Thuja is a tree. The leaves and leaf oil have been traditionally used as medicine.

Sago palm is native to southern Japan including the Ryukyu Islands. It is used as an ornamental plant. It is not a true palm tree.

Comparison of flowering and non-flowering plants



<https://www.tes.com/teaching-resource/living-things-and-their-habitats-classification-grouping-of-plants-for-ks2-and-ks3-science-12112699>

Introduction:

1. Recall students' previous knowledge about the flowering and non-flowering plants.
2. Ask the students do they have flowering plants at home.
3. Ask the students to name some non-flowering plants.
4. Inquire of the students if anyone has the hobby of gardening.
5. Show pictures of non-flowering plants and ask if any student can recognize.

Development:

1. Tell the students plants are divided in two major groups.
2. Explain that plants on which flowers grow are called flowering plants. Examples are mustard, rose, lemon, etc.
3. Show the chart of flowering plants to the students and tell them these are of various colors and sizes. They may be herbs, shrubs or trees.
4. Ask the students to read from the textbook (pg. no. 5) and focus on the pictures for imprinting.
5. Explain to the students those plants on which flowers do not grow are called non-flowering plants. Moss, fern and conifers are the examples.
6. Tell the students to read pg. no. 6 from the textbook and observe the pictures of non-flowering plants and their names.

Activity 1: Learn with Venn diagram

1. Draw Venn diagram on the board and elaborate similarities and differences between flowering and non-flowering plants.
2. Tell the students that similarities are written in the overlapping area of the circles in the diagram.
3. Ask the students to copy the diagram in their notebooks.

Activity 2: Look and guess

1. Paste the working chart or pictures of different flowering and non-flowering plants on the board.
2. Call the students one by one and ask them to identify either the plant is flowering or non-flowering.
3. Ask as many examples as you can from the students for their better practice.

Activity 3: Roam and Look for the treasure

1. Hide some flashcards or pictures of flowering
 - a. and non-flowering plants in the classroom or
 - b. science room.
2. Divide the students in pairs.
3. Ask one of them to roam around and look for the picture or flashcard.
4. The other member of the pair will guess and tell the correct group of the plant. For example, rose plant belongs to the group of flowering plants.
5. Replicate the activity with all the students and encourage them to participate.



shutterstock.com · 125057372

Sum Up:

1. Flowers grow on flowering plants and they are of various colors and sizes like rose, sunflower, lemon etc.
2. Non-flowering plants do not grow flowers and they are mostly green in color like thuja, algae, moss etc.

Assessment:

To assess the students' knowledge, ask the following questions.

1. Define flowering plants.
2. Is pine a flowering plant?
3. What is the benefit of having colourful flowers on the plant?

Test 1:

Show pictures of different flowering and non-flowering plants and ask the students to tell their correct group.

Test 2:

Draw a table on the board with two columns.

Call the students randomly to come and write correct examples in the relevant column.

Flowering Plants	Non-flowering plants
Rose Guava Mango	Pine Sago palm

Follow up:

Homework: Guide the students to read about conifers from the textbook (pg.no.6) and write a note in their own words.

Fun with worksheet

Distribute the worksheet among the students and ask them to cut and paste the pictures in correct groups accordingly.

Project: Collect and paste leaves of flowering and non-flowering plants from their homes or living areas.



CHARACTERISTICS AND LIFE PROCESS OF ORGANISMS

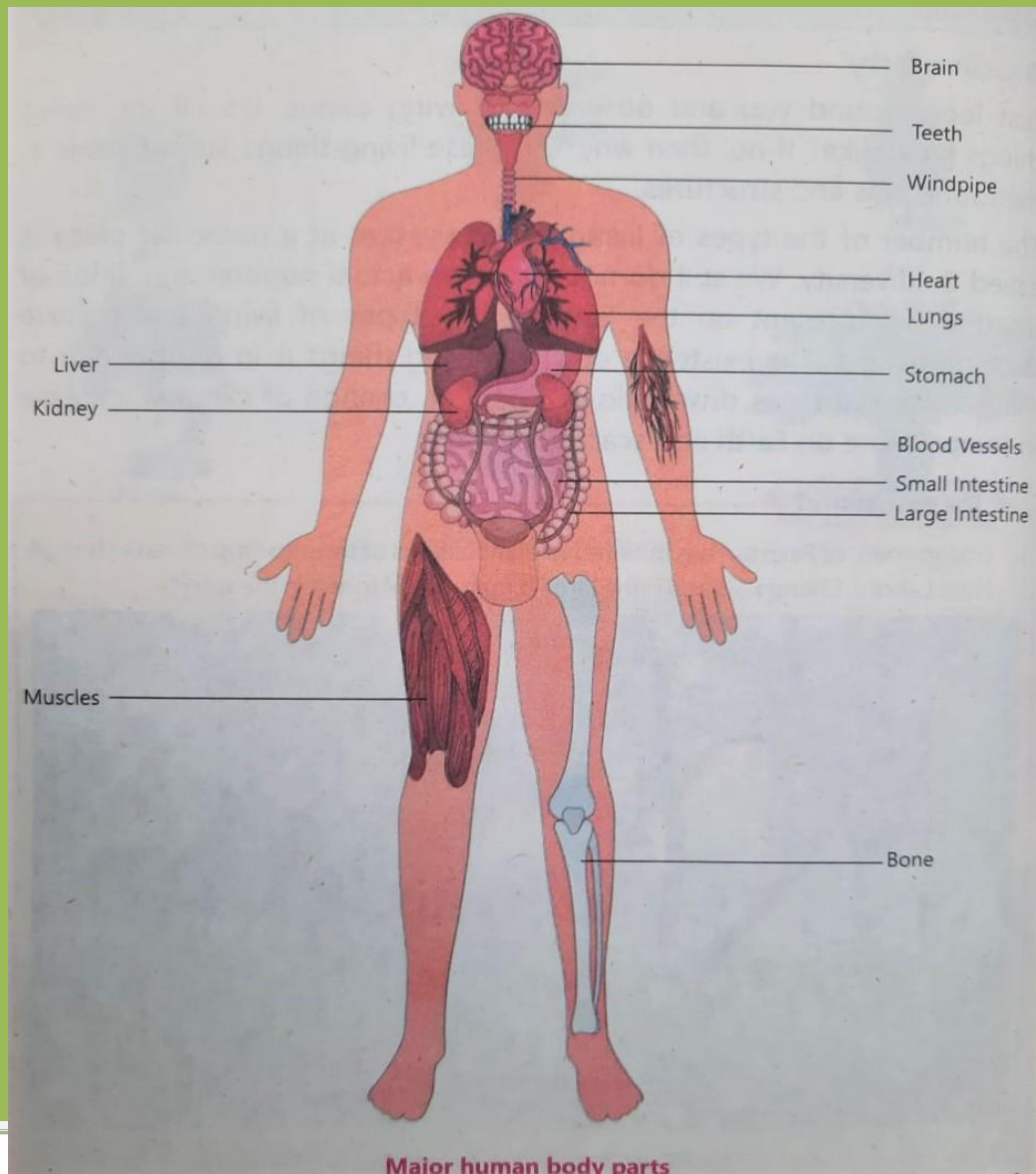
Major Body Parts

**Duration:** 40 Minutes**Students Learning Outcome:**

- Identify major parts and organs in animals (teeth, bones, lungs, heart, stomach, muscles and brain)

**Materials:**

- Chart of major parts of body, Pictures or flashcards with pictures and names of vital organs (teeth, bones, lungs, heart, stomach, muscles and brain)



Information for Teachers:

Activate the students to recall previous learning by asking them:



1. What are main parts of human body? (bones, heart, lungs, brain etc.)
2. Name three parts of body that are in pairs. (hands, legs, eyes, ears)
3. Which organ pumps blood to all parts of the body? (heart)
4. Name the first set of teeth. (milk teeth)



Development:

1. Tell the students, a human being has different parts of body and each part performs different function.
2. Show a chart to the students or ask them to see on page no. 8 of the textbook and explain the major parts and their functions one by one.
3. Show flashcards of each part separately.

Activity 1a: Teeth

1. Call a student and give a candy to eat.
2. Ask the other students that how can we eat our food by breaking or cutting it? (with the help of teeth)
3. Tell the students teeth help in breaking the food into small pieces.
4. Ask the students to open their mouths and feel different shapes of teeth in their mouths.
5. In another way, ask the students to stand in pairs and show their teeth to each other.
6. Show a chart of different types of teeth to the students. (four types)
7. Tell the students, there are four types of teeth that perform different roles in breaking the food.
8. Draw a table on the board with flashcards and functions of the teeth.

Sr.	Name and picture	Function
1	 Incisor	Biting and cutting food
2	 Canine	Piercing and tearing food

3	 <p style="text-align: center;">Premolar</p>	Chewing and grinding food
4	 <p style="text-align: center;">Molar</p>	Chewing and grinding food

9. Ask the students to copy the table in their notebooks and questions if there are any.

Activity 1b:

Show a chart and ask the students to count the teeth and identify the numbers of incisors, canines, pre molars and molars in the human body.

Activity 1c:

Ask the students to read the interesting information on page no. 9 of textbook and help them with solution of constructed response question given in exercise on page no. 18 of textbook.

- What does a tiger do with canines? (pierce the prey)
- What does a rat do with incisors? (biting food or kill the prey)

Activity 2a: Bones

1. Show a chart to the students or guide them to see at page no. 10 of the textbook.
2. Ask them what will happen if all bones are gone from the body?
(Body will collapse, it will be stack of muscles without shape)
3. Explain to the students by referring to the diagram that bones are of various sizes and shapes. For example, bones of arms and legs are longer than that of fingers.
All bones are united to each other through joints.
The frame made by all the bones in the body is called skeleton. It contains 206 bones.
The bones of arms and legs are not hollow. They have bone marrow from where the blood cells are produced.
4. Ask the students to read the names of the bones in the diagram and make a list in their notebooks.

Activity 2b:

Give a worksheet to the students and ask them to identify the bone and match the correct name.

Activity 2c:

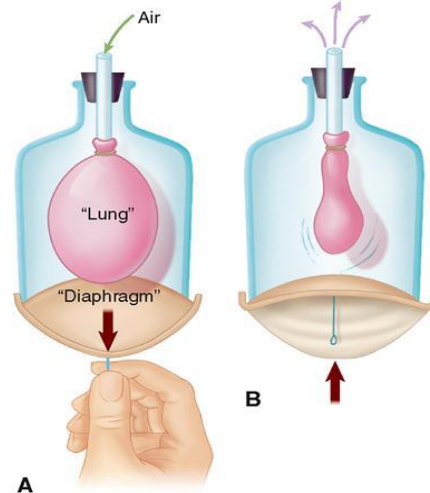
Instruct the students to solve the activity 1.6 on page no. 11 of the textbook by completing the table.

Activity 3: Lungs

1. Ask the students to take deep breaths and then question them which part of the body is filled with air?
2. Show the position of lungs in the body through a chart.
3. Explain to the students, during breathing they will feel that air enters our lungs through nose. From there, it goes into the windpipe. The windpipe opens in two lungs which are surrounded by ribs.

Activity 3a: Make your lung model

1. Tell students about the movement of lungs by giving the example of balloon.
2. Set up the apparatus and arrange it accordingly.



<https://basicmedicalkey.com/physiology-of-the-respiratory-system/>

Tell them that balloon represents the lungs. Because the balloon is stretchable, when diaphragm balloon is pulled down, the pressure in bottle decreases, causing the air to enter. The air fills the balloons (lungs). This is called inhalation.

When we breathe out, the diaphragm contracts (or squeezes in) pushing all the air out of your lungs. This is called exhalation.

Our lungs keep expanding and contracting. The exchange of oxygen between blood and air takes place in lungs.

(reference weblink: <https://ctsciencecenter.org/blog/science-at-play-make-your-own-lung-model/>)

Activity 4: Heart

1. Heart is one of the strongest organ in the body.
2. Ask the students to put their hands on the left side of their ribs. The beat of the heart can be felt.
3. Tell the students, heart is protected by the rib cage. The muscles of heart contract and relax the function of heart is to pump blood to all parts of the body through blood vessels.

Activity 4a: Pumping of heart

1. Guide the students to read page no. 19 of the textbook about the pumping of blood.
2. Collect the material and set up the apparatus accordingly in front of the students.
3. Perform the experiment and explain to the students that when the middle part of the straws is pushed by the fingers, the red liquid comes out. Heart pumps blood in the same way.



<https://www.mombrite.com/pumping-heart-model/>

Activity 5: Stomach

1. Show the chart and elaborate the position of stomach in the human body. It is a bag like organ that is present on the left side below the heart.
2. It is the biggest part of digestive track, which secretes digestive juices.
3. Explain the function of stomach is to grind the food and digestive juice digests the food. Food generally stays in your stomach between 40 and 120-plus minutes.



<https://health.clevelandclinic.org/how-long-does-it-take-to-digest-food/>

Activity 6: Muscles

1. Ask the students about the meat colour of cow or goat. (red)
2. Explain the structure and function of muscles with the help of diagram.
3. Muscles are present in various parts of the body.
4. They are soft and pink or red in colour.
5. Muscles are attached to the bones through joints.
6. Muscles help the body in movement. We can sit, walk, run and jump because muscles work with bones and joints. They help us in doing so.
7. Other functions are pumping of heart, movement of food, expansion and contraction of lungs etc.
8. Ask the students to smile and tell them that they have used 14 muscles in doing so.
9. Tell them that almost half of the body weight is due to muscles.

Activity 6a: Show your muscles

1. Call a student in front of the class and guide him to contract his arms to show some movement of muscles.
2. Muscles are soft and they can contract and relax.
3. Instruct the students to read the working of muscles on page no. 13 of textbook.
4. Explain to them, joint is where bones connect e.g., elbow, knee, wrist etc. Muscles contract to pull the bones.
5. Muscles work in pairs, when one muscle contracts the other relaxes.
6. tell the students to move their arms and feel the contraction and relaxation of muscles.



<https://www.spineuniverse.com/wellness/exercise/strength-training-safety-kids>

Activity 7: Brain

Brain is the most important part of our body.

1. Ask the students to touch their heads. This hard structure is called skull. The brain is present inside the skull. It gives protection to the brain.
2. Tell the students, brain collects information from different parts of our body and decides the type of response our body should give.
For example; if the hand touches something hot, the brain responds to draw it back.



<https://lovepik.com/images/safety-hazards.html>

Activity 7b:

1. Paste the chart of brain maze on the board and call out the students to find the way to exit.
2. Ask every student which part of their body is used in thinking about the solution of this puzzle. (Brain)

Sum Up:

Teeth, bones, lungs, heart, stomach, muscles and brain are important parts of the human body. All the organs have specific structures and functions that help the body in many ways.



- Teeth breakdown food.
- Bones support the body.
- Lungs take air in.
- The heart circulates the blood.
- The stomach helps to digest food.
- Muscles move the body.
- Brain helps in thinking.

Assessment:

Ask following questions to the students:

1. Do all the teeth have same shape? (no)
2. How many teeth does a human have? (32)
3. What is the difference between pre molars and molars? (size and shape)
4. Why are the lungs spongy? (there are mostly air spaces surrounded by the cells)
5. What will happen if air is filled into the lungs through a windpipe? (the lungs will expand)

Test 1:

Read the information from page nos. 9, 11 and 13. Fill in the following blanks.

1. When we smile, _____ muscles are needed.
2. Rats have large _____ for biting food.
3. Blood is produced in _____.
4. There are almost _____ muscles in the human body.
5. The bones of arms and legs are _____.


Test 2:

Help the students to do a live assessment worksheet.

My Body Organs

1. Match the organ with the correct location.

LUNGS





STOMACH


INTESTINE

HEART

2. Write the name of each organ:







3. Drag and drop to complete the sentences.

STOMACH

HEART

LUNGS

a. The _____ are the organs that allow us to breathe.

b. Food is digested in the _____.

c. Our _____ pumps blood around the body.

<https://www.liveworksheets.com/gi177236sb>

Follow up:

Ask the students to draw the labelled diagrams of all parts of the body and write down their functions in their notebooks.

CHARACTERISTICS AND LIFE PROCESS OF ORGANISMS

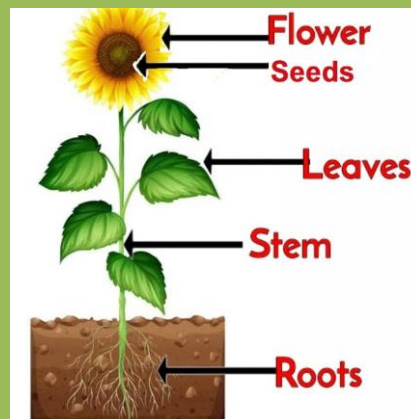
Parts of Plants

**Duration:** 40 Minutes**Students Learning Outcome:**

- Identify parts of a plant body (leaves, stem, flowers, seeds, roots)

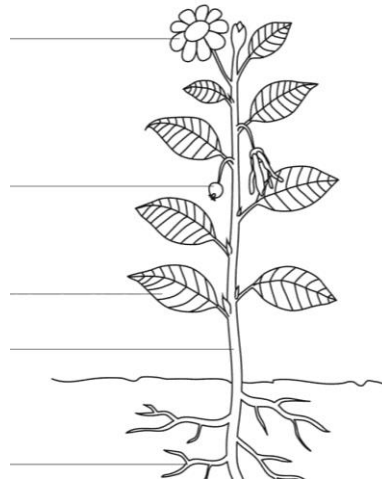
**Materials:**

- A real flowering plant (rose/ lemon), seeds of orange or watermelon, pictures or flash cards with pictures and names (stem, leaves, roots, flowers, seeds), white chart, brown wool, green paper, paper plate, scissors, colours, markers and glue



<https://www.youtube.com/watch?v=fIA57wFCOPA>

Worksheet for student assessment (Identify the part of plant and write the correct name in the given space.)

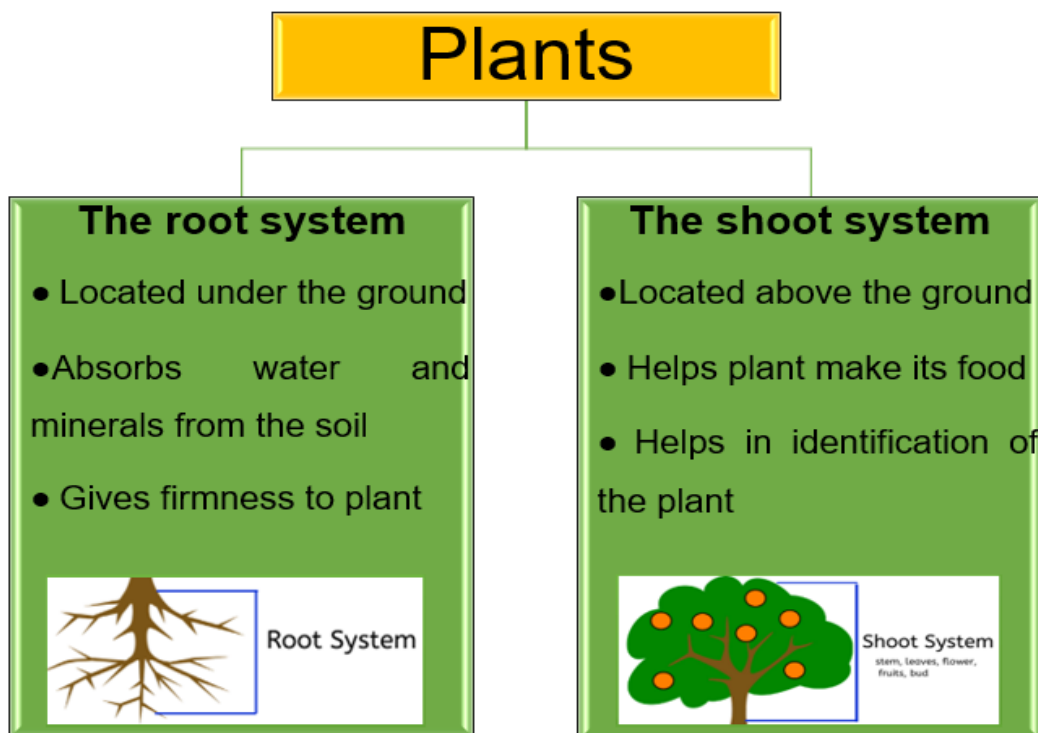


<https://smartclass4kids.com/science/plants-facts/part-of-plant/>

During teaching, also consult the textbook as and when required.

Information for Teachers:

Plants are mainly described based on two systems:



<https://smartclass4kids.com/science/plants-facts/part-of-plant/>

- **Root system** includes mainly roots.
- **Shoot system** includes stem, leaves, flowers, fruits and seeds.
- **Shoot** is a young branch springing from the main stock of a tree or other plant.
- **Roots** are hair like structures present at the base of plant under the ground.
- **Stem** is the main body or stalk of a plant present above the ground.
- **Leaf** is a flattened structure of plant, typically green and blade-like, that is attached to a stem directly or via a stalk.

- **Flower** is beautiful and delicate part of the plant that is of various shapes, sizes, and colours.
- **Seed** is part of plant which can grow into a new plant. It is a reproductive structure which disperses by air or water. It is also sown in the soil to grow a new plant.

Introduction:

1. Recall students' previous knowledge about the plants.
2. Show them chart of a plant and ask names.
3. Ask students to name the parts of plant that are green.

Development:

1. Tell the students that flowering plants have different parts.
2. Show them pictures with their names. (stem, leaf, roots, flower and seed)
3. Briefly describe all parts of the plant.

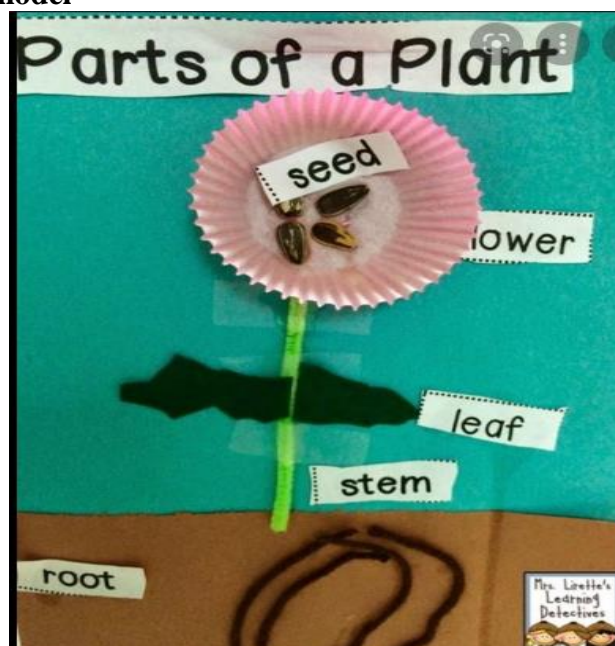
Activity 1:

(Textbook, page no. 13 – activity 1.8)

1. Take a real flowering plant and show it to students.
2. Guide them to gather around the science table.
3. Demonstrate the names and explain about the structure of all parts of the plant.
4. Ask the students to observe the plant themselves and make notes.
5. Let the students ask their queries.

Activity 2:

Thematic plant fun model



www.pinterest.com/pin/208432288982807495/?psig=AOvVaw1FBcH8Oxm67HKeU3rtGeIb&ust=1654435098621000&source=images&cd=vfe&ved=0CA0QjhxqFwoTCPiss5Txk_gCFQAAAAAdAAAAABAU

1. Take a white chart paper and draw line to separate the root and stem part.
2. Instruct the students to help you during the activity.
3. Color the portion brown, which is under the ground.
4. Glue the paper plate to make a flower
5. Use the glue to stick some seeds onto the paper plate.
6. Cut straight strips of green paper to make stem.
7. Trace shape of leaves on the green paper and cut them.
8. Use a few strings of wool to make roots.
9. Glue them all together in order to make a plant model.
10. Label the parts of plant model.

Sum Up:

- Flowering plants have five main parts i.e., stem, flower, root, seeds and leaves.
- Most parts of a plant are green in color.

Assessment:

Test 1: Take a quiz

Ask students the following questions:

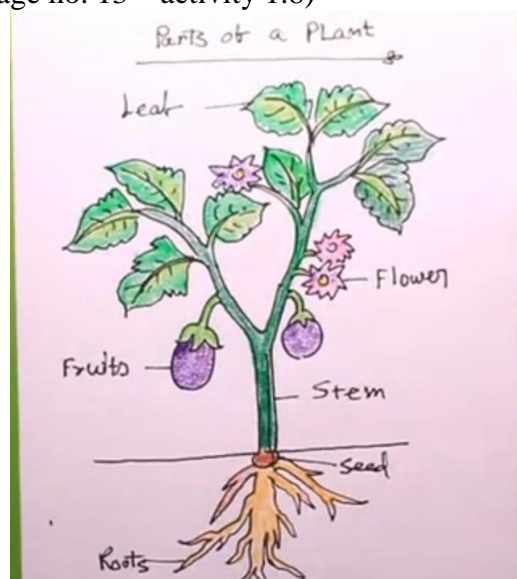
1. Which part of plant is under the ground?
2. Tell the name of part which is flat and broad.
3. Where do seeds grow? (Inside the flower or fruit)
4. What is colorful part of a plant called?

Test 2: Worksheet with peer

1. Divide the students into pairs.
2. Distribute the worksheets.
3. Guide the students to identify the parts of plant and write the correct name in given space.
4. Tell the students to color the picture of plant.

Follow Up:

Assign the students to draw a sketch of the plant in their science notebooks and label the parts of the plant. (Textbook, page no. 13 – activity 1.8)



<https://www.youtube.com/watch?v=oL4bTlrE1UM>

CHARACTERISTICS AND LIFE PROCESS OF ORGANISMS

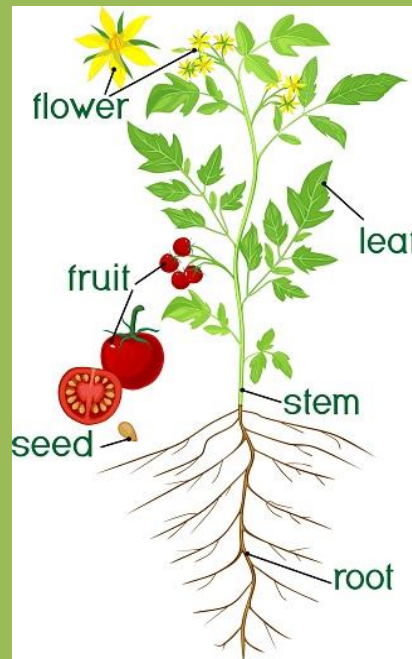
Structure and Functions of Plants

**Duration:** 40 Minutes**Students Learning Outcome:**

- Relate the structures of plants to their functions i.e., roots absorb water and anchor the plant, leaves make food, the stem transports water and food, flowers produce seeds, and seeds produce new plants.

**Materials:**

Pictures or flashcards with pictures and names of stem, leaves, roots, flowers, seeds.



<https://en.freejpg.com.ar/stockphotos/premium/989916016/parts-of-plant-morphology-of-flowering-tomato-plant-with-title>

<https://www.youtube.com/watch?v=fIA57wFCOPA>

Information for Teachers:

Activate the students to recall previous learning (grade IV: unit 1) and ask them:

5. What are the main parts of a flowering plant?
6. Where is the root system located?
7. Which parts are included in the shoot system?

Development:

4. Tell the students, flowering plants have different parts and each part performs different function.
5. Show a plant to the students and explain all the parts and their functions one by one.
6. Show flashcards of each part separately.

Activity 1:

1. Take a flower pot with plant and soil.
2. Demonstrate by taking a plant out of soil, that roots are present under the ground.
3. Its branches spread in different directions.
4. The function of roots is to anchor the plants in the soil and absorb minerals and water.



<https://gardensnursery.com/avoid-roots-spiral-plant/>

1. Tell them vegetables that grow under the ground like carrots, radishes, turnips, potatoes etc. are also edible roots.



<https://www.blendspace.com/lessons/18Nrh98IeUfIvQ/vegetables-underground-leafy-salad-vegetables>

Activity 2:

1. Show a plant to the students.
2. Indicate and tell them the tall part in the center of plant is called the stem. (Have them recall the previous lesson)
3. Show them that stem has many branches with leaves.

Color changing flowers:

1. Call the students to gather around the science table/ lab or in the garden.
2. Instruct them to read *activity 1.9 on page no. 14 of the textbook*.
3. Take two glasses and fill them with water.
4. Take two plants having white flowers with roots.
5. Wash their roots thoroughly.
6. Label the glasses A and B.
7. Add few drops of red or blue ink in glass B only.
8. Then, put a plant in each glass in such a way that roots remain under the water.
9. Leave the plants for few hours or overnight.
10. Ask the students to make notes of their observations. (flower in glass B has turned red whereas the flower in glass A remains the same.)
11. Cut the stem of the two plants and ask the differences between the two. (red lines are present in stem of plant in glass B.)

This activity can be done with various colors.



<https://www.rookieparenting.com/color-changing-flowers-science-experiment/>

Result:

1. Explain to the students that function of stem is to transport minerals and water from roots to other parts of the plant.
2. It also provides support to the plant.

Activity 3:

1. Show a plant to the students.
2. Indicate and tell them the flat structures attached to the stem and its branches are called leaves. (Have them recall the previous lesson)
3. Tell them leaves are of different sizes and shapes.





Practical and observations:

1. Take a leaf and paste it on the board.
2. Draw a diagram similar to the original one.
3. Label the diagram to show different parts of leaf.
4. Give a brief description about the parts of leaf.
5. The main function of leaves is to make food for the plant.

Activity 4: Leaf walk

1. Take the students outside the classroom for a walk in school compound, ground or garden.
2. Divide them into 5 groups.
3. Guide each group to collect two different types of leaves.
4. Once they are back in the classroom. Show them a chart of different types of leaf with names.
5. Ask them to draw the shapes of leaves and write their names.



Sr.	Type of leaf	Name
1		Star-shaped
2		Oval
3		Deltoid
4		Obovate

<https://www.pinterest.com/pin/764415736721619191/>

Activity 5:

1. Display flowers and tell the students these are colorful and beautiful parts of a plant.
2. Flowers have different shapes, sizes and colors.
3. Fruits and seeds are formed from the flowers.
4. Conduct a brainstorming session with the students and ask them the purpose of these colorful flowers.
(possible answers are they make the plants attractive)



look beautiful and attract the insects for pollination.)

5. Ask the students to draw their favourite flower in the notebooks and color it.

Activity 6:

1. Activate the students' previous learning and ask them where seeds are found. (seeds are produced in flowers or fruits)
2. Divide the students into 2 groups.
3. Give sunflower or petunia flower to one group and ask them to look for seeds in it.
4. Give any fruit (apple, guava, tomato or lemon) to the other group and ask them to look for seeds.
5. Tell them seeds are of different size, shape, color and number.
6. Explain to them when seeds are formed within the flower, the area surrounding the seed ripens into fruit.

Activity 7: The fruit game

1. Guide the students to read the paragraph about seeds on page no. 15 of the textbook.
2. Show a chart of fruits with seeds to the students.
3. Ask the students to differentiate the names of fruits with one seed and other with many seeds in the table.

Fruits with one seed	Fruits with many seeds
Mango	Watermelon
Apricot	Melon
Peach	Papaya
Lychee	Orange
Plum	Grape fruit
Avocado	Strawberry
Coconut	Pear

4. Encourage the students to share their lists with the class

Activity 8: New plants are formed from the seeds

1. Ask the students, have they ever grown a plant?
2. Take a flowerpot or box and place some soil in it.
3. Sow some seeds in it and pour water on it.
4. Keep the pot in a window of the classroom where light can penetrate.
5. Ask the students to observe the changes daily and make notes.
6. Tell them after a few days, tiny plants will sprout from the soil.
7. Show them the already grown seeds that you have prepared earlier.
8. Explain to the students when a seed is sown, a new plant germinates from it.



<https://www.scienceabc.com/nature/seed-grow-tree.html>

Sum Up:

Flowering plants have five important parts. Flowers, seeds, roots, leaves and stem play different functions in growth of a plant.

Roots absorb water and anchor the plant, leaves make food, the stem transports water and food, flowers produce seeds, and seeds produce new plants.

Assessment:

Ask following questions to the students:

1. What is the most prominent part of a plant?
2. Why are flowers colorful and beautiful?
3. Which part provides support to the plant?
4. How are leaves helpful?
5. How do plants absorb water and minerals from the soil?
6. Which part of a plant plays role in producing oxygen?

Test 1: Read and Match

1. Draw a table on the board with names of parts of plant in column A and shuffled functions in column B.
2. Ask the students to match the names with correct function.

Match the parts of the plant to their functions.		
Sr.	Column A	Column B
1	Fruit	transports water to other parts
2	Roots	make food for the plant
3	Stem	they are colorful and attracts insects.
4	Leaf	take in water and nutrients from the soil.
5	Flowers	They are fleshy and hold seeds.

Test 2:

Show flashcards of a parts of plant and ask the students one by one to tell the correct function.

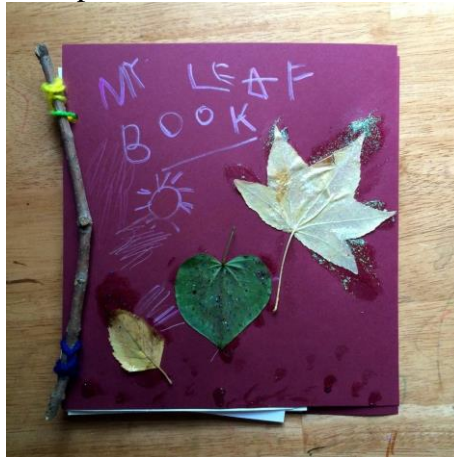
Test 32:

1. Paste the chart of plant on the board.
2. Ask the students to copy the picture in their notebooks, label it and write the functions of all the parts.

Involve the students in solving the questions given at the end of the chapter/ unit in the textbook.

Follow up:**My Leaf book project:**

1. Ask the students to read activity 1.10 on page no. 14 of the textbook.
2. Collect some leaves.
3. Take a newspaper and keep the collected leaves in it.
4. Put heavy object such as book over them.
5. After three days, take them out.
6. Paste them in their science notebooks.
7. Identify and write the name of parts of leaf.



<https://www.pinterest.com/pin/278801033159656048/>

Homework:

Ask the students to draw labeled diagrams of parts of plant and write along their functions. Following link can be helpful in doing the homework.

<https://eslforums.com/parts-of-a-plant/>

Creative work:

Read activity 1.12 on page no. 16 of the textbook and write a story with the hints given.

The colors of my happy place are fading away

One sunny morning, I woke up to see my garden outside the window. To my shock, all the beautiful and colorful flowers and lush green bushes had dried up.

I ran down the stairs.....



ECOSYSTEM

Ecosystem and Its Types

**Duration:** 40 Minutes**Students Learning Outcome:**

- Recognize an ecosystem e.g, forest, pond, river, grassland, desert.

**Materials:**

- Pictures, charts of terrestrial, aquatic and air habitats, textbook.

Information for Teacher:

- There are three types of environments:
land environment (terrestrial)
water environment (aquatic)
air environment
- Rivers, lakes, ponds, seas are the examples of water (aquatic) environment.
- Mountains, deserts, forests and plain areas are the example of land (terrestrial) environment.
- The place where birds and insects fly is an example of air environment.
- Land animals (particularly desert animals) have thick skin to stop the loss of water from their bodies.
- Land animals have strong legs for movement.
- In aquatic environment, fishes have gills for respiration, fins and boat shaped body for swimming.
- Some animals (birds, insects) fly with the help of their wings.
- Plants have roots to absorb water and for holding the plant body in the soil.
- Plants have pores in their leaves for the exchange of gases.

Plants living in water have elastic body and possess air sacs for floating. These characteristics prevent them from breaking due to water currents.

Introduction:

Ask the students:

- To describe the habitat of animals (lion, elephant, monkey), plants (grass, rose plant, fern).
- What is the environment of our class? Land, water or air!
- In which type of environment do fishes live?
Land, water or air?
- Show picture of plant and an animal to students and ask:
 1. Which part of plant helps in absorbing water?

2. Which part of body does an animal use for movement?

- Ask the students to share with the class what they know about birds.



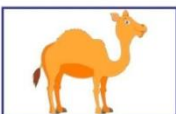

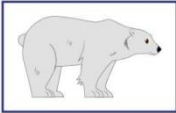

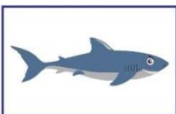

Development:

Activity 1:

- Show picture (cut from books / newspapers/magazines/stickers) of different animals and plants that live in following areas (land, water, air) to students. Ask students to come on board and match the living things with their habitat.

Animals and Their Habitats

Match each animal to its habitat.

<p>1)  tiger</p>	•		•	<p> desert</p>
<p>2)  camel</p>	•		•	<p> ocean</p>
<p>3)  polar bear</p>	•		•	<p> forest</p>
<p>4)  shark</p>	•		•	<p> Arctic</p>

- Students will be asked to observe how these animals live in their habitat (bring students to the school lawn or nearby garden)
- Ask the students to explain the characteristics of animals and plants for land environment (the role of legs and skin in animals while role of roots and leaves in plants).

Activity 2:

Draw following table on board and fill it by interactive questioning and answering with students, that how animals on land, in air and water move and respire.

Parts of body	Land environment	Air environment	Water environment
For movement			
For respiration			
Examples			



Sum up/conclusion:

- There are three types of environments:
 1. Land environment
 2. Water environment
 3. Air environment
- Organisms have characteristics that enable them to live in a particular environment
- Terrestrial animals have thick skin for the prevention of water loss, strong legs for movement and lungs for respiration.
- Aquatic animals have fins and tail for movement and gills for respiration.
- Animals that fly in air have hollow bones and wings that help in flight.

Assessment:

Ask following questions from students.

- Name any four animals that live in water.
- Name any four plants that live on land.
- Do you know any animal that can live both in water and land? (frog, crocodile)
- How do insects and birds fly?
- A fish can live in water but cat can't live why?

Follow up:

- Involve students in solving the questions given at the end of chapter/unit in textbook.
- Students will be asked to define an environment and paste pictures of animals and plants with their habitat should be in their notebooks.

ECOSYSTEM

Components of Ecosystem

**Duration:** 40 Minutes**Students Learning Outcome:**

- Explain Biotic (plants, animals and humans) and Abiotic (light, temperature, soil and water) factors and their linkages.

**Materials:**

- Pictures of animals, plants, sun, water and soil. Pictures of ponds, trees, fungi and bacteria.

Information for Teacher:

- There are two components of any ecosystem
 1. Biotic
 2. Abiotic
- Nonliving components of ecosystem are called abiotic.
- Living components of ecosystem are called biotic.
- Biotic components consists of three groups
 1. Producers
 2. Consumers
 3. Decomposers
 2. Producers are plants and they produce food for others.
- Consumers are living things which obtain food from other living things.
- Decomposers are living things which break down the dead bodies of plants and animals into simple particles.

In a balanced ecosystem all the living things are essential for each other. They affect the lives of one another.

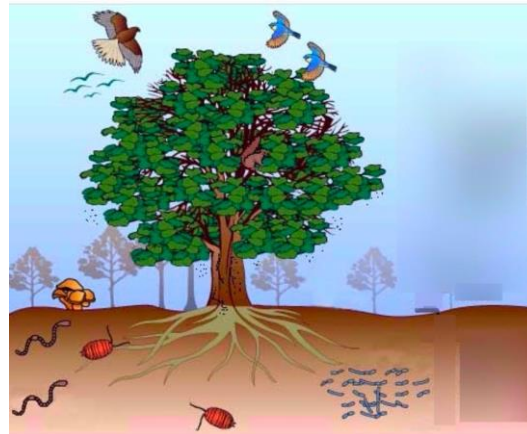
Introduction:

Ask the students:

- Which things are necessary for life?
- Write response of students on board
- Write the answer in two column i.e. living and nonliving things.
- Tell students living things are biotic component of ecosystem and nonliving are abiotic component of ecosystem.

Development:**Activity 1:**











- Take students to the school lawn and ask them to identify different objects in the surrounding of a tree.
- Let students categorize the identified objects into living and nonliving things.
- Describe tree environment and explain both components biotic and abiotic.



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Activity 2:

- Show pictures of living and nonliving things to students.
- Ask the students to tell the names of living and nonliving things in the pictures.
- Write the students response on board in separate columns with labelling.
Biotic and Abiotic components.

BIOTIC	ABIOTIC
LIVING	NON-LIVING (never lived)
 Tree	 Soil
 Acorn	 Air
 Squirrel	 Rocks
 Fox	 Sunlight
 Dead Log	 Water

<https://www.google.com/url?sa=i&url=https%3A%2F%2Fsocratic.org%2Fquestions%2Fis-sunlight-a-biotic-factor-or-an-abiotic-factor&psig=AOvVaw2TdVcRmWqqWNkhoU3IpcOy&ust=1653804304320000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCKiV7KbDgfgCFQAAAAAdAAAAABAD>

Sum Up:

- Every environment consists of living and nonliving components.
- Living components of environment are called biotic, these include plants, animals and microorganisms.
- Nonliving components of environment are called abiotic components, these include air, water, soil, light etc.



Assessment:

Students will demonstrate their understandings by:

- Asking different questions related to the concept of environment
- Provide a list of Biotic and Abiotic components to students and ask them to make separate columns to their notebooks to differentiate the biotic and abiotic components.

Follow up:

- Involve the students in solving the questions given at the end of chapter/ unit in textbook.
- Students will be asked to make pond ecosystem in cut plastic bottle and label the biotic and abiotic components.

ECOSYSTEM

Balanced Ecosystem

**Duration:** 40 Minutes**Students Learning Outcomes :**

- Analyze the way these Biotic and Abiotic constituents create a balance with ecosystem.
- Recognize the value of balanced ecosystem

**Materials:**

- Chart, pictures of producers, decomposers and consumers, pictures of water ecosystem, pictures of forest.

Information for Teachers:

- Biotic components consists of three groups
 1. Producers
 2. Consumers
 3. Decomposers
- Producers are plants and they produce food for others.
- Consumers are living things which obtain food from other living things.
- Decomposers are living things which break down the dead bodies of plants and animals into simple particles.
- In a balanced ecosystem all the living things are essential for each other. They affect the lives of one another.
- Sun is the main source of energy in an ecosystem.
- Plants make food with the help of sunlight and carbon dioxide.
- As a result of photosynthesis plants produce oxygen.
- During respiration animals produces carbon dioxide which is used by plants to make food.
- All the living things are essential for one another.
- They affect the life of one another; some animals benefit or harm one another.

Introduction:

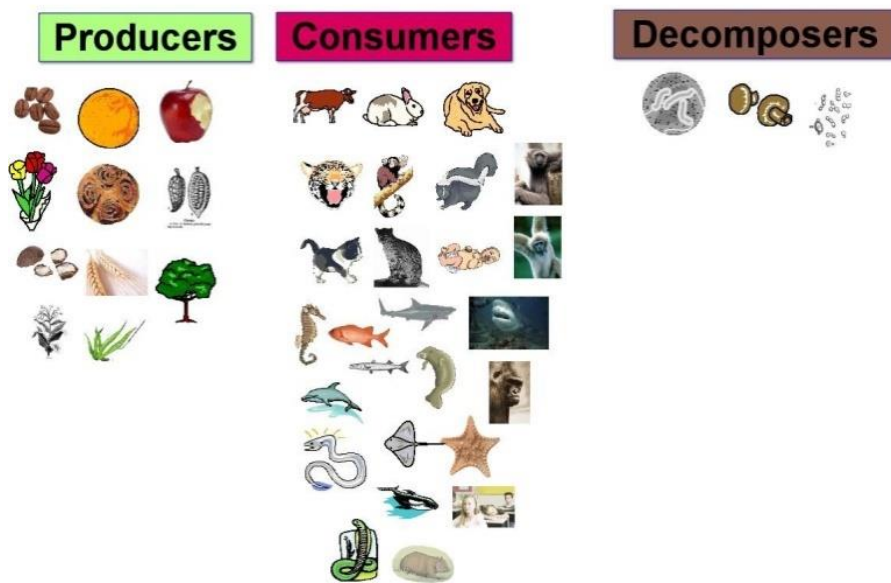
- Ask the student can you stay alive without food?
- If you are not allowed to drink water for few hours for a day. How you feel?
 - Paste a chart or give them stickers. Write names (on board) of different plants, animals and microorganisms.
 - Ask the student to circle the animals, plants and other things which they eat.
 - What do plants and animals give us?

- Note the students' responses on board and tell them biotic and abiotic components create a balanced ecosystem
- Abiotic factors include air, water, soil, light and temperature.
- Biotic factors consist of three components i.e. producers, decomposers and consumers.

Development:

Activity 1:

- Display a chart for the class with headings and pictures of producers, consumers and decomposers
- Introduce the concept of plants as producers i.e. organisms that make their own food through photosynthesis
- Introduce the concept of animals as consumers i.e. organisms that eat producers or other consumers.
- Explain the role of decomposers.
- Ask the students to tell the names of producers, consumers and decomposers in a water ecosystem.

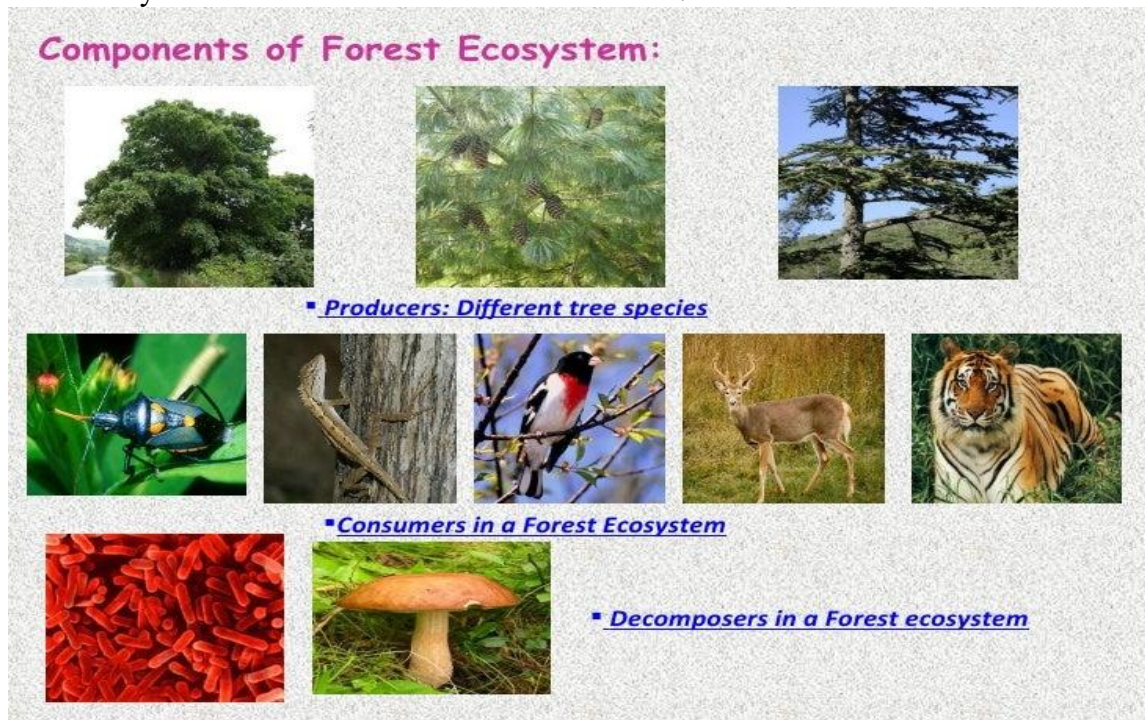


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Activity 2:

- Show a picture or model of forest ecosystem to the students.
- Ask the students what they think about a plant growing in a forest.
- Plants are biotic (producers) but they couldn't grow or survive without abiotic components such as rain and sunshine.
- Ask the students if they have ever seen a fish living without water?
- Note the students' responses and explain to them that biotic and abiotic factors are very necessary for one another. They interact with each other.

- We can say that we can't have one without the other.

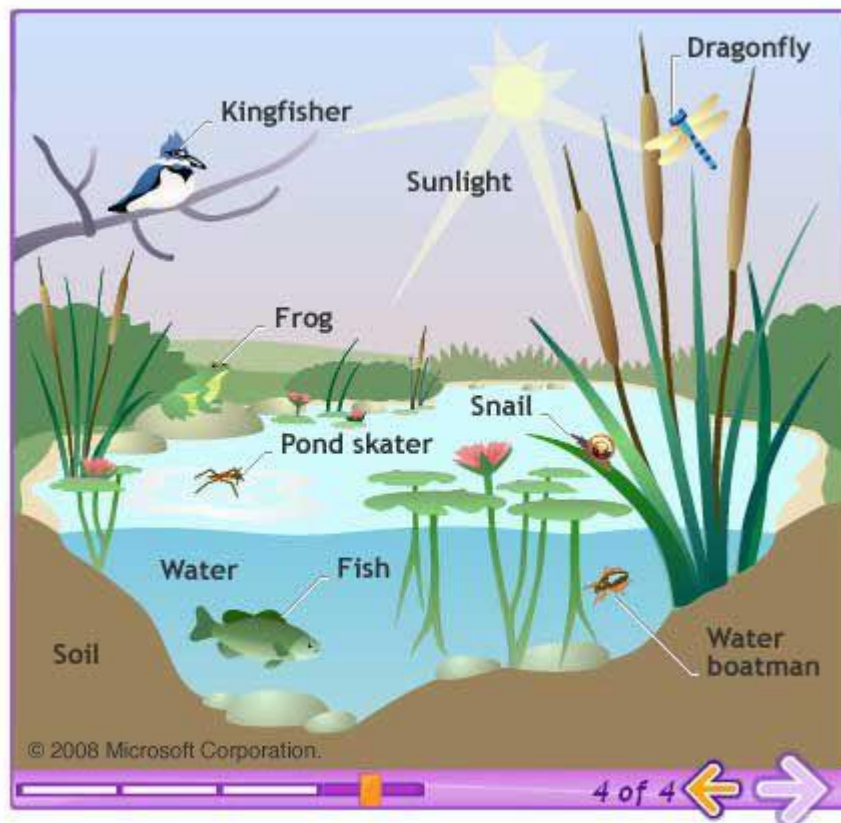


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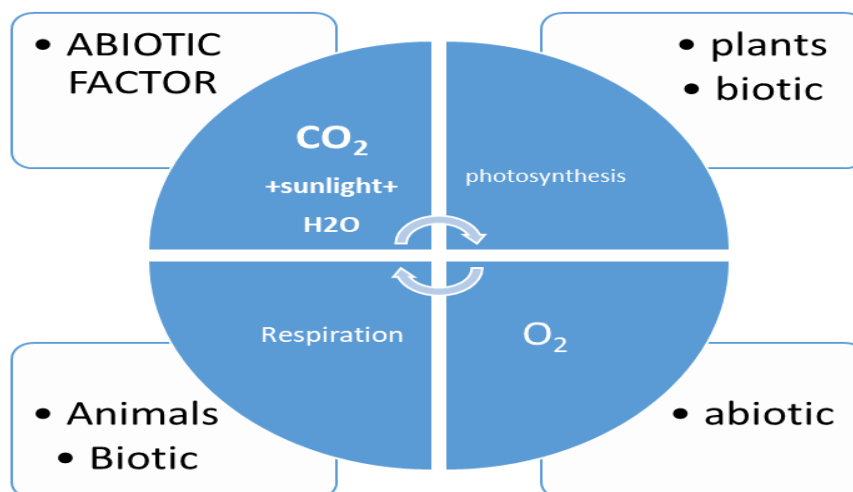
Activity 3:

- Ask the students
 1. What is the main source of heat and light?
 2. From where can we get oxygen for breathing?
 3. What happens with the carbon dioxide we exhale during breathing?
 4. Where do the dead bodies and waste of plants and animals vanish from our surrounding?
- Note the answers of the students on the board.
- Explain the concept of balanced ecosystem with the role play of biotic and abiotic factors.
- Select some students from class.
- Label three students as producers, consumers and decomposers.
- Label other students as abiotic factors (water, sunlight, air, oxygen and carbon dioxide).
- Do a short role-play with abiotic components (sunlight, oxygen, water) used by plants to make their food and oxygen is produced in this process. This oxygen is used by the animals (consumers) for respiration.
- During respiration, animals produced carbon dioxide which is again used by plants to make their food.

- In this way the cycle is replayed again and again.



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Sum-Up/conclusion:

- There is a constant relation between biotic and abiotic factors.
- It is a give and take relationship i.e. we can't have one without the other.
- Producers make their own food and food for other organisms. Mostly they are plants.
- Consumers are the organisms that eat producers or other consumers.
- Decomposers are the organisms that gets their energy or food from eating dead organism material or waste.
- All living organisms are essential for each other.



- A balanced ecosystem is very important as it leads to the continuous existence of organisms.

Assessment:

- Ask the students:
 1. What is the main source of heat and light?
 2. From where can we get oxygen for breathing?
 3. What happens with the carbon dioxide we exhale during breathing?
 4. Where do the dead bodies and waste of plants and animals vanish from our surrounding?

Follow-up:

- Ask the students to look at the picture and identify the biotic and abiotic components (book pg#24, activity 2.3).
- Observe the ecosystem of your school garden and identify the consumers, producers and decomposers.

ECOSYSTEM

Food Chains & Impacts of Human Actions on Food Chain

**Duration:** 40 Minutes**Students Learning Outcomes:**

- Describe few food chains and analyze their structure to understand their function.
- Describe the role of living things play at each link in a simple food chain (e.g. plants produce their own food: some animals eat plants, while other animals eat the animals that eat plants.)

**Materials:**

- Picture of animals and plants, charts of food chain, papers, textbook.

Information for teachers:

- To obtain food, living things depends on one another.
- Plants make food with the help of sunlight and water.
- The animal which eats plants are called herbivores.
The animal which eats other animals are called carnivores.

Introduction:

Ask question relevant to the topic:

- From where do we get our food?
- Why do we need food?
- What do plants and animals give us?
- From where do animals get their food?
- How plants, animals are related to each other?
- To make food chain, draw relation among plants, animals and man e.g.

PLANTS



COW



MEN

Development






Activity#1

- Demonstrate some examples of simple food chains.
- Introduce the concept of plants as producers i.e. organism that make their own food through photosynthesis.
- Introduce the concept of animals as consumers i.e. organism that eat producers or the consumers.
- Explain the role of decomposers in all food chains.
- Ask students to make a food chain by making a sequence of the following organism. The students will also mention the producer and the consumers.

Food Chain

Complete the food chain. Remember the arrows show the transfer of energy.

```
graph LR; A[ ] --> B[ ]; B --> C[ ]; C --> D[ ]; D --> E[ ]
```

 snake	 flower	 bird	 butterfly	 sun
--	---	---	---	--

Herbivores eat plants. Carnivores eat meat. Omnivores eat both.

Can you work out which animals are which?

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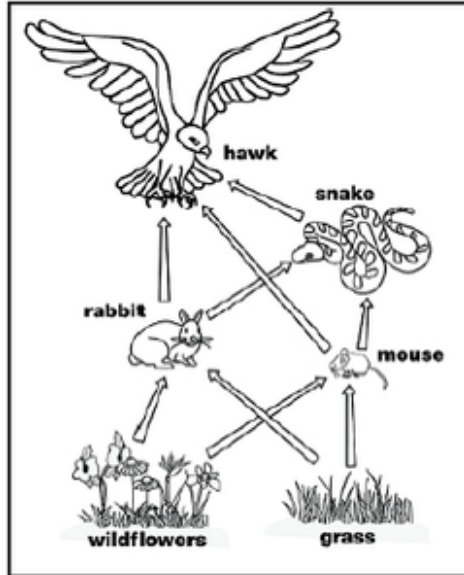
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Activity 2

Introduce a complex food chain i.e. with more than one consumer. Categorise the consumers as consumer I, II, III and so on.

Name: _____

Food Web



A **food web** shows how energy is passed on from one living thing to the next. It shows the feeding habits of different animals that live together in an ecosystem.

In the food web pictured on the left, energy is passed from the grass to the mouse to the snake to the hawk.

Producers are living things that make their own food with sun and air. The producers are pictured at the bottom of the food web.

Consumers are living things that eat other living things.

Use the food web in the picture above to answer the questions.

1. Name the living things in the food web that are producers. _____

2. Name the living things in the food web that are consumers. _____

3. Which living things does the snake eat? _____
4. Which living things does the hawk eat? _____
5. What is eaten by the rabbit? _____

Super Teacher Worksheets - www.superteacherworksheets.com

https://www.google.com/search?q=food+chain+with+consumer+i+ii+iii+work+sheet+grade+4&tbm=isch&ved=2ahUKEwip7Ymvp6r4AhU2XvEDHQKBB0Q2-cCegQIABAA&oeq=food+chain+with+consumer+i+ii+iii+work+sheet+grade+4&gs_lcp=CgNpbWcQA1DNB1iuRWCgVWgAcAB4AIBxAOIAaIdkgEIMi0xMi4xLjGYAQCgAQGqAQnd3Mtd2l6LWltZ8ABAQ&scient=img&ei=PB2nYqnfNra8xc8Pg5SS0AE&bih=762&biw=1579&hl=en-GB#imgcr=fIUd2NVOtq4BbM&imgdii=ygtEPFGYQT2fkM

ACTIVITY 3:

- Reinforce the learning of food chain through the following role-play.
- Write the word producer, herbivores, carnivores-I, carnivores-II and carnivores-III on a separate paper.
- Give one paper to each of them.
- Whatever the paper says that become the students role in the food chain.
- Paste the paper to their back.
- Herbivores try to catch the producer. When a producer gets tagged, the two students link arm.
- Carnivores-I, tries to catch the herbivore and when he or she is successful, they link arm,
- Carnivores-II, tries to catch the Carnivores-I and when he or she is successful, they link arms.
- Similarly, Carnivores-III tries to catch the Carnivores-I and when he or she is successful, they link arms.
- Ask students to draw the developed food chain on paper.

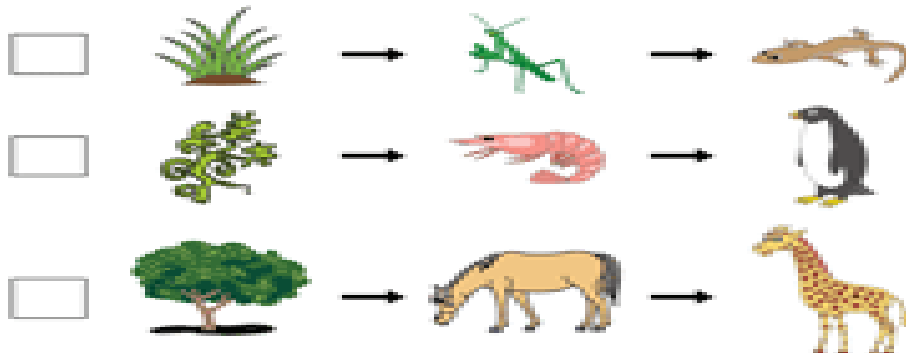
Sum-Up:

- Each living thing whether it is plant or animals depends nutrients and energy to survive.
- Food chain describes how food is passes from organism to organism.
- All food chains start with plants that make their own food. These are called producers.
- Next come organism that eats plants these organisms called carnivores-I and we know that they are herbivores.
- Then come the animals that eats herbivores these are called carnivores-II, and we know that they are carnivores.
- In all food chain, when any organism dies, it is eaten and broken down by decomposers. Some bacteria and fungi are decomposers.

Assessment:**Activity 1:**

Ask student to make correction in the following food chain.

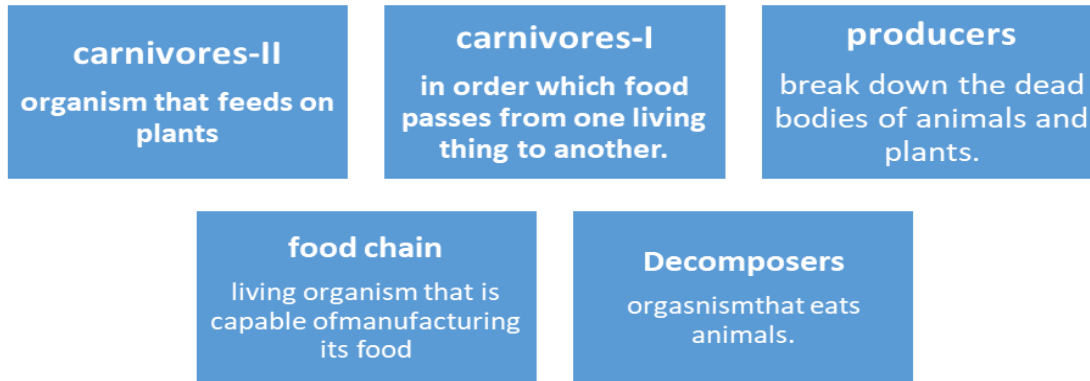
Check the sequence that shows the correct energy flow.



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Activity 2:

- Make a table on the board and ask students to copy the table on their notebook.
- Ask students to link the terms with the statement.



Follow Up:

- Ask students to complete the food chains by filling the blank boxes with the correct consumers or producers given below.
- Food chain I
 - Grass hopper, grass hawk, snake, rat
- Food chain II
 - Bird, cat, snail, grass algae
- Food chain III
 - Grass, fox, rabbit, bear

Types of organism	FOOD CHAIN I	FOOD CHAIN II	FOOD CHAIN III
Producers			
Consumers I			
Consumers-II			
Consumers-III			

Ask the students to separate different food chains in the following diagram.

ECOSYSTEM

Predator-Prey Relationship

**Duration:** 40 Minutes**Students Learning Outcomes:**

- Identify and describe some common predators and their prey.
- Recognize and explain that some living things in an ecosystem compete with each other for food and space.

**Materials:**

- Sticky note/pictures of different animals (lion, cat, mouse, deer) and plants charts.

Information For Teacher:

- A predator is an animal that hunts, kills and eats other animals for food.
- Prey is a term used to describe organisms that predators kill for food.
- Predation is an interaction in which one organism, the predator, eats another organism, the prey.

Introduction:

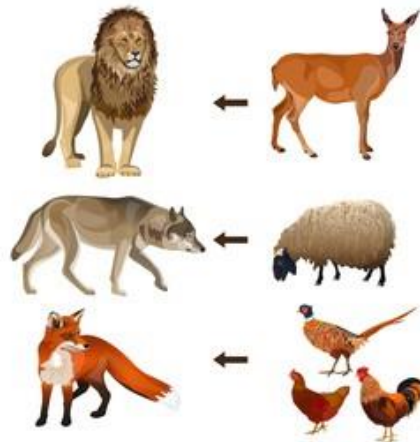
Ask Students:

- Ask the students what does a dog eat?
- What does a cat eat?
- What does a lion eat?
- Note their responses on board and then introduce the topic i.e. predator, prey and predation.
- A predator is an animal that hunts, kills and eats other animals for food.
- Prey is the term used to describe organisms that predators kill for food.
- Predation is an interaction in which one organism, the predator, eats another organism, the prey.

Development:**Activity 1:**

- Arrange the class into 5 groups.

- Provide each group with some sticky notes.
- Ask the students to write different predators and what they eat on these notes.
- Then collect the sticky notes and explain the concept of prey, predator and their relationship.

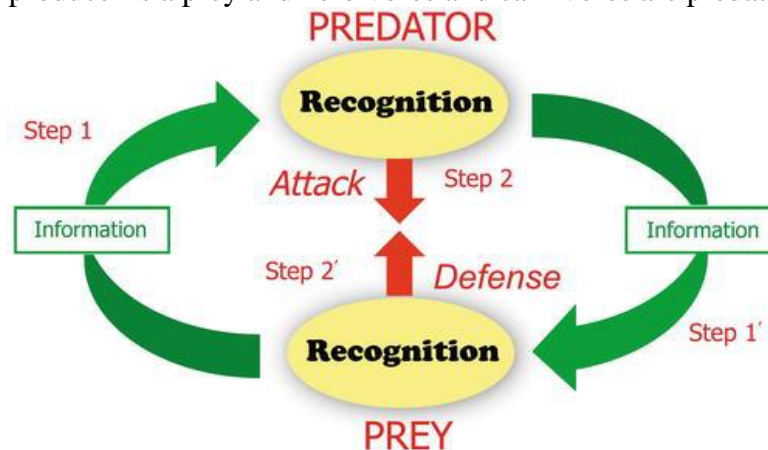


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Activity 2:

- Reinforce the learning of predator-prey relationship by a role-play. (predator, prey game)
- Give students different title as predators and prey.
- Herbivores try to catch producers.
- Carnivores try to catch herbivores or producers.
- In this game producer is a prey and herbivores and carnivores are predators.



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Activity 3:

- Ask the students to recall if they have any competition in class i.e. for first bench etc.
- or they have any eating competition.
- Note their responses and explain concept of competition among living things.

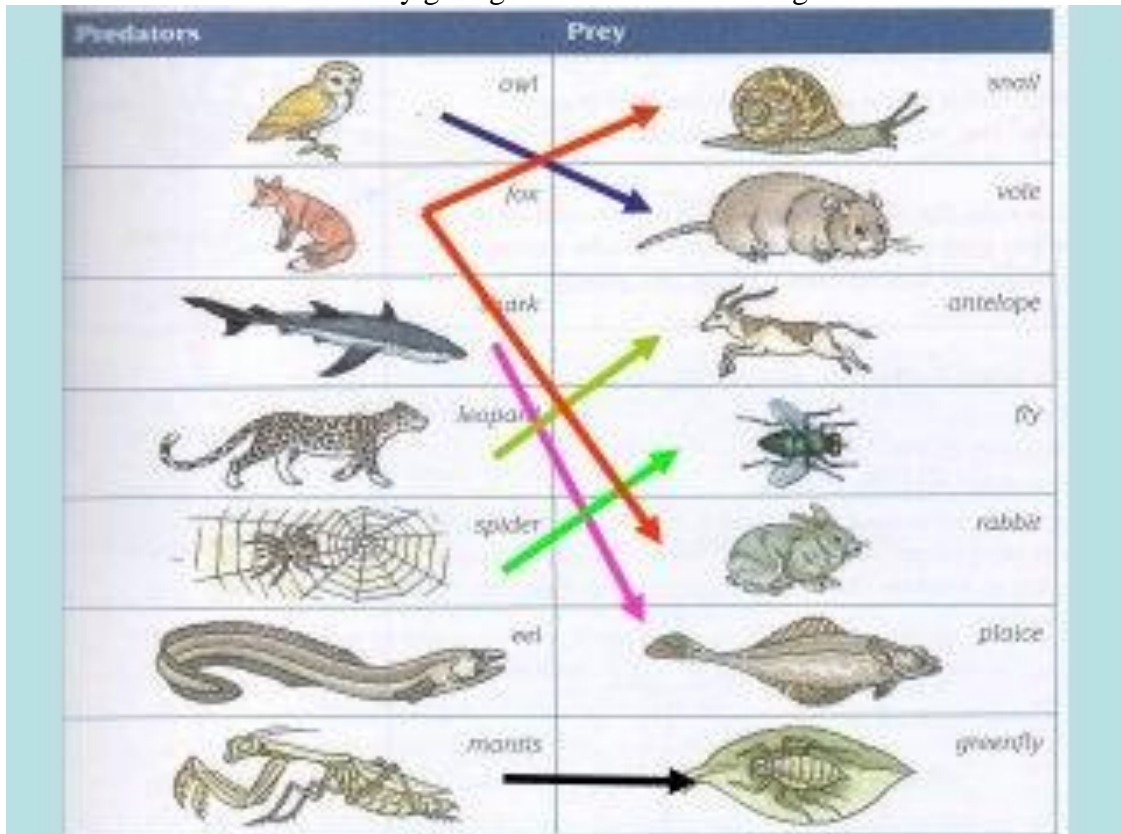
Sum-Up

- Living things compete for different natural resources i.e. air, water, food and space.

- This competition may be of friendly or predation.
- It leads to the continuous existence of all organisms.

Assessment:

- Student will be assessed by answering such oral questions.
 - 1 What does a spider hunt for?
 - 2 What does a lion hunt for?
- Student will also be assessed by giving them column matching.



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Follow-Up

- Divide the class into four groups.
- Ask them to find four different types of predators and their prey.
- Provide each group a worksheet to solve.



<https://www.google.com/search?q=predator+animals&tbm=isch&hl=en-GB&sa=X&ved=2ahUKEwiXkIWyrar4AhUQUBoKHXJ5ADcQrNwCKAB6BQgBEOwB&biw=1579&bih=762#imgrc=rhVD FjpPDtjYIM&imgdii=sCiKA7Hg-a5zZM>

ECOSYSTEM

Impacts of Human Action and Measures to Save Ecosystem

**Duration:** 40 Minutes**Students Learning Outcomes:**

- Interpret that human activities such as urbanization, pollution and deforestation affect food chain in an ecosystem.
- Identify various actions and roles that humans can play in preserving various ecosystem.

**Materials:**

- Pictures of land, water and air pollution, village and city life. Pictures of cutting trees, populated cities, endangered species of plants and animals, pictures of fishes died and persons with breathing disorders.

Information for Teachers:

- Most human's activities affects the ecosystem.
 - Due to the increase in population, human established cities. This is called urbanization.
 - For urbanization they cut forest, built roads and made factories. These actions polluted the environment and water resources.
 - Deforestation destroyed the habit of wild life.
 - Due to unnecessary of hunting of animals many wild organisms become extinct or may be endangered.
- Human trying to save the ecosystem as well by making wildlife parks, tree plantation and awareness campaign.

Introduction:

Explain the concept of Air, land, water pollution and deforestation by simple activities.

- Take a paper, cut out into different pieces and spread throughout the classroom and then ask the students.
 - How do you see now the environment of classroom? (Expected answer: dirty)
- Take two types of water (clean and dirty) into two different glasses. Ask students
 - Which water you would like to drink?
 - Let the students explain why?
 - Ask the students effects of polluted water on humans and water life.



- Burn piece of paper in classroom and allow its smoke to spread in the surrounding. Ask the students how they feel.
 - Ask students what if we continuously breathe in polluted air around us?
 - Explain students' effect of smoke on humans (respiratory diseases) and importance of plants, how they clean the environment.
- Ask the students do they use to sit under tree in summer, what will happen if they are asked to sit under sun without tree in summer?
- Ask the students about the habitat of tree and forest? What will happen when trees on large scale will be cut down and will it affect the life of animals living on tree and in forest? And effect on earth (expected reply: animals and birds will lose their home and earth will get direct heat, which will increase the temperature of earth).
- More the students will be called from any other class to create massive gathering in class, students will be asked to
 - Explain the difference in environment of class?
 - Let the students explain issues created due to gathering in classroom.

Development:

Activity 1:

Students will be provided with these pics on board and will be asked to match expression with each picture.

ENVIRONMENTAL THREATS

1. MATCH THE CORRECT EXPRESSION WITH THE RIGHT PICTURE:

DEFORESTATION - TOXIC WASTE - AIR POLLUTION - OZONE DEPLETION - ACID RAIN - DISPOSAL



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https://www.google.com/search?q=types+of+pollution+and+deforestation+activity+for+kids&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiKq5OW16r4AhWxRPEDHRejABMQ_AUoAXoECAEQAw&biw=1600&bih=762&dpr=1.2#imgrc=f7hyLJEztyAqhM&imgdii=C64c1EzEBt9cYM

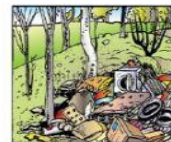
Pollution Homework

Cut each picture. Paste them under the correct heading.

Land Pollution	Water Pollution	Air Pollution



© Can Stock Photo



LIVEWORKSHEETS

https://www.google.com/search?q=types+of+pollution+and+deforestation+activity+for+kids&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiKq5OW16r4AhWxRPEDHRejABMO_AUoAXoECAEQAw&biw=1600&bih=762&dpr=1.2#imgsrc=tFSk_vRGx1YiuM&imgdii=ENng5PrxzO_GwM

Activity 2:

- Indicate the impact ecosystem through following activities.

<ul style="list-style-type: none"> • A restaurant owner wants an unobstructed view of the restaurant so he cuts down all the trees that were growing in that area. 	<ul style="list-style-type: none"> • Deforestation destroy habitat of wild life or different organism.
<ul style="list-style-type: none"> • A factory owners through all 	<ul style="list-style-type: none"> • Destroy water life through



the factory's waste water in the fresh water ocean, river	poisonous chemicals.
<ul style="list-style-type: none">• A man like to build buildings and made housing societies by cutting trees. He wish to establish cities.	<ul style="list-style-type: none">• Urbanization

Activity 3:

- Divide class into two groups.
- Group A polluted the environment by their activities.
- Group B compensate these changes by their efforts e.g. they made parks in cities.
- They plant trees.
- They start awareness campaign about the impact of human on ecosystem.
- They are ecofriendly.
- Ask the students which group they want to join. And why?

Sum-Up:

- Humans have done irreversible damage to the environment
- Ecosystem refers to a community of living organism and their interaction with the environment. Most human activities such as industry fishing affect the ecosystem.
- Global warming pollution and extinction of species are some of the consequences of such human behaviors.
- Humans are the top consumers in many foods' pyramids. To increase food production that use methods that have an effect on food chain and food webs

Assessment:

- Ask students to list at least three human activities which affect the ecosystem.
- Write T for true and F for false statement.
 1. Chemical fertilizer helps to protect to the ecosystem. F
 2. To conserve the environment the farmer should grow variety of crops instead of one crop. T
 3. Factories are being installed to conserve the ecosystem. F
 4. Tree plantation provide habitat to living things. T
 5. Unnecessary hunting may cause some species extinct. T

Activity:

pictures will pasted on board with random statements and students will be asked to come on board to match the best suited statement with pictures

1. Look at the story and think what is happening on it



2. Match the sentences with the corresponding picture



There are no more trees. Now, they could start building.



Deforestation started



There is a beautiful forest with big trees



So sad. There isn't any forest: now there is a tree museum.

https://www.google.com/search?q=deforestation+worksheet+for+kids&tbm=isch&ved=2ahUKEwjNxdjx4ar4AhWpgc4BHYyBN4Q2-cCegQIABAA&oq=deforestation+worksheet+for+kids&gs_lcp=CgNpbWcQARgAMgUIABCABFDxA1iyC2DZHwgAcAB4AIAB_AGIAbMKkgEDMi02mAEAoAEBqgELZ3dzLXdpei1pbWfAAQE&scient=img&ei=mVqnYo2VnKMDur4PjL-S8A0&bih=762&biw=1600#imgre=FcYWtsHEEyDQIM&imgdii=DKlxUha1eYYTyM

Follow-Up:

- Give a work sheet to the students and ask them to write
 - What is pollution?
 - What are different types of pollution?
 - What are the effects of pollution on humans?
 - Who do you think are responsible for the following disaster?
 - Are you affected by the pollution?
 - Why and why not?

List at least two ways how you compensate these effects of human activities.

HUMAN HEALTH

Contagious and Non-Contagious Diseases

**Duration:** 40 Minutes**Students Learning Outcome:**

- Differentiate between contagious diseases (hepatitis, TB, flu) and non-contagious diseases (cancer and diabetes)

**Materials:**

- Room spray, a glass filled with tap water, flash cards with the names of contagious and non-contagious diseases, chart paper.



During teaching, also consult the textbook as and when required.

Information For Teachers:

Disease is a disorder of structure or function in a human, animal, or plant.

There can be various types and causes of diseases.

Diseases are often known to be medical conditions that are associated with specific signs and symptoms.

Contagious is likely to spread and affect others.

Non- Contagious is not communicable directly or indirectly.

Inflammation is a physical condition in which part of the body becomes reddened, swollen, hot, and often painful, especially as a reaction to injury or infection.

TB is tuberculosis – a lung disease

Congested is abnormally full, crowded or overflowing?

Symptom is an indication or condition of disease, particularly that is apparent to the patient.



Transmission is an action of transfer or transmitting.

Contamination is an action or state of making or being made impure by polluting or poisoning.



Polio vaccines are given orally because its virus rests in throat or intestine of the person.

Cardiovascular refers to heart and blood vessels.

Introduction:

1. Recall students' previous knowledge about the diseases
2. Ask the students what happens when they catch a cold.
3. Ask the students why does a teacher advise the fellow who is suffering from flu to take rest at home.

Development:

Activity1:

1. Tell the students about contagious diseases using the textbook. They are transmitted from one person to another person through contaminated air, water or food.
2. Give examples of contagious diseases. (Flu, polio, TB, hepatitis and COVID-19 etc.)
3. Explain to the students all diseases are spread by different germs. These germs are present everywhere.

4. Give example from the textbook.

Flu: It is a viral disease and patient complains about congested or runny nose and headache.



Polio: It is caused by a virus. The virus remains in the throat or intestine of a person and paralyzes the legs permanently. This virus is transmitted through food, water and air.

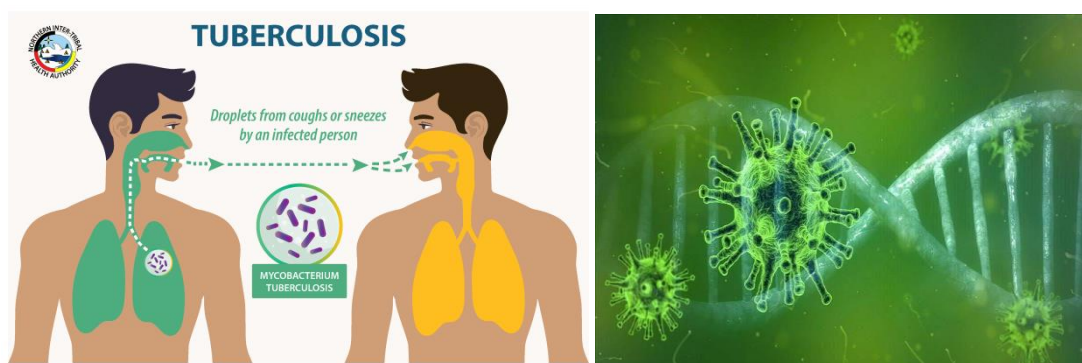


Activity 2:

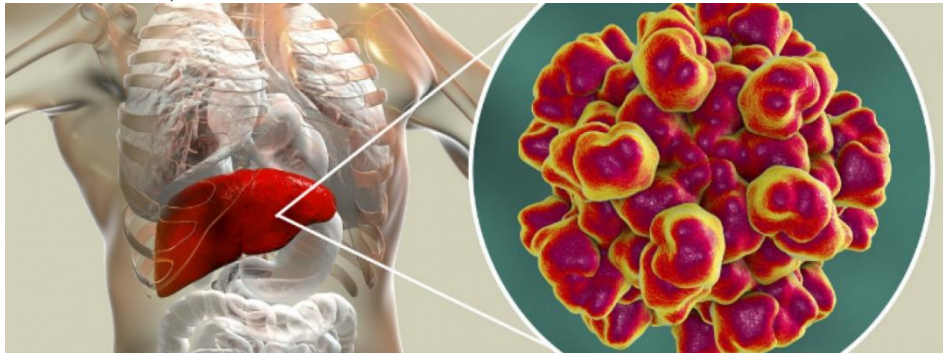
1. Take the room spray to the classroom and do 1 to 2 pumps in the classroom.
2. Wait and ask the students if they can smell the fragrance even when they are sitting at their places.
3. Tell the students germs of contagious diseases also travel like this. If the person with infection is present in the same place or in environment.
4. Give examples by using the textbook.

TB (Tuberculosis) is caused by a particular bacterium. It usually damages the lungs. It is transmitted from one person to another through coughing, sneezing and use of the articles of the infected person and conversation.

Flu and COVID-19 are also such contagious diseases.



Hepatitis is inflammatory condition of the liver. The germs of this disease are transmitted through polluted water, food or blood.



Activity 3:

1. Place the glass of tap water on the table in front of the class.
2. Ask the students to tell what they think about the purity of water.



3. Explain to the students that tap water is not pure or clean. We have to boil it. If someone drinks it, he/ she will get sick due to germs in it.
4. Then call a student and ask him/ her to pick the glass and place it on the other table.
5. Explain to the students, that germs from the hands of student 1, are transmitted to the glass and now if a new student will touch it, the germs will get on his/ her hands. That is why diseases are called contagious.



Non- Contagious Diseases

1. Tell the students that non-contagious diseases are not transmitted from one person to another.
2. Give examples like diabetes, cancer and cardiovascular diseases.
3. Elaborate and explain to the students about different diseases.

Diabetes: In this disease, the sugar level in blood increases. The patient feels very thirsty, hungry, frequent urination, extreme fatigue and weight loss. It may affect kidneys, heart and eyes.



Cancer: It can attack in any part of body. There is uncontrolled increase in number of cells in the affected organ. It may confine to a particular organ or may spread in the whole body.



Sum Up:

- The diseases which can be transmitted from one person to another person through air, water and food are called contagious. e.g., Flu, TB and COVID-19.
- The diseases which cannot be transmitted from one person to another person are called non-contagious diseases. e.g., diabetes and cancer

Interesting for students

Contagious vs. non-contagious

- | | |
|--|---|
| <ul style="list-style-type: none">• Contagious: (Infectious)<ul style="list-style-type: none">***infectious carriers- Virus- can't be cured but can treat symptoms<ul style="list-style-type: none">• Vaccine- little piece of virus to build immunity- Bacteria- can be killed by antibiotics- Protists- can be killed | <ul style="list-style-type: none">• Noninfectious: (not Contagious)<ul style="list-style-type: none">***genetic carriers- Inherited- Examples:<ul style="list-style-type: none">• Color blindness• Sickle cell anemia• Dwarfism- Developed because of:<ul style="list-style-type: none">• Genetics• Environment• lifestyle- Examples:<ul style="list-style-type: none">• Cancer• Diabetes• Lung, liver or other organ disease |
|--|---|

Assessment:

Test 1:

To evaluate the students, ask the following questions:

1. What are contagious diseases?
2. Where does the polio virus remain?

3. Give two examples of non-contagious diseases.

Test 2:**Think, Discuss and Share**

1. Draw a table on the board with separate columns for contagious and non-contagious diseases.
2. Divide the students in groups.
3. Give out the flashcards with the names of contagious and non-contagious diseases.
4. Let the students discuss and ask the students to share with others.
5. Direct every group to paste the flashcard in the correct column.

Contagious Diseases	Non-contagious Diseases

Follow up:

Ask the students to write a note about any contagious or noncontagious disease you or any member of your family recently encounter with, by using the detail:

- Where it is received from?
- Initial symptoms.
- Later symptoms.
- Precautionary measurements.
- Medication detail if any.
- Recovery time/duration.
- Post-disease symptoms.

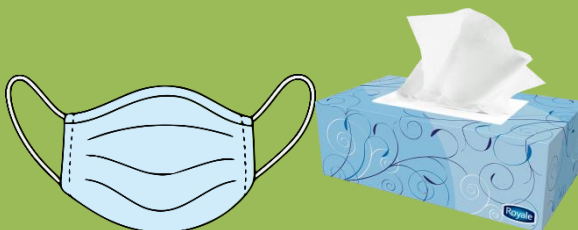
Human Health Communicable Diseases

**Duration:** 40 Minutes**Students Learning Outcome:**

- Relate the transfer of common communicable diseases (e.g., touching, sneezing, coughing) to human contact.

**Materials:**

- Face masks, tissue box, chart of COVID-19 SOPs



During teaching, also consult the textbook as and when required.

Information for Teachers:

Communicable diseases are spread from one person to another through a variety of ways. e.g., physical contact, contact with blood and body fluids, breathing in air infected with germs, bitten by an insect.

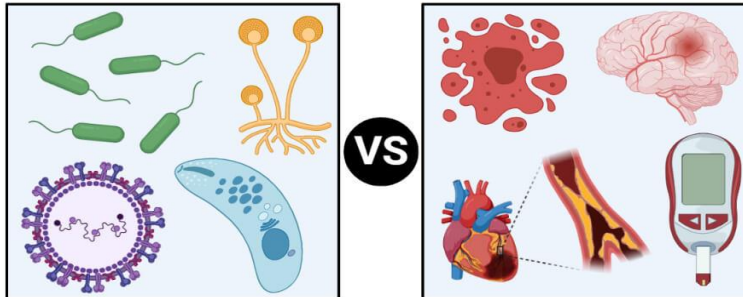
Influenza, mumps, chickenpox, plague and hepatitis are some examples of communicable diseases.

These diseases can also be called contagious or sometimes referred to as “infectious” or “transmissible” diseases.



Fact Finding

Communicable and Non-Communicable Diseases



<https://microbenotes.com/communicable-vs-non-communicable-diseases/>

Sick is a person or animal affected by physical or mental illness.

Mucous is a protective substance that's excreted from multiple areas of the body, such as the mouth, sinuses, throat, lungs, stomach, and intestines.

Introduction:

1. Recall students' previous knowledge about the transmission of germs.
2. Ask the students why is it necessary to wear mask during COVID-19 pandemic?
3. Ask the students what can a hand sanitizer do?

Development:

Tell the students, the normal temperature of human body is 98.6° F or 37° C.

Fever is when our body temperature exceeds the normal limit. It is not a disease but a symptom of disease.

Cough is an instant response of our body. It is due to the soreness and scratchiness of the throat. Coughing removes obstruction (e.g., dust or mucous) from the windpipe.



Sneezing helps us to get rid of the viruses and bacteria present in the nose.

Flu is a disease as well as symptom of many diseases.



Activity 1:

Mask etiquette

1. Distribute face masks among all the students of the class.
2. Tell them the correct way of wearing it.
3. Demonstrate in front of them.
 - Clean your hands before you put your mask on, as well as after you take it off, and after, you touch it at any time.
 - Place the mask on your face covering your nose, mouth and chin, making sure that there are no gaps between your face and the mask. Place the straps behind your head or ears. Do not cross the straps because this can cause gaps on the side of the mask.
 - When you take off a mask, store it in a clean plastic bag, and every day either wash it if it's a fabric mask, or dispose of a medical mask in a trash bin.

imagine | TRESOR | 

MASK ETIQUETTE



**THE CORRECT
WAY OF WEARING
A MASK!**

INCORRECT WAYS OF WEARING A MASK



Under
your nose



Under
your mouth



Around
your neck

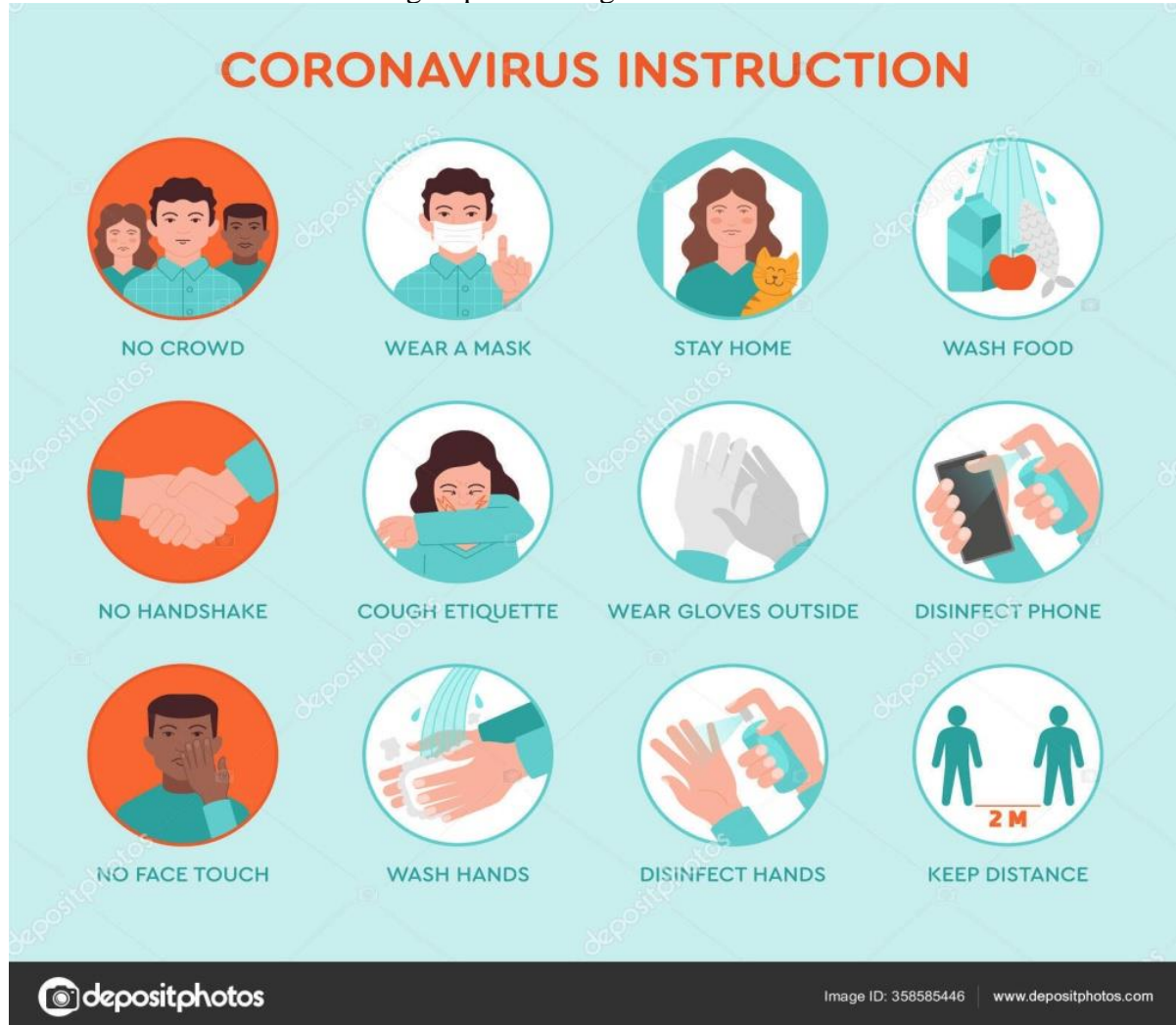
https://www.facebook.com/imagineapple/photos/a.383288548410129/5368560933216174/?type=3&_rdr

4. Explain to the students, that the correct way of wearing a face mask can only protect them from infection.
5. Ask all the students to wear their masks correctly.

Activity 2:

Role play

1. Ask the students to make a list of SOPs observed during COVID-19 pandemic.
2. Divide the students into groups and assign them to demonstrate/ act one of the SOPs.



<https://depositphotos.com/358585446/stock-illustration-infographic-icons-coronavirus-instruction.html>

3. Tell the students communicable diseases are transferred from a person to another by coughing, sneezing, human contact like touching, shaking hands etc.

Activity 3:

1. Take the chart of COVID-19 Sops and show it to students.
2. Relate and explain to the students that communicable diseases like flu, cough, ringworms etc. also spread the same way as Corona.
3. Tell the students how communicable diseases can be avoided.
4. Describe to the students that international organizations e.g., World Health Organization – WHO, United Nations International Children's Emergency Fund – UNICEF and The Global Health Council etc. work for the healthcare of the world.

SAFE RETURN TO SCHOOL

GUIDANCE FOR CHILDREN

REMEMBER 6 POINTS



<https://twitter.com/nhsrcofficial/status/1303610485535891456?lang=fi>

Sum Up:

Communicable diseases are transferred from one person to another by:

- Infectious droplets in the air
- Shaking hands after coughing and sneezing
- Using the articles of infected person like clothes or utensils

Assessment:

Test 1:

To evaluate the students, ask the following questions:

1. Define communicable diseases.
2. What is the benefit of coughing?
3. Give three examples of communicable diseases.
4. What happens if we don't wash our hands after sneezing?

Test 2:

1. Place a tissue box in front of the class.
2. Call a student and ask him/ her to pull out one tissue.
3. Tell the student to clean his/ her hands with it.



4. Then, call another student and ask will he/ she use the same tissue or pull out a new one? (He/ She will pull out a new one to avoid the germs and infection.)
5. Ask the reason from other students.

Follow up:

Ask the students to write three reasons of falling sick.

Ask the students to make a DIY (do yourself) face mask .



<https://sarahmaker.com/how-to-make-a-no-sew-face-mask-with-at-home-materials/>

HUMAN HEALTH

Ways to Make Water Clean



Duration: 40 Minutes



Students Learning Outcome:

- Explore a few ways that can help make water clean and suitable for drinking (water filtration and boiling)



Materials:

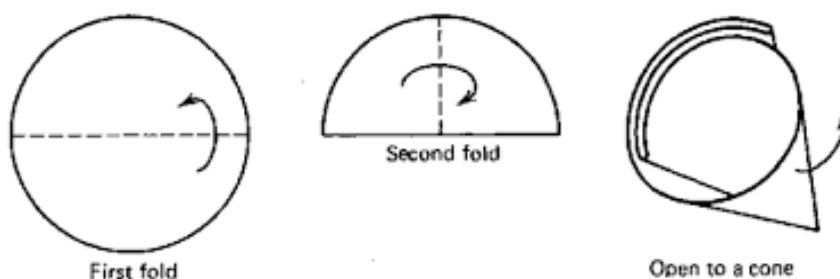
A small amount of soil and following is a list with reference pictures.

1. Burner	2. Match box	3. Beaker
		
4. Tripod stand	5. Wire gauze	6. Glass rod
		
7. Tea with tea leaves	8. Sieve	9. Cup
		
10. Flask	11. Filter paper	12. Glass funnel
		
13. Pictures of different water purifiers		14. Picture of simple water filtration plant
		

During teaching, also consult the textbook as and when required.

Information for Teachers:

- **Boiling** is the rapid vaporization of a liquid, which occurs when a liquid is heated to its boiling point.
- **Boiling point** is the temperature at which the vapour pressure of a liquid is equal to the pressure exerted on the liquid by the surrounding atmosphere.
- Boiling point of water is 100° Celsius.
- Flask is a bottle which is used for carrying liquids in laboratory.
- Funnel is a tube or pipe that is wide at the top and narrow at the bottom, used for guiding liquid or powder into a small opening
- Beaker is a cylindrical container with a flat bottom. Most also have a small spout to aid pouring.
- Folding of filter paper is done in the following way:



http://wrhsmrschang.weebly.com/uploads/1/3/2/1/13211043/f17_lab_safet_equipment_packet.pdf

- Dampen the folded filter paper before placing into the funnel.
- Never press the filter paper too hard as it will get torn.

Introduction:

1. Recall students' previous knowledge about the cleaning of water.
2. Ask the students where do they get clean water from?
3. Inquire from the students about different methods of cleaning water.
4. Ask the students why is it important to drink clean water?

Development:

1. Tell the students that there are various methods to make water clean and suitable for drinking.
2. Communicate to the students that they will study two methods i.e., boiling and filtration

Activity1:

Bubbles in water

1. Tell the students that boiling is the easiest method to clean water.
2. Explain to the students that boiling is a method in which liquid is heated to its boiling point.
3. Demonstrate the process of boiling in front of the class or in the science laboratory.

Method: Set up the apparatus/ material (burner, match box, beaker with tap water, wire gauze and tripod stand)



<https://www.dreamstime.com/royalty-free-stock-image-science-experiment-image7023406>

1. Light the burner with match stick and place the beaker over the wire gauze.
2. Heat the water till it reaches the boiling point.
3. Ask the students to observe the bubbles appearing in the water.
4. Monitor students during the activity to avoid any accident.
5. Then, let the water boil for another 5 to 10 minutes.
6. Explain to the students that boiling the water kills most of the germs present in it.
7. Ask students to note down their observations and write the process of boiling water in their notebooks.

Activity 2: The Tea Game

1. Call the students and ask them to stand in a circle.
2. Place a table in the center and set up the materials i.e. tea with tea leaves, sieve and cup.
3. Demonstrate the method of filtering tea.



<https://focusedcollection.com/150110520/stock-photo-straining-tea-through-a-strainer.html>

1. Explain to the students the concept of filtration. In this activity, tea is passed through a sieve that filters the tea leaves. Tea is collected in the cup without them.
2. Elaborate that filtration is a process by which the particles present in the water get separated by a filter.
3. Call a few students to replicate the activity.

Activity 3:

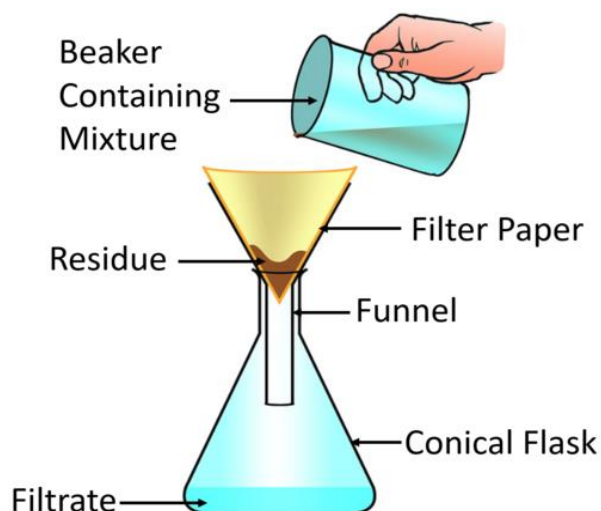
Water Filtration

1. Set up the apparatus in the classroom or science laboratory. (beaker, funnel, glass rod, flask, filter paper).
2. Take tap water in the beaker.
3. Mix small amount of soil in water with the help of glass rod.



<https://www.dreamstime.com/scientist-preparing-soil-extract-table-closeup-laboratory-analysis-scientist-preparing-soil-extract-table-closeup-laboratory-image162026483>

4. Pour out the water mixture through the funnel slowly.
5. Explain to the students that water will pass through the filter and get cleaned. The particles present in water cannot pass through the pores of the filter paper.
6. In the end clean water is collected in the flask.





<https://keystagewiki.com/index.php/Filtration>

Tell the students that water at the filtration plants also gets cleaned in the same way.

Reference:

<http://www.chymist.com/FILTERING%20SOLUTIONS%20LSM.pdf>

Sum Up:

Water can be cleaned by many methods. Boiling is the easiest one. Water can be filtered through filter paper. Particles in the water cannot get through the pores of the filter paper.

Assessment:

To assess the students, ask the following questions.

- Name two methods to make water clean and drinkable.
- What is the use of filter paper?
- How can we separate tea leaves from tea?

Follow up:

Ask the students to draw a labelled diagram showing the process of filtration and also write the methodology.

MATTER AND ITS CHARACTERISTICS

States of Matter and its Characteristics

**Duration:** 40 Minutes**Students Learning Outcome:**

- Describe characteristics of each state of matter with examples.

**Materials:**

- Water, ice, balloon, a brick, beaker or glass or cup, heating device, spoon

Information for Teachers:

- Everything which has mass and occupies space is called matter.
- A way to describe the behavior of atoms and molecules in a substance is called state of matter.
- Teacher will use one-minute paper activity for written assessment.

Introduction:

- Eat candy, drink water and inhale air through nasal passages and tell students that these are three states of matter; solid, liquid and gas. Today we will study shape volume characteristics of matter.

Development:**Shape and volume characteristics in solid****Activity 1:**

- Take book, pen, watch or chair from the classroom.
- Observe the shapes and volume of these objects.
- Press these objects.
- There is no change in shape and volume.
- Solids have fixed shape and volume.

Activity 2:

- Take three vessels of different shapes.



- Pour water in these vessels.
- Observe the shape and volume of water in these three vessels.
- When a liquid is poured in any vessel it takes the shapes of that vessel.
- It means the shape of the liquid changes
- There is no definite shape of liquid.
- Observe whether the volume of the water changes when it is poured from one container into another.
- Volume of water does not change but remains fixed.

Activity 3:

- Take a cup of water and pour it into a glass.
- Is the volume of water the same as it was in the cup?

**Activity 4:**

- Take three balloons of different shapes.



- Fill air in the balloons.
- Observe the shapes and volume of the balloons.



- Three balloons have different shapes
- It means gases do not have fixed shapes and volume.

Conclusion:

In characteristics of states of matter; solids, liquids and gases we studied only shape and volume characteristics. Solids have fixed shape and volume, liquids have definite volume but no fixed shape and gases have no definite shape and volume .

Assessment:

- Differentiate among solids, liquids and gases on the basis of shape and volume in one minute.

Follow up: written work

- Write an activity to demonstrate shape and volume characteristics of matter other than examples mentioned in the textbook.

Point to ponder

Why does an inflated balloon burst when placed in the sun?

Answer: Due to heat of the sun, energy of gas particles increases inside the balloon. The balloon continues to expand and will eventually burst.

MATTER AND ITS CHARACTERISTICS

Classification of Objects on the Basis of Physical Properties

**Duration:** 40 Minutes**Students Learning Outcome:**

- Compare and sort objects and materials on the basis of physical properties (e.g., mass, volume, states of matter, ability to float or sink in water).

**Materials:**

- Wooden rod, football, book, pen, glass, piece of wood, cloth bag, plastic bag, water, beaker, burner or heating device, water in a pot, rubber, pencil, piece of paper etc.

Information for Teachers:

- Materials are the matter that objects are made from; glass, plastic, rubber, metal, wood and stone etc.,
- Quantity of matter in an object is called its mass.
- Space that an object occupies is called its volume.

Introduction:

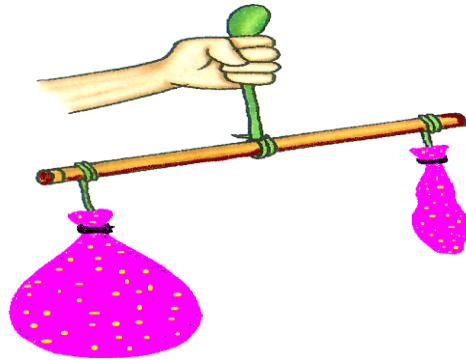
- Display glass, piece of wood, plastic bottle, rubber, pencil, piece of paper etc., on a table and ask students how they think the objects are different. Expected response: these objects have different mass, volume and density.

Development:

Objects are classified on the basis of their physical properties. These physical properties include mass, volume, states of matter, ability to float or sink in water.

Mass**Activity 1:**

- Tie a balloon which is not inflated at one end of the wooden rod.
- Tie an inflated balloon at the other end of the wooden rod.
- Ask the students to observe which end of the wooden rod bends down and why?



- Tell the students that the wooden rod will bend towards inflated balloon because inflated balloon has air inside it. Due to the weight of the gas, the wooden rod bends.
- Inform them that the masses of matter never change at any condition.

Mass is measured in gram and kilogram. 1 kilogram = 1000 grams

Activity 2:

- Ask the students to observe the objects given below:
Football, book, pen, glass



- Ask them which object has occupied more space?
- The football has occupied more space
- Share the following information to the students.

States of Matter and Arrangement of Particles

All matter consists of very tiny particles. The arrangement of particles in solid, liquid and gas is different

Arrangement of Particles in Solid

In solids the particles are strongly attached with each other. These particles have strong force of attraction. The particles vibrate but do not change position. Solids cannot be easily pressed. Solids maintain their definite shape and volume.

Activity 3:

- Put a piece of wood in a cloth bag.



- Make a small hole at the bottom of the bag
- Ask the students to try to remove the wood through the small hole.
- Inform them that it will not come out because the shape of the solid remains the same.

Activity 4:

- Pour water in a plastic bag and tie a knot at its top.



- Now make a hole at the bottom of the plastic bag
- Ask the students to observe what happens?
- Inform them that the water flows out of the hole because of weak force of attraction among the liquid particles. They can flow fast. That is why the shape of the liquid is not definite.
- Share following information to the students.

Activity 5:**Arrangement of Particles in Liquid**

The particles in liquids are near to each other. They are in constant motion. They keep colliding with each other. Since the force of attraction among the liquid particles are weaker than solids, they can flow.

The volume of liquid is definite, but their shape is not definite. A liquid takes the shape of the vessel in which it is poured.

- Press a soft plastic bottle filled with water.

- Ask the students that. What is their observation?
- Inform them that:
- When we pressed the soft plastic bottle filled with water, the shape of the bottle changed and the shape of the water also changed. But volume of the water remained the same.

Arrangement of Particles in Gas

The particles in a gas are at great distance from each other. They move fast because of the weak forces of attraction. They can move freely in any direction to occupy all the available space. This is the reason that they have no definite shape and volume.

Activity 6:

- Take a piece of ice in a beaker or any pot.



- Heat it.
- Tell students that you will see that the solid ice changes into liquid water.
- Ask them to heat it more.
- Keep a steel plate in an inclined way over the beaker. The water will change into vapours i.e., gas.
- Inform them that vapours will gather on the steel plate.
- After becoming cool, the vapours will change into drops.
- The drops will be collected in cups. Now, if you put this water in a freezer then after a few hours it will be changed into solid ice.
- Ask them that what conclusion have you made from this activity?
- Ask them to write your observations.
- Share this information to the students that:

We conclude from this activity that water exist in three states; sold, liquid and gas. When it is heated or cooled it changes its states. At normal temperature it is liquid, when it is heated it becomes gas and when it is cooled it becomes ice which is solid.

Activity 7:

- Take water in a glass or pot.



- Put rubber, iron needle, pencil, piece of paper, wooden pieces, plastic bottle, and plastic toy etc., in it as shown in **figure**.
- Ask students to observe what happens?
- Ask them to write the names of objects which float on water and write the names of objects which sink in water.
- Share this information to the students that:
- Pencil, piece of paper, wooden pieces, plastic bottle, plastic toy float on water because of low density and rubber and iron needle sink in water because they have greater density.

Conclusion:

Objects are classified on the basis of physical properties (e.g., mass, volume, states of matter and density).

Assessment:

- Ask the students to:
- sketch the shapes of arrangement of particles in solids liquids and gases on their notebooks.

Follow Up:

- Ask the students to write these questions on their notebooks.

Which state of matter has lowest density?

State the arrangement of particles in solids.

MATTER AND ITS CHARACTERISTICS

Physical Properties of Metals

**Duration:** 40 Minutes**Students Learning Outcome:**

- Explore the properties of metals (e.g., appearance, texture, colour and density).

**Materials:**

- Ornaments, knives, spoons, cooking utensils, cooper wire, silver wire, aluminum foil.

Information for Teachers:

- The mass present in a definite volume is called its density.

Introduction:

Ask the following questions.

- Do you know the names of a few metals? Iron, silver, gold
- What is the external appearance of metals? Metals are hard or soft, light or heavy and coloured in appearance.
- Why does ice float on the surface of water? Ice floats on water because ice has a lower density than does water.

Development:

- There are any objects around us which are made of metals; for example, ornaments, knives, spoons, cooking utensils.

Activity 1:

- Make a list of objects present in your home which are made of metals and observe the appearance of metals. All metals are lustrous.
- Share this information to the students.

Texture of metals

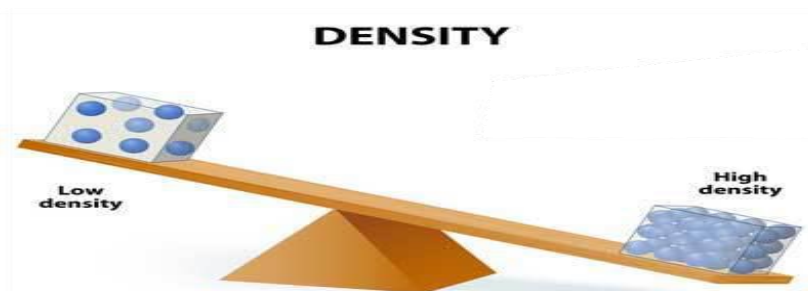
Metals are usually solid. Some metals are hard and strong for example iron. That is why they are used to make various tools and machines. Some metals are soft such as gold, silver and copper. Due to this property, these are used to make foil sheets and wires.

Colour of metals

Metals occur in various colours. Gold is yellow, copper is red. Silver is white. Tin and nickel are light pink. Zink, chromium and aluminum are light blue in colour. Most of the metals are gray in colour.

Density of metals

Look at the given picture. The volume of both the objects is the same, but why is one at a height? Two objects having equal volume may have different mass. The floating and sinking of objects depends on their density. The objects having less density than the density of water, float on water. The objects having more density than the density of water, sink in water. The metals usually have more density. If you tap any metal you can hear the resonance of the metal. This is due to density.



Activity 2:

- Ask students to Put a brick on one pan of the balance and a bigger piece of foam on the other pan.
- Now ask which pan will tilt and why?



(The brick balance pan will tilt; the volume of brick and foam can be the same but the weight of the brick is more than that of foam.)

Conclusion:

All metals are lustrous. Usually metals are solids. Some metals are soft, some are hard and strong. The metals usually have more density.

Assessment:

- Ask students to do question as assessment.
- State the arrangement of particles in solids.

Follow Up:

- Ask the students to
- Collect four types of metals. Observe them and write their properties.

Serial No	Metal	Appurtenance	Texture	Colour
1	Copper	Lustrous	Soft	Red
2	Iron	Lustrous	Hard	Gray
3	Silver	Lustrous	Hard	White
4	Aluminum	Lustrous	Soft	Light blue

MATTER AND ITS CHARACTERISTICS

Metals as Conductors

**Duration:** 40 Minutes**Students Learning Outcome:**

- Identify properties of metals (conducting heat and electricity) and relate these properties to the use of metals (i.e., a copper electric wire and an iron cooking pot).

**Materials:**

Iron rod, cell or battery, copper wire, bulb or LED, insulated electric wire steel spoon, plastic scale and pencil.

Information for Teachers:

- The objects which allow heat to pass through are called conductors of heat.
- Metals such as copper, aluminum and silver allow electricity to pass through them. These are the conductors of electricity. These types of metals are used to make electric wires. Metals are also good conductors of heat such as iron, copper, and aluminum etc., therefore, these metals are used in cooking utensils.

Introduction:

- Ask following questions:
- Why does a person use a cloth when holding a pan while cooking?
- Why does an electrician use an electric tester that has plastic insulation at the touching or holding end?

Development:**Activity1**

- Ask the students to follow instruction:
- Put a few objects such as a steel spoon, plastic scale, pencil etc., in a beaker or glass as shown in the picture.



- Pour some warm water into the beaker.
- Wait 1-2 minutes.
- Touch the outer end of each object.

Write your observations in the following table:

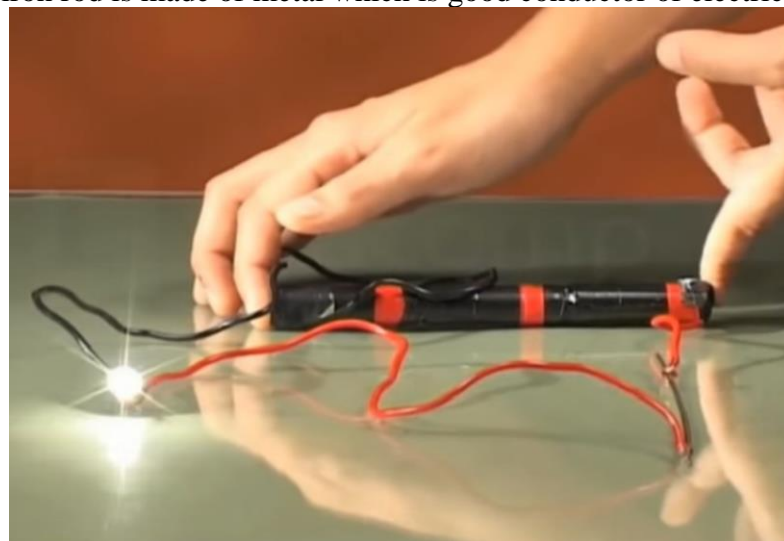
Objects	Form of matter	End is hot or not
steel spoon	Metal	Hot
plastic scale	Plastic	Not hot
Pencil	Wood	Not hot

Reason:

- Explain them that the outer end of steel spoon becomes hot because metals are good conductors of heat.

Activity :2

- Ask the students to follow these instructions.
- Make an electric circuit with help of electric wire, battery and a bulb.
- Connect the iron rod with the open end of the wires.
- Complete the circuit.
- The bulb glows.
- It means iron rod is made of metal which is good conductor of electricity.



Conclusion:

The metals are good conductors of heat and are used to make cooking utensils. The metals which are good conductors of electricity are used to make electric wires.



Assessment:

- Ask the following questions.
- Why are cooking utensils made of metals?
- Why do handle of cooking spoon made of plastic or wood?

Follow Up:

- Ask students to:
- enlist metals other than given above which are good conductors of heat and electricity in their notebooks.

FORMS OF ENERGY AND ENERGY TRANSFER

Behavior of Light

**Duration:** 40 Minutes**Students Learning Outcome:**

- Relate familiar physical phenomena (i.e., shadows, reflections and rainbows) to the behavior of light.

**Materials:**

- Torch, candle, lamp or mobile phone light, prism, pencil, cardboard sheet, toy

Information for Teachers:

- Light is a form of energy.
- Prism is a three-faced transparent object, which breaks light into different colours.

Introduction:

- Ask the students; have you ever seen a shadow. Most of them will say “yes”.
- Ask the students; have you ever seen a rainbow. Most of them will say “yes”.
- Ask the students; can you see your image in the mirror. All of them should say “yes”.

Development:

- Share this information to the students for their better understanding.

Shadow

When light leaves its sources, it travels in all directions in straight lines.

Light can pass through some objects. When an opaque object is placed in the path of light, light does not pass through the body and a shadow is formed. Hence, shadow of that object is formed behind it. Example, light passes through glass and no shadow formed. Light does not pass through body and shadow is formed.

Shadow is a region of darkness behind an object facing the source of light. A shadow always forms on the opposite side of the light sources.

Activity 1:

- Ask students to follow these instructions.
- A candle, a lamp or mobile phone light in a dark room.
- Put your hand between light source and the wall.
- Ask them that what do they see on the wall? (Expected response shadow of the hand).
- What do you see on the wall? (Expected response: shadow of the hand).

- Is the shadow on the wall like hand? (Expected response: no it is bigger than my hand).
- Bring your hand near the lamp.
- How is the size of the shadow affected? (Expected response: The shadow of the hand gets bigger as we bring the hand nearer to the light source and shadow of the hand gets smaller as we move the hand away from the light source).



Reflection of light

- Share this information to the students:

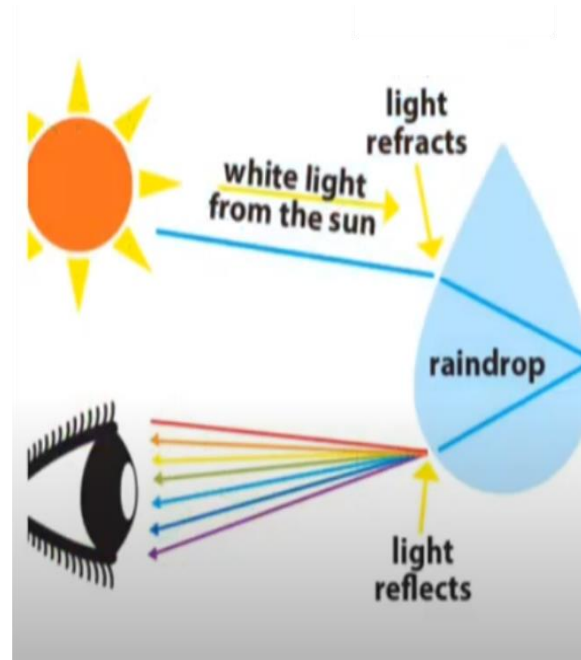
In the morning, you usually see your image in the mirror. Can you see your image in the dark? No. When light strikes the shiny and smooth surface of a mirror, it bounces back and enters the eyes. So, we can see our image. It is called reflection of light.



Rainbow is an example of refraction of light.

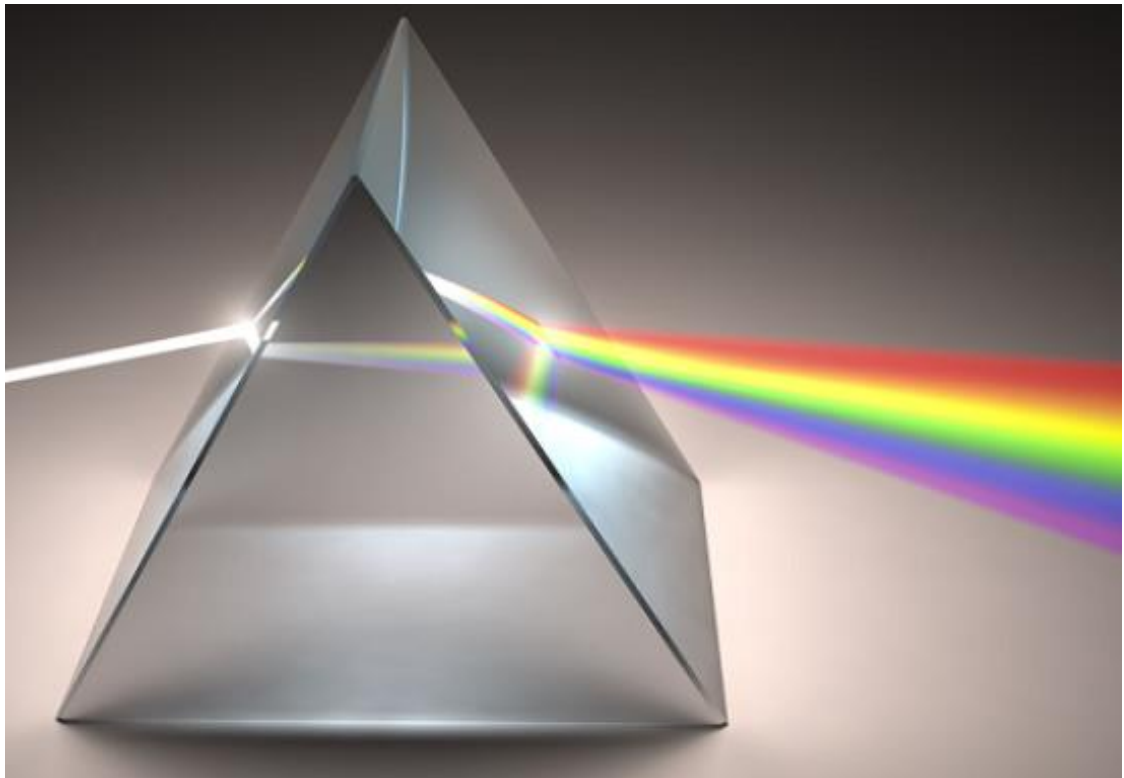
Rainbow

There are seven colours in sunlight (red, orange, yellow, green, blue, indigo and violet). After rain, some drops of water are suspended in the air. When the sunlight passes through water droplets, they break it into seven colours like a prism. This is called a rainbow. Conditions for a rainbow: Sunlight and water droplets.



Activity 2:

- Ask them to follow the instructions:
- Use a pencil to make a narrow hole in a cardboard sheet.
- Place this cardboard in front of sunlight to get a narrow ray of light.
- Place a prism in front of this ray of light.
- Rotate the prism slowly till you see the sunlight broken into different colours on the screen.

**Sum Up:**

Light is a form of energy. Light helps us to see things. We see shadows, images and rainbows due to light. A shadow is dark spot that is shaped like the object. Reflection occurs when light strikes on a shiny surface and bounces back. Rainbow is formed when sunlight passes from water droplets through a process of refraction.

Assessment:

- Ask this following questions to the students:
- When can we see a rainbow? How is it formed? We can see a rainbow in the sky after rain. Some drops of water are suspended in the air. When sunlight passes through water droplets, they break it into seven colours like a prism and we see a rainbow in the sky?.

Follow Up:

- Ask them to solve these questions in their notebooks.
- What is shadow? How does it form?

Describe an activity to show reflection of light.

FORMS OF ENERGY AND ENERGY TRANSFER

Electrical Energy

**Duration:** 40 Minutes

Students Learning Outcome:

- Describe and demonstrate that electrical energy in a circuit can be transformed into other forms of energy (e.g. heat, light, sound).



Materials:

- Two paper cups, two small pieces of twigs, thin wire 7 meters, pencil or nail, school bell, cardboard sheet, cells, two pieces of wires, electric heater wire

Information for Teachers:

- The ability to do work is called energy.
- The process of changing one form of energy into another form is called energy transformation.
- Electrical energy can be transformed into heat, light and sound forms of energy.

Introduction:

- Ask these questions to the students:
- Why should we not use energy unnecessarily? (We should not use energy unnecessarily because energy sources are limited.)
- What is the basic source of energy on the Earth? Sunlight is the basic source of energy on the Earth.

Development:

Electrical Energy

- Share this information to the students:

Electricity or electrical energy is produced by generators. This electricity is supplied to our homes through wires. Cells and batteries are also the sources of electrical energy. These are used in toys, torches, clocks and remote controls etc. We use electric energy for running many devices in our homes. Electrical energy can be transformed into other forms of energy like heat, light and sound.



In heater, the electric energy changes in to heat.



In electric bulb, the electric energy changes in to light.



In loud speaker, the electric energy changes in to sound.

Heat Energy

Heat is form of energy that can pass through metals. Metals are good conductors to pass electrical energy. Electrical energy can be transformed into heat energy.

Activity 1:

- Ask the students to follow the instructions.
- Take a cardboard sheet.
- Cut two pieces of cardboard sheets in equal height and width.
- Fix two pieces of cardboard vertically with gum.
- Use metal wires to join cell and electric heater wire with the switch as shown in the diagram.
- Touch the electric heater wire with finger after five minutes, it will be heated up, it means electrical energy can be transformed into heat energy.



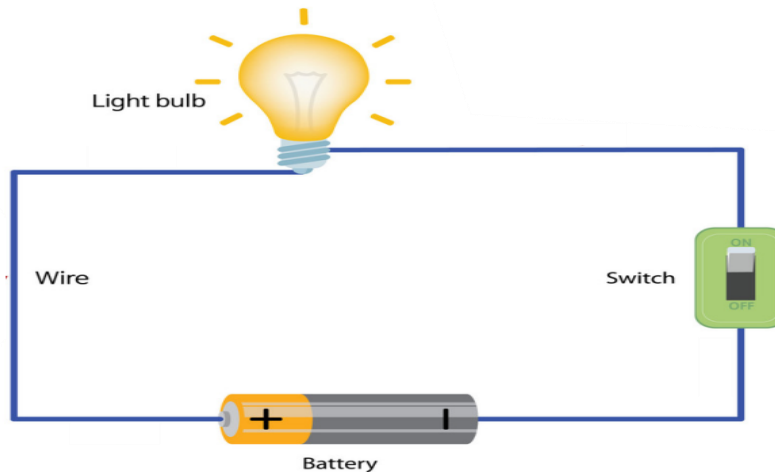
Light Energy

- Share this information to the students.

Light is a form of energy that helps us to see things around us. The sun, stars, and lightning are natural sources of light. Candle, oil lamp, torch and electric bulb etc. are artificial sources of light. Electrical energy can be transformed into light energy.

Activity 2:

- Ask the students to follow the instructions.
- Fix a torch bulb in a holder.
- Use metal wires to join the bulb with a cell and the switch as shown in the diagram.
- Turn the switch “ON”.
- The bulb lights up!
- It means electrical energy can be transformed into light energy.



Sound Energy

- Share this information to the students.

Sound is the form of energy that is produced by vibrations in an object. These vibrations reach our ears through the particles of the air. In this way, we hear sound.

Electrical energy can be transformed into sound energy.

Activity 3:

- Ask the students to follow the instructions.
- Shake the school bell vigorously.
- Do you hear any sound?
- Touch the bell with your finger.
- Do you feel vibrations?
- What is produced from the vibrations of the object (bell)?



The vibrating object produces sound. Sound needs some medium to travel. Most of the sounds reach us by traveling through air.

- Share this interesting information to the students.

Do you know?

When we speak, the vocal cords present in our throat vibrate and produce sound.

Interesting information



Sound cannot travel in space. This is the reason we cannot hear the sound of explosions in the Sun.

Like light, sound also reflects. When sound bounces back from an object at a certain distance and we hear it again, it is called echo.

Interesting information

Bats use echo to catch their prey in the dark. It emits sound from its mouth. By using echo of its sound, it finds the way in the dark to reach the prey.

Do you know?

A hard and smooth object reflects sound better

Do you know?

To hear a clear echo, the reflecting surface should be at least 17 meters away from the surface of the sound.

Conclusion:

Electrical energy can be transformed into other forms of energy like heat, light and sound.

Assessment:

- Ask the students to do this question.

Into which forms of energy is the electrical energy transformed in a television? In a television, the electrical energy is transformed into sound and light.

Follow Up:

Project

Use concept of energy transformation to make an electric bell.

FORMS OF ENERGY AND ENERGY TRANSFER

Simple Electric Circuit

**Duration:** 40 Minutes**Students Learning Outcome:**

- Explain and provide reasoning that a simple electric circuit requires a complete electrical pathway.

**Materials:**

- Bulb, switch, key, electric wires, cell, holder

Information for Teachers:

- The path of a current is called an electric circuit.

Introduction:

- Ask following questions to the students.
- Write the names of three main sources of electrical energy?
- What are the basic components of an electric circuit?

Development:

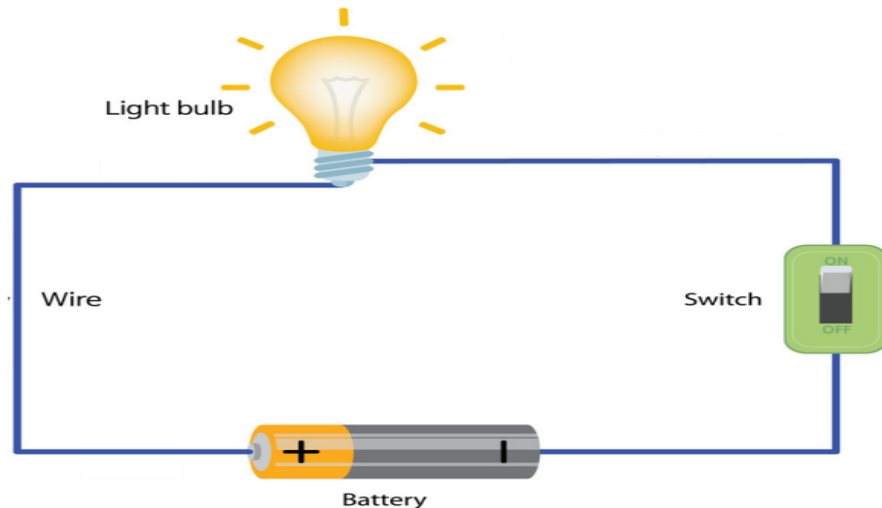
- Share this information to the students.

The flow of electricity from one place to another is called electric current. A path is needed to flow an electric current.

This pathway of the current is called an electric circuit. The basic components of an electric circuit are wires, a power source and an electrical appliance.

Activity 1:

- Ask the students to follow the instructions.
- Fix a torch bulb in a holder.
- Use metal wires to join the bulb with a cell or battery and the switch as shown in the diagram.
- Turn the switch “ON”.
- Does the bulb light up?
- Now, turn the switch “OFF”. Why does the bulb not remain lit?
- When the switch is turned “ON” the path of the electrical circuit is completed and the bulb is lit.

**Conclusion:**

Electric circuit requires an electrical pathway for current to flow. The path of current is called an electric circuit.

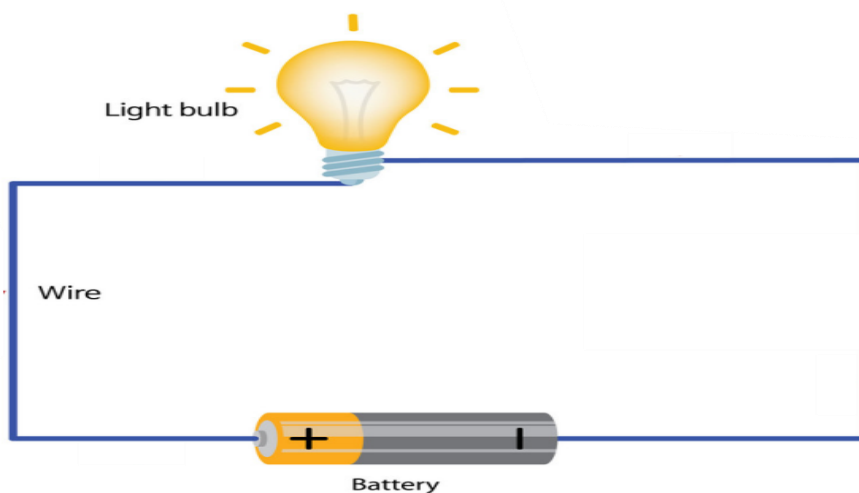
Assessment:

- Ask the students to make an electric circuit using cell, bulb, electric wires and key or switch as an assessment.

Follow Up:

- Write and draw this on board as a homework.

A simple electric circuit consists of a battery or cell, bulb and electric wires. Its electric path has broken and the bulb is not glowing. We want to complete the electric path so that the bulb can light up by using the electrical energy of the battery. We have cotton bud, a plastic ball pen, an ice-cream stick, a key, and pencil. Which object should we join with the ends of the wire, so that the electric circuit is completed and the bulb lights up?





We can use a nail or key to join with the ends of the wire to complete the electric circuit.
Once the electric circuit completes the bulb lights up.
Draw a simple electric circuit in your notebook.

FORCE AND MOTION

Force and Motion in Daily Life

**Duration:** 40 Minutes**Students Learning Outcome:**

- Describe force and motion with examples from daily life.

**Materials:**

- Plastic bottle, paper clips, paper, toothpaste, rubber bands, kneaded clay

Information for Teachers:

- The act of pushing or pulling a body is called force.
- The process in which a body changes its position is called motion.

Introduction:

- Ask these questions to the students.
- Why different bodies are sometimes found in a state of rest or motion?
- Have a look at your surrounding? You will notice some objects are stationary and some are moving.
- Can you tell how to produce motion in the bodies at rest?
- For example how can a toy car be moved?
- When you push or pull the toy car with your hand, it causes the toy car to move.

Development:

- Share this information to the students for their better understanding.

Force

Force is used to move or stop the body. For example, to open a door, we either pull it towards us or push it away.

In fact, push or pull are forces. Forces increase or decrease the speed of a body. Force can also change the direction of motion. For example, applying forces to a bat changes its direction of motion.

A force acting on a body can change its shape. For example, if we pressed an empty can, it will be compressed

Do you know?

When you pick up an object, you are pulling it.

When you throw an object, you are pushing it.

Interesting information

A force changes the shapes of the bodies.

Point to ponder

Can you tell how force is used in everyday life? When we push or pull a door and when we kick a football.

Activity 1:

- Ask the students that which force (push or pull) will be applied to change the shape of the following objects?



- Share this information to the students.

Motion

You may have seen different types of swings in a park or playground. How do they move? The see-saw moves up and down. The merry-go-round moves in a circle while the swing moves back and forth. What do you observe from these?

The body changes its position during movement. For example, a see-saw is in a state of rest in the park. Children sitting on a see-saw apply force on it and the see-saw starts moving up and down. The process in which a body changes its position is called motion.

Activity 2:

- Ask students to observe the objects around you and tell:





- Which object moves up and down? See-saw
- Which object moves back and forth? Swing
- Which object moves in a circle? merry-go-round

Conclusion:

Force is a push or pull which acts on an object. The process in which a body changes its position is called motion.

Assessment:

- Ask following question to the students.
- Enlist two uses of force.
- Describe up and down motion, back and forth motion and motion in a circle from daily life examples.

Follow Up:

Give them a question to do as a homework in their notebooks.

- How are force and motion related? Explain.

FORCE AND MOTION

Friction

**Duration:** 40 Minutes**Students Learning Outcome:**

- Provide reasoning with evidence that friction can be either detrimental or useful under different circumstances.

**Materials:**

- Paper sheet, plastic sheet, hardboard, pen, piece of wood, nail etc.

Information for Teachers:

- The force that stops or tends to stop moving objects is called friction.
- It is caused by roughness of two surfaces.
- Friction can be helpful or a hindrance for motion. It prevents objects from starting to move.

Introduction:

- Ask a student to push a book lying on the table.
- Then ask the students what happened to the book (student's response: the book moved on the table. Eventually, it slowed down and stopped.)
- Ask following questions to the students.
- Why do bodies stop moving? (Student's response: there must be a force acting opposite to the motion of the object.)
- What is the force which stops the movement of the objects? (Student's response: when an object moves, it rubs against the surface on which it moves. Rubbing provides an opposite force. This force is called friction.)

Development:

- Share this information to the students.

You have observed that when you kick a football, it stops after covering a certain distance. Why does it stop? Certainly, there is a force acting on the football that stops it. What force is this?

Friction occurs when a body moves in contact with another body. Friction always acts against the direction of the movement.

Advantages of Friction

Friction plays a very important role in our daily life. Igniting of the match stick, penetration/fixing of the nail into the wood or wall, slowing down of the vehicles and eventually stopping are all possible due to friction.

Do you know?

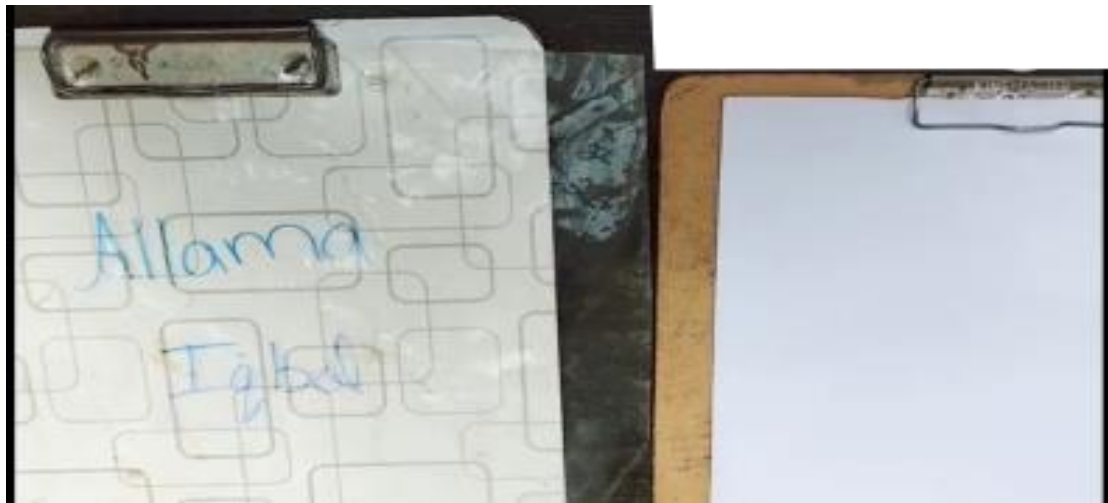
We cannot walk on Earth without friction. If there is less friction, it becomes difficult to walk.

Point to ponder

What would happen if there was no friction? (Friction is the force that stops the moving objects. If there was no friction, then most of the tasks such as walking on the ground, writing on a paper or board would become difficult.)

Activity 1:

- Ask the students to:
- Stretch a paper sheet on a hardboard.
- Place a plastic sheet on another hardboard.
- By using a pen write their name on both of them, turn by turn.
- Ask them what do they observe?



(It is easy to write on paper while it is difficult to write on a plastic sheet.)

Disadvantages of Friction

- Share this information to the students:

Friction is very useful in our daily life but sometimes it can be harmful.

For example, friction causes our shoes to wear out. Due to friction, the tyre of the car not only gets worn out over time but sometimes they can even burst.

Similarly, friction causes wear and tear of moving parts of machines over time and the machines become unusable.

Point to ponder

How can we reduce friction? (Friction can be reduced by making the sliding surface smooth, or using ball bearings or polishing of surfaces or streamlining the bodies.)

Do you know?

The worn tyre of a vehicle must be replaced otherwise the risk of accidents increases.

Conclusion:

The force which opposes the motion of one object over another is called friction. Friction can be either detrimental or useful under different circumstances.

Assessment:

- Ask the students to:
define friction. In which direction does it act?

Follow Up:

- Ask students to:
- Look carefully at the pictures given below. Which one of these shoes is suitable for rocky soil, which one for playground and which one for icy surface? Explain the reason in your answer.



- Ask them to do this investigation.

Investigate

Suppose you are writing on a notebook with a pencil. Answer the following questions based on observation:

- What force do you use (push or pull) while writing?
- What is the role of friction in writing on paper with a pencil?
- After using the pencil, why do we need to sharpen it?

Answers

- We use the force of push while writing.
- Writing on a paper requires friction. First, friction helps to hold a pencil in our hand. Second, due to friction, the lead of the pencil sticks to the paper which makes our writing visible.

When we use pencil, the tip of the pencil and paper rub together. In doing so the tip becomes rough and friction increases. In order to decrease the friction we need to sharpen the pencil.

FORCE AND MOTION

Simple Machines

**Duration:** 40 Minutes**Students Learning Outcome:**

- Recognize that simple machines (e.g. gears, ramps, levers, pulleys) help make motion easier (e.g. make lifting things easier, amount of force required).

**Materials:**

- Meter rod, a pencil, a book, an iron hanger, a small wooden reel, rope, flag, plumb line, bricks, books, wooden plane, spring balance, thread and wedge.

Information for Teachers:

- Everything that makes our work easier is called a machine.
- Lever is used to lift heavy objects with less effort around the fulcrum.
- Pulley is used to change the direction of force.
- A wheel with teeth is called gear. It is used to change direction of speed.
- Ramp (inclined plane) is a slope used to move objects from bottom to top easily.

Introduction:

- Ask the students, what is a simple machine? (a device which makes work easier to do.)
- Ask the students, to name some simple machines you often use in daily life. (wheel, scissors, ladder etc.)

Development:

- Share this information to the students.

The use of machines in our lives is increasing day by day. What is the reason for this? Machines make our work easier by changing the amount and direction of force. Lever, pulley, gear and ramp (inclined plane) are simple machines.

Do you know?

Modern machines, such as cars or bicycles are made of simple machines. Each machine has to be provided energy constantly to keep it working.

Lever

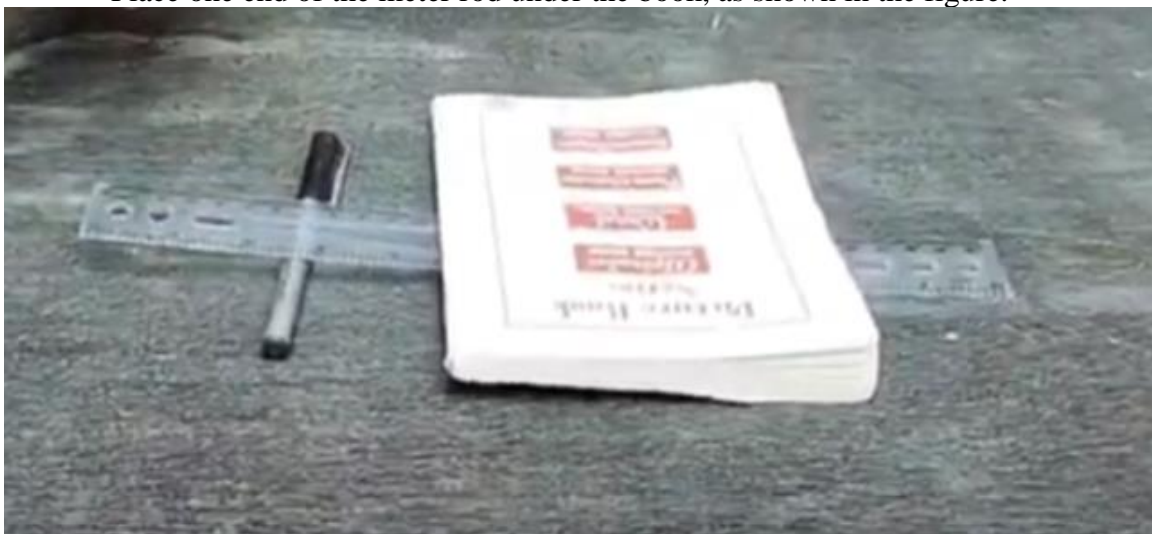
A lever is a simple machine that can be used to push or lift heavy objects. The lever is like a simple rod that turns around a certain point called fulcrum. To one end of the lever, by applying force (effort), the weight (load) at the other is lifted.



For example, scissors, sea-saw, bottle opener, human arm etc.

Activity 1:

- Take a meter rod, a pencil, and a book.
- Place one end of the meter rod under the book, as shown in the figure.



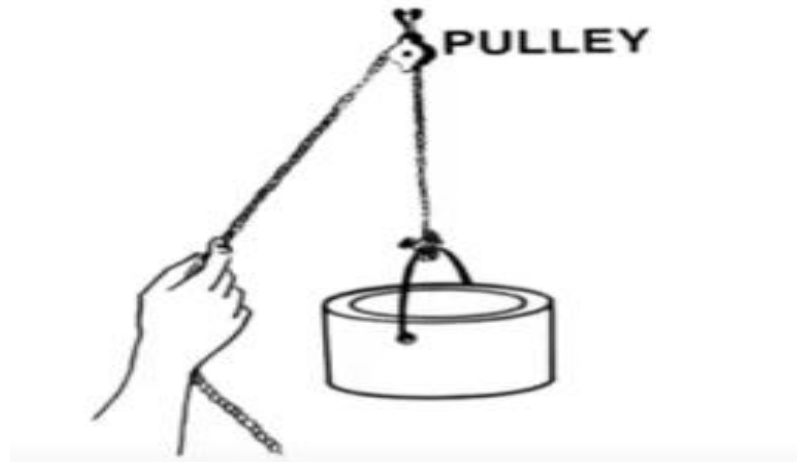
- Place the pencil, under the meter rod near the book, apply force on the other end of the meter rod to lift the book.
- Ask the students that what do they observe?

(In this activity, pencil will act as fulcrum, while the book will be a weight load which can be easily lifted with the help of force (effort).)

- Ask them if we change the position of pencil (fulcrum) what will be the effect on force (effort) and weight (load) (Less force will be required when pencil is nearer to the fulcrum.)
- Share the following information to the students.

Pulley

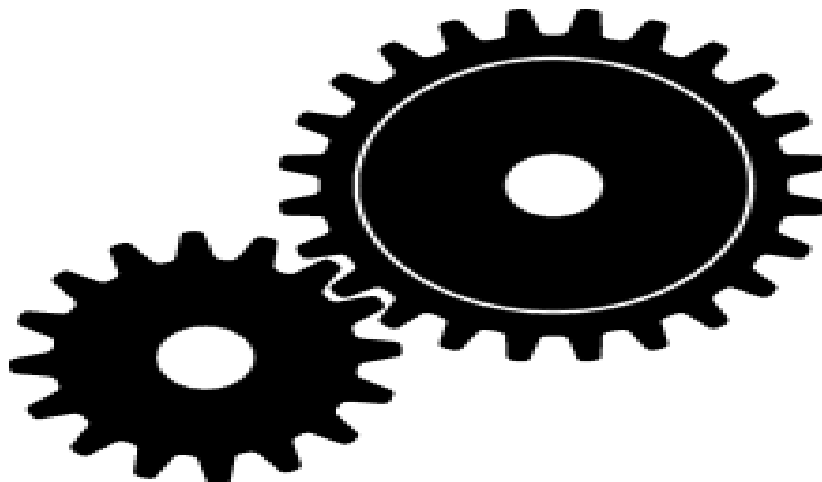
Pulley is a simple machine, consists of a grooved wheel and a rope. The load is lifted up by applying force (effort) on one end of the rope passing over the pulley. As pulling a weight is easier than lifting it so the machine can easily lift heavy objects. For example, water can be easily drawn from a well by using a pulley. The flag is raised up with the help of a pulley. For this, when you pull the rope down, it lifts the flag upwards. Changing the direction of the force makes it easier to work with the pulley. For example, if we want to lift heavy objects with the help of a pulley, we have to put the effort downwards. For example, fetching water from the well.



Gear

Gear is a simple machine which consists of toothed wheels of different sizes. The teeth of these wheels fit in with each other and move together. With the help of gears, we can increase or decrease the speed.

In everyday life, gears of various sizes are used in bicycles, grinders and sugarcane juice machines.



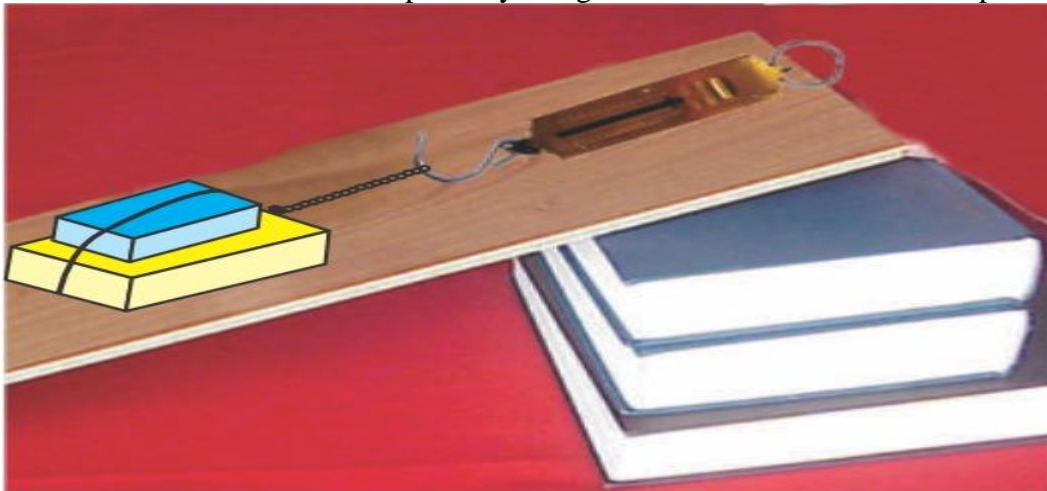
- Ask them which simple machines are used in a bicycle? (Gear and wheel)
- Share this information to the students.

Ramp (inclined plane)

Inclined plane is a simple machine with one end relatively higher than the other. It requires less force and energy to move objects from one place to another. It allows us to move objects easily from bottom to top. The picture shows different types of inclined planes. For example, car ramps, ladder and parking ramp etc.

**Activity 2:**

- Ask a student to lift a bundle of books tied with the spring balance vertically upward.
- Ask him/her to measure the weight of bundle by noting the reading on the spring balance.
- Then ask him to make inclined plane by using a stack of books and wooden plane.



- Tie a bundle of books with one end of the thread.
- Attach the other end of the thread with a spring balance and pull the bundle along the inclined plane
- Ask the student to note the reading on the spring balance.
- Ask, which reading is smaller.
- Students' response: the reading when books tied with the spring balance are pulled along the inclined plane.
- Why the reading is less in the second case? (students' response: less force is required to pull same load along an inclined plane.

- Ask which will be easier; moving the books using inclined plane or moving them by lifting straight up and why?
- Students' response: moving the books along inclined plane is easier.

Conclusion:

Simple machines help to lift things, to change the direction of the force and to move objects easily, for example, levers, pulleys, gears and ramps.

Assessment:

- Ask them:
- What is a machine and how does it work for us?

Follow Up:

- Ask the students to follow these activities.

Make a mast (pole) in the school ground with the help of a bamboo (cane). Hoist the national flag of Pakistan with this pulley.

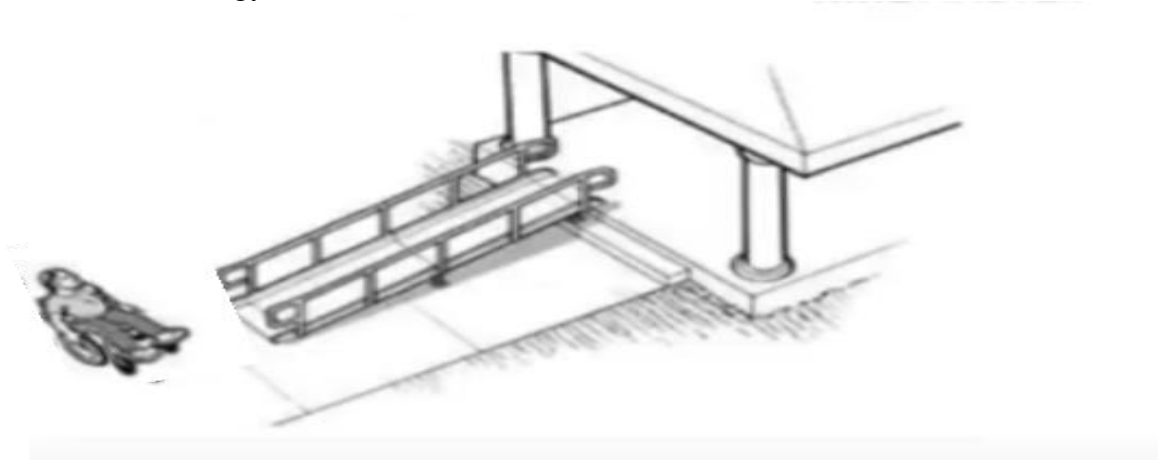


- The patient is sitting in a wheelchair. Which machine will be helpful to take him to the required floor?



(Ramp (inclined plane)

Ramp is used to take a patient sitting in a wheelchair to the required floor level. It is because ramp is a simple machine used to move objects from bottom to top and top to bottom with less force and energy.)



EARTH AND ITS RESOURCES

Natural Resources

**Duration:** 40 Minutes**Students Learning Outcome:**

- Identify some of Earth's natural resources (e.g., water, wind, soil, forests, oil, natural gas, minerals) that are used in everyday life.

**Materials:**

- Chart, Markers, board

Information for Teacher:

- The Earth has many resources like water, air, soil, forests, coal, oil, natural gas etc.
- We use natural resources in our daily life. For example, clay is used to make bricks and pottery, sand is used to make buildings etc.
- **Water:** It is used for drinking, cooking and washing clothes. Water is also used for plants growth. Running water is used to generate electricity
- **Air:** It is very important for life on Earth. It is present all around the Earth's surface. It is also present in soil and water due to which living things can breathe in soil and water. Air is also used to generate electricity.
- **Soil:** It provides essential nutrients to plants for growth. It provides shelter to many organisms. It is also used to make bricks, glass and utensils.
- **Forests:** The part of the Earth which is completely covered with trees is called forest. It provides us timber. It is also natural habitat for some animals. The forests provide us fresh air.
- Natural Oil is found underground. It is used in vehicles. Electricity is also produced from it.
- **Natural Gas:** It is used as a fuel for cooking in homes. It is also used to make fertilizers.
- **Minerals:** These are non-living chemicals present in the Earth. The examples of minerals are gold, silver, copper, iron, cobalt etc. Mineral coal is used as a fuel.

Introduction:

- Ask the students following questions.
 1. From which material your pencil is made? (It is made from wood of a tree).
 2. You need a rubber to rub the words. From where the rubber is obtained? (It is obtained from the secretions of a specific tree).
 3. Do you need to drink water every day? (Yes).
 4. If we do not get water for a long time, what will happen? (We cannot live).
 5. From where water is obtained? (From soil).



6. Do you need air to breathe? (Yes, we need).
7. Do you celebrate World Soil Day? (Yes/ No)
8. The soil provides us so many things. Do you think we should celebrate this day. (Yes).
9. On which date is the World Soil Day celebrated? (5th December every year).

Teacher will tell the students that Earth provides us many resources. These are very important for the existence of our life. Some examples of Earth's resources are water, air, soil, forests, coal, oil, natural gas etc.

Development:

Activity1: Identification of Earth's Resources (10 min)

- Separate the students into groups.
- Ask each group to write the maximum number of resources with brief description.
- Ask students that group can present their findings to the class.
- Inform the students that:
 - The Earth has many resources like water, air, soil, forests, coal, oil, natural gas etc.
 - We use natural resources in our daily life. For example, clay is used to make bricks and pottery, sand is used to make buildings etc.

Activity 2: Discussion and Presentation on Earth's Resources (10 min)

Ask the students to make 7 groups.

- Award one resource to each group.
- Ask each group to discuss about the resource and write their points on the chart paper as follows:
 1. Name of the resource.
 2. Introduction of resource
 3. Importance of resource written in the text.
 4. Importance of resource according to their own experiences.
 5. Draw some pictures from the textbook as well as your daily life experiences.
- Ask each group to share the resource with the whole class. Then ask them to place these charts on the wall and ask the students to visit and note important points.

Conclusion:

- The Earth has many resources like water, air, soil, forests, coal, oil, natural gas etc. The natural resources are very useful in our daily life.
- **Water** is used for drinking, cooking and washing clothes. It is also used for plant growth and to generate electricity
- **Air** is present all around the Earth's surface. It is also present in soil and water. It is very important for the existence of living things on Earth. It is also used to generate electricity.
- **Soil** provides essential nutrients to plants for their growth. It provides shelter to many organisms. It is also used to make bricks, glass and utensils.
- **Forest** is the part of the Earth which is completely covered with trees. It provides us timber and fresh air. It is also natural habitat for some animals.
- **Natural Oil** is found underground. It is used in vehicles. Electricity is also produced from it.
- **Natural Gas** is used as a fuel for cooking in homes. It is also used to make fertilizers.
- **Minerals:** These are non-living chemicals. The examples of minerals are gold, silver, copper, iron, cobalt etc. Mineral coal is used as a fuel.

Assessment:

- Ask these following questions to the students.
 1. Name some Earth's resources.
 2. Tell the importance of water, air and soil.
 3. What is the importance of Natural Oil and Natural Gas?
 4. Why forests are important for us?
 5. How minerals are obtained and what are their benefits?
 6. Provide them following worksheet to assess worksheet from next page.

Worksheet: Earth's Resources

Q1. Match each item to the natural resource

sand sweater

cow baseball bat

tree gasoline

metal ore glass

oil milk

cotton soda can

Q2. Write the natural resource that each item comes from.

writing paper _____

eggs _____

glass bottle _____

plastic toy _____



Q3. Write the uses of the following:

1. Forest-----

2. Natural Oil-----

3. Natural Gas -----

Follow Up:

- Assign the students to:
- Draw or collect the pictures of natural resources of the Earth indicating their uses.

EARTH AND ITS RESOURCES

Fossils

**Duration:** 40 Minutes**Students Learning Outcome:**

- Recognize that some remains (fossils) of animals and plants that lived on the Earth a long time ago are found in rocks, soil and under the sea.

**Materials:**

- Markers, plastic glasses, plaster of Paris, cardboard box/ disposable glass.

Information for Teacher:

- Thousands of years ago, there were many organisms that do not exist in this world today but their imprints or remains are found under rocks, soil and sea. These imprints or remains are called fossils.
- The skeletons of many ancient animals are still preserved in soil and rocks.
- One example of fossil is **Dinosaurs** which were lizard-like giant animals.
- These animals were present on Earth millions of years ago but now they are extinct.

Introduction:

- Ask the following questions from the students:
 1. Have you ever noticed during walking on soil, your footprints are imprinted on it? (Yes).
 2. Can you preserve these marks? (Cannot be preserved forever).

Development:**Activity 1: Reading and Discussion on text and pictures**

- Divide the students into groups and ask them to read the paragraph.
- Ask them to observe the pictures of fossils and write the answers of the following questions:
 1. How old are fossils?
 2. Differentiate between imprint and remains?
 3. Where are the fossils found?
 4. What was the shape of Dinosaurs?
 5. When Dinosaurs were present on the face of Earth?
 6. What is meant by extinct?
 7. How fossils are found?

Tell them the correct answers and ask them to check their answers in their notebooks and make corrections if necessary. The answers are as follows:

Answers

1. Fossils are thousands of years old.
2. Imprint is mark of an organism on a rock while remains are preserved parts of animals or plants in the rocks.
3. They are found under rock, soil and sea.
4. The Dinosaurs were lizard-like, giant animals.
5. They were present on Earth millions of years ago.
6. The animals and plants which have vanished from the face of Earth. They are not present now.
7. They are found by digging out from soil and rocks.

Activity 2: Preservation of Footprints

1. Make a mixture in a pot by adding water into one part cement and two parts sand.
2. Now level the surface of this mixture.
3. Ask one student to make his footprint on it
4. Place the pot in one corner of the room and leave it for one week.
5. After one week it will be observed that the mixture in the pot has become solid and turned into stone.
6. Along with the liquid, the footprint has also been preserved on it.
 - Explain to them as these footprints are preserved, in the same way millions of years ago the marks left of plants and feet of animals were preserved.

Activity 3: Making an Imprint

Arrange the students in groups and ask them to perform the following activity.

1. Take a cardboard box / disposable glass and fill it half with wet soil.
2. Press a small plastic toy/ coin/ oyster shell into this soil.
3. Put a quarter of plaster of Paris in another glass and mix it with water to make a thin mixture.
4. Pour this mixture over the mark in the first glass.
5. Leave this glass for two/ three days to dry.
6. Cut the glass and get the fossil present inside. Clean the fossil with brush.
7. Compare your toy etc. with the imprint.
 - Explain to them as these hard structures are preserved, in the same way millions years ago the stems of plants and skeletons of animals were preserved.

Conclusion/ Sum up:

- Millions of years ago, many organisms died and their imprints or remains are found under rock, soil or sea. These imprints or remains are called fossils.
- Dinosaurs are the examples of fossils. They were present on Earth millions of years ago but now they are extinct.
- The shape of the Dinosaurs was lizard-like.
- The fossils are got by digging out from soil and rocks.

Assessment:

- Ask following questions to the student.
1. How old are fossils?
 2. What do you think about imprints and remains of organisms?
 3. What are Dinosaurs?
 4. Provide them following worksheet to solve as assessment.



Worksheet: Fossils

Q1. Fill in the blanks with correct words. Use words from word bank.

years	plants	soil	formed	extinct
-------	--------	------	--------	---------

- i. Fossils are rock prints of animals or -----.
- ii. The rock prints were made millions of ----- ago.
- iii. Plants and animals get buried under layers of rock and -----.
- iv. Dinosaurs are now -----.

Q2. Answer the following questions:

- i. What are fossils? -----

- ii. What do you know about Dinosaurs? -----

Q2. Draw pictures of two fossils.

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Follow Up:

Draw the pictures of fossils given in Textbook page 89 on a chart.

EARTH AND ITS RESOURCES

Effect of Human Activities on Natural Resources

**Duration:** 40 Minutes**Students Learning Outcome:**

- Investigate the impact of human activities on the Earth's natural resources.

**Materials:**

- Colored markers, charts

Information for Teacher:

- The lavish (more than required) use of natural resources is causing irreparable damage to our environment.
- Growing population, excessive use of fossil fuels and deforestation etc. are rapidly reducing land resources.
- Humans are facing problems such as climatic change, pollution and lack of clean drinking water.
- If we will not use natural resources carefully then a time will come when renewable resources like trees, animals, soil, water and air will soon run out or become unusable.
- Therefore, the careful use of natural resources and their preservation is very essential.

Introduction:

Ask the following questions from the students:

1. Can you tell the names of some natural resources? (forests, natural gas, natural oil, minerals etc.).
2. What do you think will happen to animals if the forests are cut? (The animals will find no place to live and they will die).
3. If we overuse electricity, what will happen? (Load shedding)
4. If we overuse natural gas at our homes, what will happen? (It will be reduced and it will not be possible for us to cook food etc.).
5. Can you differentiate between renewable and non-renewable resources? (Non-renewable sources can be used once and they are difficult to be replaced e.g. petrol, diesel, natural gas etc. Renewable resources can be replaced e.g. air, water, soil etc.).

Development:**Activity 1:**

Divide the students into groups and ask them to:

- i. Identify at least 3 impacts of human activities on natural resources (Burning natural gas, over-population, deforestation)
- ii. Make charts showing over-population, burning of natural gas, deforestation etc.)

Activity 2: Reading and Discussion on text and pictures

The teacher will divide the class into groups and ask them to read the paragraph and also observe the pictures of tree cutting, burning natural fuel, dying fish and write the answers of the following questions:

1. What do you know about lavish use of natural resources? (Overuse/ excessive use).
 2. Which of the things are rapidly reducing land resources? (Over population, excessive use of fossil fuels, deforestation etc.).
 3. What are the effects on human beings due to reduction in resources? (Climate changes, lack of clean drinking water).
 4. What will happen if we will not use the resources carefully? (A time will come when the renewable resources like trees, animals, soil, water and air will run out).
 5. Differentiate between renewable and non-renewable resources)
- Tell them the correct answers and ask them to check their answers in their notebooks and make corrections if necessary.

Activity 3: Analysis of Reduction of Resources

Divide the class into three groups and give them topics of discussion as follows:

Group 1: Growing Population

Group 2: Excessive use of Fuels

Group 3: Deforestation

- Ask each group to give a detailed viewpoint about their topics on charts as follows:

Growing Population	Excessive use of Fuels	Deforestation
<ol style="list-style-type: none">1. Cities are expanding2. Less place available for growing crops3. Lack of drinking water4. Food shortage5. Health issues6. Poverty7. Reduces quantity and quality of natural resources	<ol style="list-style-type: none">1. Causes pollution2. Climate changes3. Less space available for breathing4. Breathing problems	<ol style="list-style-type: none">1. Less availability of fresh air2. Breathing problems3. Less space for living of animals4. Damage to ecosystem5. Many wild animals have been extinct.

Conclusion/ Sum up:

- The excessive use of natural resources causes damage to environment.
- Growing population causes food shortage, poverty, health problems etc.
- Excessive use of fuels is the cause of pollution, breathing problems.
- Deforestation causes the extinction of animals because the food sources and shelters of the animals have been destroyed.
- Therefore, a great need of careful use of natural resources.



Assessment:

- Ask following questions to the students.
 1. What problems human beings will face due to growing population?
 2. What problems human beings are facing due to excessive use of fossil fuels?
 3. What problems to human beings and animals are due to deforestation?
 4. What will happen if we will not use natural resources carefully?
 5. Assign worksheet to each student to assess their understanding.



Worksheet: Effect of Human Activities on Natural Resources

- Answer the following questions:

1. What is a renewable resource? Give some examples of renewable sources.

2. What is a non-renewable resource? Give some examples of non-renewable sources.

3. Why conservation of resources is necessary?

4. Name a way you conserve natural resources each day in school.



Follow Up:

- Ask the students to:
- Write short notes on the following topics, in their notebook.
 1. Growing population is the cause of poverty.
 2. Excessive use of fuels causes pollution
 3. Deforestation cause extinction of animals

EARTH AND ITS RESOURCES

Conservation of Natural Resources

**Duration:** 40 Minutes**Students Learning Outcome:**

- Suggest the ways to conserve the natural resources.

**Materials:**

- Board, marker, small plants from nursery, shovel, bucket of water, measuring tape, waste papers, bowl, screen, and blender.

Information for Teacher:

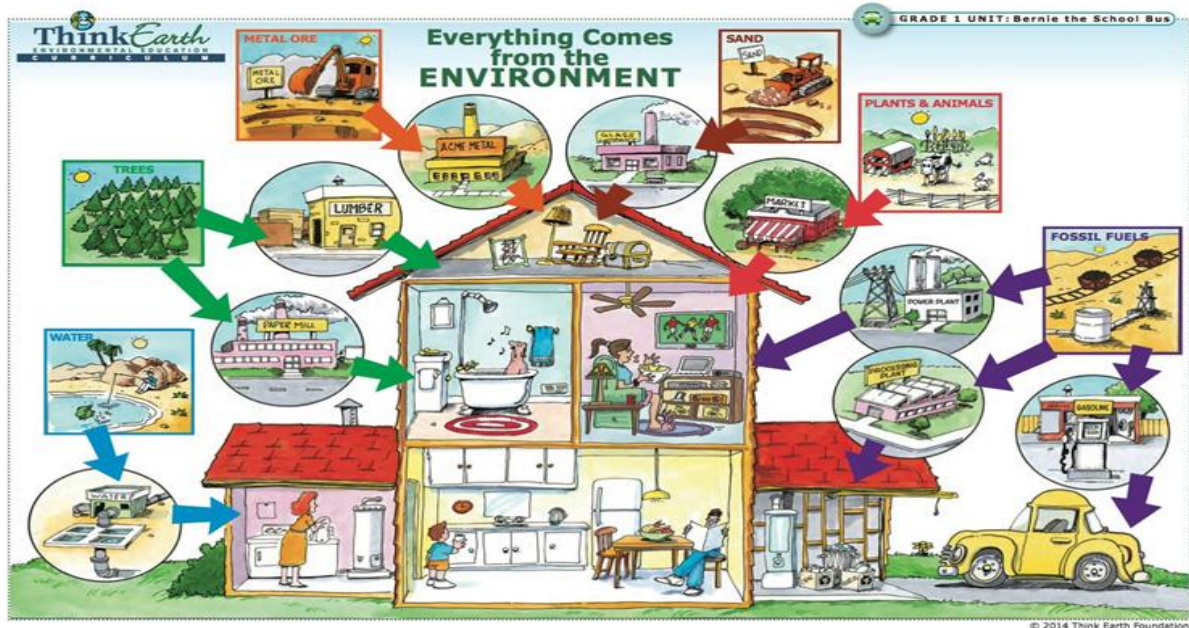
- All organisms need natural resources for their survival.
- Every person needs air to breathe, clean water to drink and food to eat.
- As every person needs natural resources, therefore, every person should contribute to the conservation of natural resources.
- How we can conserve them? In the following ways we can conserve the natural resources:
 1. **Tree Plantation:** Trees provide us oxygen. They are also the natural habitat of many animals.
 2. **Recycling:** Recycle paper, plastic, glass and other materials instead of throwing them away.
 3. **Use of Renewable Resources:** Make use of more and more renewable resources such as wind, water and solar energy to generate electricity.
 4. **Protection:** Protect air, water and land from pollution.
 5. **Careful use:** Use water and electricity carefully.

Direction: Start from the statement that everything in our home comes from the environment. When students understand that everything comes from the environment, they are more likely to engage in behaviours that conserve resources, reduce waste, and minimize pollution.

Introduction:

Activity 1: Colour Poster

Show a colour poster to the students and ask them:



- View in the poster that everything comes to your home from the environment.
- Identify an item in your home and ask students to name the resource it comes from. For example, your cotton shirt is made from cotton which we get from the cotton plant.
- Then ask following questions from the students:
 1. Our wooden table is made from wood. Where this wood comes from (From trees).
 2. What other things are made from wood? (Chair, cupboard).
 3. What other things we get from the environment? (Water, natural gas, electricity etc.).
 4. What do you think, we should save the environment or not? (We should save the environment).
 5. If we do not save the environment, what will happen?

Development:

Activity: Tree Planting Activity

- Divide the students into groups and ask them to:
- Pick out a plant.
- Select a suitable spot with sufficient amount of sunlight.
- Dig a hole and set aside the soil.
- Put the plant in the hole and fill 2/3 of it with the soil. Fill the rest of the hole with water.
- Water the plant every day.
- At the beginning of each week, take a look at your plant.
- Ask them to record in your notebook the following observations:
 1. Measure the height.
 2. How many branches does it have?
 3. Does it have leaves? If so, how many leaves and what is their color?
 4. Does it have buds?
 5. Does it have fruit or seeds?

**Activity 2: Recycling of waste paper**

- Talk to the students about recycling process and discuss why recycling is important.
- Arrange the students into groups and direct them as follows:

Part 1: Soaking Paper

1. Rip the paper into small pieces.
2. Place the paper into a bowl.
3. Add hot water to the bowl.
4. Blend the paper to give the pulp a softer consistency. If blender is not available, then let the paper soak overnight.

Part 2: Making Pulp

1. Place your hands or whisk into the bowl and mix the pieces until they break down into a pulp.
2. Blend the paper pulp for a smooth consistency.
3. Thick, dry pulp will not create smooth paper. If the pulp seems dry after blending, add a few tablespoons of water. Pour the water in small amounts and blend it for 10 seconds before adding more.
4. Mixing of 1-2 teaspoons of starch (optional), can help the pulp hold together better as it dries into paper later on.

Part 3: Drying paper pulp

1. Spread the pulp as thinly and evenly across the flat pan as possible to make uniform pieces of paper. Use your hands or a large spoon to flatten the pulp. If you cannot easily spread the paper pulp around, it may be too thick. Then add more water to thin out its consistency.
2. Place a non-rusting screen into the bottom of the pan. Use a screen that is approximately the same size as your pan. Move the screen around until it is evenly covered in the pulp.
3. Lift the screen out of the pan.
4. Lay the screen on an absorbent surface. Place the screen face down on a towel or absorbent cloth that can soak the water as the paper pulp dries.
5. Let the paper pulp dry for about 24 hours.
 - Then ask the following questions:
 - What happened to the pieces of paper when you added hot water and blended? (pulpy)
 - What are benefits of recycling paper? (No pollution by throwing of waste papers here and there; not much expenditures; no use of plants. Therefore, it is the best method to save the plants).

Activity 3: Reading and Discussion on text and pictures (Textbook p.91)

- Divide the class into groups and ask them to read the paragraph and also observe the pictures of tree plantation, saving water, and recycling of waste empty wooden boxes; and answer the following questions (written on the board):
1. How can we get fresh air? (By planting more and more trees).
 2. How should we deal with waste materials instead of throwing them here and there? (Recycling).
 3. What are renewable resources? (These resources like trees, animals, soil, water and air will run out).
 4. Why we should have to use more and more renewable resources? (Because these can be used again and again).

Conclusion/ Sum up:

- As every person needs natural resources, therefore, every person should contribute to the conservation of natural resources.



- Tree Plantation should be encouraged because they provide us oxygen. They are also the habitat of many animals.
- Recycle paper, plastic, glass and other materials instead of throwing them away.
- Make use of more and more renewable resources such as wind, water and solar energy to generate electricity.
- Protect air, water and land from pollution.
- Use water and electricity carefully.

Assessment :

- Ask following questions to the students.
 1. What is the importance of trees for us and for animals?
 2. What is a recycling process?
 3. Give some examples of renewable resources?
 4. Give some examples of non-renewable resources?
 5. What are the meanings of the terms, reuse, reduce, and recycle?
 6. Ask them to solve the worksheet as an assessment.



Worksheet: Conservation of Natural Resources

Q1. Fill in the blanks with terms next to the correct definitions. Use words from word bank.

conservation	natural resources	recycle	reuse	reduce
--------------	-------------------	---------	-------	--------

- i. To make new products from old products -----
- ii. Things found in nature used by living things -----
- iii. To use less of something -----
- iv. The wise and careful use of natural resources -----
- v. To use something again instead of throwing it away -----

Q2. Indicate true or false in the following statements:

S. No.	Statement	T	F
1	Stand in the refrigerator while drinking water.		
2	Turn off lights when not in use.		
3	Take bath tubs instead of showers.		
4	Leave the water running while brushing your teeth.		
5	Leave the light on until you return to your room.		
6	Use a dryer instead of towel.		

Follow Up:

- Ask the students to explain different ways of Conservation of Natural Resources on their notebooks.

EARTH'S WEATHER AND CLIMATE

Relationship between Geographical Location and Climate

**Duration:** 40 Minutes**Students Learning Outcome:**

- Relate the global changes in weather patterns to the geological locations.

**Materials:**

- Board, Marker, Chart

Information for Teacher:

- The climate or weather changes of any region depend upon falling of Sun's rays either vertically or slanting.
- On the basis of climate, the Earth is divided into three zones: Tropical, Temperate and Polar.
- **Tropical Zone:** The regions located around the equator. In this zone Sun's rays fall vertically. Therefore, the climate of this zone is **hot**.
- **Temperate Zone:** This zone is in between Tropical and Polar Zones. In this zone Sun's rays fall diagonally/ slanting. Therefore, the climate of this zone is **mild**.
- **Polar Zone:** The regions located around the north and south poles of the Earth. In this zone, the Sun's rays are more slanted. Therefore, the climate of this zone is **very cold**.

Introduction:

- Ask the following questions:
 1. What is the weather like today? (Hot, cold, rainy etc.).
 2. How many seasons are there in Pakistan? Name them. (4 seasons. summer, winter, spring, Autumn).
 3. Which season is going on right now? (Summer/ winter/ spring/ Autumn).
 4. Is there difference in season and weather? (Season cannot change every day and weather can change every day).

Development:

Activity 1: Concept of Weather, Season and Climate

The teacher will give the concept with the help of the following Chart:

Weather	Weather Pattern (Season)	Climate
Daily changes in: <ul style="list-style-type: none"> • Temperature • Humidity • Precipitation • Rainfall • Wind • Sunshine 	<ul style="list-style-type: none"> • When the weather stays the same for days or weeks at a time. • The patterns of weather are tied to the four seasons: Summer, winter, spring, and fall. 	<ul style="list-style-type: none"> • Long-term pattern of weather in a particular area. • Average of that weather. • Example: You can expect snow in the Northeast in January or for it to be hot and humid in the Southeast in July. This is climate.

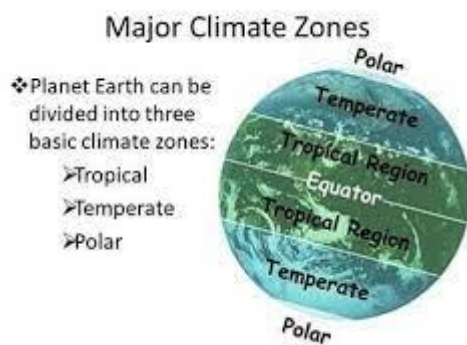
Activity 2: Four Seasons

- Divide the students into groups and ask them to:
- Observe the given pictures carefully
- Identify the climate (dry, mild, desert and snow) in the pictures and label them in the given boxes.



Activity 3 (a): Picture of Climate Zones

- Tell that on the basis of climate, we can divide the Earth into three zones i.e. Tropical, Temperate and Polar zone.
- Show a picture to explain the equator and poles; and how Sun's rays fall on Earth.





Activity 3 (b): Reading of the content

Divide the students into groups and ask them to:

- Read content under heading **Relationship between Geographical Locations and Climate** in the Textbook p. 98 and 99.
- Observe the pictures of zones carefully along with the content.
- Answer the following questions:
 1. What is equator? (The equator is an imaginary line that divides the Earth into two equal parts).
 2. What is the reason of climate change? (It depends upon falling of Sun's rays either vertically or slanting).
 3. Tell the names of three zones on the basis of climate? (Tropical, Temperate, Polar).
 4. On which zone Sun's rays fall vertically? (Tropical zone).
 5. On which the Sun's rays fall slanting? (Temperate zone).
 6. What is the direction of Sun's rays in Polar zone? (More slanting).

Conclusion/ Sum Up :

- The climate of any region depends upon falling of Sun's rays either vertically or slanting.
- On the basis of climate, the Earth is divided into three zones: Tropical, Temperate and Polar.
- Tropical regions are located around the equator. In this zone Sun's rays fall vertically. Therefore, the climate of this zone is hot.
- Temperate zone is in between Tropical and Polar Zones. In this zone Sun's rays fall diagonally/ slanting. Therefore, the climate of this zone is mild.
- Polar zone is located around the north and south poles of the Earth. In his zone, the Sun's rays are more slanted. Therefore, the climate of this zone is very cold.

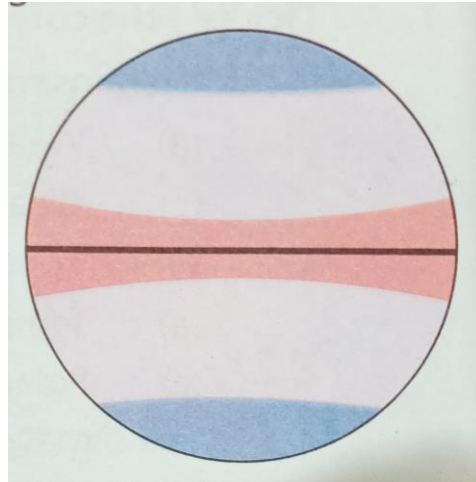
Assessment:

- Ask the following questions:
 1. If you move from equator to poles, what changes would you find? (At equator the climate is hot, but as we move towards poles, the climate becomes less hot and even some regions are very cold).
 2. What is the difference in weather, season and climate?
 3. Ask the students to solve the following worksheet

Worksheet

(Relationship between Geographical Location and Climate)

1. Identify the different zones on the figure of the Earth, on the basis of climate.



1. What is the climate of these zones? Describe with reasons? -----

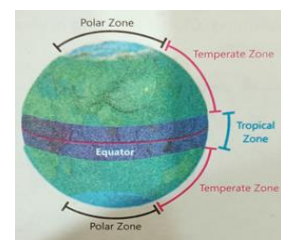
In winter, the temperature of Skardu, is below zero, while the temperature of Karachi is mild.

Why is it so? -----

Follow Up:

- Ask the students to:

1. Learn the names of different zones and write them in their notebooks.
2. Ask them to draw the picture of Earth on chart and label it according to the labelled picture given in Textbook p.99).



EARTH'S WEATHER AND CLIMATE

Changings and Temperature Precipitation

**Duration:** 40 Minutes**Students Learning Outcome:**

- Recognize that the average temperature and precipitation can change with seasons and locations.

**Materials:**

- Board, marker, flash cards

Information for Teacher:

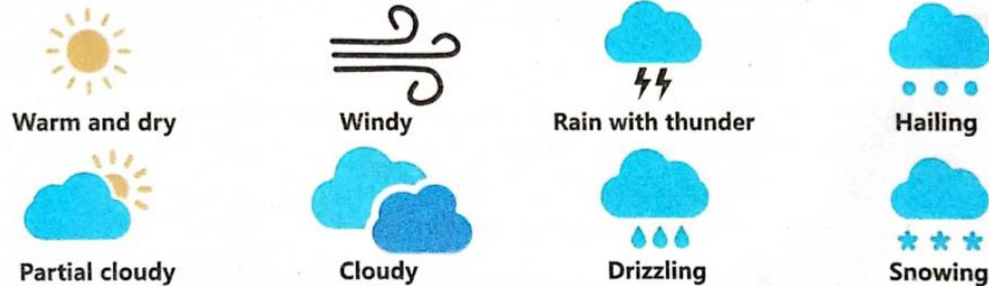
- Weather is described in terms of temperature, humidity in air, precipitation, clouds and winds of **Changes in Temperature and Precipitation** that particular location.
- Precipitation means rain or snow.
- Temperature and precipitation are fundamental factors for describing climate.
- As average temperature rises, more evaporation occurs, which in turn increases overall **precipitation**. Therefore, a warming climate is expected to increase.
- Geographical **location** of a region is an important factor determining its climate. The climate or weather changes of any region depend upon falling Sun's rays either vertically or slanting. Sun's rays fall vertically at **equator**. That's why; the climate of this zone is **hot**. On the other hand, the Sun's rays are slanted at Polar Regions. Therefore, the climate of this area is cold.
- **Seasonal Change:** Each area of the Earth has a unique climate based on the weather conditions, like **temperature and precipitation** that occur over a period of time. **Deserts** are generally dry and warm, while the **tropical rain forest** is warm and wet every day. **Polar Regions**, on the other hand, are perpetually **cold**. These consistent patterns of **temperature and precipitation** determine the climate of each region.
- Have you ever wondered why the weather changes with the arrival of spring, summer, winter, or fall? Seasonal changes are a direct result of the sun and our Earth's relationship with it.
- Water bodies make the climate of adjacent land areas mild.
- With the rise of height from sea level, the climate becomes cooler and the duration of winter season increases.
- **Global change in climate:** The heat, smoke and gases released from factories, vehicles and other human activities not only pollute our environment but also cause an increase in the average temperature of the Earth. It is called **global warming**.
- Global warming is very harmful for climate and life on land and in water. Global warming is often associated with greenhouse effect. The greenhouse effect describes the process of certain gases including carbon dioxide (CO₂) that

trap solar radiation in the Earth's atmosphere. Greenhouse gases let the sun's light shine onto Earth's surface, but they trap the heat that reflects back up into the atmosphere. In this way, they act like the glass walls of a greenhouse.

Introduction:

Activity 1: Observation of Picture

- Ask the students to observe the following picture and answer the following questions:



- What does this picture represent? (This picture shows weather conditions i.e. warm, dry, cloudy, rainy, and snowy).
- Are these conditions the same at all times? (No)
- Are these conditions different in different areas? (Yes).
- How many seasons are in our area? (4).
- Name the seasons. (Spring, summer, winter, and Autumn).
- Why the temperature changes with the arrival of spring, summer, winter, or Autumn? (Seasonal changes are a direct result of the sun and our Earth's relationship with it).

Development:

Activity 2: Changes in Average Temperature due to Location

Divide the students into groups and ask them to read the content from **Textbook p.98 -99** and answer the following questions:

- What is the climate of Tropical zone?
- What is the climate of Temperate zone?
- What is the climate of Polar zone?
- Why the climate in three different zones is different?

The teacher will write the correct answers on the board and ask the students to check their answers according to it.

Activity 3: Flash cards about Climate according to Location (10 min)

The teacher will show flash cards about changes in temperature and precipitation according to location and ask the following questions:

Location	Desert	Tropical	Temperate	Polar
Temperature	Very high	High	Mild	Very low
Precipitation/ Rainfall	Almost no rain Hot and Dry conditions	Rainfall all year	Enough rain but not too much	Snow/ ice

- In which location, the temperature is very low?
- Which location has dry conditions?
- What is the condition of rainfall in tropical zone?
- What type of climate is present in temperate region?

The teacher will give constructive feedback to the students.

Activity 4: Flash cards about Climate according to Seasons

The teacher will show flash cards about changes in temperature and precipitation according to seasons and ask the following questions:

Seasons	Summer	Fall	Winter	Spring
Temperature	Very high	Mild	Very low	Mild
Precipitation/ Rainfall	Heavy rainfall Thunderstorms	Less rainfall	Light rainfall	High rainfall

1. In which season, the temperature is very high?
2. Which season has very low temperature?
3. In which season, the rainfall is at its highest level?
4. What type of climate is found in winter season?

The teacher will give constructive feedback to the students.

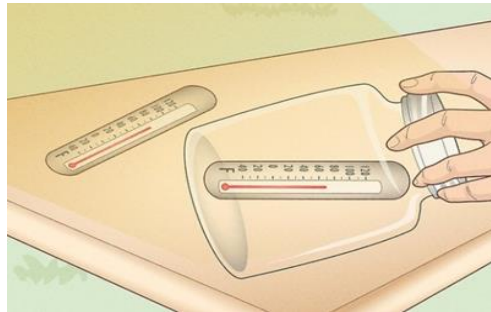
Activity 5 (a): Global warming Experiment

The teacher will divide the class into groups and ask them to perform the experiment.

Materials: Two glass thermometers, glass jar with a lid, watch or clock

Procedure

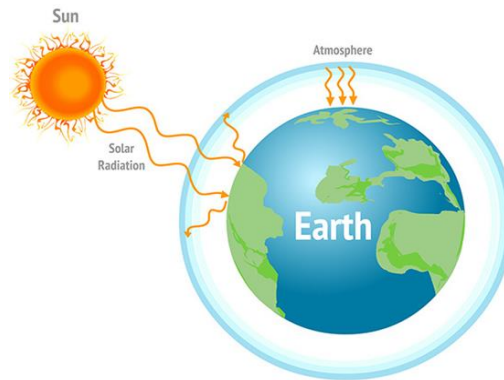
- Take two thermometers.
- Put one thermometer in the glass jar and label it 'A'. Seal the jar with the lid.
- Leave the other thermometer in the sun and label it 'B'.
- Check that the lid does not cast a shadow on either thermometer, as this will affect the results.
- Flip the jar over so the lid is facing down and doesn't cast a shadow.
- Wait for 10 minutes.



- Write the results as follows:

Thermometer A	Thermometer B

- Show a picture to them and ask the following questions:



1. Which thermometer shows high temperature, A or B?
2. What is the role of glass jar in increasing the temperature?
3. Is there any relationship between the experiment and the picture of global warming?

Give your reflection about the topic to students.

Activity 5 (b): Reading Global change in Climate

Ask the students while remaining in groups, read the paragraph, discuss in groups and answer the following questions:

1. What are the reasons of pollution in environment?
2. What is the effect of this pollution on environment?
3. What does global warming mean?
4. What are the effects of global warming?
- Give your reflection about the topic.

Conclusion/ Sum up:

- Weather conditions may be warm, dry, cloudy, rainy and snowy
- Average temperature and precipitation change with location.
- Average temperature and precipitation change with seasons.
- Global change in climate: The heat, smoke and gases released from factories, vehicles and other human activities not only pollute our environment but also cause an increase in the average temperature of the Earth. It is called global warming.
- Global warming is very harmful for climate and life on land and in water.

Assessment:

- Ask following questions to the students.
- 1. What kind of temperature and rainfall conditions are found in Deserts?
- 2. What is the precipitation condition in polar region?
- 3. What type of climate is present in fall season?
- 4. Compare the climate of summer and winter?
- 5. What are the causes of global warming?
- 6. What are the effects of global warming?
- 7. Ask the student



Worksheet: Changes in Temperature and Precipitation

Q1. What are the main factors that influence temperature?

Q2. Draw the picture of Earth and indicate three temperature zones.

Q3. Complete the following compare and contrast table to show relationships among temperature zones of Earth, position on Earth, and direction of Sun's rays falling on Earth.

Temperate Zone		Slanting
		Vertical
	Around north and south poles	

Q4. Enlist main factors that affect precipitation.

Q5. Tick the correct answer:

ii. If it rains suddenly, what does this indicate?

- (A) Weather condition (B) Climate (C) Location (D) Weather and Climate

iii. Which zone of the Earth receives vertical Sun's rays?

- (A) Temperate (B) Tropical (C) Polar (D) All three

iv. The climate of the region of Polar Zone is:

- (A) warm (B) humid (C) mild (D) extremely cold



v. Due to smoke and gases emitted from factories and vehicles, the average temperature of Earth is:

- (A) increasing (B) decreasing (C) fluctuating (D) not-affecting

Q6. In which zone our country is located? You can use map or globe. -----

Q7. What are the causes of global warming?

Q8. What are the effects of global warming?

Follow Up:

- Ask the students to observe the weather and temperature for one week and complete the following table (**Textbook Activity 8.1, p.97**)

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Max. Temp.							
Minimum. Temp.							
Weather							

Project Work (Textbook Activity, p.102)

- Make a simple rain gauge by using transparent plastic bottle, scissors, cello tape and paper strip (marked in millimeter scale).
- By using this rain gauge, compare the amount of rain during three days in a rainy season.

Days	Day 1	Day 2	Day 3
Rainfall (millimetre)			

SOLAR SYSTEM AND OUR EARTH

Solar System

**Duration:** 40 Minutes**Students Learning Outcome:**

- Describe and demonstrate the solar system with the Sun at the center and the planets revolving around the Sun.

**Materials:**

- Board, coloured markers, paper, pencil, compass, charts, pictures of solar system, clay.

Information for Teacher:

- **Sun** is the center of the solar system. It is the biggest source of light and heat for our Earth and existence of life on Earth. Why does the Sun look bigger than the other stars? It is due to the fact that the Sun is very near to Earth as compared to other stars.
- The stars other than the Sun are also present in day time but we cannot see them because Sun's light is so bright that these stars become invisible.
- **Solar system** (word solar is derived from Latin word 'sol' or 'solaris' which means Sun) consists of Sun at the centre and the planets revolving around it. The names of planets are: **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.**
- The closest star to the Sun is Mercury and farthest one is Neptune.
- **Venus** is the third brightest thing in the sky after the Sun and Moon. However, Moon and Venus are not stars but they reflect the sunlight.
- **Mercury** is the smallest planet and **Jupiter** is the largest planet in our Solar System.
- The circular path of a planet around the Sun is called its **orbit** and the time taken by a planet to complete one round in an orbit is called a **period.**
- Each planet has a different speed and has different distance from the Sun. That is why the duration of the day on each planet is different.
- In addition to the eight planets in the Solar system, five dwarf planets, including Pluto, millions of asteroids and comets are revolving around the Sun.
- **Pluto** is a large, distant member of the solar system that formerly was regarded as the outermost and smallest planet of our Solar System. But now it is considered as a dwarf planet.

Introduction:

(Note: The teacher will ask the students to observe the sky one day before teaching the lesson).

Ask the following questions to the student:

- What did you see in the night sky? (Stars, Moon)
- What is the brightest thing in the sky during night time? (Moon)
- What is the brightest thing in the sky during day time? (Sun)
- Are the stars present in day time? (Yes).
- Why we cannot see them during day time? (Because of the Sun's bright light, we cannot see the light of other stars).
- What is the shape of stars and planets? (Spherical/ ball-like).
- Tell students that we see several shining bodies in the clear sky at night. These are stars, Moon or Venus. The stars are big spheres of burning gases. They produce light and heat. The Sun is also a Star. Some stars are smaller and some are bigger than the Sun. The Sun is an average type of star (**Textbook p.104**). However, Moon and Venus are not stars because they do not have their own light. They reflect sunlight and seem illuminated.

Then the teacher will tell the students that along with Sun, there are also present other stars in the sky which are not visible in day due to brightness of Sun. We can see them only at night.

Development:

Activity1: Difference between Stars and Planets

- Call two students in front of the class.
- Give torch to one student and ask him to stand in one place.
- Ask the other student to move around him.

Now ask the class, following questions:

1. What is the difference between the two students? (One is standing and the other is moving around him)
 2. Which student has light? (who is standing)
 3. What does standing student represent? (Star)
 4. What does moving student represent (Planet)
 5. Do the stars have their own light? (Yes)
 6. Do the planets have their own light? (No)
 7. If planets do not have their own light, how they look bright? (They reflect the light emitted by stars and in this way they look bright).
 8. Is Sun a star or planet? (It is a star because it is not moving and it has its own light).
 9. Our Earth is moving around the Sun. Is it a star or planet? (Planet)
- Ask the students to write differences between Stars and Planets in the following table.

Stars	Planets

Explain that to the students:

- The stars have their own light but planets do not have such light. The planets only reflect the light of stars.
- The stars are not moving themselves but some objects move around them. These moving objects are called planets.
- As the Sun is a star, therefore, it is not moving but 8 planets move around it. The Sun and its planets form a system. This system is called the **solar system**.

Activity 2: Read and Discuss the Paragraph

- Ask the students to make groups, then read and discuss the paragraph in groups from textbook.
- Ask the students to answer the following questions:
- Which object is the centre of the solar system?
- Name 8 planets of the Sun.
- Name the planet which is closest to the Sun?
- Which one is the biggest source of light and heat on Earth?

Activity 3: Learning the names of Planets, and estimation of their sizes/ shapes and Distance from the Sun

Ask the students to observe the picture of solar system (Textbook p.104), and answer the following questions:



- Identify the largest planet? (Jupiter).
- Identify the smallest planet? (Mercury).
- Which planet has rings around it? (Saturn).
- Which planet is nearest to Sun? (Mercury).
- Which planet is furthest from Sun? (Neptune).
- At what number Earth is present? (At 3rd number after Mercury and Venus).

Ask the students to:

- Name planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- Drill the names and write the names in their note books.

Activity 4: Movement of Planets around Sun (Metaphor)

- Arrange for a torch and 9 placards.
- Number the play cards as follows:

Playcard Number	0	1	2	3	4	5	6	7	8
Object	Sun	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune

- Write basic information about Sun and planets on placards according to the following table.

Placard	Star/Planet	Information written on placard
1	Sun	My name is Sun. I am a star. I am a huge sphere. I have burning gases that produce light and heat. Due to my gravity, many celestial bodies such as planets including our Earth and the Moon, comets and asteroids revolve around me.

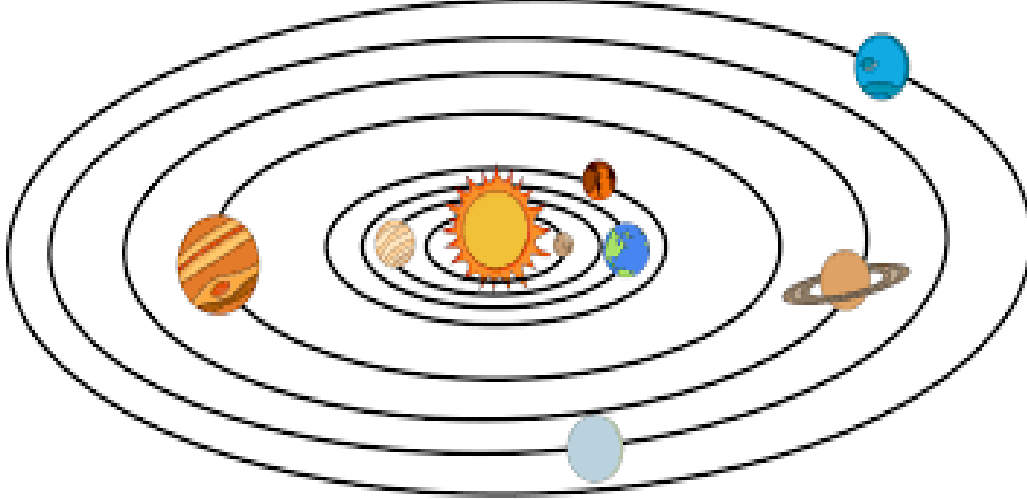
2	Mercury	My name is Mercury. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 50 Million kilometres away from Sun. My diameter is 4,900 kilometres.
3	Venus	My name is Venus. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 110 Million kilometres away from Sun. My diameter is 12,100 kilometres.
4	Earth	My name is Earth. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 150 Million kilometres away from Sun. My diameter is 12,800 kilometres.
5	Mars	My name is Mars. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 228 Million kilometres away from Sun. My diameter is 6,780 kilometres.
6	Jupiter	My name is Jupiter. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 780 Million kilometres away from Sun. My diameter is 142,800 kilometres.
7	Saturn	My name is Saturn. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 1,430 Million kilometres away from Sun. My diameter is 120,800 kilometres.
8	Uranus	My name is Uranus. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 2,780 Million kilometres away from Sun. My diameter is 51,800 kilometres.
9	Neptune	My name is Neptune. I am a planet. I revolve around the Sun. I do not have my own light but I reflect Sun's light. I am 4,497 Million kilometres away from Sun. My diameter is 49,400 kilometres.

- Take the students to the lawn or playground or any place where enough space is available for performance of the activity.
- Select 9 students. Give playcards to each of the 9 students.
- Mark a central place for Sun and eight circles around it with white wash powder.
- The student with playcard of Sun will stand in the central place.
- Then call 8 students, give them playcards about Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune and stand them along with Sun in order.
- Each student will tell the information verbally about the sun or planet which he is going to represent. For example, the student with a placard and torch will represent the Sun.
- In next stage, the student representing Sun will remain standing while others will start moving around him in order and in their orbits.
- Ask the following questions after activity.
 - What does 'standing student' represent? (Sun, a star)
 - What does torch represent? (Stars have their own light)
 - What do the moving students represent? (Planets)
 - Is Sun a star or planet? (Star)
- Tell the names of different planets. (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune).

- Is Pluto a planet? (In the beginning it was considered as a planet. But now, it is not. It is named as a dwarf planet).
- Ask the students to read information about the Sun (**Textbook p.104**) and table about planets (**Textbook p.105**).

Activity 5: Understanding the movement of Planets in Orbits

- Explain to the students that the planets move in different orbits around the Sun.



- Explain to the students that:
- The circular path of a planet around the Sun is called an **orbit**.
- The time taken by a planet to complete one orbit is called a **period**.
- Each planet has a different speed and distance from the Sun. That is why the duration of the day on each planet is different.
- Jupiter is the largest planet in the solar system.

Activity 6: Chart showing diameter of Planets and their distance from Sun

Tell the diameter of each planet and the distance of each planet from Sun with help of following chart (**Textbook page 105**).

Planet	Distance from the Sun (Million kilometres)	Diameter (kilometres)
Mercury	50	4900
Venus	110	12100
Earth	150	12800
Mars	228	6780
Jupiter	780	142800
Saturn	1,430	120800
Uranus	2,870	51800
Neptune	4,497	49400

Activity 7: Model of Solar System with Clay

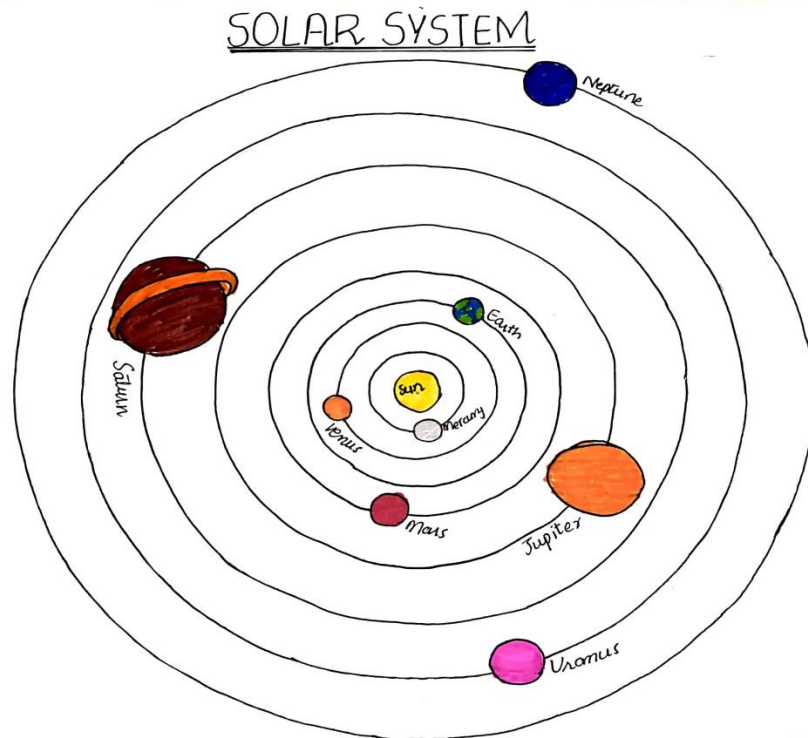
Before starting this activity, Explain the proportions of the planets as follows:

Planet	Diameter (kilometres)	Proposed Diameter Scale: 4900 km =1cm	Proposed Radius Proposed Diameter/2	Comparison of stars for proportionate diagrams
Mercury	4900	1.0	.5	Small
Venus	12100	2.5	1.2	Small
Earth	12800	2.6	1.3	Small
Mars	6780	1.4	0.7	Small
Jupiter	142800	29.1	14.5	Large
Saturn	120800	24.7	12.4	Large
Uranus	51800	10.6	5.3	Medium
Neptune	49400	10.1	5	Medium

- Divide the students into groups and ask them to make a model of Solar System with clay according to the following instructions:
 1. Make eight clay balls of round shape according to their proportionate sizes.
 2. Show a Sun with a balloon/clay/football/ball of crumpled papers, but keep its size even larger than the other eight clay balls.
 3. Make your model of Solar System according to the order and size of the planets and arrange it on the table/ cardboard etc.
 4. Colour and label the planets.

Activity 8: Drawing of Planets in Orbits

- Divide the students into appropriate groups and ask them:
- To draw small circle with the help of compass and pencil in the centre of paper and mark it Sun.
- Then draw four circles around Sun. Make very small sized ball-like structures (with little differences) on each circle but at different places. These balls indicate Mercury, Venus, Earth and Mars.
- Then draw two large circles around these small circles. Make large sized ball-like structures (with little differences) on these circles but at different places. These represent Jupiter and Saturn.
- Draw a ring like structure around Saturn because it is the characteristic of this planet.
- Then draw two more large circles and make medium sized balls (with little differences) at different positions. These balls indicate Uranus and Neptune.
- Ask them to label the names of planets and colour them.



Conclusion:

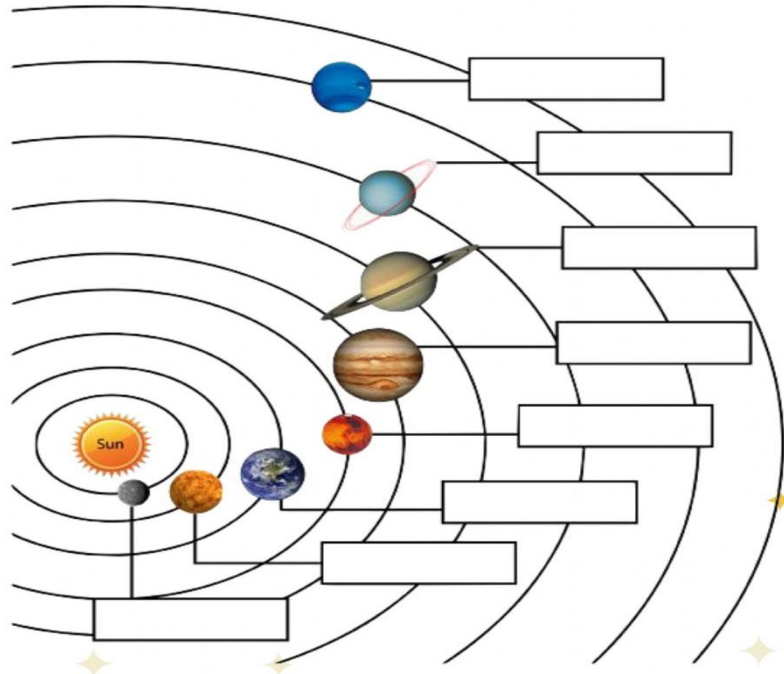
- Solar system consists of Sun and its eight planets.
- Sun is a star as it has its own light while planets do not.
- The planets are named as **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune**.
- Mercury, Venus, Earth, Mars are small planets, Jupiter, Saturn are very large planets while Uranus and Neptune are medium sized planets.
- The smallest planet of solar system is **Mercury** and the largest planet is **Jupiter**.
- At first Pluto was the 9th planet of the solar system but latest research has minimized its status from a planet to dwarf planet.
- Sun is stationery while planets move around the Sun in different orbits.

Assessment:

- Ask following questions to the students.
 1. Differentiate between a star and a planet.
 2. Name planets of the solar system.
 3. How will you categorize the planets on the basis of their diameter?
 4. How will you categorize the planets on the basis of their distance from Sun?
 5. What do you know about Pluto?
 6. What is solar system?
 7. Ask them to solve the following worksheet at home.

Worksheet: Solar System

Q1. Fill the boxes with names of respective planets. The names of planets are Earth, Jupiter, Venus, Mercury, Uranus, Neptune, Saturn and Mars.



Q2. Write two differences between a planet and a star.

1. -----
2. -----

Q3. Why the Sun is called a star?

Q4. In the beginning **Pluto** was the ninth planet but now it is not. What is the reason of its exclusion from the status of a planet?



Follow Up:

- Ask the students to do following as homework in their notebooks.
- Drawing and colouring solar system on chart.
- Write the names of planets, their diameter and their distance from Sun.
- Learn the names of planets by heart.

SOLAR SYSTEM AND OUR EARTH

Moon

**Duration:** 40 Minutes**Students Learning Outcome:**

- Recognize that the Earth has moon that revolves around it, and from Earth the moon looks different at different times of month.

**Materials:**

- Board, coloured markers, paper, pencil, compass, charts, paper fasteners, cardboards, scissors.

Information for Teacher:

- After the Sun, the brightest object appearing in the sky is the Moon.
- Moon is the natural satellite of the Earth. It is closest to the Earth. It is about 384,000 kilometres from the Earth.
- The size of Moon is much smaller than the Earth. Its diameter is about 3,500 kilometres.
- It completes its revolution around the Earth in 29.5 days.
- There are different shapes of moon. Very thin Moon is called Crescent while a complete Moon is called Full Moon (Badar).
- The **ebb and flow of the Moon** in the sky is due to its rotation around the Earth. As the Moon reflects the Sun's rays towards the Earth, the rays falling on the part of the Moon that is opposite to Earth cannot be seen. On the first day of lunar month, we see very narrow sunlight on Moon, and the size of the lit part of Moon gradually increases till a full Moon is visible. After this its bright part gradually decreases and eventually disappears.
- Moon rotates about its axis and also revolves around the Earth. We can see only the same one half of the surface of the Moon and cannot see the other half.
- The Moon has no atmosphere and no water. Therefore, no life can exist there.

All planets of solar system have Moons except Mercury and Venus. Jupiter and Saturn have maximum number of Moons.

Introduction:

- Ask the students to observe the sky one day before the start of the lesson.
- After observation, on the very next day, the teacher will ask the following questions:
- How many Moons did you see in the night sky? (One)
- Has the Moon similar shape every day? (No, Moon changes its shapes)
- Has the Moon its own light? (No, it reflects the light of Sun and that's why it looks bright)

Explain to the students that:

- Moon is a natural satellite of the Earth as it moves around the Earth. On the other hand artificial satellites are made by scientists and are sent for information in the orbit of Earth.
- Moon changes its shapes every day.
- Moon does not have its own light but it reflects sunlight.

Development:

Activity 1: Characteristics of Moon

Characteristics of the Moon

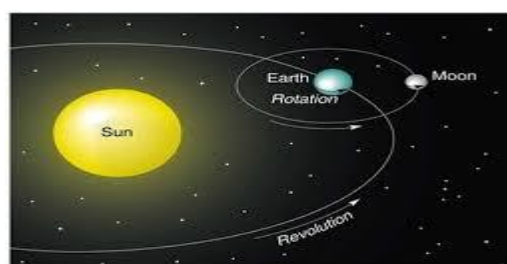
- The **brightest object** appearing in the night sky.
- Moon is the **natural satellite** of the Earth (Artificial satellites are those which are made by scientists).
- It is **closest to the Earth**.
- It is about **384,000 kilometres** from the Earth.
- It is much **smaller than the Earth** having diameter 3,500 kilometres.
- It completes its **revolution around the Earth in 29.5 days**.
- It **different shapes**. Very thin Moon is called **Crescent** while a complete Moon is called **Full Moon (Badar)**.
- Moon also **rotates about own axis**.
- There is **no atmosphere and no water**. Therefore, **no life** can exist there.

Note: *All planets of solar system have Moons except Mercury and Venus. Jupiter and Saturn have maximum number of Moons.*

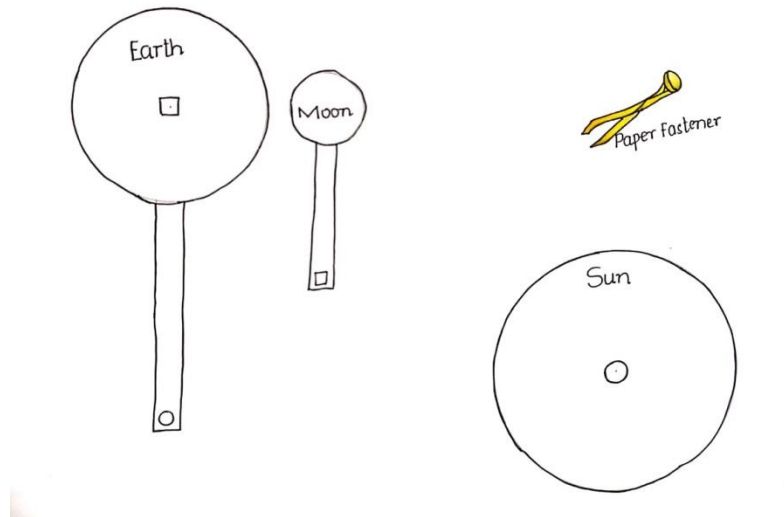
- Divide the students in groups.
- Ask them to read and discuss the paragraph about Moon (**Textbook p.106**); and write the answers of the following questions in their notebooks:
 1. Which is the brightest object in the sky?
 2. Which is the second brightest object in the sky?
 3. How much time does it take the moon to complete one revolution around the Earth?
 4. When the Moon is called Crescent?
 5. What is the distance of Moon from the Earth?
 6. What is the diameter of the Moon?
 - Receive answers from the groups and tell the correct answers if the correction will be needed.

Activity 2: Movement of the Earth and Moon(Working Model)

Show a picture and explain the movement of Earth and Moon to the students as follows.



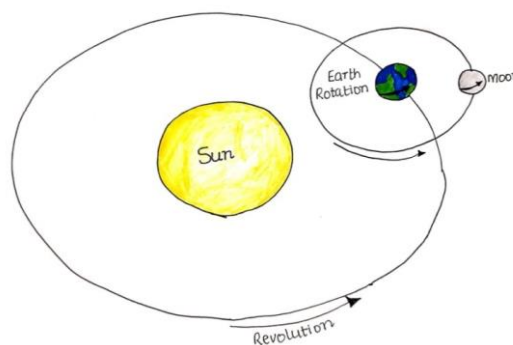
- Ask the students to work in groups and instruct them as follow.
- Cut out the patterns.
- Colour the Earth (green), Moon (yellow) and Sun (red).
- Connect the Earth to the Sun using a paper fastener on the circles.
- Connect the Moon to the Earth using a paper fastener on the square shapes.
- Show the movement of the Earth and Moon by moving the Earth around the Sun and the Moon around the Earth.



- Share this information to the students.
- The Earth moves around the Sun and around its own axis.
- Moon moves around the Earth as well as it also moves about its own axis.
- The duration in which the Moon completes one trip around the Earth is 29.5 days. Therefore, the lunar month is of 29 days or 30 days.
- The duration in which Moon completes one trip around the Earth, it also completes one rotation around its axis.

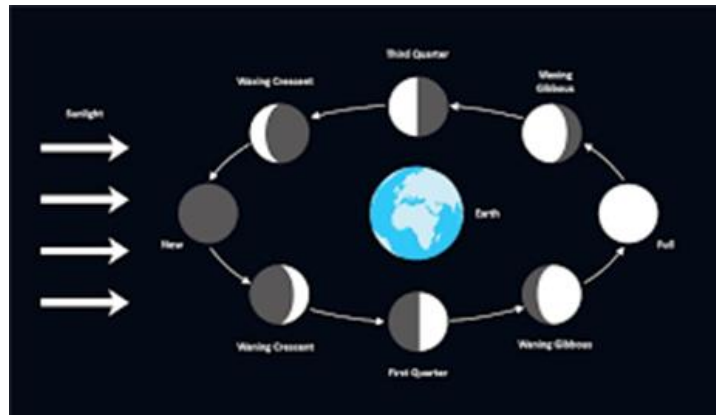
Activity 3: To draw the picture showing the movement of the Earth and Moon

- Make the groups of students
- Ask them to:
- Draw the picture showing the movement of Earth and Moon
- Label the picture.



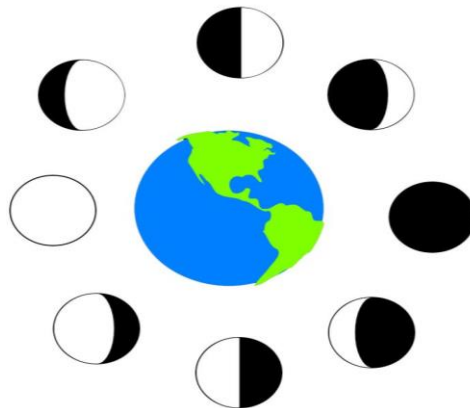
Activity4 (a): Picture showing phases of the Moon

- Make the groups of students, ask them to read and discuss the material of Ebb and Flow of Moon and observe the picture of phases of Moon (Textbook p.107).

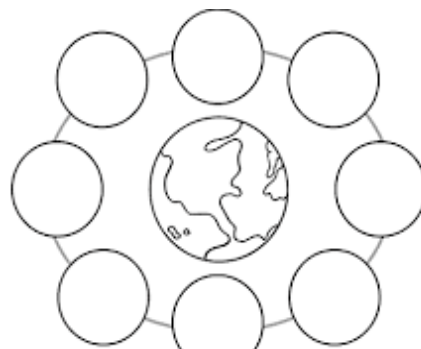


- Ask the following questions to the students:
 1. What is the meaning of ebb and flow? (Decline and regrowth).
 2. Why the Moon disappears after some days of its appearance? (As the Moon reflects the sun's rays towards the Earth so when the sun's rays are falling on the part of Moon that is opposite to the Earth, we cannot see the Moon).
 3. How the size of Moon gradually increases and decreases.
 4. We can only see one side of the Moon. Explain.

Activity 4 (b): Observing picture 'A' fill the picture 'B' (10 min)



Picture A



Picture B



- Explain to the students that:
- There are different shapes of moon. Very thin Moon is called Crescent while a complete Moon is called Full Moon (Badar).
- The **ebb and flow of the Moon** (decline and regrowth) in the sky is due to its revolution around Earth. As the Moon reflects sun's rays towards the Earth, the rays falling on the part of the Moon that is opposite to Earth cannot be seen. On the first day of lunar month, we see very narrow sunlight on Moon, and the size of the lit part of Moon gradually increases till a Full Moon is visible. After this its bright part gradually decreases and eventually disappears.
- Moon also rotates about its axis. The duration, in which it completes one trip around the Earth, it also completes one rotation about its axis. That is why we can see only the same one half of Moon. We cannot see the other half.

Conclusion/ Sum up:

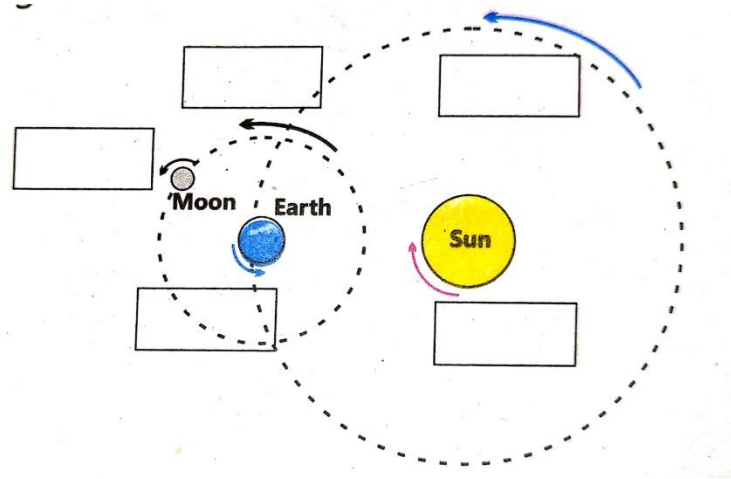
- Moon is the natural satellite of the Earth. It is closest to the Earth i.e. about 384,000 kilometres from the Earth.
- The size of Moon is much smaller as compared to the Earth having diameter about 3,500 kilometres.
- It completes one revolution around Earth in 29.5 days.
- There are different shapes of moon i.e. very thin Moon called **Crescent** and a complete Moon called **Full Moon**.
- The decline and regrowth of Moon in the sky is due to its revolution around the Earth.
- The duration, in which Moon completes one trip around the Earth, it also completes one rotation about its axis. That is why we can see only the same one half of Moon.
- The Moon has no atmosphere and no water; hence, no life can exist there.

Assessment:

- Ask the students these following questions.
1. What is the diameter of Moon and its distance from Earth?
 2. What do you know about ebb and flow of Moon?
 3. Differentiate between a Crescent and a Full Moon.
 4. Explain the movement of Moon and Earth around Sun.
 5. We can see only one side of Moon. Why?
 6. Ask the students to fill this worksheet.

Worksheet: Moon

Q1. Write the correct type of movement (rotation, revolution) in the box given near each arrowhead.



Q2. Define the following terms in relation to Moon.

1. Natural Satellite -----

2. Crescent Moon-----

3. Rotation of Moon -----

4. Revolution of Moon -----

Q2. Encircle the correct answer.

1. The diameter of Moon is:
(A) 3300 km (B) 3500 km (C) 3700 km (D) 3900 km
2. The distance of Moon from Earth is:
(A) 284,000 km (B) 285,000 km (C) 286,000 km (D) 287,000 km
3. The environment of Moon consists of :
(A) Water (B) Air (C) Life (D) None of these



Follow Up:

- Ask students to do these questions in their notebook.
- Draw the picture showing the movement of Moon and Earth around Sun.
- Draw different 8 shapes of the Moon as seen from the Earth

SOLAR SYSTEM AND OUR EARTH

Formation of Day and Night

**Duration:** 40 Minutes**Students Learning Outcome:**

- Investigate and describe how day and night are related to Earth's daily rotation about its axis.

**Materials:**

- Torch, piece of chalk, globe, Top.

Information for Teacher:

- The Earth is not flat. It is round in shape.
- It is a big sphere like a football.
- The Earth spins about its own axis like a top. The axis of Earth is an imaginary line that passes through north and south poles of the earth.
- The days and nights are caused by the spin of the Earth.
- The side of the Earth that faces the sun has day and the side that is away from the Sun has night. The Earth completes one spin rotation in 24 hours.

Introduction :**Activity1: Spinning of a Top**

Teacher will take a top and call one student in front of the class to spin it on the table or floor. Other students will observe its movement.



Ask the following questions from the students:

1. What is the type of motion of the top? (Movement around its axis).
2. Where is the axis of the top? (The line passing through the middle of the top).
3. What is the name of this type of motion? (Spinning/ Rotation).

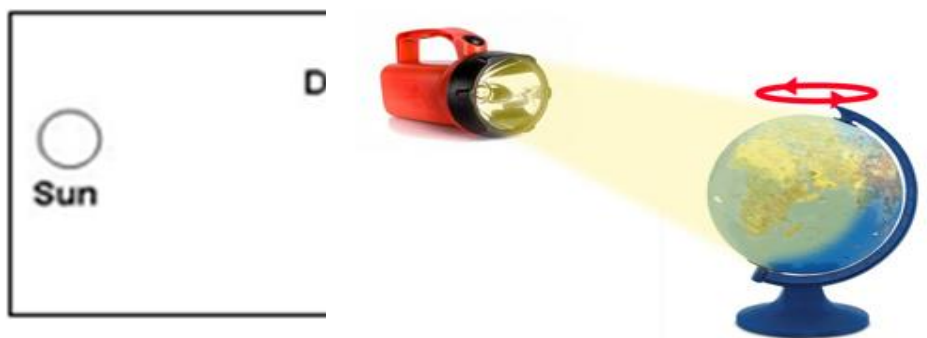
Tell the process of motion of top to the students. When we spin the top, it starts moving along its axis. This movement is called spinning or rotational motion. Then the teacher will explain

that our Earth also has spinning or rotational motion. The axis of the top is visible, but the axis of Earth is not visible. It is an imaginary line that passes through the north and south poles of the Earth. Due to Earth's rotation, there is occurrence of day and night.

Development:

Activity 2: Globe in a Dark Room (Activity 9.2 of Textbook p.108)

- Give the following instructions to students.
1. Take a globe and throw torch light on it at one side. Here the globe represents the Earth and torch represents the Sun.
 2. Rotate the globe slowly in front of the lit torch.
 3. It is day at the part of the Earth which is in front of light whereas it is night on the remaining part.



Ask the following questions from the students:

1. Is the entire surface of the globe lit?
2. Is only one half of the globe that is in front of the torch lit?
3. Is the other half dark that is opposite to torch?
4. Suppose torch is Sun and globe is our Earth, then how will you relate this activity with the concept of day and night on Earth?

Explain to the students that the Sun also brightens the Earth in the same way. There is day in the bright part of the Earth and night in the dark part. So it is concluded that day and night are caused by the spinning/rotation of the Earth.

Tell the students that:

- The Earth rotates from west to east. This is the reason that the Sun appears to rise in the east and set in the west.
- The Earth completes one spin/ rotation in 24 hours. Therefore, the duration of one day on Earth is 24 hours.
- Every planet is present at a different distance from the Sun and revolves at different speed. Therefore, the duration of day is different on different planets.

Activity 2: Discussion on Paragraph

Ask the students to make groups, read and discuss the content about Rotational Movement of Earth, and answer the following questions:

1. Differentiate between rotation and revolution of the Earth.
2. What is an axis?
3. How day and night are produced?
4. How much time the Earth takes to complete one rotation about its axis?



Conclusion/ Sum up:

- The Earth not only revolves in its orbit around the Sun, but it also rotates about its own axis.
- The Earth completes one rotation about its axis in 24 hours.
- The axis of Earth is an imaginary line that passes through the north and south poles of the Earth.
- The day and night appear due to spin of the Earth's axis.
- It is day in the part of the Earth which is in front of the Sun.
- It is night in other part of the Earth which is opposite to the Sun.

Assessment:

- Ask the students to answer the following questions.
1. What is the role of axis in spinning of a top?
 2. Differentiate between rotation and revolution of Earth.
 3. What do you know about axis of the Earth?
 4. How day and night are formed?
 5. If the Sun rises in the East and sets in the West, then what is direction of rotation of the Earth? Explain.

Follow Up:

- Ask the students to do these questions in their notebooks.
- Draw the picture to show the formation of day and night.
- How can you say the Earth rotates about its axis from west to east?

Worksheet: Rotational Movement of Earth

Q1. Encircle the correct answer.

i. Rotation means:

- (A) Move up and down (B) Spin round and round
- (C) Move in a straight line (D) Move in a circular path around another object

ii. Another name for spinning is :

- (A) Orbiting (B) Rotating (C) Revolving (D) Movement in straight line

iii. The Earth rotating on its axis causes:

- (A) Years (B) Seasons (C) Sun spots (D) Days and Nights

iv. How long does it take Earth to make one rotation on its axis:

- (A) One year (B) One day (C) One week (D) One month

Q2. Label the part of the Earth which is in day time and which is in night time.

Draw what you see in the sky.

Daytime	Nighttime
---------	-----------

Q3. How can you say that the spinning direction of the Earth is from west to east?

SOLAR SYSTEM AND OUR EARTH

Annual Rotation of Earth (Seasons)

**Duration:** 40 Minutes**Students Learning Outcome:**

- Describe how seasons in the earth's northern and southern hemispheres are related to the earth's annual movement.

**Materials:**

- Torch, piece of chalk, rubber ball, knitting needle, candle.

Information for Teacher:

- One round trip of an object around another is called a revolution.
- Time taken for one revolution is called time period.
- The Earth revolves around the Sun. Time taken by the Earth for one revolution is 365 days.
- The path followed by the Earth is not exactly circular but it is an oval shaped path.
- The Earth is tilted on its axis. That is why there is winter in the southern half of the Earth when there is summer in the northern half.
- The revolution of the Earth around the Sun and the tilt of axis of the Earth cause change in seasons.

Introduction:**Activity1: Difference between Rotation (Spinning) and Revolution**

- Take a top and call one student to spin it on the table or floor.
- Ask the following questions to the students.
 1. What is spinning? (When an object rotates about its axis, it is called spinning).
 2. What is axis? (It is an imaginary line about which a body rotates).
- Explain the process of motion of top to the students. When we spin the top, it starts moving along its axis. This motion is called spinning or rotational motion.
- Call two students in front of the class.
- Asks one student to stand and asks the other student to move around him.
- Explanation that this type of motion is called revolution.
- Explain them that the Earth has two types of motions i.e. motion about its axis called spinning or rotational motion and other type of motion around the Sun which is



called revolution. So from the first type of motion day and night are formed and from second type of motion seasons are formed.

Development:

Activity1: Knitting Needle and Rubber Ball

Ask the students to follow the instructions:

- Take four knitting needles and four rubber balls. Pass a knitting needle through each rubber ball.
- Mark a red line around the balls at the middle with a marker.
- Draw an oval shaped line on the table.
- Place a candle at the centre of the oval path.
- Tilt the needles slightly towards right.
- Call four students and give each of the students, a ball through which a knitting needle has been passed.
- Ask the students to hold and observe the ball at positions 1, 2, 3, 4 in the same tilted position.
- Ask them to observe the light falling on ball.

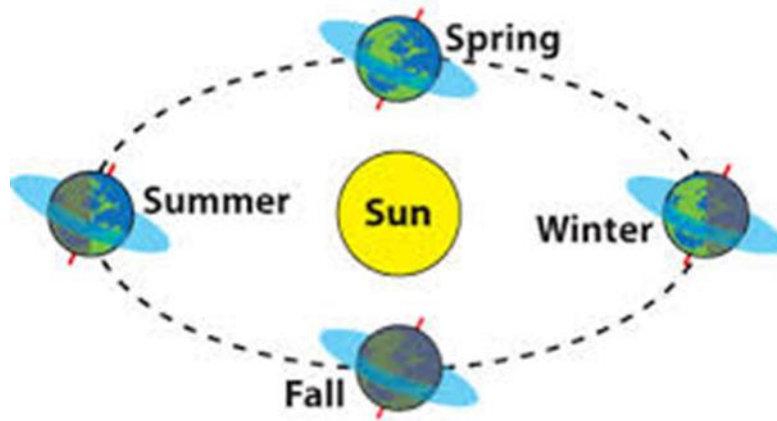
Ask the following questions to the students:

1. What will be the season on the part of the Earth where the sun's rays fall at right angles?
2. What will be the season on the part of the Earth where the sun's rays do not fall at right angles?

Activity2: Discussion on Paragraphs (Textbook p.109 and 110)

Ask the students to read and discuss about Annual rotation of Earth around the Sun and answer the following questions in their own words:

1. What is orbital motion?
2. What is shape of the path of Earth's revolution around the Sun?
3. How much time, the Earth takes to complete one revolution around the Sun?
4. If there were no tilt in Earth's axis, how would it have affected the seasons?
5. When it is winter in the northern hemisphere then what will be the season in southern hemisphere?
6. Draw the diagram about seasons in your notebook by observing the picture of seasons on p.109 of the Textbook.



- Explain to the students:
- The revolution of Earth around the Sun is called **orbital motion**.
- The path of Earth's revolution is almost circular.
- The Earth completes one revolution around the Sun in 365 days (one year).
- The Earth's axis is tilted towards one side. Due to it. The **Sun rays fall vertically** at the northern hemisphere of the Earth. Therefore, the duration of the day increases and that of the night decreases. It shows **summer season** in the northern hemisphere. During the same time, the southern hemisphere of the Earth receives **slanting sunrays**. Therefore, in this part, duration of the day decreases and that of the night increases. It shows **winter season** in the southern hemisphere.

Conclusion/ Sum up:

- One round trip of an object about another is called a revolution.
- The Earth makes one revolution around the Sun in 365 days.
- When sun's rays fall normally on half portion of Earth, there is summer season and on other half there will be winter, where sun's rays are not falling normally.
- When sun's rays fall slightly oblique on both the halves, the season is moderate on both parts of the Earth.
- The revolution of Earth and the tilt of its axis cause change in seasons.

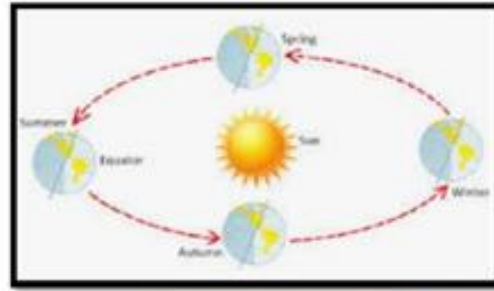
Assessment:

- Ask following questions to the students.
1. How do the seasons on Earth change?
 2. How the seasons on Earth are changed?
 3. Ask the students to solve this worksheet.

Worksheet: Annual Rotation of Earth around the Sun

Q1. Match the following words to the picture.

Revolution	Rotation
------------	----------



Q2. Write true or false

- Earth takes one year to complete one revolution around the Sun.
- A year is divided into 3 seasons.
- The path of Earth's revolution around the Sun is almost circular.
- The Earth's axis is tilted towards one side.
- The revolution of the Earth around the Sun is called orbital motion.

Q3. Why the days are longer than nights in summer, and shorter than nights in winter?

Explain.

Q4. Identify the season in the southern hemisphere as per the given figure (Textbook p.115). Write the correct season in the boxes given near the dates.

Picture p.115

Follow Up:

- Ask the students to do these questions on their notebooks.
- Write the reasons of change of seasons i.e. summer, spring, winter and Autumn.
- Construct a model to show how seasons are changed.

SOLAR SYSTEM AND OUR EARTH

Lunar Eclipse

**Duration:** 40 Minutes**Students Learning Outcome:**

- Illustrate and explain how solar and lunar eclipses occur.

**Materials:**

- Torch, piece of chalk, rubber ball, knitting needle, candle.

Information for Teacher:

- **Lunar Eclipse:** Sometimes the Earth comes between the Sun and the Moon, therefore, the sunlight does not reach the Moon. Due to which the shadow of Earth is formed on the Moon and it looks dark.
- An eclipse by definition, refers to an astronomical event when an astronomical object being viewed is temporarily over shadowed by another passing astronomical object such as a space craft or natural or manmade satellite. The shadow being cast on the astronomical object being viewed, maybe partial or complete; hence observing a partial eclipse or a full or complet eclipse.
- For the current case of Lunar and Solar eclipse, the astronomical objects being considered are the Earth, the Sun and the Moon.
- Let's consider the case of the Lunar eclipse. Refer to the diagram of the Lunar eclipse phenomenon in the textbook on page 110.
- Earth's natural satellite, the Moon revolves around the Earth in an orbit. Similarly, the Earth revolves around the Sun in an orbit as well. Hence, during the process of revolutions, whenever the Sun, Earth and the Moon come in a straight line in the same order as mentioned, a Lunar eclipse occurs. The process happens as the sunlight emerging from the Sun, which is reflected by the moon due to which we see the moon at night, gets blocked as the Earth obstructs the sunlight. Hence, in this process the sunlight hits the Earth, which is supposed to hit the Moon during the Lunar eclipse process and hence, the Earth's shadow falls on the moon causing the eclipsing of the moon. It's important to know that a lunar eclipse can only occur on a full moon day.

Note: A shortcut to remember why the lunar eclipse can only occur on full moon is because only then can you see the full moon being eclipsed as the Earth's shadow is cast over it.

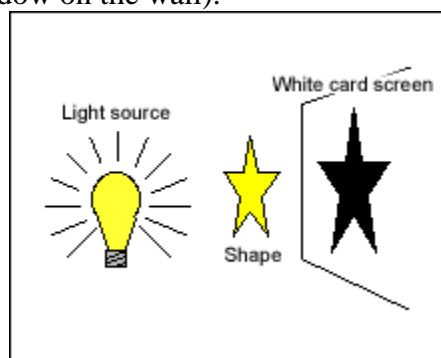
Remember that the reason for both lunar eclipse and solar eclipse are opposite to each other, since, the lunar eclipse only occurs on Full moon day. The solar eclipse can only happen on a new moon day.

Introduction:

- Ask following questions to the students.
1. What is a shadow? (A shadow is a dark area where light from a light source is blocked by an opaque object).
 2. Have you observed the shadow of a tree? (Yes).



3. Can you produce a shadow in the classroom? (Yes with bulb/ torch and a star/ ball, we can produce a shadow on the wall).



eclipse

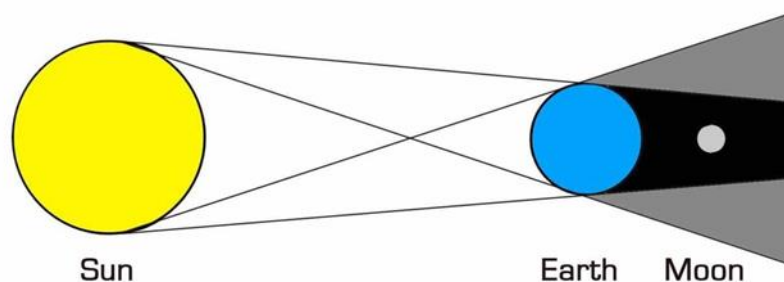
Development:

Activity1: Formation of shadow of football on tennis ball(Activity 9.5 of Textbook p.111)

- Place a torch, a football and a tennis ball in one line on wooden blocks or on any other support.
- Light the torch and ask the students to observe the shadow of football on the tennis ball and answer the following questions:
 1. Which side of the football is bright and which is dark?
 2. Why the tennis ball looks dark?
 3. If we switch of the torch what will happen?
 4. How are shadows formed?
 5. What is an eclipse?
- Explain to the students if something cannot appear or become invisible due to the shadow of another object, it is called an eclipse.
- Relate this activity with Lunar Eclipse by considering torch as Sun, football as Earth and tennis ball as Moon.
- Explain to the students that in Lunar Eclipse the shadow of Earth falls on Moon, therefore, we cannot see the Moon. This disappearance of Moon is Eclipse of the Moon. In Latin language, lunar means pertaining to the Moon. That's why the hiding of Moon due to the shadow of Earth is called **Lunar Eclipse**.

Activity 2: Discussion on the paragraph and picture of Lunar Eclipse (Textbook p.110)

- Ask the students to read and discuss about the content and observe the picture about Lunar Eclipse and answer the following questions in their own words:
 1. Name three objects involved in Lunar Eclipse?
 2. Which object will form the shadow?
 3. Which object is under shadow and not visible?
 4. Which object is eclipsed?
- Ask the students to observe the picture and explain in their own words what is happening in the picture.



Explain the whole process of lunar eclipse as follows:

- An eclipse by definition refers to an astronomical event when an astronomical object being viewed is temporarily overshadowed by another passing astronomical object such as a spacecraft or natural or manmade satellite. The shadow being cast on the astronomical object being viewed, maybe partial or complete; hence observing a partial eclipse or a full or complete eclipse.
- For the current case of Lunar and Solar eclipse, the astronomical objects being considered are the Earth, the Sun and the Moon.
- Earth's natural satellite, the Moon revolves around the Earth in an orbit. Similarly, the Earth revolves around the Sun in an orbit as well. Hence, during the process of revolutions, whenever the Sun, Earth and the Moon come in a straight line in the same order as mentioned, a lunar eclipse occurs. The process happens as the sunlight emerging from the Sun, which is reflected by the moon due to which we see the moon at night, gets blocked as the Earth obstructs the sunlight. Hence, in this process the sunlight hits the Earth, which is supposed to hit the Moon during the lunar eclipse process and hence, the Earth's shadow falls on the moon causing the eclipsing of the moon.
- It's important to know that a lunar eclipse can only occur on a full moon day. Why the lunar eclipse can only occur on full moon is because only then can you see the full moon being eclipsed as the Earth's shadow is cast over it.

Conclusion/ Sum Up:

- Eclipse means to be shadowed by an opaque object and this object is not visible at that time.
- During the process of revolutions, whenever the Sun, Earth and the Moon come in a straight line in the same order as mentioned, a lunar eclipse occurs.



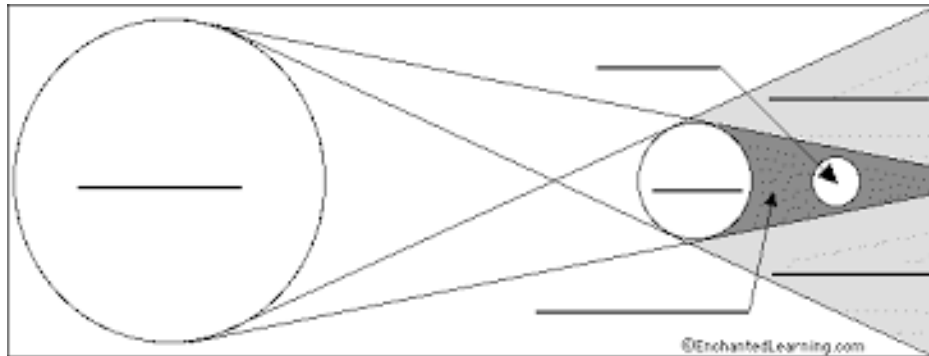
- The process happens as the sunlight emerging from the Sun, which is reflected by the moon due to which we see the moon at night, gets blocked as the Earth obstructs the sunlight. Hence, in this process the sunlight hits the Earth, which is supposed to hit the Moon during the lunar eclipse process and hence, the Earth's shadow falls on the moon causing the eclipsing of the moon.
- Lunar eclipse can only occur on a full moon day. Why the lunar eclipse can only occur on full moon is because only then we can you see the full moon being eclipsed as the Earth's shadow is cast over it.

Assessment:

- Ask following questions to the students.
 1. What is the meaning of eclipse?
 2. During lunar eclipse, which object is eclipsed or shadowed?
 3. On which phase of Moon solar eclipse can be observed.
 4. Is the lunar eclipse partial or full?
 5. Ask them to solve the worksheet as assessment.

Worksheet: Lunar Eclipse

Q1. Label the lunar eclipse and colour it.



Q2. Choose the correct answer:

1. A lunar eclipse is when the moon is blocked by _____.

- a. Sun
- b. Venus
- c. Earth
- d. Mars

2. What is the name of the lunar eclipse phase where the moon is directly in Earth's shadow and completely blocked?

- a. partial
- b. total
- c. annular
- d. half

Q3. Write the complete process of lunar eclipse in your own words.



Follow Up:

- Ask them to do those activities as homework.
- Draw the diagram of lunar eclipse in your notebooks.
- Write the description of lunar eclipse in your own words in your notebooks.

SOLAR SYSTEM AND OUR EARTH

Solar Eclipse

**Duration:** 40 Minutes**Students Learning Outcome:**

- Illustrate and explain how solar and lunar eclipses occur.

**Materials:**

- Torch, piece of chalk, rubber ball, knitting needle, candle.

Information for Teacher:

- Solar Eclipse: Sometimes, the Moon comes in between the Earth and the Sun and the Sun is hidden behind the Moon. In this condition a shadow of the Moon falls on the Earth and there is darkness on the Earth.
- An eclipse refers to an astronomical event when an astronomical object being viewed is temporarily over shadowed by another passing astronomical object such as a spacecraft or natural or manmade satellite. The shadow being cast on the astronomical object being viewed, maybe partial or complete; hence observing a partial eclipse or a full or complete eclipse.
- For the current case of solar eclipse, the astronomical objects being considered are the Earth, the Sun and the Moon.
- Solar Eclipse: As we know the Earth revolves around the Sun, and the Moon in turn revolves around the Earth in an orbit as well. Similarly as in the Lunar eclipse process, during the revolutions of Earth around the Sun and the Moon around the Earth whenever the Sun, Moon and the Earth come in a straight line in the same order as mentioned, a Solar eclipse occurs. The process happens as the sunlight emerging from the Sun is blocked as the Moon orbiting the Earth obstructs the sunlight as it reaches the Earth. Hence, in this process the sunlight which is supposed to reach the Earth unhindered, instead hits the Moon causing the Moon's shadow to fall on the Earth and hence, the solar eclipse occurs. It's important to know that a solar eclipse can only occur on a new moon night.
- Remember that the reason for both lunar eclipse and solar eclipse are opposite to each other. The lunar eclipse only occurs on Full moon day. The solar eclipse can only happen on a new moon day.

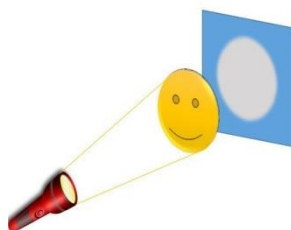
Introduction:

- Ask following questions to the students.
1. What is a shadow? (A shadow is a dark area where light from a light source is blocked by an opaque object).
 2. Have you observed the shadow of a tree? (Yes).



a.

3. How is a shadow produced? (When Sun's rays fall on an opaque object, they cannot pass through the object and a shadow is produced on the opposite side of light source).
4. Can you produce a shadow in the classroom? (Yes with torch and ball, we can produce a shadow on the wall).



Development:

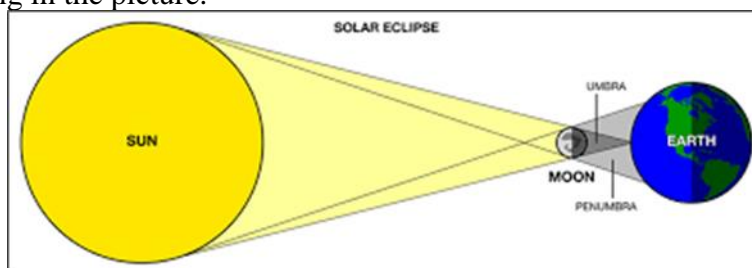
Activity1: Formation of shadow of tennis ball on football

The teacher will:

- Place a torch, a tennis ball and a football in one line on wooden blocks or on any other support.
- Light the torch and ask the students to observe the shadow of the tennis ball on the football and answer the following questions:
 1. Which side of the tennis ball is bright and which is dark?
 2. Can you see the shadow of tennis ball on football?
 3. Does the shadow fall only on some part of the football or completely covers the football?
 4. If we switch of the torch what will happen?
 5. How are shadows formed?
 6. What is an eclipse?
- Explain to the students that if something cannot appear or become invisible due to the shadow of another object, it is called an eclipse.
- Relate this activity with Solar Eclipse by considering torch as Sun, tennis ball as Moon and football as Earth.
- In Solar Eclipse the shadow of Moon falls on Earth, therefore, we cannot see the Sun. This disappearance of Sun is Eclipse of the Sun. In Latin language, 'sol' means Sun. That's why the hiding of Sun due to the shadow of Moon on Earth is called **Solar Eclipse**.

Activity 2: Discussion on the paragraph and picture of Solar Eclipse

- Ask the students to read and discuss about the content and observe the picture about Solar Eclipse and answer the following questions in their own words:
 1. Name three objects involved in Solar Eclipse?
 2. Which object will form the shadow?
 3. Which object is under shadow and which object will not be seen from Earth?
 4. Which object is eclipsed?
- Ask the students to observe the picture and explain in their own words what is happening in the picture.



Explain to them:

- An eclipse refers to an astronomical event when an astronomical object being viewed is temporarily over shadowed by another passing astronomical object such as a spacecraft or natural or manmade satellite. The shadow being cast on the astronomical object being viewed, maybe partial or complete; hence observing a partial eclipse or a full or complete eclipse.
- For the current case of solar eclipse, the astronomical objects being considered are the Earth, the Sun and the Moon.
- As we know the Earth revolves around the Sun, and the Moon in turn revolves around the Earth in an orbit as well. Similarly as in the Lunar eclipse process, during the revolutions of Earth around the Sun and the Moon around the Earth whenever the Sun, Moon and the Earth come in a straight line in the same order as mentioned, a Solar eclipse occurs.
- The process happens as the sunlight emerging from the Sun is blocked as the Moon orbiting the Earth obstructs the sunlight as it reaches the Earth. Hence, in this process the sunlight which is supposed to reach the Earth unhindered, instead hits the Moon causing the Moon's shadow to fall on Earth and hence, the solar eclipse occurs.
- It's important to know that a solar eclipse can only occur on a new moon night.

Conclusion/ Sum Up:

- Earth revolves around the Sun and the Moon revolves around the Earth in an orbit as well.
- During the revolutions of Earth around the Sun and the Moon around the Earth whenever the Sun, Moon and the Earth come in a straight line, a solar eclipse occurs.
- In this process, the sunlight emerging from the Sun is blocked as the Moon orbiting the Earth obstructs the sunlight as it reaches the Earth.
- The sunlight which is supposed to reach the Earth, hits the Moon causing the Moon's shadow to fall on Earth. It is called solar eclipse.
- The complete solar eclipse is very rare. Usually, we see partial solar eclipses. It is because the Moon is much smaller than Earth. Its shadow falls only on a small part of the Earth. Therefore, the solar eclipse can be seen only in some parts of the Earth.



Assessment:

- Ask the following questions.
 1. What is an eclipse?
 2. How the process of solar eclipse takes place?
 3. Why we see a partial solar eclipse?
 4. Differentiate between solar eclipse and lunar eclipse.
 5. Ask them to solve the given worksheet.

Worksheet: Solar Eclipse

Q1. Observe Figure 1 and colour Figure 2 accordingly.

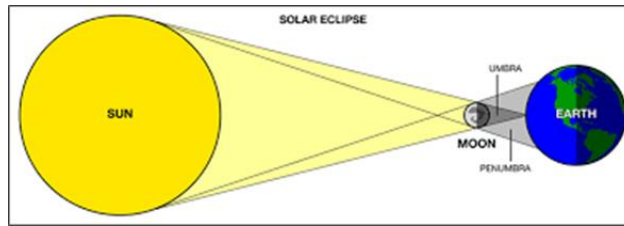


Figure 1

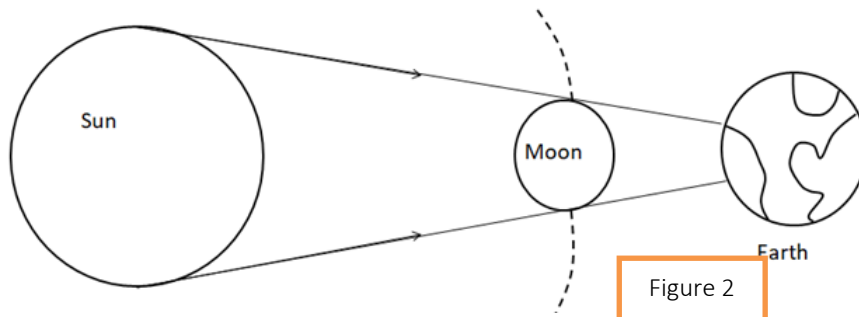
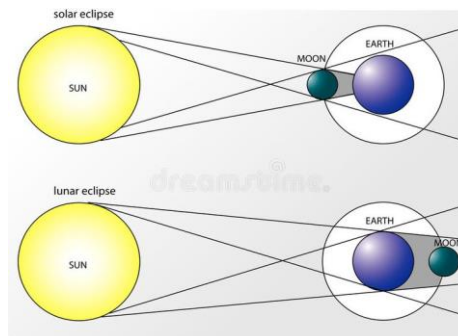


Figure 2

Q2. Observe the following pictures and write the differences in Solar Eclipse and Lunar Eclipse.



Sr.No.	Solar Eclipse	Lunar Eclipse
1		
2		
3		



Follow Up:

- Ask the students to solve these questions.
- Draw, label and colour the picture showing the solar eclipse.
- How will you compare this picture with lunar eclipse? Write 3 differences.

TECHNOLOGY IN EVERYDAY LIFE

Basic Craft Making

**Duration:** 40 Minutes**Students Learning Outcome:**

- Design paper bags, envelopes, cards and facemask.

**Materials:**

- Papers, cardboards, glue, stapler, punching machine

Information for Teachers:

- We are living in the information age.
- The paper is not only used for writing but also for making items i.e. paper bags, envelopes, cards and facemask.
- Unless we do some tasks with our own hands, we cannot understand its complexities.
- Students should practice folding, cutting, tearing and pasting to make various shapes using old newspapers.

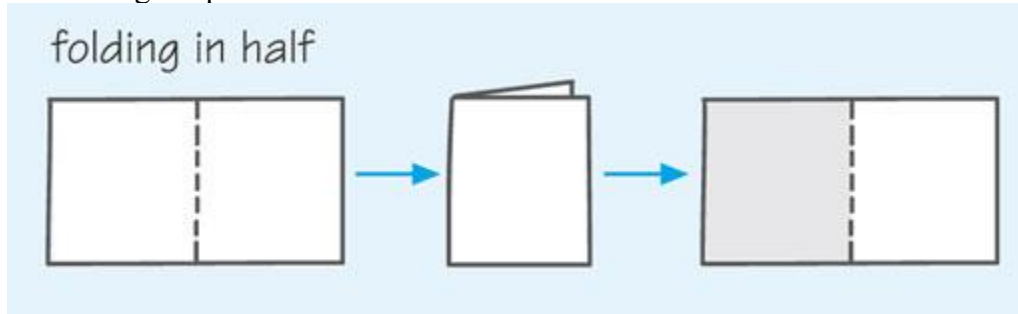
Introduction:

- Enter in the class with an enveloped letter or paper bag having geometry box in it.
- Greet the class and then ask them some questions related to their routine life e.g.
 - How you receive your bakery items?
 - When you purchase something, how you carry it from market to home?
 - How do you wish on birthdays or Eid to your friends?
 - Have you ever been surprised by your elder sister or friend or brother wearing Superman, Spiderman or a hawk's mask?
- Note student's responses on board and then introduce the topic "Today we are making paper bags, envelopes, cards and facemasks."
- Is it a skill or art?
- It has always been a necessity
- The paper is not only used for writing but for also making items like paper bags, envelopes, cards and facemasks etc.

Development:**Activity 1:**

- Ask the students to follow instructions.

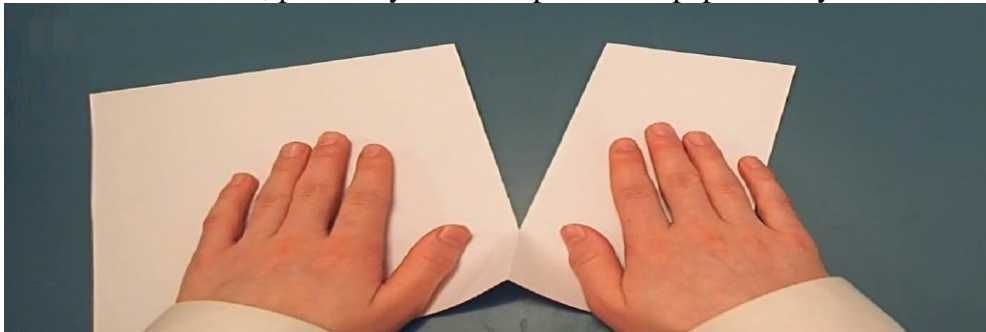
- Stretch a sheet of paper on a flat smooth surface preferably on a table top. Draw a line from where to fold the paper.
- Keep pressing one edge of the paper with one hand, turn the paper with your other hand to fold it along the line. To make a crease rub your finger over the fold or use a ruler's edge to press the fold.



https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.open.edu%2Fopenlearncreate%2Fmod%2Foucontent%2Fview.php%3Fid%3D608%26section%3D2.2&psig=AOvVaw2HWx5U024GucksqmSKqXo_&ust=1653974331155000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCOisj9u8hvgCFQAAAAdAAAAABAJ

Activity 2:

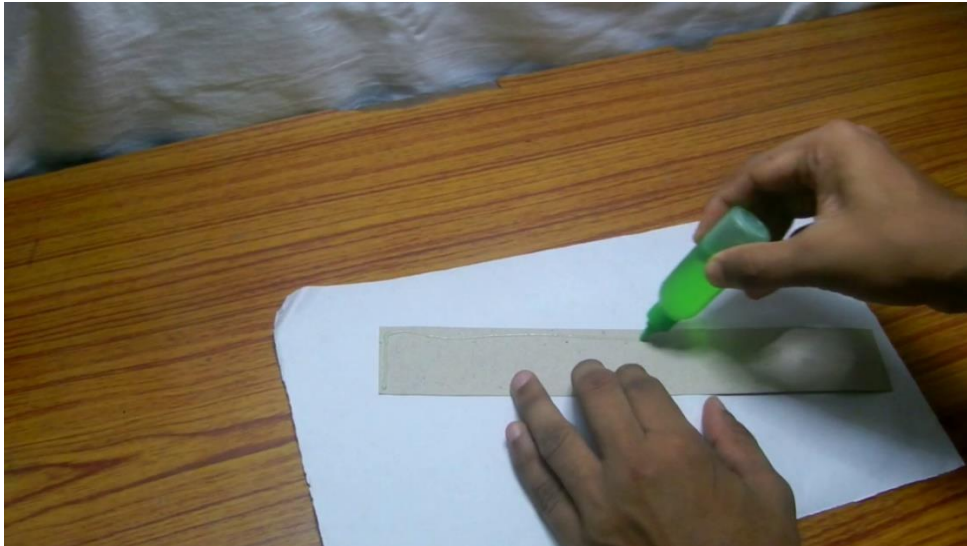
- Ask the students to follow instructions.
- If you want to tear apart a paper, first fold it and make a crease. Tear a little of it at the edge by pulling it apart on both sides with both hands.
- Then spread the paper on a flat surface. Keep on pressing the paper on one side of the crease with one hand, pull away the other part of the paper with your second hand.



<https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DkfSXFdfVunE&psig=AOvVaw137IJywSOQswYzoP33qMQJ&ust=1653974237830000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCIj7rbC8hvgCFQAAAAAdAAAAABAK>

Activity 3:

- Ask the students to follow instructions.
- Put the paper on a flat surface with its front sides facing downward. Then apply glue evenly all over the paper.
- Pick the paper up and place it carefully on the desired place keeping the glued side downward. Rub it with your finger to paste it evenly.



<https://www.google.com/url?sa=i&url=https%3A%2F%2Ffeltmagnet.com%2Fcrafts%2FDIY-crafts-how-to-make-a-paper-house-for-kids&psig=AOvVaw31Gxbb3gm2IrZuy4Qi2mT3&ust=1653974086544000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCNjcpvK7hvgCFQAAAAAdAAAAABAE>

Activity 4:

- Ask the students to follow instructions.
- You need a sheet of paper (A4 size) and glue. Overlap in the middle. Glue the edge to join them together.
- Fold a small part from the bottom inward as shown by the curved arrow.
- Pull apart both sides of the folded flap.
- Fold a little more than half of the lower flap. Repeat the same for the upper flap and paste over the lower flap by using the glue. Your paper bag is ready. You can open it from the top to put anything in it.
- You can attach two strips on both sides on top of the bag to hold it.

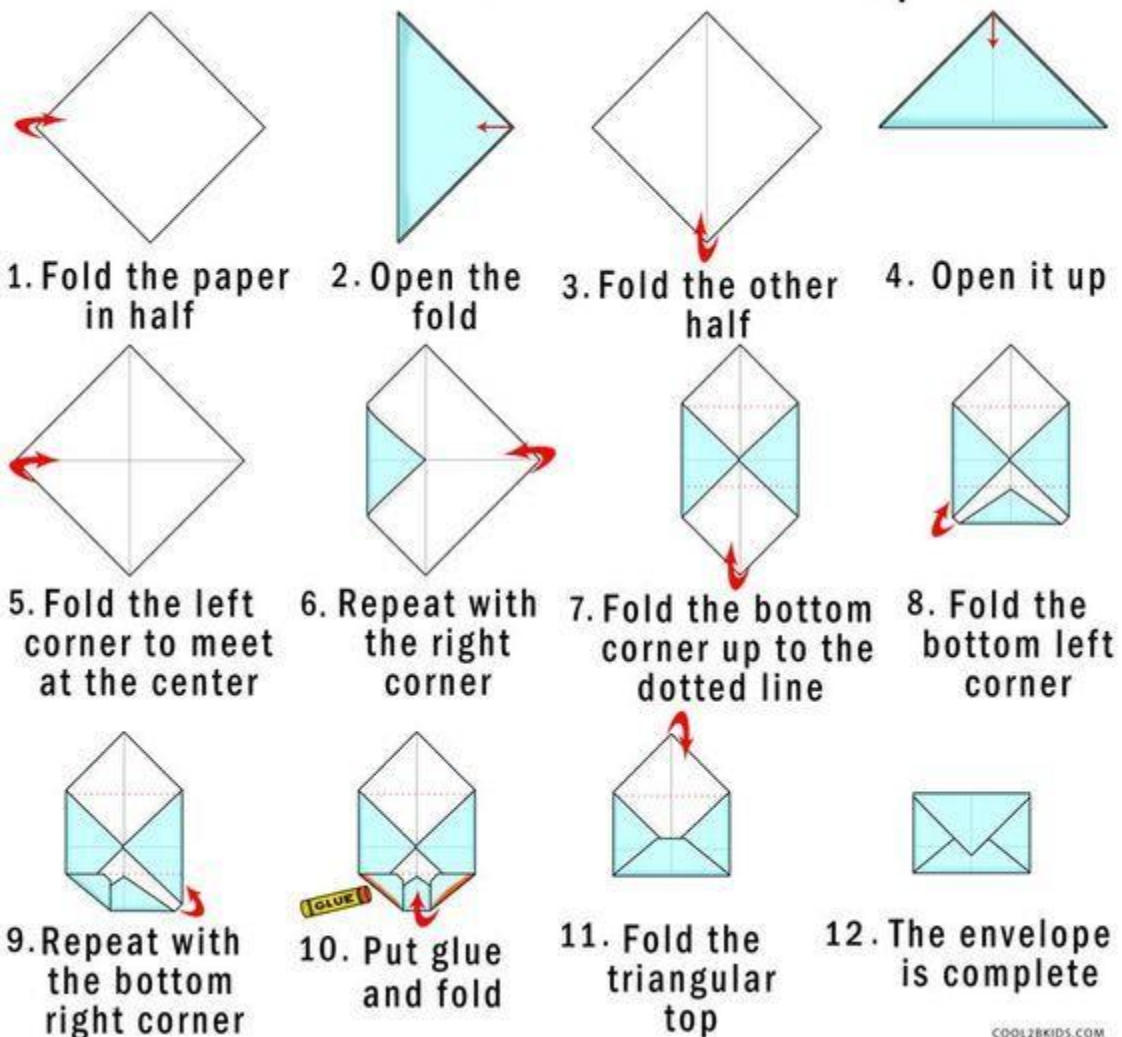


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Activity 5:

- Ask the students to follow instructions.
- Take a paper of square shape. Fold the paper vertically in half open this fold and fold it horizontally in half. Then open it. Place the paper on the table in such a way that the corners are on vertical and horizontal lines.
- Fold the left corner to meet at the center. Repeat with the right corner.
- Fold the bottom corner up a little above the center. Apply glue along its edges and fix it on the sides of the envelope.
- Similarly fold the top corner up to a little below the center. This becomes the flat top flap. This can be glued after putting a card or a letter in the envelope.

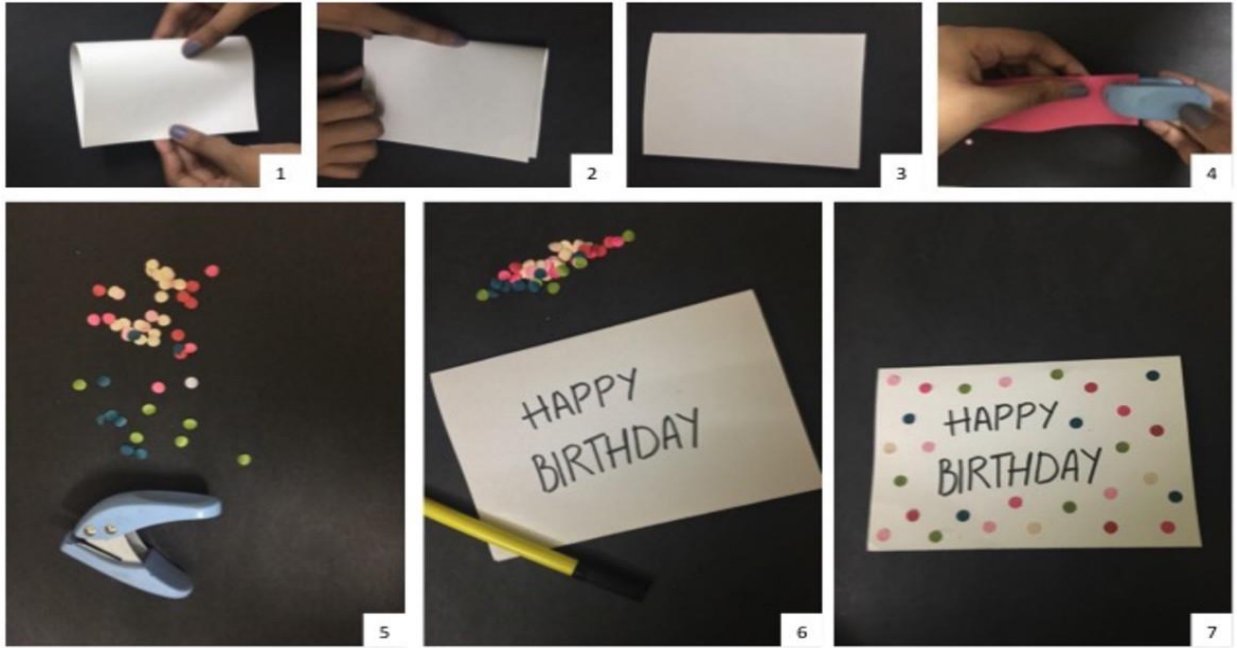
How to Make an Envelope



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Activity 6:

- Ask the students to follow following instructions.
- Cut a card to the size of your choice. Create or trace a design of balloons and ribbons on it with a pencil. Express your sentiments by writing “EID GREETINGS”.
- Fill color in it using markers.



<https://www.google.com/url?sa=i&url=https%3A%2F%2Fholidayparty.com%2Fgreeting-cards%2F3-Easy-Birthday-DIY-Greeting-Card-Ideas-5-Minute-DIY-Projects&psig=AOvVaw0ZPiq8ZpfwJt-o6rvWmoK&ust=1653973598578000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCLiwm4u6hvgCFQAAAAAdAAAAABAD>

Activity 7:

- Ask the students to:
- Make facemasks of various designs using cardboard or chart paper as instructed in diagrams.





https://www.google.com/search?q=how+to+make+mask++if+different+designs+with+paper+step+by+step&tbm=isch&ved=2ahUKEwje_P6KuIb4AhWwx4UKHR9GBdIQ2-

Conclusion:

In this session students have learnt paper art, techniques and technologies. (e.g. paper bags, envelopes, cards and facemasks.)

Assessment:

- Divide the class into three groups.
- Assign each group different tasks.
GROUP 1: Fold the paper
GROUP 2: Take measurement
GROUP 3: Cut the paper
- Ask questions to the students.
- Can an envelope be made with a square shaped paper?
- Why is a line drawn on a paper before cutting it with scissors?

Follow Up:

- Give tasks to the class in groups or individually.
- Make a Spiderman mask or any other mask of your choice.
- Make envelope for letter.
- Make a greeting card (i.e. birthday, 'Eid, Mother's Day, Father's Day, teacher's day, get well soon etc.)

TECHNOLOGY IN EVERYDAY LIFE
Model Making**Duration:** 40 Minutes**Students Learning Outcomes :**

- Design models of sphere, cube, prism, cylinder and cone with clay or play dough.

**Materials:**

- Clay, textbook of science grade 4

Information For Teacher:

- Model making of different things has always been a necessity.
- It can be done with paper, kneaded clay or playdough.
- It develops fine motor skills.

Introduction:

- Greet the class and tell them that today they are going to know about their childhood activities.
 - It will create lot of enthusiasm and curiosity that what they are going to do.
- Take some playdough and kneaded clay in the class.
- Tell the class that they are going to work with playdough and kneaded clay to make different shapes with it, such as sphere, cylinder, cube, cone, prism etc.

Development:**Activity 1:**

- Ask the students to make models of various shapes using clay instruct them as follow.
- Take some clay.
- Mix a little water in it and make a dough of clay.
- Stretch and compress it many times like a dough of flour which is made for chapatti/bread.
- This dough of clay is called kneaded clay which can be used for making clay models.



<https://theartofeducation.edu/2016/07/18/6-essential-tips-teaching-clay-art/>



<https://www.accessart.org.uk/how-to-clay-play/>



Conclusion:

- Making models with kneaded clay or playdough is a very important activity. It develops fine motor skills in the students.

Assessment:

- Divide class into four groups.
- Ask them to make shapes of sphere, cylinder, cube and cone.

Follow-Up:

- Ask the students to make a model house using these shapes.
Can you make any other shapes with kneaded clay? If yes, then make it.

TECHNOLOGY IN EVERYDAY LIFE

Use of Mobile Phone

**Duration:** 40 Minutes**Students Learning Outcome:**

- Operate tablets /mobile phones for the use of calculator, alarm clock and calendar.

**Materials:**

- Mobile phone

Information for Teachers:

- A mobile phone can perform a variety of tasks such as telling the time, keeping us organized and capturing previous moments. Mobile phones can also be used as a calculator, an alarm clock, a calendar and a camera.

Introduction:

- Ask following questions to the students.
- What are modern sources of communications?
- What are cell phones and photo phones?

Development:

- Share this information to the students.

Mobile phones are usually used for making calls. The smart phone has got many apps which are very helpful to us. For example, it can be used as a calculator, alarm clock, and calendar. Let us learn some uses of a mobile phone as calculator, alarm clock, and calendar.



Activity 1: As Calculator

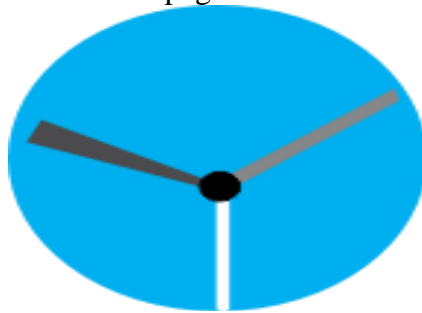
- Ask the students to follow instructions.
- Click the menu button on your mobile phone screen.
- Now click on the calculator icon.
- As you get a calculator on the screen, find out the answer for 129×27 . After that, solve it yourself.



- Ask the following questions.
- Is there any difference in the answers?
- Was the duration for solving yourself less or more than the calculator?

Activity 2: As Alarm Clock

- Ask the students to follow instructions.
- Click the icon on the mobile screen.
- Doing so will open a new alarm page.

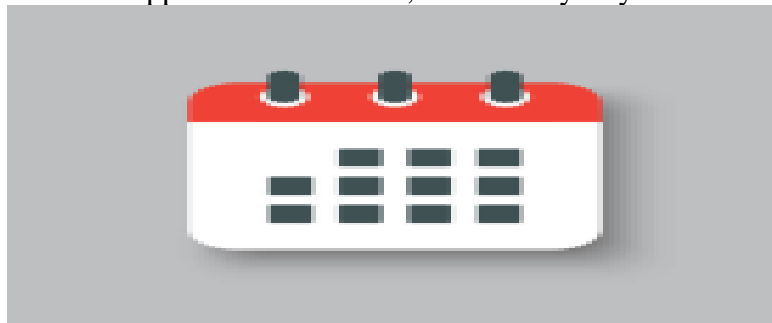


- Set the alarm time for 10 minutes after it and observe its working.
- Now ask them can you change the alarm tune? (Yes)

Use of Mobile Phones as a Calendar

Activity 3: As Calendar

- Ask the students to follow instructions.
- Tap the calendar icon.
- As the calendar appears on the screen, find the day of you birth.



- Now ask them, does this calendar indicate the important days of the year? (Yes)



Conclusion:

Mobile phone is basically used for making calls. Mobile phone is also used to take pictures. We can use mobile phone as a calculator, an alarm clock and a calendar.

Assessment:

- Ask these questions to them:
 1. Why is the mobile phone technology progressing rapidly?
 2. What will the mobile phones of the future look like?

Follow Up:

Make a model of the mobile phone you own using with kneaded clay.

TECHNOLOGY IN EVERYDAY LIFE

First Aid Box

**Duration:** 40 Minutes**Students Learning Outcome:**

- Recognize the items of a first aid box.

**Materials:**

- First aid box including items (handbook, tweezers and scissors, cotton and alcohol, bandages, gauzes, medical tape, medicines (Disprin, Panadol, Brufen, Stemitil etc.) and creams (Polyfax, Quench, Mycitracin etc.), instant cold pack, thermometer (Clinical and Digital)
- Teacher can make Flashcards of the items.

During teaching, also consult the textbook as and when required.

Information for Teachers:

Accidents are mishaps which can happen anywhere and at any time. They can be avoided by taking preventive/safety measures like:

- We should not play with electric appliances or wires.
- We should not fly kites from the roof tops.
- We should avoid playing with fire.
- We should not play near construction sites.
- We should always follow traffic rules.

Aid means 'help', to provide immediate relief or help to the victim.

Victim: A person who is injured or harmed as a result of crime or accident.

Dressing of wound: a piece of material used to cover and protect a wound.

Shelf life is the length of time that a commodity may be stored without becoming unfit for use, consumption, or sale.

MFG date: Manufacturing Date – It's the date when the product was manufactured.

EXP date: An expiration date is **the last day that a consumable product such as food or medicine will be at its best quality**, according to the manufacturer. This can also be mentioned as B.B. (best before)



Introduction:

1. Recall students' previous knowledge about first aid and safety measures for accidents.
2. Ask the students to think what will they do if someone gets a paper cut and is bleeding. (Use a first aid bandage)
3. Ask the students to briefly list the preventive measures (SOPs) for COVID-19.(Face masks, social distance, sanitizers, handwash etc.)
4. Ask the students, how many of them have First Aid boxes at home?

Development:

Activity 1:

1. Show a First Aid box or the picture to the students.

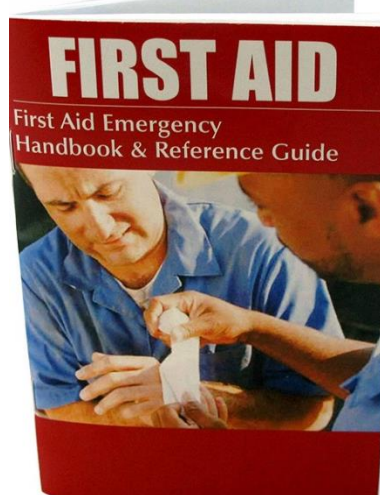


2. Explain, with the help of textbook that:
 - What is first aid and its purpose?
 - What is a First Aid box?
3. Tell the students that a first aid box can be kept at all places like home, school, office or any work place.

Activity 2:

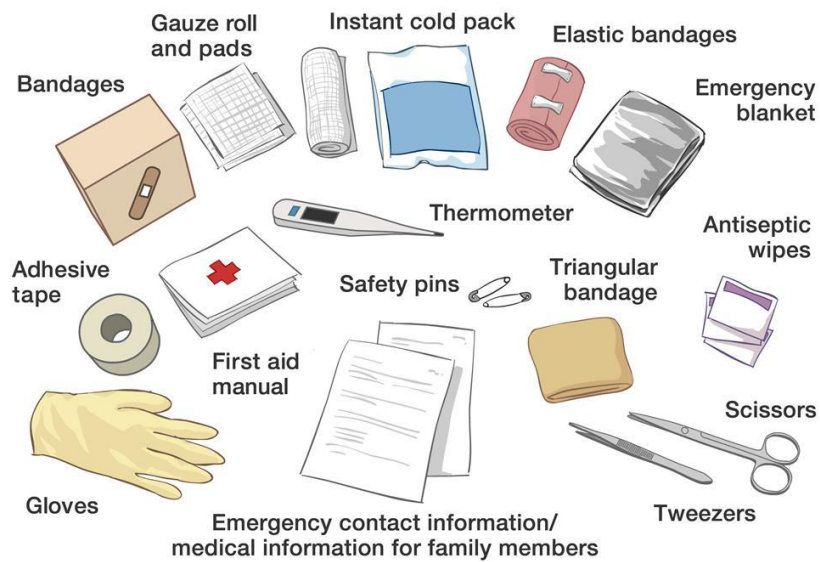
1. Show a first aid box handbook to the students that mostly comes with the box.
2. Tell the students that this handbook contains the information regarding the usage of items in the first aid box.

For Example: Measuring temperature or dressing of wounds.



Activity 3:

1. Show flashcards or pictures of the items of the first aid box from the textbook to the students.






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2. Tell the students, the first aid box items can vary according to the situations.
3. Display the items or pictures one by one and tell them their usage.

Tip: Teacher can draw a table on the board and make columns. He/ she can paste the pictures of items in the table and then tell their usage.

(Table 1.1)

Sr.	Item	Name	Usage
1		Tweezers and Scissors	A tweezer is used to pick glass pieces, thorns and bits from the wound. The scissors is used to cut the bandages.

2		Alcohol	Alcohol is used to clean the wound before bandaging. (Dressing)
3		Bandages	Sticky tapes on bandages are used for small wounds like paper cut, bruise from the road.
4		Thermometer	Thermometer is used to measure the temperature.

4. Inform the students about all the items mentioned in the textbook.
5. Tell the students about the shelf life of medicines or other items in the first aid box.
6. Show them by describing manufacturing and expiration dates that are mentioned on the creams or medicines.
7. First Aid boxes can be bought from pharmacies or medical stores and can be made on our own by keeping required items at one place.

Conclusion / Sum Up:

- First Aid is a temporary and emergency care or help that is given to a sick or injured person.
- Different items in the First Aid box help us to provide instant aid.

Assessment:

Test 1: To assess the understanding of students, ask the following questions:

- Define First Aid?
- To whom first aid can be given?
- What is First Aid Handbook?

Test 2:

- Reproduce the Table 1.1 from the above-mentioned activity 3, erase the details except the pictures.
- Ask the students to write the names and usage of the first aid items on the board.

Test 3:

- Divide the students into groups and place different first aid items/ pictures along with other general items like books, erasers, pencils, pins, caps etc. in front of them.
- Ask every group to identify the first aid items and name them correctly.

Follow Up:

1. Ask the students to think of a situation, if your fellow fell from the swing. What will be the first thing you can do to help him/ her?
2. Ask them to make a list of some useful medicines and other things that can be helpful to give first aid in a road accident.



TECHNOLOGY IN EVERYDAY LIFE**Thermometer****Duration:** 40 Minutes**Students Learning Outcome:**

- Use digital and clinical thermometer externally to measure body temperature.

**Materials:**

First aid box including instant cold pack, thermometer (clinical and digital), thermal strip, cotton and alcohol, disinfecting swab

- Teacher can make flashcards of the items.



During teaching, also consult the textbook as and when required.

Information for Teachers:

Temperature: The physical quantity that expresses the measure of coldness or hotness of a body.

ThermalStrip: A strips determine the surface **temperature** of the measured object or body.

Clinical Thermometer: A medical thermometer is used for measuring human or animal body temperature.

Digital Thermometer: They are temperature-sensing instruments that are easily portable and have a convenient digital display.

Bulb: It is thin part of the thermometer which is made of glass and absorbs heat from the sample being measured. (Usually indicated in red color)

Fever: A fever is a temporary rise in body temperature.

Sterilization: A process of complete elimination or destruction of all forms of microbial life.

Normal Body Temperature: Body temperature indicates whether a person has fever or not. Normal body temperature is measured as 98.6° Fahrenheit or 37° Celsius.

Fahrenheit Scale: The Fahrenheit scale is a temperature scale based on one proposed in 1724 by the physicist Daniel Gabriel Fahrenheit. The scale is based on 32° for the freezing point of water and 212° for the boiling point of water.

Celsius Scale: Celsius, also called centigrade, scale based on 0° for the freezing point of water and 100° for the boiling point of water. Invented in 1742 by the Swedish astronomer Anders Celsius, it is sometimes called the centigrade scale because of the 100-degree interval between the defined points.

Introduction:

1. Recall students' previous knowledge about the temperature of a body or fever.
2. Ask the students to think what will they use to measure the temperature of a body.

Development:

Activity 1:

4. Show all three types of thermometers to the students from the First Aid box or the pictures.
5. Explain, with the help of textbook that thermometers and thermal strips are used to measure the body temperature.



Activity 2:

1. Call a student in front of the class.
2. Take a thermal strip from the first aid box and place it on his/ her forehead.
3. Keep the strip pressed for 1 minute.
4. Read the temperature shown on the scale.



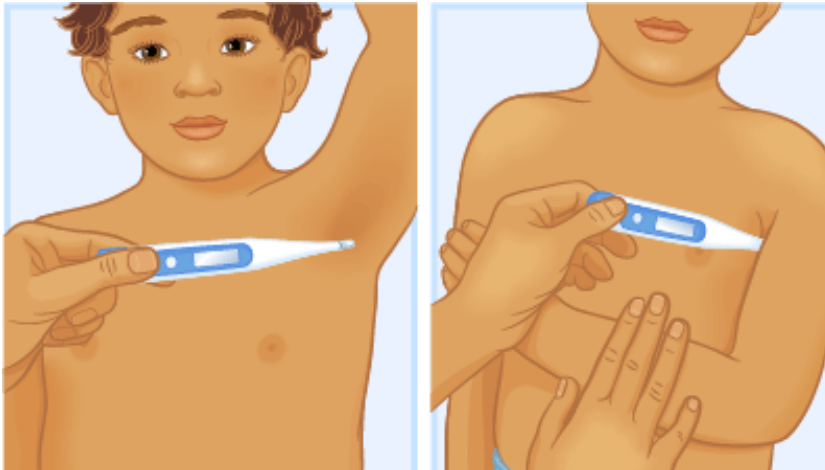
5. Information them that mostly this method is used for infants

Activity 3:

1. Take the clinical thermometer from the first aid box. Ensure its bulb is sterilized.
2. Tell the students about the process of sterilization.
3. Take the cotton ball and alcohol from the first aid box and dip the cotton ball in alcohol.
4. Wipe down the thermometer and clean it with disinfecting swab. (At home, thermometer can be cleaned under running water and then rubbed by the sanitizer.)



5. Give few jerks to the thermometer to bring mercury or alcohol level down into the bulb.
6. Call a student in front of the class.



7. Put the bulb of thermometer under the armpit of a student and wait for 1 minute.
8. Remove the thermometer and read the temperature on its scale.
9. Show it to other students for their better understanding.
10. Add 1 in this reading to get the correct internal temperature of the body.

A doctor can measure body temperature by putting a thermometer under the tongue.



Activity 4:

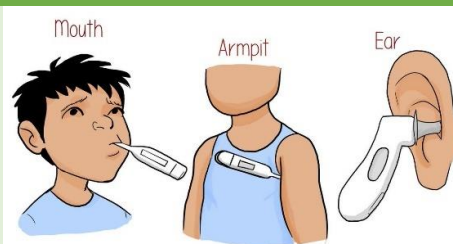
1. Take the Digital thermometer from the first aid box.
2. Call a pair of students in front of the class.
3. Ask one of them to sterilize the bulb of the thermometer.
4. Tell the students that there is no need to give jerks to a digital thermometer.
5. Instruct the student to put the thermometer under the armpit of the other student.
6. Ask him to note the time till 1 minute or till hear the BEEP.
7. Then ask him to read the temperature on the digital thermometer.
8. Digital thermometer is easier to use as the temperature is clearly displayed on it.

**Conclusion/Sum Up:**

1. A thermometer is used to measure the temperature of a body.
2. The rise in normal temperature of the body is called fever. Temperature of the body can be measured by:
 - Clinical Thermometer
 - Digital Thermometer
 - Thermal Strips
3. It is important to sterilize the equipment before use.

**Interesting Information for Students**

Temperature can be measured through different parts of the body.



During COVID-19 pandemic, Thermal guns were used to assess the body temperature.

They have digital display and are used in places where large number of people can gather like banks, shopping malls and restaurants etc.





Assessment:

Test 1:

To evaluate the students, ask the following questions:

1. Define temperature?
2. What is normal body temperature in degree Centigrade and degree Fahrenheit?
3. How can we sterilize the thermometer?
4. Why is a clinical thermometer given jerks a few times before using it?

Test 2:

1. Ask the students to stand in a circle. Label them 1,2 3 and so on.
2. Give a thermometer to student No. 1 and ask him/ her to note the temperature of Student No. 2.
3. Ask student No.1 to write observations for presentation afterwards.
4. Repeat the activity for every student to assess his/ her understanding.
5. Ask the students to present their observations after the practical/ activity.

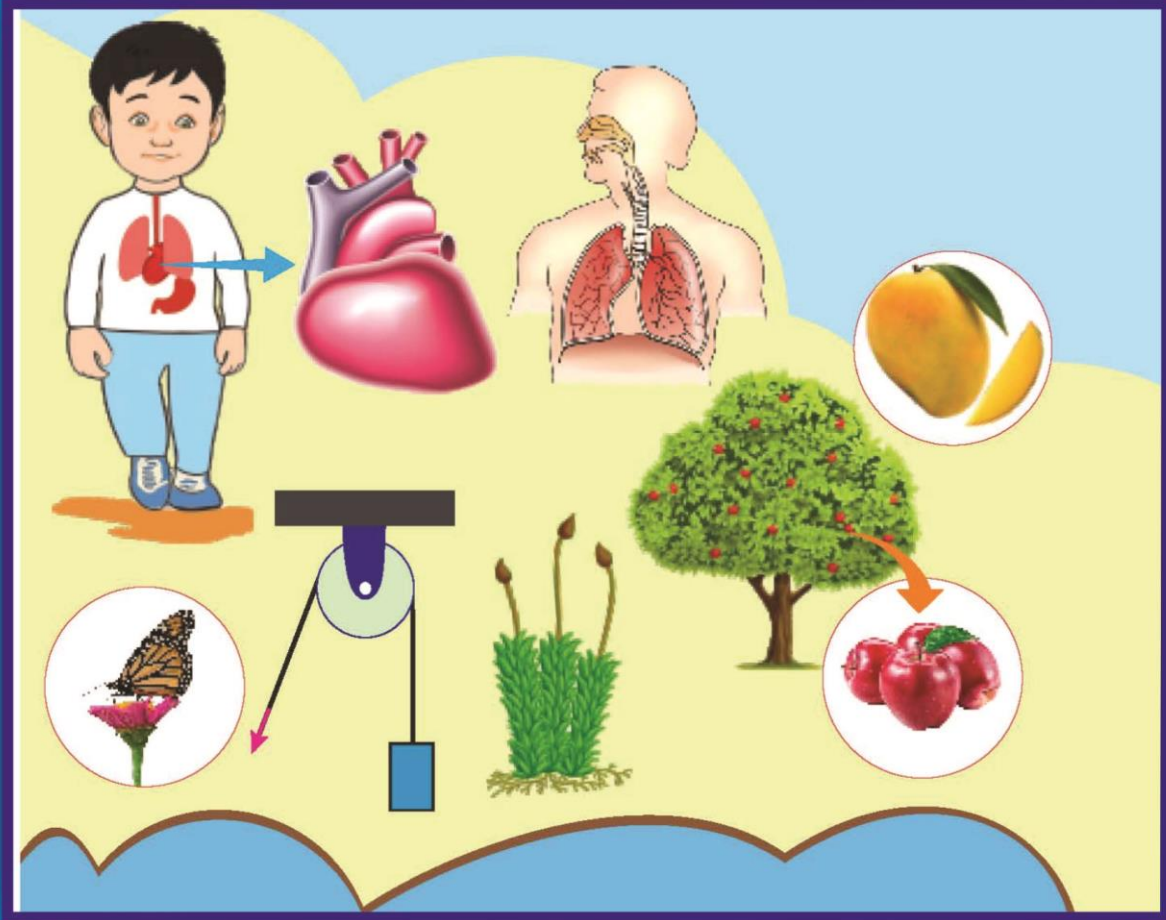
Follow Up:

1. Ask the students to draw a table on their notebooks and write three differences between clinical and digital thermometers.
2. Draw diagrams of thermal strip, clinical and digital thermometers.

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Science Teachers' Guide Lesson Plans



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