nexrise

Next Level Learning

Teacher Resource Pack

Science

Class 5

UNIT - I LESSON - 1

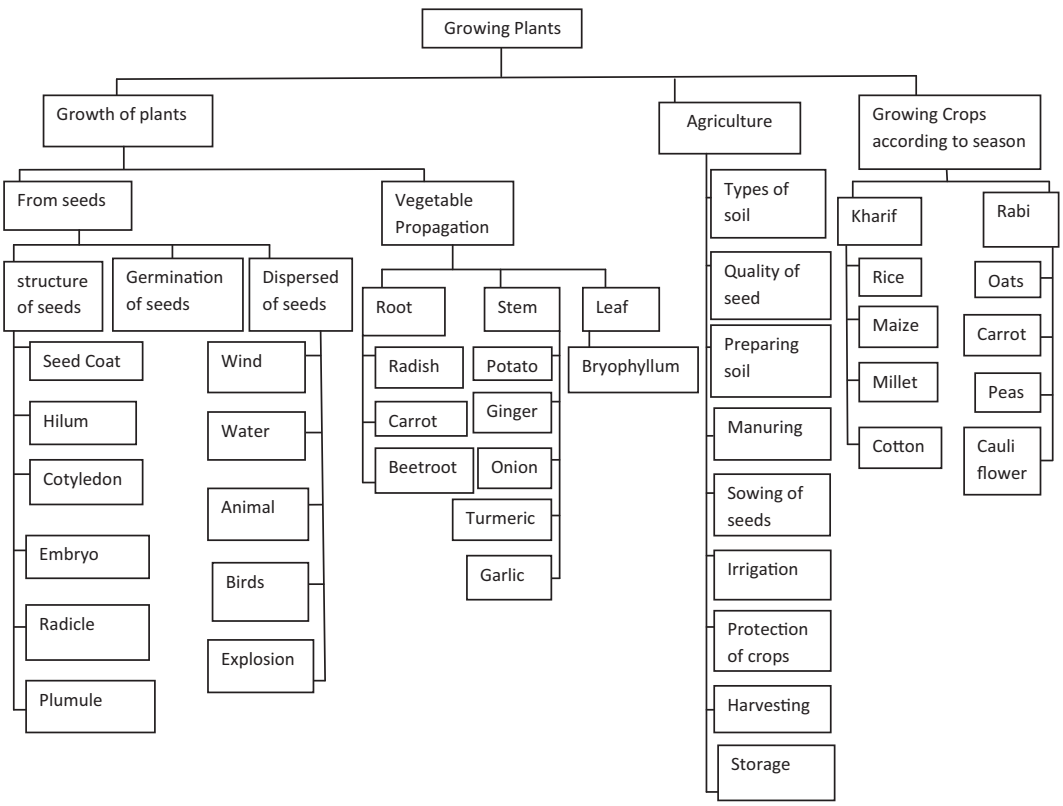
Growing plants

No. of Periods: 5 or 7

Objectives

- To understand the growth of new plants from seeds.
- To identify and list out parts that make up the structure of the seed.
- To understand the different stages of germination in a seed.
- To know the different ways of seed dispersal.
- To know the different methods of vegetative propagation.
- To understand and describe the various stages involved in agriculture.

Lesson at a glance:



In brief

- The growth of a new plant from seeds.
- The structure of a seed.
- Germination of seeds into a new plant.
- The different ways in which seeds are dispersed.
- Reproduction of plants by vegetative propagation.
- The different stages of agriculture.
- Type of soil and climate playing a key role in growing of crops.

Pre-requisite skills

1. Why are plants and trees important for us?
2. How does a new plant grow?
3. What does a plant need to grow?
4. How do we depend on plants for all our needs?
5. Which part of the plant is food for us?
6. How are animals and plants inter dependent?

Motivation

Let Us Begin

Plants give us: fruits, nuts, wood for construction of a house, wood for making furniture, fibre for making clothes. To begin with the teacher can write the poem on the black board and ask the students to give it a tune. They can all sing together.

Life of a plant

A plant will grow from a tiny seed.

Some water and sun is all you need.

First the roots grow underground.

They suck up minerals from all around.

Then come the stem, some tall, some stout.

And next the branches spread about.

Leaves grow in all shapes and sizes,

Watch this new life as it rises,

Flowers bloom from buds on stems,

They are as pretty as precious gems.

Some plants give us juicy fruit,

Some have vegetables at the root,

New seeds travel to and fro,

By wind and water on they go.

And the cycle keeps on going,

Soon new stems and leaves are showing.

Questions to be asked while teaching.

Name the following (structure of a seed).

1. The covering of the seed - seed coat.
2. The small pore on the seed coat - hilum.
3. The part inside the seed to store food for the baby plant - cotyledon.
4. It develops into root - radicle.
5. It develops into shoot - plumule.
6. What are the two types of cotyledon? Explain with suitable examples.
7. What is germination?
8. What are the conditions required for the germination of seeds?
9. What is dispersal of seed?
10. What are the different ways in which seeds are dispersed?
11. How does wind act as an agent of dispersal? Give examples of such seeds?
12. Water is an agent of dispersal. Explain with examples.
13. Explain how animals and birds help in dispersal of seeds.
14. Which are the seeds that are dispersed by explosion of seeds?
15. What is vegetative propagation?
16. By vegetative propagation how are plants grown from the following parts of a plant? Give suitable examples.
    - from roots
    - from stem
    - from leaves
17. What is grafting? What is a hybrid plant?
18. What is agriculture?
19. What are the agricultural practices that the farmer follows to get a good harvest of crops?
20. What are kharif crops? Give examples.
21. When are Rabi crops grown? Give examples.

Vocabulary

seed coat, radical, plumule, hilum, cotyledon, dispersion, vegetative propogation, hybrid,

grafting, kharif crop, Rabi crop.

New concepts

- Germination of seeds.
- Dispersal of seeds.
- Structure of a seed.
- Grafting.
- Kharif and Rabi crops.

Assessment

The teacher can ask the students to do the following activity and bring it after a week.

Materials required

- An empty jam bottle.
- A big blotting paper.
- Some kabuli chana soaked in water.
- Garden soil.

Procedure

Take an empty jam bottle. Remove the label on it and clean it thoroughly. Put a sheet of blotting paper along the inner wall of the jam bottle. Take some soaked kabuli chana and place them (about 5 - 6 seeds) between the inner side of the jam bottle and the blotting paper and add the garden soil into the bottle. Now space out the seeds so that they are a distance away from each other and around the bottle. Now you can view the seeds. Add sufficient water to the soil and leave it aside. As the plants grow the plumule, radicle and then the seedling - you will be able to see it.

This way the students clearly understand germination of seeds.

1. Why do we grow hybrid plants?

   Ans: Hybrids are plants that are got by the cross breeding of two different varieties of the same species. The hybrids have the good traits of both the parent plants. They result in higher yield and stronger plants. They show higher yield of fruits and vegetables. They have a strong resistance to disease than the parent plant.

2. Why is dispersal of seeds necessary?

   Ans: This is important because if the seeds are not dispersed, many germinating seedlings will grow very close to the parent plant. This results in competition between every one of the seedlings as well as with the parent plant. They compete for light, space, water and nutrients.

   Activities 1,2 & 3 can be done in the class so that all the students are able to view them.

Answer key:

What I know

A.	B.	C.
1. radicle	1. T	1. leaves
2. stem	2. T	2. seed coat
3. peas	3. T	3. wheat
4. manure	4. F	4. hilum
5. cotyledons	5. F	5. air, water and warmth

What I Understand

A.

1. Fruits of balsam plants burst open when ripe. The force of explosion scatters the seeds. When the seeds get favourable conditions they grow into new plants.
2. Seed drill.
3. Agriculture.
4. The plant that results from the grafting of two varieties of plants is called hybrid.
5. We can protect plants from pest by using pesticide.

B.

1. It is the process by which seeds grow into a new plant. Air, water and warmth are required for germination of the seeds.
2. The process in which parts of plants other than seed is used for growing a new plant is called vegetative reproduction.
3. Dispersal is the process by which seeds are scattered far away from the mother plant by different agents. Example: wind and water.
4. Insects and rats are some of the pests that attack crops. Pesticides and insecticides in right quantity are used to protect plants from pests.
5. According to the seasons crops are classified as Kharif crops and Rabi crops.

   Rice, maize, millet that grow from June to October are called Kharif crops. Crops like wheat, mustard, gram oats that grow in the winter months of November to April are Rabi crops.

Challenger

Organic farming is a method of crop production that involves choosing not to use pesticides, fertilizers, genetically modified organisms, antibiotics and growth hormones. Organic food is often fresher because it doesn't contain preservatives that make it last

longer. Organic farming is better for the environment. Organic food may have higher nutritional value than conventional food. The reason: In the absence of pesticides and fertilizers, plants boost their production of vitamins and antioxidants that strengthens their resistance to bugs and weeds.

I can explore

A. Pesticides impact the environment. Pesticides can contaminate soil, water, turf and other vegetation. In addition to killing insects and weeds, pesticides can be toxic to a host of other organisms including birds, fish, beneficial insects and plants.

Values for me

1. You can preserve your clothes and make them smell good by using neem leaves as these protect your clothes from deterioration and make them last long.

2 Neem leaves have antipest and antifungal properties.

3. Naphthalane balls are commonly used in homes. But the strong odour of these on the clothes is a disadvantage. They also bring about a deterioration with respect to to the metallic work done on clothes. Hence, neem leaves are used instead of chemicals.

UNIT - II LESSON - 2

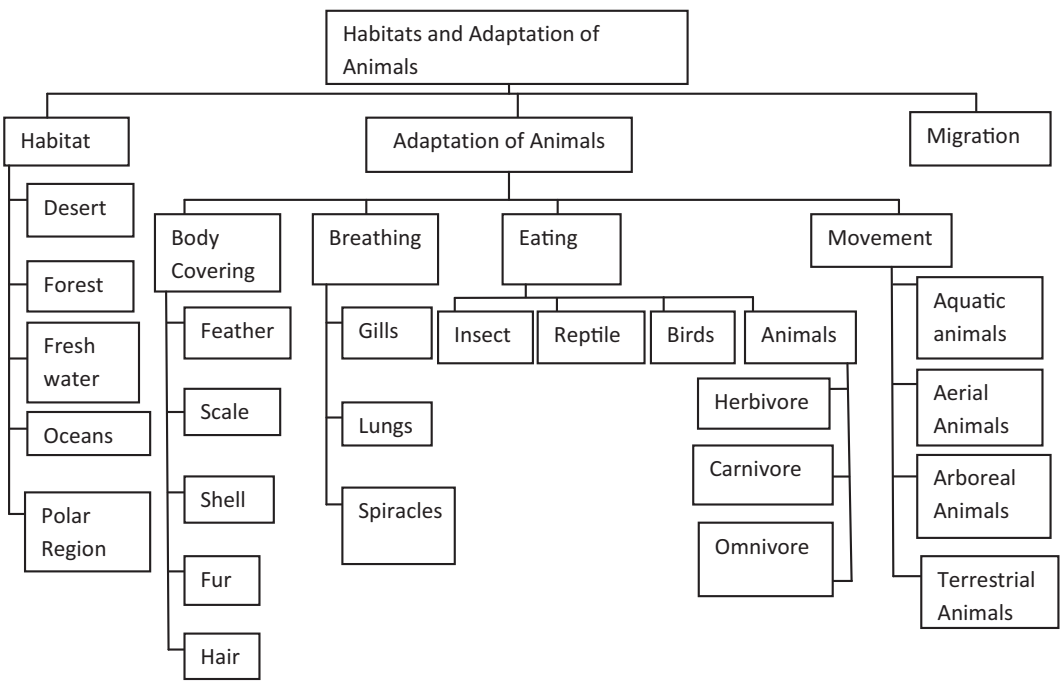
Habitats and Adaptations of Animals

No. of Periods: 5 or 7

Objectives

- To understand the adaptations made by animals according to their habitats.
- To know the different adaptations that animals exhibit.
- To list out the adaptation in the different body coverings and to understand these adaptations.
- To know the different breathing organs in animals and describe how these organs show adaptations.
- To know the different eating habits in animals and describe the modifications the animals have made.
- To understand the movements of aquatic, aerial, arboreal and terrestrial animals.
- To know about the migration of different animals and birds.

Lesson at a glance:



In brief

- The different habitats of animals and the adaptation the animals have made to suit the habitats.
- Adaptation, animals and birds have made in their body covering.
- The variation in breathing organs of different animals.
- Adaptation made by animals to suit their eating habits.
- Adaptation, animals and birds have made to help in their movement.
- Migration of birds and animals.

Pre-requisite skills

1. Are animals and birds found in all parts of the world?
2. List the animals that are found in the different geographical regions of the world like the hilly regions, plains, deserts, snow capped mountains, rivers and oceans and forests.
3. How do fish breathe?
4. How do human beings breathe?
5. Can you describe the beaks of different birds?
6. What are carnivores, herbivores and omnivores?
7. How do birds move from one place to another?
8. Have you seen a monkey jumping from one tree to another?
9. How do you all, use your fingers and limbs?
10. During the winter season have you seen a wide variety of birds flying in the air? Where were these before?

Motivation

The answers to 'Let Us Begin".

fresh water forest meadow polar region desert

The teacher can play a guessing game

Who am I?

1. I live in a desert. I have a hump on my back - camel.
2. I have soft body which is protected by my hard shell I live for many years - tortoise.
3. I have colourful wings. I suck nectar from flowers - butterfly.
4. I have gill to breathe and scales on my body - fish.
5. I am a carnivorous bird. I make my nest on the top of tall trees - vulture.
6. I have chisel like beak. I make my nest in tree trunks - kingfisher.

7. I have white fur on my body. I live in ice cold regions - polar bear.
8. I am a flightless bird. I lay the largest egg - ostrich.
9. I have eight legs. I creep and crawl on the walls. I weave a web - spider.
10. I have a pouch to keep my baby. I hop with my strong hind limbs - kangaroo.

Question asked while teaching.

1. What is habitat? What does the habitat provide for the animals?
2. Name some habitats.
3. Describe a desert.
4. What are the animals found in a desert?
5. How is camel adapted to live in a desert?
6. How is it possible for a rattle snake to move on the hot sand of a desert?
7. How has the desert lizard adapted itself to live in a desert?
8. What protects the squirrel from the sun's heat?
9. Describe a forest.
10. Name the carnivores and herbivores found in the forests.
11. What are the other animals that are found in the forests?
12. What are the special adaptations all the animals of the forest have?
13. Name some fresh water habitats.
14. What are the animals and birds that are found here?
15. What kind of feet do the frogs and water birds have?
16. Describe the ocean habitat. Name some oceans.
17. List out the animals that live here.
18. Which are the polar regions? Describe them.
19. Name the animals of the polar region adapted to this region.
20. How have the animals of the polar region adapted to this region?
21. What is the need for animals to make adaptations?
22. What are the different adaptations undertaken by animals?
23. What are the different body coverings that animals have to help them survive in their habitat?
24. What are the different types of feathers that birds have?
25. How do scales protect some of the animals?
26. What are the animals that have shells? How do these shells protect these animals?
27. What are mammals?
28. Describe the adaptation made by the animals found in cold countries.
29. What are the different respiratory organs seen in animals?
30. Describe the gills that fish have. How does it help in exchange of gases?

31. What are spiracles?
32. Give an account of the respiratory organs of human beings.
33. What is haemoglobin?
34. How do dolphins and whales breathe?
35. How do insects take in their food?
36. How do reptiles consume their food?
37. How are the beaks of the following birds modified according to their food habits?
    a. Eagles & kites b. sparrows c. kingfisher d. woodpecker e. humming bird
38. What are the 3 classifications of animals according to the food they eat?
39. How are the teeth of herbivores modified to suit their food habits?
40. What are the modifications in the teeth of carnivores to suit their eating habits?
41. Give an account of carnivores.
42. How do fish move in water?
43. What do turtles, whales, seals and dolphins have for swimming?
44. What is the butterfly's wing made up of?
45. Describe the adaptations in the bird's body for its movement.
46. Name some birds in flight.
47. Name some arboreal animals. How do they move about on trees?
48. Name some terrestrial insects and how do they move on land?
49. How do reptiles move?
50. Which animal uses only its hind limb?
51. Explain the movement of some terrestrial animals.
52. Describe the arms and legs of a human being.
53. What is migration?
54. Why do salmons and whales migrate?
55. Why are Locusts harmful?
56. Name the birds that migrate to India.
57. Which is the longest migrating bird?
58. Salmon and eel migrate. Why?
59. Name the butterfly that migrates. Why?
60. What is moulting?

New words

adaptations proboscis migration chitin haemoglobin

New concepts

- Body cover as adaptation in animals and birds.
- Migratory animals and birds.

Assessment

To assess the understanding of the children the following column can be given.

1. seal, walrus arctic fox	a. shell	7
2. fish, crocodile, lizard	b. proboscis	5
3. rat, squirrel	c. chitin	8
4. grasshopper	d. polar region	1
5. butterfly, bee	e. scale	2
6. man, crow, bear	f. arboreal	10
7. snail, crab, lobster, oyster	g. gnawing	3
8. mosquito and flies	h. walking on hind limb	11
9. dolphin, whale	i. migratory birds	12
10. monkey, squirrel, sloth bear	j. omnivores	6
11. gorilla, chimpanzee	k. spiracles	4
12. Siberian crane, Flamingo, Brahminy duck	l. lungs	9

What is the colour of insects' blood?

Ans: Insects' blood is colourless. Insects do not have red blood because they do not use haemoglobin to carry oxygen. They do not carry oxygen in their blood stream either.

Answer key:

What I Know

A.

1. spiracles
2. ostrich
3. crow
4. gills
5. flippers

B.

1. migration
2. carnivores
3. habitat
4. camouflage
5. camel

What I Understand

A.

1. Proboscis.
2. Fur of the body of the animal protects the being from extreme cold.
3. Most of the aquatic animals breathe through gills.

4. Birds migrate in search of food and shelter.
5. Arboreal animals are those that live on the trees.

B.

1. Haemoglobin is the red pigment found in the blood. It carries oxygen and gives blood its red colour.
2. Shell is the hard outer covering that protects the animal from its predators. Example: shells of the tortoise and snail.
3. Polar bear has thick fur which helps it survive the cold climate by keeping the body warm.
4. Snakes do not have limbs, they crawl and slither using scales present on the lower side of their bodies.
5. Animals in the polar region survive with the help of thick fur covering the body.

Challenger

Opposable - means capable of being placed opposite to something else, Capable of being placed against one or more of the remaining fingers of a human hand.

The thumb is called opposable because the thumb can be moved around to touch the other fingers, which gives people the ability to grasp things. Without the thumb we cannot get a grip of anything; we can't hold things and writing would become next to impossible.

I can explore

Toads sea horse stick insect snow leopard hedge hog Mediterranean octopus owl dead leaf butterfly chameleons common baron caterpillar

Values for me

It is indeed cruel to make animals perform in circuses. Animals in circuses are kept in captivity and used against their will for human entertainment. Here the animals are exploited. They are typically meant to live in the wild. Being trained to do tricks for other people's entertainment is a form of slavery.

Life skills

1. ✓ 2. × 3. × 4. ✓

Get creative

1. Bandipur Reserve - Karnataka
2. Corbett - Uttarakhand
3. Kanha - Madhya pradesh
4. Manas - Assam
5. Melghat - Maharashtra

6. Ranthambore - Rajasthan
7. Sunderban - West Bengal
8. Periyar - Kerala
9. Kalakad Mundanthurai - Tamil Nadu
10. Mudumalai - Tamil Nadu

There are 50 Tiger Reserves in India.

Habitat - Tigers occupy a variety of habitats from tropical forests, evergreen forests, woodlands and mangrove swamps to grasslands, savannah and rocky country. They are mostly nocturnal (more active at night) and are ambush predators that rely on the camouflage that their stripes provide.

Tigers eat a variety of prey - moose, deer species, pigs, cows, horses, buffalo and goats, wild bear, antelopes, elephant calf.

UNIT - III LESSON - 3

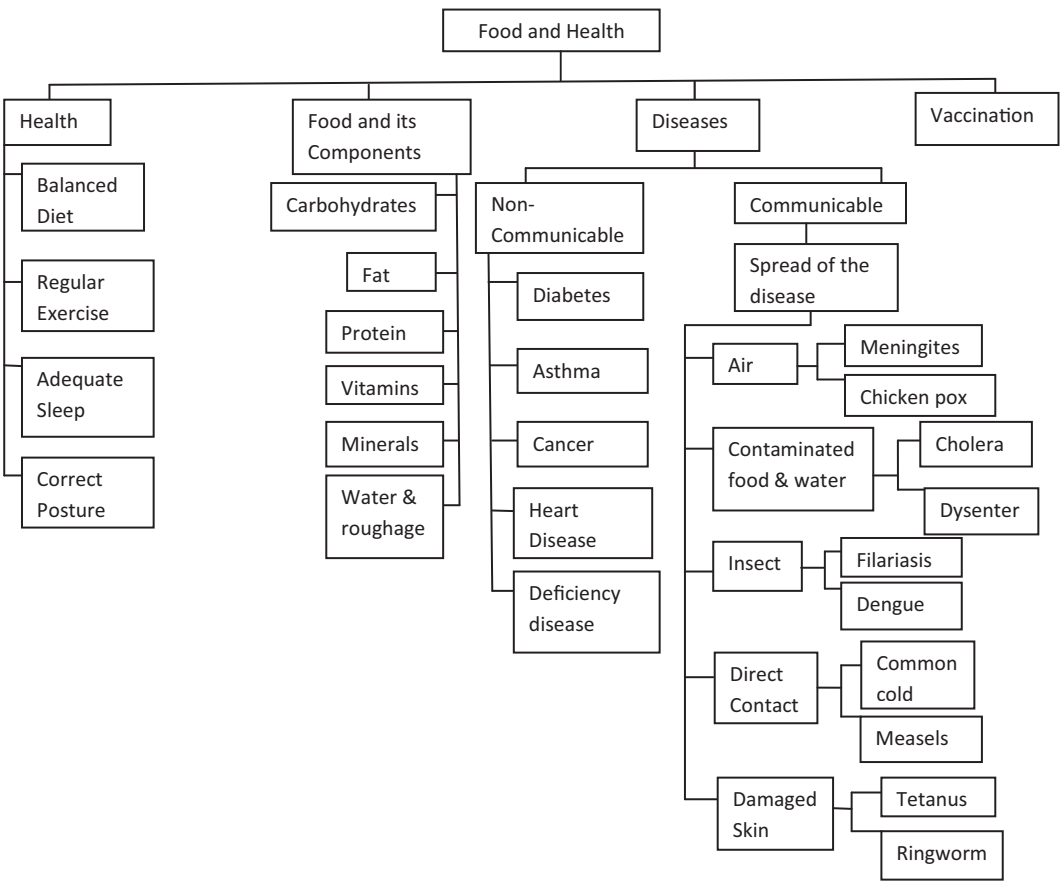
Food and Health

No. of Periods: 5 or 7

Objectives

- To understand how to lead a healthy life.
- To know food and its components.
- To understand the need for a balanced diet and appreciate the value of eating nutritious food.
- To realize the importance of keeping fit.
- To identify the food categories used in the food pyramid.
- To know communicable and non-communicable diseases.
- To understand the need for Vaccination.

The lesson at a glance:



In brief

- Ways to lead a healthy life.
- Food and its five major nutrients.
- Non-communicable diseases.
- Deficiency diseases, their symptoms and sources.
- Communicable diseases and the different ways they are spread.
- Ways to prevent communicable diseases.
- Vaccination and its benefits.

Pre-requisite skill

1. What did you have for breakfast today?

   (If they have eaten idlis, ask them the quantity they have eaten).

2. What do you normally have for lunch?
3. Do you have vegetables and fruits in your diet?
4. Do you drink a glass of milk everyday?
5. What is your favourite food?

   (If they say pizzas, burger, chocolate, french-fries etc. tell them that they are not healthy food).

6. What time do you have your supper? (Tell them that an early supper is good)
7. Do you go out and play in the evening?
8. What games do you play? (Tell them that outdoor games are important and sitting and playing video games is very unhealthy)
9. Have you ever fallen sick?
10. What is the very common disease that people get? (common cold).

Motivation

Start with 'Let Us Begin' activity.

Ans: Fruits, Bread, Jam, Chapattis, Dal, vegetables, milk, Biscuits.

Students can be asked to list out their favourite food and a discussion can be led by the teacher as to which food is a better choice and a healthier one.

Questions to be asked while teaching.

1. How do you define health?
2. When are you physically and mentally fit?
3. What are the five nutrients of food?

4. What are the energy-giving food and what do they provide us? Give examples.
5. Give an account of the slow energy-giving food? fat.
6. What are the proteins also called? How do they help our body? Give examples.
7. What is the work of vitamins?
8. How are minerals helpful to our body?
9. What is the work of roughage?
10. What is a balanced diet?
11. Why do we need to exercise regularly?
12. What are the benefits of a good posture?
13. Why is sleep essential for our body?
14. When do we say we have a disease? What are the two types of diseases?
15. What are non-communicable diseases? Name some non-communicable diseases.
16. For the following diseases give the nutrients that are deficient, their source of food and the symptoms they show.

    a. Protein-energy malnutrition or PEM b. night blindness c. BeriBeri d. Scurvy e. Rickets f. Anaemia g. Calcium deficiency h. Goitre

17. What are communicable diseases?
18. What are the diseases spread by a. Bacteria b. Virus c. Fungi d. Protozoa
19. What are the diseases spread through air?
20. Name the diseases spread because of the contamination of food and water.
21. Which are the diseases spread by insects?
22. How can diseases spread by direct contact?
23. Can diseases spread through damaged skin? How?
24. List out the ways by which you can maintain personal hygiene.
25. How can you keep your surroundings clean?
26. What is a vaccination? What is the work of vaccines?
27. Against which diseases have we developed vaccines?

Assessment

1. Look at the 'Food pyramid' on page 31. What does it tell us?

   Ans: The 'Food Pyramid' is about getting the correct amount of nutrients - protein, fat, carbohydrates, vitamins and minerals you need to maintain good health - The pyramid gives a choice of different food from which to choose a healthy diet. At the base of the pyramid is bread, cereals, rice wheat - all food from grain. You need most of these food each day. The next level includes food that come from plants - vegetables and fruits. Most people need to eat more of these food for the vitamins, minerals and fibre they supply. The level above in the pyramid are those food that come mostly from animals, milk yogurt, cheese, meat, poultry, fish, dry beans, eggs, and nuts. These food are important for protein, calcium, iron and zinc. The small tip of the pyramid shows fats, oil and sweets. Food such as oil, cream, butter, sugar,

soft drinks, candies provide calories and less nutrition. People should eat this food sparingly.

2. Mr. Sathish is suffering from night blindness. What is the deficiency that he has? How can you help him?

   Ans: Mr. Sathish has deficiency of Vitamin A. He needs to eat a diet rich in vitamin A like fruits, including papaya, mango, green leafy vegetables, as also carrots, sweet potato, milk, butter, yolk of egg and animal liver.

3. Doctor has told Murali that he lacks sunshine vitamin. How can Murali be helped?

   Ans: The sunshine vitamin is nothing but vitamin D. He needs to take a lot of milk, butter and eggs and get adequate exposure to sun light every day. Too much deficiency of vitamin D leads to Rickets when the bones become soft and brittle.

4. List out all the junk food, why are they harmful?

   Ans: Junk food like pizza, Burger, fried chicken, noodles, french fries, hot-dogs, donuts, potato chips, sweets and biscuits, popcorn, pancakes, cookies, potato wedges contain high level of calories from sugar or fat with little fibre, protein, vitamins and minerals.

Your body does not like to waste energy therefore the excessive fat content from these food are stored, causing weight gain. Eating junk food for a long period of time can lead to obesity, vitamin deficiency, heart disease and other health problems.

For a week ask the students to categorise the food they bring under the 5 nutrient carbohydrates, fats, vitamins, minerals, protein. Encourage them to drink a lot of water and include roughage in their diet. You can ask them to write it down on a chart paper and discuss it in the class. This way the students keep a check on their diet as well as learn about food and health efficiently.

5. Why nowadays iodine is also included in salt packets is because of the following reason.

   Ans: It has come to be known that many people are suffering from a deficiency of iron that is why the Government of India has been encouraging the intake of iodine which also comes as iodized salt. Iodine deficiency leads to Goitre which is a swelling in the neck region.

Answer key:

What I know

A.

1. fats
2. sunlight
3. night blindness
4. mosquito
5. goitre

B.

1. night blindness
2. anaemia
3. beriberi
4. rickets
5. weak bones

C.

1. typhoid, jaundice
2. goitre, anaemia
3. butter, oil
4. night blindness, scurvy
5. fruits, vegetables

What I understand

A.

1. Five major components of food are carbohydrates, fats, proteins, vitamins and minerals.
2. Bacteria, virus, protozoa.
3. Malaria, filaria, chikungunya and dengue are spread by mosquitoes.
4. Measles spreads by contact. Hence the infected person is kept away from others.
5. Polio vaccines are given to children in order to develop immunity against the disease.

B.

1. Roughage is undigested part of plants that helps in moving the food along the digestive tract and adds to the bulk of food.
2. Proteins are essential for the growth of the body and for muscle- building. The rich sources of protein are meat and egg.
3. Disease is a condition when the body does not function properly and we feel uncomfortable.

   We can avoid diseases by being clean, eating balanced diet and taking enough rest.

4. Regular exercise helps to keep the muscles toned and maintain the body in good shape. It makes the bone strong. Our blood circulation improves and keeps us fit.

5. Vaccination is the process of injecting the dead or weak germs of a specific disease called vaccine into our blood. This makes our body develop immunity against the disease.

Challenger

It is wise to buy food from the canteen where healthy food is sold. We all know the importance of a balanced diet. Your food should include a proper mixture of protein, rice, dal, roti and vegetables along with curd. Food sold outside may look attractive, but these may not be prepared under hygienic conditions and these fast food/junk food are harmful to our body.

I can explore

A. Rani is most likely to have measles which is caused by a virus. Measles is a communicable disease spread through the air. Rani's teacher did the correct thing by sending Rani home to her parents immediately. Otherwise there is a high possibility of the virus spreading the disease to the other students in the class.

B. Ravi seems to be suffering from anaemia due to the deficiency of iron in his body. The symptoms he has clearly convey this. Ravi needs to include a lot of guava, dates, apples, whole grains, spinach and meat in his diet.

Values for me

4 and 5 statements are correct.

B. It is not safe to drink water from anywhere as this water may be contaminated and we run the risk of contracting diseases like typhoid, cholera, jaundice, dysentery and diarrhoea which are spread through contaminated water.

Tap water is treated with chlorine which, in high proportion too is not good. So it is always safe to use filters that can remove the bacteria, heavy metals and pesticide that are present in water and thereby making it safe for drinking.

Life skills

Malaria, filaria, chikungunya and dengue are spread by mosquitoes.

The above-mentioned diseases are caused by protozoa. The following measures can be adapted to help stop the spread of diseases:

1. Empty, drain or cover all things that can and may hold water as stagnant water is where mosquitoes breed.

2. Mosquito repellants can be used to ward off mosquitoes.

3. It is always better to use a mosquito net as mosquito repellants give out strong chemicals which may cause respiratory problems.
4. The oil used as a water cover prevents the larvae of mosquitoes from breathing and penetrating the surface. This method also prevents the mosquitoes from laying eggs.
5. Guppy fish are introduced into all potential mosquito breeding habitats including marshes, dams, canals and ponds as these eat up the larvae of mosquitoes. This is a better way than using chemicals to treat stagnant water.

UNIT - III LESSON - 4

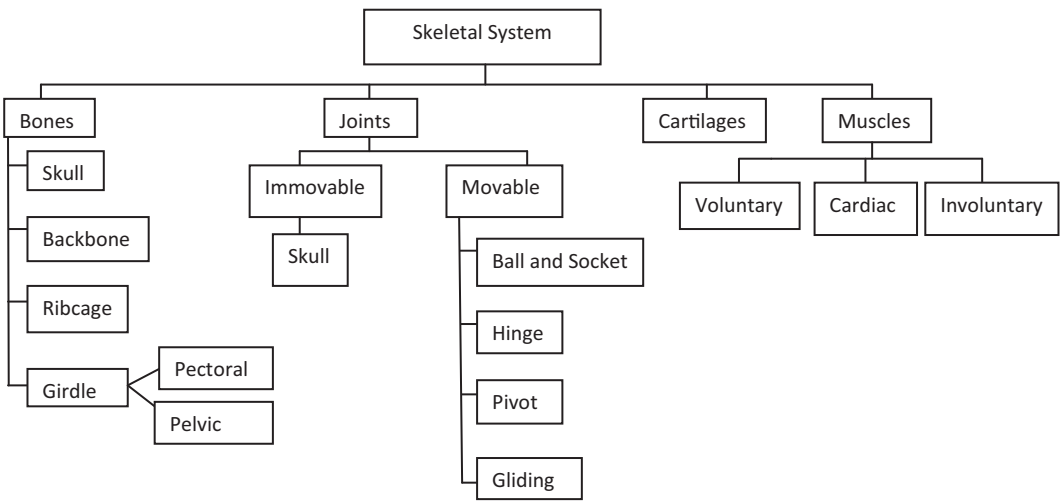
Our Skeletal System

No. of Periods: 5 or 7

Objectives

- To understand and explain the functions of the skeletal systems.
- To identify the different parts of the skeletal system and state their functions.
- To list out the different types of joints and describe how they move.
- To know the functions of cartilages.
- To classify the muscles into their three types and comprehend their functions.

The lesson at a glance:



In brief

- The importance of the skeletal system.
- The different parts of the skeletal system and their functions.
- The functions of the skeleton.
- The types of joints and how they function.
- The importance of cartilages.
- The working of the muscles.
- The classification of the muscles and their functions.

Pre-requisite skills

- What are the different organ systems?
- Can you tell how many bones we have?

- Which is the hardest part in your body? enamel of tooth
- What should you eat to keep your bones strong?
- What kind of food is good for the muscles?
- How are the muscles, of those who exercise regularly?
- How should you sit and stand?

Motivation

The teacher can do a warming up exercise in class. She can ask the students to sit and stand alternatively but suddenly change. This way half the class would not have obeyed the command.

Now she can ask the following questions.

1. Were you able to stand erect?
2. What would happen if you didn't have bones in your body?
3. Pick up a pencil - Imagine you don't have bones in your fingers. Can you hold the pencil?
4. Your brain is an important and delicate organ? How is it protected?

The teacher can do the 'Let us Begin' activity.

Answers: body legs digestive system brain

Questions to be asked while teaching.

1. Why is the skeleton system important to us?
2. How many bones are there in the adult skeleton system?
3. Why do babies who have 600 bones, have only 206 bones when they are adults?
4. What makes up the skeletal system?
5. What are the different parts that the skeleton is made up of?
6. Which are the smallest and largest bones in your body?
7. What is the function of the skull?
8. How many bones are there in the skull and which bone is not fixed?
9. How does the jaw help us?
10. What is the vertebral column or the back bone made up of?
11. What is the function of the vertebral column?
12. How many bones are there in a ribcage and how are they connected? What is the function of the ribcage?
13. Where are the girdles present in our body? How do they connect to the body?
14. What are the two parts of the upper limbs?
15. What is the bone in the upper arm called? How is it connected to the body?
16. What are the bones of the lower arm called? Where are they connected to the upper arm and palm?
17. What are the two parts of the lower limb called?

18. What is the bone in the thigh called? How is it connected to the body?
19. What are the bones of the calf called? At which place are they connected to the feet?
20. What are the bones made up of?
21. Give the functions of the skeleton.
22. Why are joints important?
23. What are ligaments?
24. What are the two types of joints in our body?
25. Name the four types of movable joints?
26. What are the functions of the a) Ball and socket joint b) Hinge joint c)Pivot joint d) Girdle joint
27. What are cartilages? Where are they found?
28. How are muscles attached to the bones?
29. How many muscles are there in our body? How do they help us?
30. How do you differentiate voluntary from involuntary muscles?
31. Describe the fatigueless muscles?
32. How many muscles together bring about our movement? How do they work unitedly?

Vocabulary

- girdle
- bone marrow
- voluntary muscles
- involuntary muscles

New concepts

- The different types of bones in the skeletal system.
- The types of joints.
- Cartilages.
- Types of muscles.

Assessment

1. How do you treat a fractured bone?

   Ans: A fracture is a break or a crack in the bone. Treatment includes immobilising the bone with a plaster cast, or surgically inserted metal rods or plates to hold the bone pieces together.

2. How do broken bones heal?

   Ans: Your bones are natural healers. At the location of the fracture, your bone will produce lots of new cells and tiny blood vessels that rebuild the bone.

The teacher can do these two exercises.

Who am I

- I am the first bone of the vertebral column - atlas.
- We are also known as fatigueless muscles - cardiac muscles.
- I am a strong tissue, at the joint I hold the joints together - ligaments.
- We bones are present in the calf -tibia and fibula.
- I am the only movable bone in the skull - jaw bone.
- We are the two bones in the forearm - radius and ulna.
- We tissues attach muscles and bones - tendons.

Match the columns A & B

1.	sternum	- upper arm 3
2.	femur	- joints 4
3.	humerus	- voluntary 6
4.	pivot and hinges	- involuntary 5
5.	eye muscles	- breast bone 1
6.	skeletal muscles	- thigh 2

Answer key:

What I Know

A.		**B.**		**C.**	
1.	ligament	1.	Cervical bone	1.	shoulder joint, hip joint
2.	206	2.	tendons	2.	wrist, ankle
3.	hinge	3.	hinge joint	3.	knee, elbow
4.	femur	4.	sternum	4.	neck, wrist
5.	33	5.	cardiac muscle		

What I understand

A.

1. Ball and socket joint allows maximum movement, whereas hinge joint allows movement only in one direction.
2. Voluntary muscles are those on which we have control but involuntary muscles are not under our control.
3. Ligaments connect bones together and tendons connect bones to muscles.

B.

1. The skeletal system is a framework which provides definite shape and support to the body.

2. The leg has two parts, the thigh and calf. The thigh consists of a long and a powerful bone called femur. It fits into the hip girdle at the top end. It is connected to two long bones of the calf called the tibia and fibula at the knee. The feet are made up of many small bones joined together. The foot is joined to the leg at the ankle which has strong bones.
3. A joint is formed when two or more bones meet at the joints. Bones are held together by strong tissues called ligaments. These help in moving the bones. Examples: Ball and socket, hinge joint.
4. The muscles of the heart are called cardiac muscles. We have no control over their movement. They work tirelessly from birth to death. They are also known as fatigueless muscles.
5. Cartilage is a tough elastic tissue found in joints like knee, elbow and ankle and between vertebrae. Cartilage prevents the bones rubbing against each other. It prevents wear and tear of joints. Cartilage is also found in parts like our ear and nose.

Challenger

A. Weight training is a common type of strength training for developing the strength and size of the skeletal muscles. It builds muscle strength, gives you an edge over stress, heart disease and cancer. Thus you can see it is useful.

B. The knee is an example of the hinge joint. Just like the hinge in a door this joint allows movement only in one direction. So the leg bends backward at the knee and not forward.

I can explore

The ball and socket joint at the shoulder moves first. Then the joint at my elbow the hinge joint helps the arms to bend forward to pick up the pencil. Next the pivot joint at my wrist moves and finally the gliding joint and hinge joints in my finger help to pick up the pencil and hold it in my fist.

The hinge joint in my hand had maximum movement while holding the pencil in my fist.

Values for me

1. Wear a helmet while riding a two wheeler.
2. Wear a seatbelt in a four wheeler.
3. It anything is spilt on the floor, wipe it dry immediately to avoid a fall.
4. Avoid using carpets and doormats on slippery floor otherwise you may trip and fall.
5. Call a doctor immediately if you hit your head or have an accident as head injuries are serious.

Life skills

Jaya's friends can follow statements 1, 4 and 5 if they want to help her out.

1. ✓ 2. × 3. × 4. ✓ 5. ✓ 6. ×

Get Creative

Breathing	- involuntary
pumping of blood	- cardiac
walking	- voluntary
Digestion of food	- involuntary
shutting of eye lids	- involuntary
chewing the food	- voluntary
sneezing	- involuntary
moving a foot on being tickled	- involuntary

UNIT - III LESSON - 5

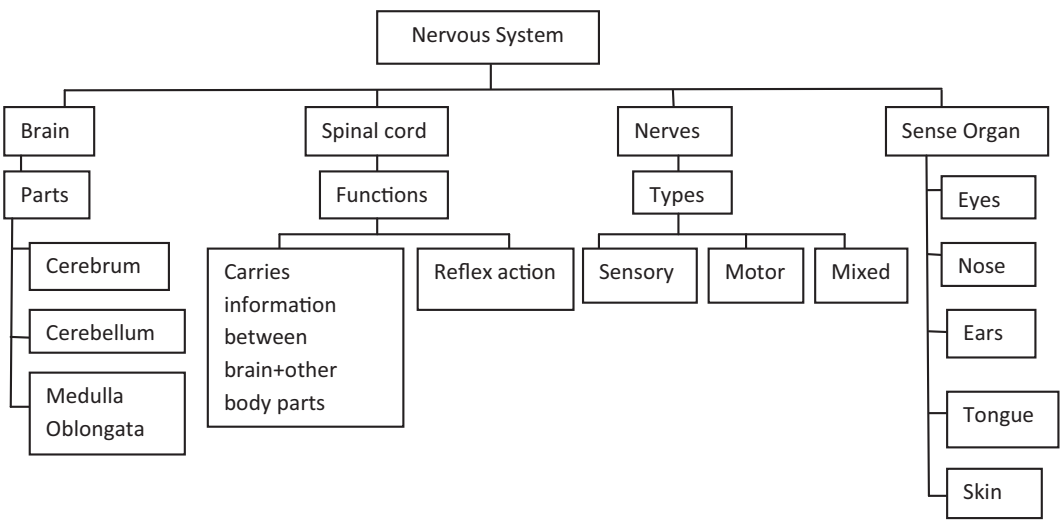
Our Nervous System

No of Periods: 5 or 7

Objectives

- To understand the structure of the brain and state its functions.
- To know what makes up the spinal cord and describe its functions.
- To identify the three nerves and understand their functions.
- To list the parts of the human eye and understand where they are located.
- To classify the ear into its parts and state its functions.
- To understand the structure and functions of the nose.
- To know the work of the skin.
- To describe the tongue along with the four types of tastes it can detect.

The lesson at a glance:



In brief

- The description of the brain.
- The three parts of the brain and their respective functions.
- The spinal cord and its functions.
- The three types of nerves and what they do.
- The different parts of the eye and care of the eye.
- The parts of the ear and ways to take care of the eye.
- The different parts of the nose and how these function.
- Care of the nose.

- The structure of the tongue.
- The functions of the skin and skin care.

Pre-requisite skill

- What are your 5 sense organs?
- What does each sense organ do?
- What is the nervous system made up of?
- Somebody suddenly slams the door? You get scared. Which part of your organ system is responsible for this? Your nerves
- What protects the spinal cord?
- How is the brain protected?

Questions to be asked while teaching.

1. What is the nervous system made up of?
2. What is the skull also known as?
3. Explain the structure of the brain?
4. What are the three parts of the brain?
5. Describe the functioning of the cerebrum.
6. What is the cerebellum?
7. What is the medulla oblongata responsible for? Where is it located?
8. Where is the spinal cord located? What are its functions?
9. How do you explain a reflex action?
10. How do the nerves function?
11. Name the three types of nerves and explain their functions.
12. What are the sense organs? Name them.
13. Explain the structure of the eyes.
14. What are the ways in which you can take care of your eyes?
15. What are the 2 functions of the ears?
16. How can you take care of your ears?
17. What are the 3 parts of the ears?
18. What are the 2 functions of the nose?
19. What is a palate?
20. Give ways to take care of our nose.
21. The tongue carries 2 functions. What are they?
22. What are the 4 types of tastes the tongue can detect?
23. What are the sensations the skin can feel?
24. How can we take care of our skin?

Motivation

Begin the class with the 'Let Us Begin' activity.

Ans: Nervous system

Brain

The teacher can give them the following riddle.

1. Two fathers and two sons go fishing. Each of the them catches one fish. So how do they bring home only 3 fish?

   Ans: Because the fishing group comprises a grandfather, his son and his son's son - hence 3 people.

2. I add 5 to 9 and get 2. The answer is correct how?

   Ans: When it is 9 am, add 5 hours to it and you will get 2 pm.

3. I am an odd number, take away an alphabet and I become even, what number am I?

   Ans: Seven (SEVEN -S = EVEN)

   The teacher should ask the students as to how they solved the riddle or what they did as soon as the riddle was posed to them. Then she can begin to teach about the brain.

Spinal cord (Reflex action)

The teacher can all of a sudden raise her hand as though she is about to strike a student. He would at once move away. Now she can go on to teach reflex action. The teacher can call a student and give simple commands like - sit, stand, hold your ears, close your eyes, bring that book etc and explain that these commands could be followed because of the motor nerves.

Sense organs

The teacher can blindfold a student and lead him around the class. Then she can remove the blindfold and ask the student to share his experience with his fellow students.

The teacher can do the following activity and ask them which sense organ is being used.

What is the colour of my saree?	-	eyes
With a scale hit the desk(sound)	-	ears
Places an ice cube on the face of a child	-	skin
Ask them to smell a scented eraser	-	nose
Rings a small bell	-	ears

The teacher can call out the names of certain eatables and ask them how it tastes.

lime	-	sour
laddu	-	sweet
bittergourd	-	bitter
salted biscuit	-	salty
dark chololate	-	bitter

payasam	-	sweet
vinegar	-	bitter
pickle	-	sour
roasted	-	salted
nuts	-	salty
sugar	-	sweet
table salt	-	salty
halwa	-	sweet
sourcurd	-	sour

Now the teacher can go on to teach about all the sense organs.

Materials required

ice cubes a small bell a scale

Vocabulary

cerebrum, retina, cerebullum, pupil, reflex action, palate, cornea

New concepts

- The parts of the brain and its functions.
- The 3 different types of nerves.
- The parts of the 5 sense organs and their functions.

Assessment

1. Why does stuffy nose affect my taste?

   Ans: There are a series of nerve endings in your nose, that not only allows you to smell, but to taste at the same time. Most of what we taste in our food is actually smell. We can only taste sweet, sour, salt and bitter.

2. Why does the skin play a dual role?

   Ans: Skin is a sense organ. We feel the sensations of touch, heat, pain and pleasure. The skin is also part of the excretory system whereby the waste is removed from the body through sweat. Thus it plays a dual role.

3. What happens if the retina of your eye is damaged?

   Ans: The retina is part of your eye which sends images through your optic nerve to the brain. When the retina is damaged, it pulls away from the back of the eye and the blood supply stops. Without blood supply, the retinal cells will start to die. This can cause permanent damage to your vision.

Name the organ

- This protects the brain - cranium or skull.
- The three protective layers on the brain - meninges.
- This is responsible for intelligence, memory etc - cerebrum.
- It is responsible for co-ordination of muscles, posture, balance of the body - cerebellum.
- It is responsible for breathing, swallowing, digestion - medulla oblongata.
- Reflex actions are controlled by this organ - spinal cord.
- Carries message from sense organ to brain and spinal cord - sensory nerves.
- This sense organ is responsible for balance - ear.
- This sense organ has mucous gland - nose.
- The bonny structure that separates mouth and the nasal cavity - palate.
- This sense organ has hair and pores - skin.

Answer key:

What I know

A.

1. brain
2. cerebrum
3. optic
4. sclera
5. spinal cord

B.

1. F
2. T
3. F
4. T
5. T

What I Understand

1. The brain is made up of three parts, the cerebrum, the cerebellum and the medulla oblongata.

   Cerebrum is responsible for intelligence, hearing, learning logic, memory and voluntary reactions. It is also responsible for the working of our sense organs.

   Cerebellum is responsible for coordination of muscles, posture and maintaining the balance of the body.

2. Nervous system is made up of the brain, spinal cord and the nerves.

3. The three types of nerves are the sensory nerves, the motor nerves, and the mixed nerves.

   The sensory nerves carry messages from sense organs to the brain and spinal cord.

   The motor nerves carry back orders or responses from the brain and spinal cord to the rest of the body.

Mixed nerves carry messages in both directions from different parts of the body to the brain and spinal cord and from brain and spinal cord to the rest of the body.

4. Brain is safely placed inside the skull which is also called the cranium or brain-box. The brain is covered by three protective layers called the meninges. Hollow parts of the brain are filled with a clear fluid which provides protection against jerks and injuries.

5. The outer receives sound waves which travel and strike the ear drum. Three small bones in the ear transfer the sound from the middle ear to the inner ear. The inner ear converts the sound waves into nerve impulse. These impulses transferred it to brain through the auditory nerve.

Challenger

A. Poking things into your ear, such as cotton buds or sharp objects, can cause damage to the ear canal. Sharp objects can easily puncture a hole in your ear drum and this may even lead to hearing loss.

B. When a person has an injury on his head, there can be severe head or face bleeding. The person is confused tired or unconscious. The person stops breathing as serious head injuries can turn out to be fatal.

I can explore

A. A healthy eye needs vitamin A, Meat liver, carrot, sweet potato, spinach, broccoli, butter and eggs are rich in Vitamin A. Deficiency of vitamin A affects the vision. It can cause night blindness.

B. Mihir withdraws his foot quickly because of reflex action. The spinal cord in the nervous system controls reflex action.

Values for me

Ans: Statements 1 and 3 should be followed to maintain a healthy skin.

1. ✓
2. ×
3. ✓
4. ×

Life skills

Ans: Statements 1, 3 and 4 are followed, it may harm the eyes.

1. ×
2. ✓
3. ×
4. ×

Get creative

A reflex action is an involuntary and nearly instantaneous movement in response to a stimulus.

A reflex is made possible by a neural pathway called reflex arcs which can act on an impulse before the impulse reaches the brain eg of reflex action.

1. pulling your hand away when you touch a hot vessel.
2. blinking when something comes dangerously close to the face.
3. pulling of hand when a sharp object or pin gets through the soft skin
4. suddenly curling the tongue while drinking hot tea or coffee.
5. a reddening of the face caused by embarrassment, or shame.

UNIT - III LESSON - 6

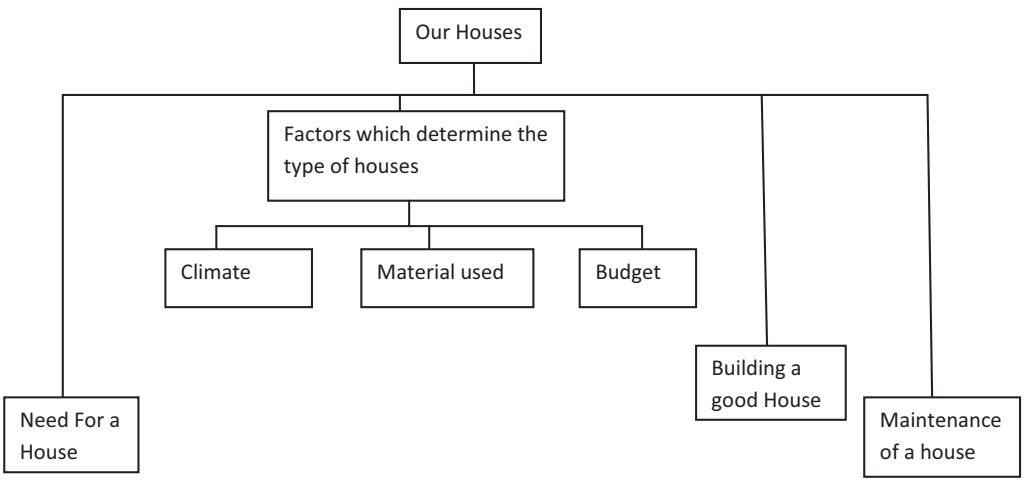
Our house

No. of Periods: 5 or 7

Objectives

- To understand the need for a house.
- To analyse the factors which determine the type of house in a region.
- To comprehend the factors that contribute towards making a good house.
- To list out the ways to maintain the house.

The lesson at a glance:



In brief

- The need for a house.
- The factors which determine the type of houses suited to a region.
- Climate plays an important role to determine the kind of house suitable for a region.
- Materials used to build the house.
- Budget determines the size and type of house.
- Points to be kept in mind for building a good house.
- Maintenance of the house.

Pre-requisite skill

- What kind of house do you live in?
- What are the important rooms that are there in your house?
- What buildings can you see as you go around the city?

Ans: Houses, flats, bungalow, church, temple, mosque, shops, malls, theatre, police station, hotels, hospitals, school, sky scraper, offices, warehouse etc.

- What kind of houses do villagers live in?
- What is the igloo made up of? Who lives in igloo?
- Where do they build houses on stilts?
- Name some types of houses.

  Ans: Hut, castle, palace, flat apartment, bungalow, cottage.

- What is your house made up of?

Motivation

'Let Us Begin' answers.

Stilt house, Igloo, Hut, Houseboat, Apartments

Start on a lighter note. Ask the student to name the homes of some animals.

dog	- kennel
cow	- cow shed
horse	- stable
sheep	- pen
bee	- hive
bear	- cave
spider	- web
lion	- den
hen	- coop
ant	- ant hill
pig	- pig sty
rabbit	- burrow
mouse	- hole

The teacher can play a guessing game.

1. A house to live in rivers, lakes, or sea - house boat.
2. A kind of home in a building, in cities - apartment.
3. A house made of mud and straw - hut.
4. A movable house on wheels - caravan.
5. A house made of wood in the mountains - tree house.

6. A house common in tropical countries - bungalow.
7. A house now used for recreation - cottages.
8. A home for queens and kings - castle.
9. A house built on poles near lagoons - stilt house.

Questions to be asked while teaching the lesson.

1. Why do we need a house?
2. What are the factors which determine the type of houses in a given place?
3. How do the houses look in regions of hot weather?
4. What types of houses are built in regions where there is heavy rainfall?
5. In regions where there is a snow fall, how are the houses built? Describe the roofs of the houses.
6. What are the materials used in building kutcha houses earlier and now?
7. What are the materials used to build pucca houses like flats and bungalows?
8. Explain how the house should be constructed.
9. What steps are to be taken to keep away mosquitoes, flies and germs from the house?
10. Give an account of the drainage system and the flooring of the house.
11. How would you maintain your house for many years?

Vocabulary

fire place, nomad, budge

New concept

- Materials used to build a house.
- Budget available.
- Points for building a good house.

Assessment

1. Mr. Shastri is going to build a house in Shimla, a cold region. He had made plans to build a house with a flat roof. How would you advice him?

   Ans: Since Mr. Shastri is going to build a house in Shimla where there is a snowfall during winter it is advisable to build a house with a sloping roof as this does not allow the snow to pile on the roof making it damp and cold. The sloping roof helps the snow to slide off.

2. What is the advantage of a pucca house over a kutcha house?

   Ans: Kutcha houses are made of mud, stone, wood and hay though now they are made of brick, cement and concrete. Kutcha houses don't last long as they cannot withstand strong weather conditions. During heavy rainfall they may develop cracks and leak. The drainage system here may not be properly laid. Most houses lack

provision of tap water.Pucca houses are made of high quality material with all the modern facilities.

3. Would it be wise to build a house without foundation?

   Ans: No structure should be built without a foundation. The foundation of a house, holds it up, keeps the structure of a house from falling apart or collapsing in, on itself.

Answer key:

What I know

A.

1. drain water quickly
2. both heat and cold
3. huts
4. cross ventilation
5. cold regions

B.

1. kutcha house
2. pucca house
3. ventilation
4. architect
5. igloos

What I Understand

A.

1. Three important factors that determine the type of house.

   1. Climate 2. Materials used to build the house 3. The budget available

2. A good house should have plenty of sunlight and wind. The cross ventilation is necessary for the movement of fresh air and sunlight.

3. Kutcha or temporary house is found in villages. It is made up of mud, stones, wood and hay.

4. Windows and doors must be fitted with mesh or wire nettings to prevent entry of flies and mosquitoes inside the house.

5. Pucca houses are built using concrete, bricks, cement, glass and iron rods. Soft tissue that contains blood vessels and nerves is called the pulp.

B.

1. A flat roof with thick walls is seen in places where it is hot. Thick walls help to keep the house cool from inside. The flat roof can be used by people to sleep outdoors.

2. After the house is built, it should be well maintained. A clean and well maintained house stays in a good condition for many years.

   It should be cleaned regularly. The walls and windows should be dusted and the floors ought to be swept and mopped daily. It should be periodically painted.

3. The budget or amount of money available determines the size and type of house.

Small house requires less money while big buildings require lot of money. In big cities houses are costlier.

Challenger

Reinforced cement concrete (RCC) is used to build houses in earthquake prone areas along with wood and steel. In RCC, concrete is filled in and around iron wire netting which makes the building strong.

In earthquake prone areas it is not advisable to build with heavy materials as it will cause lot of damage to properties and lives. Materials like wood and cardboards are used to reduce the loss.

I can explore

Cities are becoming over populated. There is a shortage of space and so the land value has increased incredibly. Many houses can be accommodated in a high rise building. These houses are much more affordable.

Values for me

I will first check if the foundation is laid properly. The foundation gives strength for the structure. If the foundation is weak the building may collapse. I will check if the plan drawn is properly laid. I will check if the building materials used are of high quality and there is no adulteration in the cement used. I will see to it that enough doors and windows are there for cross ventilation. I will see that the walls are strong, properly plastered and made damp-proof. Proper weathering of the building should be done. The drainage system should be well laid. I will check for proper and safe electric connection. Installation of pipes and water taps will be checked. Finally the flooring of the house should be smooth with proper tiles to avoid cracks and breaks.

Life skills

Statements 1 & 3 should not be followed

Get creative

Cave dwellers - The cavemen lived in nuclear families, taking shelter in caves and living a rudimentary existence some 200000 to 300000 years ago.

Mohenjo-Daro - literally means 'the mould of the dead', which is just a term used to describe the 5000- year-old city. It was during the proto-historic period that a full-fledged, planned city started functioning. It's architectural beauty stunned modern architects around the world, as there was a well planned street grid, along with a proper waste disposal system that would put our current waste management means to shame.

A hut

A hut is built of readily available materials such as wood, stone, grass, palm leaves branches, and mud.

A pucca house

House made with high quality materials throughout, including the floor, roof and exterior walls are called pucca houses.

An igloo

An igloo is a shelter made from blocks of snow placed one on top of another often in the shape of a dome. They are used by Eskimos as a temporary shelter or for hunting expeditions. Snow's effective insulating properties enable the inside of the igloo to remain relatively warm.

UNIT - III LESSON - 7

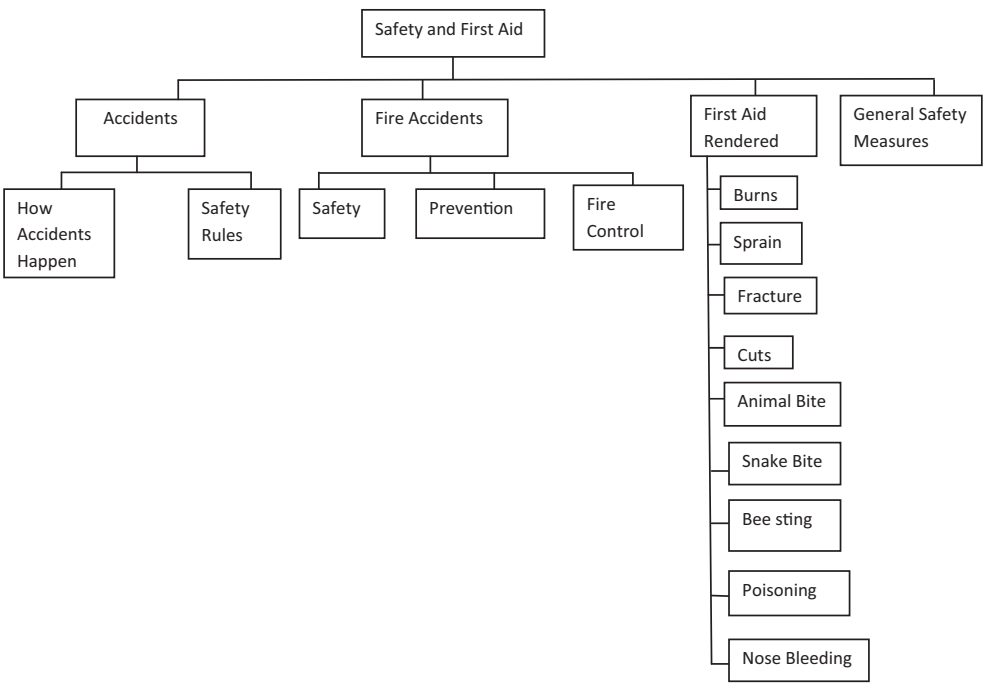
Safety and First Aid

No. of Periods: 5 or 7

Objectives

- To understand how Accidents happen.
- To Know the safety rules in order to avoid accidents.
- To know how fire accidents can be caused and to analyse how it can be prevented and controlled.
- To realise the need for first aid.
- To identify and describe the kind of first aid that has to be administered in the case of different accidents.
- To gain an awareness of the general safety measures.

The lesson at a glance:



In brief

- How do accidents happen?
- The safety rules to avoid accidents.
- How do fire accidents occur?

- Prevention and control of fire accidents.
- The need for first aid.
- First aid given for burns, fracture, sprain and cuts.
- The kind of first aid that can be administered in the case of animal bite, bee sting and snake bite.
- First aid for poisoning and nose bleeding.
- General safety measures that are to be remembered.

Pre-requisite skills

- Suggest some ways in which you can prevent accidents at home.
- How would you behave when there is no teacher in the class?
- What are the safety rules that you should follow when you are in the play ground?
- How should you behave when you are in a moving vehicle?
- While crossing the road what are the rules to be followed.
- What should you do when someone accidently cuts his hand?

Motivation

Let Us Begin (Answers).

1. can be hit by a car.
2. can slip and fall down.
3. someone can slip and fall on the banana peel.
4. Can cut your finger.
5. Can lose balance and crash into something.
6. Can get an electric shock.

Before the start of the lesson the teacher can ask the students the following questions and ask them whether it is wrong or right.

- I hold a cracker in my hand and light it . ☐
- I pour water on the floor and wait behind the door to see if anybody would slip and fall down. ☐
- I cross the road only at the zebra crossing. ☐
- When the bell rings I rush out of the class room. ☐
- When my friend has an injury on her leg, I make her sit down wash her wound and apply an ointment. ☐
- When no adults are at home I try to switch on the gas stove. ☐
- When the teacher is not in the class I sit in my place and to do my work. ☐

- When some body is about to sit, I pull his chair. ☐
- When going for P.T. class, I ask everyone to go in a single file. ☐
- I wipe my hand dry before touching the electric switch. ☐
- After playing with my toys I put them away in their place. ☐
- I will put out my head, when I am going in a bus. ☐
- I will drink my medicine only when adults are around me. ☐
- I will use a knife to sharpen my pencil. ☐
- If I can't reach something and no one is around I will climb a stool to reach it. ☐

Questions to be asked while teaching the lesson.

1. What are accidents?
2. What are the safety rules to be followed at home?
3. How would you remain safe in a park?
4. What are the rules to be followed in school to avoid accidents?
5. How is a fire accident caused?
6. When using a match stick, how can you ensure no accidents take place?
7. What are the steps to be followed when there is a gas leak?
8. How would you put off an electric fire?
9. What would you do when the clothes of a person catch fire?
10. What is first aid? How should it be administered? What is the need for first aid?
11. What are the ways in which you can burn yourself?
12. What would you do in the case of a minor burn?
13. What first aid should be given for severe burns?
14. How are chemical burns treated?
15. What is a sprain?
16. How would you give first aid for a sprain?
17. What is a fracture?
18. What kind of first aid would you give if the person has fractured his leg?
19. If the arm is fractured, how would you administer first aid?
20. Why should we not ignore cuts and scratches?
21. How would you stop excessive bleeding?
22. Why is it important to give ani-tetanus injection if the injury is due to a rusted object?
23. What is rabies? What first aid should be administered in case of an animal bite?
24. How would you treat a bee sting and wasp sting?
25. Why should we not stop the bleeding in the case of a snake bite?

26. What first aid should be given for a snake bite?
27. What should be done when a person consumes poison?
28. How could a nose bleeding be treated?
29. What are the safety measures to be followed in general?

Vocabulary

tetanus, tourniquet, venom

New concepts

- First aid for sprain.
- First aid for animal bite.
- First aid for snake bite, poisoning.
- First aid for nose bleeding.

Assessment

1. You can smell the leaking of gas. Nobody is at home what would you do?

   Ans: First I will turn off the regulator. Then I will open all the door and windows for the gas to move out. I will not operate any electrical switches as even a spark can cause a fire and then inform my elders.

2. Simi lights a candle with a match stick and throws it away into the waste paper basket. Is it right?

   Ans: No, Simi should first put off the fire in the match stick before throwing it in the waste paper basket otherwise the paper in the basket could catch a fire.

3. There is an electrical short circuit. Mr. Raj throws water on it. What should he have done?

   Ans: Water is a good conductor of electricity. By throw water on an electrical fire, Mr. Raj would get an electric shock. Mr. Raj should put off the main switch and use a fire extinguisher or sand to put out the fire.

4. I burn my hand and I have a blister. I prick it and it breaks. Have I done the right thing?

   Ans: No, if the blister is pricked it can be easily infected. The burn has to be covered with a soft, sterile gauze after which you should see a doctor.

5. Why is anti-tetanus given to a person who has cut himself?

   Ans: Tetanus is an infection caused by a germ which can attack the muscles and the nervous system. Tetanus is a serious infection which can be fatal. Tetanus germs live in soil and dirt. The bacteria may get into your body through a cut or a wound in the skin.

6. When is tourniquet used?

   Ans: When a person is bleeding profusely and his bleeding cannot be stopped by

applying pressure with a sterile bandage, a tourniquet is used. It is a band tied upon the wound to stop bleeding.

A tourniquet is a device for stopping the flow of blood through a vein or artery, typically by compressing a limb with a cord or a tight bandage. It is used also in the case of a snake bite to prevent the venom from spreading in the body and flowing towards the heart.

7. What is the use of a sling for a fractured arm?

   Ans: Following a surgery or injury, many people are advised to wear an arm or shoulder sling for a speedy recovery and healing of the particular arm or shoulder. Its primary purpose is to stabilise the area so that the injured part can rest and not become aggravated by excessive movement.

As an assignment ask the students to make a booklet with all the important phone numbers including police station, fire station, ambulance.

Answer key:

What I know

A.

1. fracture
2. tourniquet
3. accidents
4. rabies
5. toothpaste

B.

1. tetanus
2. rabies
3. sprain
4. splint
5. tourniquet

C.

1. T
2. F
3. F
4. F
5. T

What I understand

A.

1 The patient with nose bleed should be made to sit nose tilted up.

2. The fractured part is the leg, tie a splint against the fractured part to give support. If the fractured part is an arm it must be put in a sling to rest the arm.

3. Animal bites cause diseases like Rabies.

4. Bee sting must be treated with baking soda or toothpaste.

5. The substance that is obtained from snake venom is called anti-venom which is used for treating snake bite.

B.

1. First aid is the immediate help given to the injured person before the arrival of a doctor. First aid is necessary as it helps to save lives, prevents further injury and helps in recovery.

2. Splint tied against a fractured part gives support to the part and prevents further damage.

3. If the injury is due to rusted objects anti tetanus injection is given.

4. In case of minor burns cool the burn to help soothe the pain, hold it under running water till the pain subsides. Clean the area with mild soap and apply antiseptic.

5. Fire can be caused due to careless handling of burning candles, matchsticks or fire crackers. Accidents may occur due to leakage of gas or electrical faults.

Challenger

A. For an electric fire, class C fire extinguisher should be used. This can effectively put out fires that originate around wiring, outlets, appliances and circuit breakers. Then turn off the power at the electrical panel to prevent the fire from growing. Never try to cool with water because water conducts electricity and can give you an electric shock.

B. First we should wash our hands before providing first aid, this helps to avoid infections. This should be cleaned with clean water. Now with an antiseptic solution clean the wound. If bleeding does not stop gently apply pressure with a sterile bandage and keep the injured part in an elevated position.

Values for me

Statement 3, 4 and 5 are correct and should be followed during Diwali.

Life skills (Answers)

1. Monu is suffering from a sprain in his ankle.
2. These seemed to have been a ligament tear around the ankle.
3. Ligaments are bands of fibrous tissues that connect bone to bone on joints.
4. An x-ray was taken to check and see if Monu had fractured his ankle. X-rays can penetrate less dense matter such as skin and body tissues but not bones. They are taken to give images of the human body.
5. First Monu's ankle would have been kept in an elevated position. Then in order to limit the swelling at the ankle, an ice pack would have be used at the place of injury. Then the area would have been compressed with a bandage to reduce movement.

UNIT - IV LESSON - 8

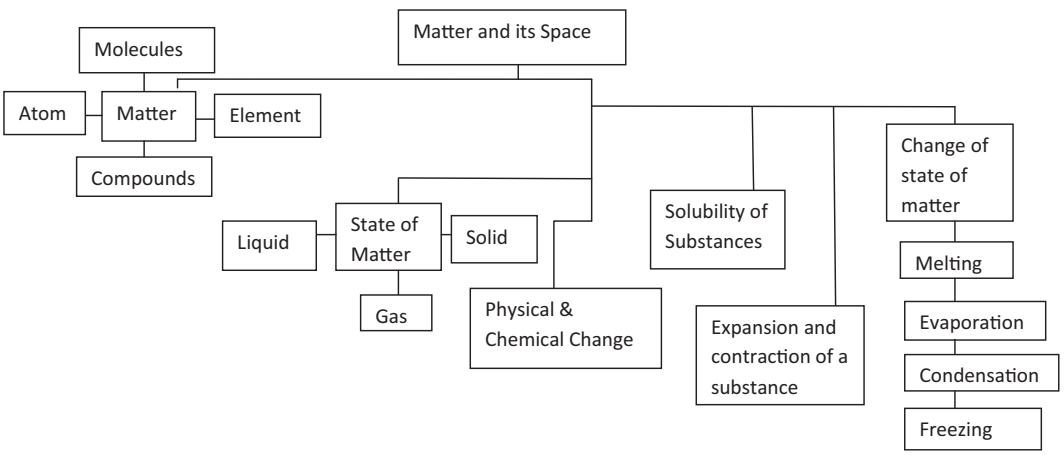
Matter and its State

No. of Periods: 5 or 7

Objectives

- To comprehend the inter-relationship between the molecule atoms, elements and compounds.
- To analyse the state of matter in terms of inter-molecular force and inter molecular space.
- To understand the solubility of substances.
- To comprehend the effect heating and cooling has on the change in the state of matter
- To understand physical and chemical changes.
- To comprehend the effect heating and cooling has on the expansion and contraction of substances.

The lesson at a glance:



In brief

- Matter is made up of molecules and atoms.
- Three states in which matter exists.
- The solubility of solids, liquids and gases in water.
- The change of state of matter on heating and cooling.
- Physical and chemical changes.
- Expansion and contractions of substances on heating and cooling.

Pre-requisites skills

- What are the three states of matter?
- What is matter?
- What are the three states in which water exists?
- How does matter change from one state to another?
- How do we get rain?(Explain water cycle)
- Compare the properties of solid, liquid and gas.

Motivation

Let Us Begin (Answers)

1. Hydrogen, Nitrogen 2. sponge, clay 3. milk, vinegar 4. petrol, kerosene 5. carbon-di-oxide, water vapour 6. Oxygen(supports burning), Hydrogen burns 7. coal 8. wood, metal

States of Matter

The teacher can place few solids like duster, eraser, pen, pencil, book, a bottle of water, a glass of milk, a bottle of coke and explain the properties of solid, liquid and gas.

- The teacher can compress a sponge and show the students that even though a sponge is a solid it can be compressed because it has pores which trap air and then explain that when the sponge is compressed the air is expelled and so it can change its shape.
- Change of state.

  A few ice cubes are placed on a plate and student can observe the ice melting and changing into water. The plate of water can then be left aside in the sun(on the window sill) and can be observed after sometime.

- Solubility of substances.

  Salt and sugar solutions can be prepared in the presence of the children. In a glass of water a little bit of cooking oil can be added. The oil remains above the water without mixing - Immiscible liquids can be taught. A spoon full of honey can be mixed in water - Miscible liquids can be taught. Sand can be added to water. The students observe that it settles at the bottom - Insoluble solids can be taught.

- Physical and chemical change.

  Melting of ice and wax can be shown as an example of physical change. A piece of paper can be lighted in the presence of the children using a candle flame - chemical change can be taught. A bowl of raw rice and a bowl of cooked rice are shown- chemical change.

Materials required

- Note book, eraser, pen, pencil, duster, sponge.
- bottle of water, glass of milk, bottle of coke.

- ice cubes and a plate.
- sugar, salt, a glass tumbler and spoon, sand.
- cooking oil and honey.
- candle, match box, a sheet of paper.
- A bowl of raw rice, a bowl of cooked rice.

Vocabulary

compounds, universal solvent, immiscible, permanent, irreversible, expansion, contraction

New concepts

- Definition of elements and compounds.
- Concept of intermolecular space and intermolecular force.
- solubility of substances.
- physical and chemical changes.
- Expansion and contraction of substances.

Questions to be asked while teaching.

1. What is matter? What is molecule?
2. What is an atom?
3. How is an element different from a compound?
4. What is intermolecular space and intermolecular force?
5. Why are solids hard with fixed shape and volume?
6. Why do liquids flow?
7. Give the properties of gases.
8. What is solubility? When do we say that a substance has dissolved in water?
9. Define: 1. solute 2. a solvent and 3.a solution
10. What is an aqueous solution?
11. Why is water called a universal solution?
12. How are insoluble solids separated?
13. Differentiate between miscible and immiscible liquids?
14. How are immiscible liquids separated?
15. How do aquatic animals and plants benefit from water soluble gases?
16. Which gas is dissolved in aerated drinks?
17. What is melting? What is melting point?
18. When does a gas evaporate? What is boiling point of water?
19. When does condensation take place?
20. What is the melting point of ice?
21. What is freezing?

22. When does change of state take place?
23. Give a short note on physical changes.
24. Explain a chemical change.
25. When do solids expand and contract?
26. What are alloys?

Assessment

1. Why is that I can compress a gas, but I cannot compress a solid?

   Ans: Solids have great intermolecular force between the molecules and so there is negligible intermolecular space between the molecules. Whereas in a gas the intermolecular force of attraction is very less when compared to a solid which is why the gas molecules are far apart and so they can be compressed, but not solids.

2. Why is honey, milk, fruit juice, ink miscible liquids?

   Ans: They are miscible because when they are added, the molecules of these liquids occupy the space between the molecules of water and completely dissolve.

3. When I put a laboratory thermometer in a pot of boiling water, what temperature will it show?

   Ans: 1000C

4. Differentiate physical from chemical change.

Physical change	Chemical change
No new substance is formed	A new substance is formed
It is a temporary change	It is a permanent change.
Change is reversible Eg. Melting of ice	Change is irreversible Eg. Ripening of fruits

5. Ans:

(I). Burning of wood - chemical change

(II). Cooking of food - chemical change

(III). Water cycle - Physical change

(IV). Rusting of iron - chemical change

(V). Digestion of food - chemical change

(VI). Melting of an ice cream - physical change

(VII). Rottening of food - chemical change

(VIII). Evaporation of water - physical change

6. When the railway lines are laid, why are gaps left in between?

   Ans: During summer, it is very hot and this heat of the sun expands the iron (railway

lines). Now the railway lines fill the gap during winter. When it is cold the railway lines contract and go back to their original place. If these gaps are not left, during expansion the railway lines may bend and the train would be derailed.

Answer key:

What I know

A.	**B.**	**C.**
1. three	1. physical change	1. matter
2. melting	2. chemical change	2. gases
3. atoms	3. physical change	3. melting
4. slows down	4. physical change	4. expansion
5. solids	5. chemical change	5. water

What I understand

A.

1. Immiscible liquids.
2. Solute.
3. Fish breathe in water with the help of gills.
4. The process by which solid changes to liquid is called melting.
5. Aqueous solution is one in which the solvent is water.

B.

1. Melting is the process by which solid changes to liquid on heating. The ice melts at a temperature of 0°C to change into water.

   Boiling is the process of heating liquid to convert it into vapour. Water on heating boils at 100°C to form vapour.

2. In liquids the molecules are loosely packed. The intermolecular force of attraction is less. The molecules can move about freely in a fixed space. Hence liquids flow.
3. Two types of changes are physical change and chemical change. Example for physical change: Water changing into vapour on heating.

   Example for chemical change: Burning of match stick.

4. When solids are heated the molecules start moving and vibrating more. They take up more space and this leads to expansion.
5. Most of the substances dissolve in water. Hence water is called universal solvent.

Challenger

A. In a burning candle, there are both physical and chemical changes. The melting of solid wax to form liquid wax and the evaporation of liquid wax to form wax vapour are physical changes, because the wax on cooling changes from wax vapour, to liquid wax to solid wax. When wax burns the wax vapours react with the Oxygen in the air to form new substances including carbon di oxide and ash. So it is a chemical change and here it is irreversible as the ash is the new substance formed and it cannot be converted to wax again.

B. Solids are hard and rigid because the intermolecular force between the molecules of a solid is very high so this result in the solids having no intermolecular space.

I can explore

1. The sugar dissolves in the water.
2. No, there is no change in the level, as the sugar molecules have occupied the space between the molecules of water.
3. It is a sugar solution.
4. Dissolving sugar in water is an example of physical change. On evaporation we can separate sugar from water.

Life skills

statements 2,3 and 4 are correct.

Get Creative

Recipe Ingredients: 4 cups of orange juice, 8 tea spoons of sugar.

By mixing orange juice with the sugar we get a solution. When this solution is poured into moulds and put into the freezer, freezing takes place. Since the temperature in the freezer is very low, the solution changes to ice candy.

UNIT - IV LESSON - 9

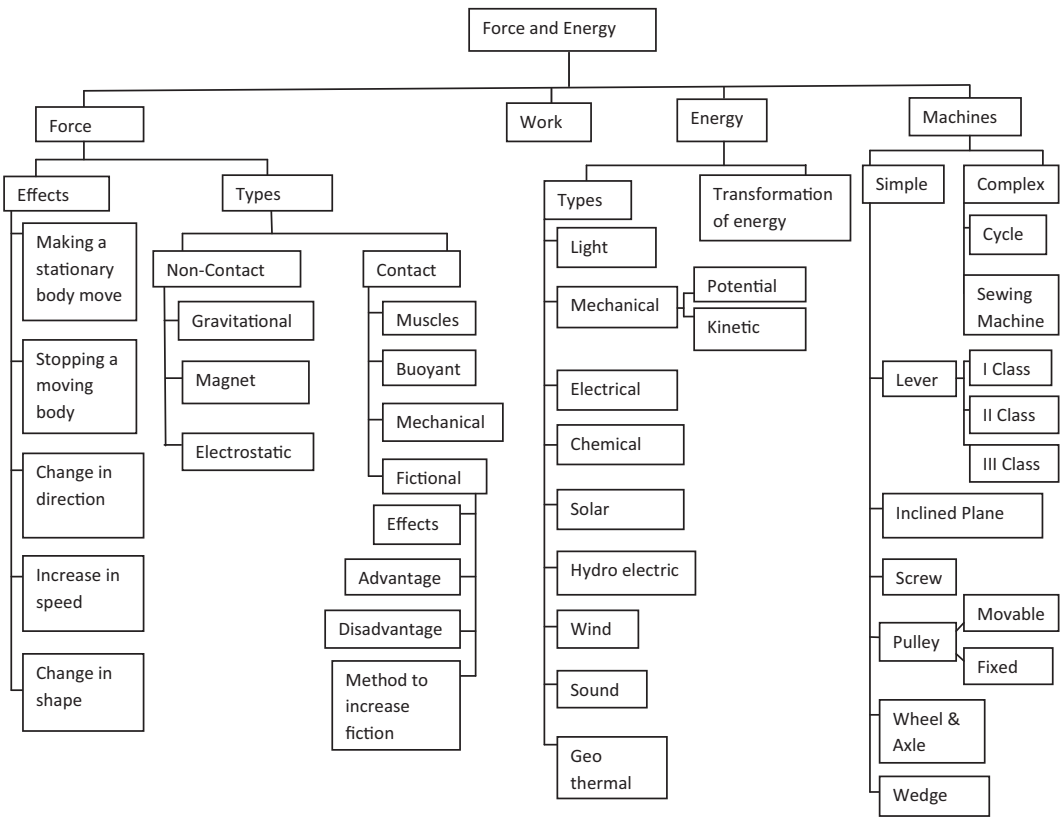
Force and Energy

No. of Periods: 5 or 7

Objectives

- To understand and list out the effects of force.
- To analyse the types of forces and categorise it as contact and non-contact.
- To understand the definitions of work.
- To list out the different types of energy and describe each of them.
- To comprehend the transformation of energy from one into the other.
- To classify the machines into simple and complex.
- To understand the working of simple machines.

The lesson at a glance:



In brief

- Definition of force and its effects.

- The two types of forces.
- The different types of non-contact forces with examples.
- Effects of frictional force.
- Advantages and disadvantages of frictional force.
- Methods to increase and decrease friction.
- The definition of energy.
- The different types of energy with suitable examples.
- The different types of simple machines.

Pre-requisite skill

1. If I want to move the chair, what should I do?
   Ans: Apply force and push it.
2. If I want to open a drawer, what should I do?
   Ans: Pull it.
3. What is force?
4. When I carry a bag, what kind of force is it?
5. When something falls from top, what force is exerted?
6. Which force helps me to walk on the road?
7. A crane is lifting a car. What force does it use?
8. Name some simple machines that we use in our day-to-day life.
   Ans: Scissors, knife, bottle opener, tong, nut cracker.
9. What are the sources of energy you have learnt?

Motivation

'Let Us Begin' Answers.

1. push 2. pull 3. push

Force

The teacher can state the following and ask the students whether it is pull or push.

1. Remote control - push
2. Open a drawer - pull
3. Telephone buttons - push
4. Friend on a swing - push
5. Move a furniture - push
6. Opening door of refrigerator - pull
7. Flying a kite - pull

8. Baby in a pram - push

9. Shopping cart - push

10. Tug of war - pull

Contact Force

Gravitation force - The teacher can throw a ball upwards to demonstrate gravitational force.

Magnetic force - The teacher can use two bar magnets. Place one bar magnet on the table, take another bar magnet close to it. Let the same poles face each other N N or other S S . With one magnet you can push the other magnet without touching it.

Electrostatic force - With a plastic comb - run the comb on dry hair and take it near bits of paper which will get attracted.

Buoyant force - Push a mug in a bucket of water, it comes up. This is buoyant force.

Energy (types of Energy)

The teacher can ask the children to look around the class room and point out the different types of energy.

The fan - Mechanical energy.

bulb, tube light - light energy.

strike the chair with a stick - sound energy.

light a candle - light energy.

touch the flame - heat energy.

move a toy car - kinetic energy.

place a pencil and paper on the table - both have potential energy.

take the pencil and write with it - how the pencil has kinetic energy.

Transformation of energy

From the above transformation of energy can be taught. fan - electrical mechanical

bulb and tube light - electric light energy

lighted candle - chemical light and heat energy

pencil lifted and written with - potential kinetic energy

Simple machine

The teacher can teach simple machine, by showing it to them.

First - class lever - scissors.

Second - class lever - bottle opener, nut cracker.

Third - class lever - tongs.

Inclined plane - The teacher can place a scale(ruler) in an elevated position on a pile of books and slide a marble - The elevated scale is an example of inclined plane

Screw - For this show the hinges of the door.

Pulley - The example for this can be a pulley helps to raise a flag on a flag pole.

Wheel and axle - Example of the cycle wheel.

Wedge - a knife of a blade.

Materials required

- ball
- 2 bar magnets
- comb (plastic), bits of paper
- mug and a bucket of water
- fan, tube light, candle, match box, toy car, pencil paper
- scissors
- bottle opener, nut cracker
- tongs
- ruler and a marble
- knife, blade

Vocabulary

- electrostatic force
- buoyant force
- geothermal energy
- fulcrum
- load
- effort
- wheel and axle

New concepts

- Contact and non contact force.
- Buoyant force.
- Advantages and disadvantages of friction.
- Methods to increase and reduce friction.
- Geothermal energy.
- Lever - First class, Second class and third class lever.

Questions to be asked while teaching.

1. What is force?
2. What are the effects of force?
3. What is a stationary body?
4. In which direction is the force applied to stop a moving body? Give examples.
5. When can the speed of a moving body be increased?
6. Give few examples when force is applied to change to shape of a body.
7. What is the unit of force?
8. What are two types of forces?
9. Name the different non-contact forces. How do they act?
10. Explain gravitational force with an example.
11. What is magnetic force?
12. Explain the magnetic force?
13. Explain the magnetic poles of a magnet. What is a magnetic substance?
14. Explain electrostatic force with an example.
15. What is a contact force? What are the types of contact forces?
16. What is muscular force?
17. Define buoyant force. Who gave the idea of buoyant force?
18. What is mechanical force?
19. What is frictional force?
20. What are the effects of friction?
21. In which way friction is of help to us?
22. Give instances when friction becomes a disadvantage.
23. What are the ways in which friction can be reduced?
24. How can you increase friction? Give examples.
25. Define work. Give its unit.
26. What is energy? What is its unit?
27. List out the different types of energy.
28. Give examples of light energy.
29. What is heat energy used for? Give examples.
30. What is mechanical energy? What are the two types of mechanical energy?
31. What is potential energy? What is kinetic energy?
32. Give example for potential and kinetic energy.
33. What is electric energy? Give the appliances that run on electricity?
34. What is chemical energy? State some examples.
35. Where do we get solar energy from?
36. How is solar energy useful to us?
37. What is hydroelectric energy? How is it useful?

38. What is wind energy?
39. What is sound energy?
40. How is geothermal energy useful to us?
41. List out the renewable and non-renewable sources of energy.
42. What is transformation of energy? Give some examples in which energy is transformed from one to another?
43. What is a simple machine?
44. What are levers?
45. Explain i. Fulcrum ii. Load iii. Effort iv. Load arm v. Effort arm
46. Explain a first - class lever with examples.
47. Describe a second-class lever with examples.
48. What is a third class lever? Give examples.
49. What is an inclined plane? State examples.
50. Is a screw an inclined plane?
51. What is a pulley? What are the two types of pulley?
52. How does a wheel and axle work?
53. How does a gear work?
54. What is a wedge? Give examples.

Assessment

The teacher can ask the students to name the force involved in the following:

1. Pulling a cart - muscular force.
2. Striking a match stick on the sides of a match box - frictional force.
3. Ship sailing in water - buoyant force.
4. Refrigerator door closing on its own - magnetic force.
5. Coconut falling from a tree - gravitational force.
6. After the TV is switched off, if your hand is taken near the screen, the hair on you hand raises - electrostatic force.
7. An(electro-magnetic) crane lifting a car - magnetic force and mechanical force.
8. Porter carrying luggage - muscular force.
9. Boat in water - buoyant force.
10. Opening a door - mechanical force.

What are the energy transformation in the following:

1. A toaster - electrical energy heat energy
2. A blender - electrical mechanical energy

3. Our body - chemical energy (in food) mechanical energy (energy to move about)
4. LPG gas - chemical energy heat energy.
5. Jumping from the diving board into the swimming pool - potential energy kinetic energy.
6. Green plant on a sunny day - light energy chemical energy.
7. Drum - mechanical energy sound energy.
8. Hair dryer - electrical energy heat energy.
9. Bicycle - mechanical energy kinetic energy.
10. Electric guitar - electric energy sound energy.

What kind of simple machines are the following:

1. ladder - inclined plane
2. axe - wedge
3. fishing rod - third-class lever
4. crowbar - first - class lever
5. ramp - inclined plane
6. broom - third class lever
7. cutter - wedge
8. drilling machine - screw
9. cutting plier - first-class lever
10. staircase - inclined plane
11. screw driver - wheel and axle
12. spoon - first-second lever
13. paint brush - lever
14. shovel - third-class lever

Answer key:

What I know

A.

1. potential energy 2. energy 3. joules 4. frictional force 5. friction

B.

1. × 2. ✓ 3. ✓ 4. × 5. ✓

C.

1. scissors, sea saw
2. bottle opener, wheelbarrow
3. tweezers, ice tongs
4. bicycle, door knob
5. ramp, slide

What I understand

A.

1. There are three classes of lever.
2. The unit of force is Newton (N).
3. Work is said to be done when a force applied on an object moves it through a distance in the direction of the force applied.
4 It is called fulcrum.
5. The force applied by our muscles to push or pull objects is called muscular force.

B.

1. Non-renewable energy is the energy that cannot be renewed over a period of time. It is limited and has to be used very carefully. Fossil fuels coal and petrol are examples of non-renewable energy.
2. Forces can be classified as non-contact forces and contact forces.

   Non-contact forces: gravitational force, magnetic force, electrostatic force

   Contact forces: muscular force, buoyant force, mechanical force, frictional force

   Fibres are twisted together to form yarns which are woven together to form fabric.
3. Frictional force is a force opposing motion when two objects are in contact and one of them is moving.

   Friction between the ground and our feet helps us to walk and prevents us from falling. Friction between paper and pen helps us to write and light a matchstick.

   Friction can be reduced by using lubricants like grease, oil etc.
4. Pulley is wheel with a groove on the outer edge to hold the rope in position. Pulleys are of two kinds, fixed and movable pulley.

   Pulleys are used to draw water from the well or to lift heavy loads.
5. Solar power is renewable source of energy. It is available in plenty in tropical countries. We get heat, light and electricity from solar power.

Challenger

A. The banana peel is slippery and so stepping on it reduces friction and the person falls.

B. When cycling uphill you are going against the force of gravity so it is more difficult than downhill.

I can explore

There is frictional force when you rub the palms of your hand. Friction produces heat and that is why when you rub your palms you feel hot.

Friction plays an important part in our daily life. We cannot walk if there is no friction between the soles of your feet and the floor. You cannot stop a car if there is no friction between the brake and the tyres of the car; you cannot write if there is no friction between your pen and the paper.

Values for me

A crow bar is a first-class lever.

Here muscular energy is used.

statement 2 will help Ajay to remove the boulders.

Life skills

Statements 1 & 3 help us to save electricity.

UNIT - IV LESSON - 10

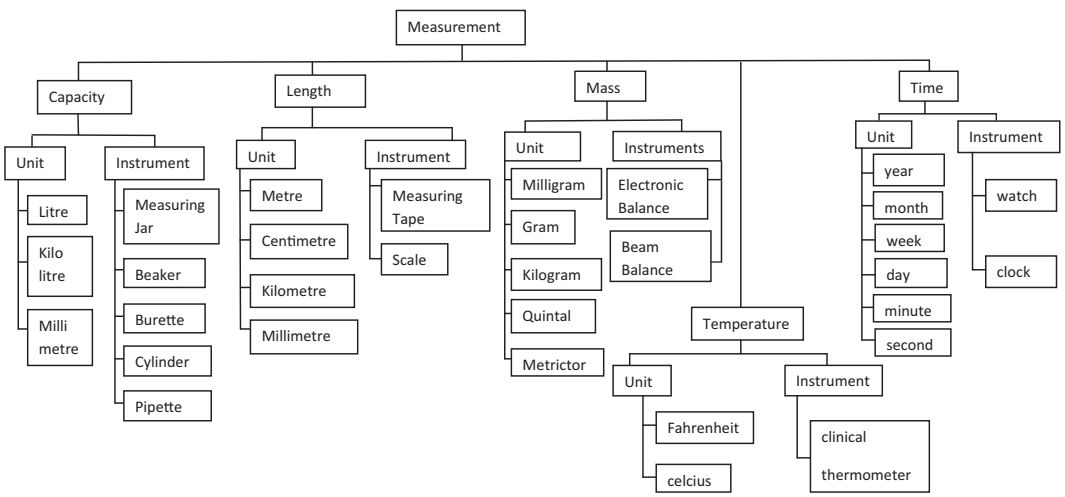
Measurement

No of Periods: 5 or 7

Objectives

- To understand the different quantities for measurement.
- To understand the need for a standard unit.
- To select the appropriate tool to measure the different quantities.
- To analyse and select the relevant unit to measure a given quantity for all the different quantities of measurement.

The lesson at a glance:



In brief

- Body parts used to measure things in earlier days.
- Measurement of capacity.
- The unit used to measure capacity.
- The instruments used to measure capacity.
- Measurement of length.
- The units and the instrument used for measuring length.
- Measurement of mass.
- The units and instruments used to measure mass.
- Measurement of temperature.
- The units and instruments to measure time.

Pre-requisite skill

- How do you reach school on time every day?
- How is that your uniform is stitched perfectly by your tailor?
- Sona's mother buys 1 litre milk from the milk man? How is your mother sure it is just 1 litre, not more or less?
- When I have fever, the doctor is able to tell exactly how much the temperature of my body is and gives the required medicines. How is it possible?
- How do I know the distance from my home to school?

Questions to be asked while teaching the lesson.

1. What is measurement?
2. In earlier days people used body parts to measure things. What were they?
3. What is a unit?
4. What are the five different quantities for measurement?
5. What is capacity? Give its units.
6. What are the measuring instruments used in a laboratory?
7. What is length? How is length measured? Give the units of length.
8. What is mass? What are the instruments used to measure mass? What are its units?
9. What is the unit for measuring very big mass like a container full of iron rods?
10. What is temperature? Which instrument is used to measure temperature? What are the scales used to measure temperature?
11. How do you convert from Fahrenheit to Celsius scale and vice versa?
12. What is time? What are the instruments used to measure time? What are the units of time?
13. What is the normal temperature of human body?

Motivation

Let us Begin (answers)

1. cloth - measuring tape 2. vegetables - beam balance, 3. water - measuring jar 4. milk - measuring cup 5. corn - digital balance 6. temperature - thermometer

Measurement in early days

Using hand span the students can measure the length of their desk and the varying results can be discussed.

Measuring capacity

The teacher can show the burette, pipette, measuring cylinder, beaker and measuring jar and explain to the students how liquids can be measured using these instruments.

Measuring length

Here with a scale and measuring tape the teacher can teach how to measure the length

of a book or a cloth. The students can measure their pen/pencil with a scale.

Measuring mass

The teacher can explain how vegetables are measured using a beam balance, where vegetables(tomato) are placed in a pan and how vegetables(tomato) are added and removed till both pans are balanced. She can tell how the digital balance just displays the weight of the object.

Measuring temperature

With the help of a thermometer she can actually measure the temperature of a student today and teach her students how to read the temperature.

Measuring time

With the help of a watch and clock she can teach them how to read the time.

Assessment

1. Who uses the cubit even now?

   Ans: flower seller.

Mother decided to make butter cake for tea. Help her choose the appropriate measuring instruments for all the ingredients in the cake.

Recipe	Measuring instrument
250g butter, softened	digital balance
180g caster sugar	digital balance
3 eggs	
350 g of self-raising flour	beam balance
200ml of milk	measuring jar
2ml of venilla essence	measuring spoon

2. What is the unit used for the following?
   a. Distance from Chennai to Mumbai - kilo metres
   b. How is the climate today - Fahrenheit
   b. Cloth required for stitching a dress - metre
   d. Length of an eraser - millimetre
   e. Quantity of petrol in the tank - kilo litre
   f. Quantity of vegetable required for wedding feast - kilogram
   g. Quantity of sand for a building construction - quintal
   h. Time taken for one period to get over - minutes

i. Milk required for making milk peda - litre

j. Time taken for a plant to grow into a tree - years

k. Time taken for curdling of milk - hours

3. Why does a leap year have 366 days?

Ans: The length of time it takes the earth to complete its orbit around the sun, is about 354 1/4 days. The four 1/4 days are added to make 1 full day which is added in the leap year, which comes once in 4 years. This is added to February in the leap year when February has 29 days instead of the 28 days it has in an ordinary year.

Answer key:

What I know

A.	**B.**	**C.**
1. metre	1. T	1. 1000 ml
2. 100	2. F	2. 10mm
3. milligram	3. T	3. 1000 kg
4. 52	4. F	4. 3600 secs
5. 1000	5. T	5. 12 months

What I understand

A.

1. Measurement is finding size or quantity. Measurement is usually made in comparison to a standard value.
2. The standard measurement universally used is called unit.
3. Medicines in injections are measured in millilitres.
4. The amount of liquid a container can hold is called its capacity.
5. Smaller masses are measured in milligrams.

B.

1. In early day people used body parts to measure. For example: cubit, hand span etc. As these measurements varied from person to person it was not a standard measurement.
2. Kilometre is used to measure distances between places.
3. Time is measured using watch or clock.

   Longer duration of time is measured as days, week, months or year.
4. Standard units of measurements:

Capacity: Litre

Length: metre

Mass: Kilogram

Temperature: Degree Centigrade or Fahrenheit

Time: seconds

5. Temperature is the degree of hotness or coldness of a body.

   Units: Degree Centigrade or Fahrenheit .

   Thermometer is the device used to measure temperature.

Challenger

Adding the 2 hours of practice and Raju's travel time from home to school to 3.30pm(the time the school gets over) we can calculate and conclude that Raju would reach his home approximately at 5.45pm.

I can explore

On the first day Rita should start from her home relatively early and note the time she starts from home. When she reaches school she has to again note the time. She can subtract the two timings(ie) the time she reached school minus the time she started from home. (1 hour, 60 minutes) This would give her the total time she has taken to ride from her home to school on her bicycle. Now that she knows the total time it takes to reach school, she can plan accordingly and reach school on time every day.

Life Skills

The right unit to be used is 100grams as we buy raisin in small quantities. And the unit used to measure small quantities is grams and not kilograms.

UNIT - V LESSON - 11

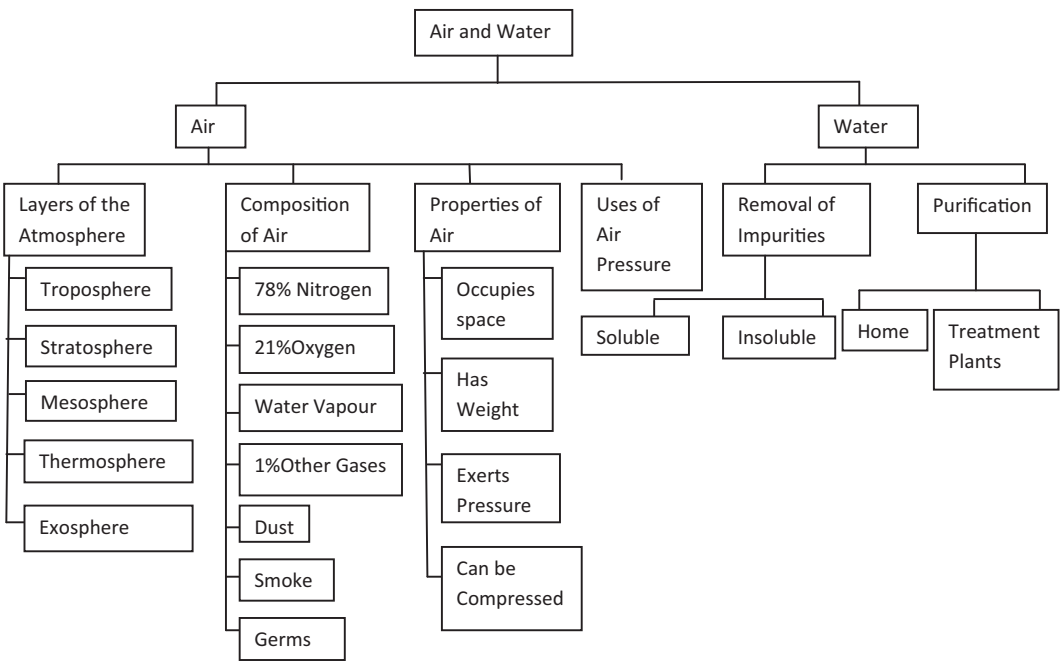
Air and Water

No of Periods: 5 or 7

Objectives

- To identify the different layers of the atmosphere and understand the importance of each.
- To list out the composition of air.
- To understand the properties of air.
- To comprehend the uses of air pressure.
- To know how to remove the impurities from water after classifying it as soluble and insoluble.
- To describe the purification of water done on a larger scale.

The lesson at a glance:



In brief

- The different layers of the atmosphere.
- The uses of the atmosphere.
- The composition of air.

- Properties of air.
- The uses of air pressure.
- Removal of impurities from water both soluble and insoluble.
- Purification of drinking water both at home and at the treatment plant.

Pre-requisite skills

1. What is all around us what is that we cannot see but feel?
2. What are the gases present in the air?
3. Which gas is essential for breathing as well as for burning?
4. How do plants and animals depend on each other?

   Ans: Animals and human beings breathe in oxygen and breathe out carbon-di-oxide. This carbon-di-oxide is used by plants to prepare food and after photosynthesis oxygen is given out. This cycle continues. Animals and human beings depend on plants for food.
5. How can clean water be obtained from a mixture of sand and water?
6. How should one purify drinking water?
7. When you are travelling, which is the safest water to drink?

   Ans: Distilled water obtained in bottles.
8. How does air get polluted?

   Ans: a. smoke from exhaust of vehicles, factories etc b.Burning of garbage and plastic c. Burning of fossil fuels like coal, petrol, oil etc. d. Deforestation (less of trees more of co_2 in the air)
9. How does water get polluted?

   Ans: a. Chemical waste from factories is sometimes dumped into rivers and lakes.

   b. Pesticides applied to farmland enter surface water and ground water.

Motivation

Let us Begin (Answers).

In hot air balloon - air.

Oxygen for breathing from the oxygen cylinder.

Water for drinking.

Water for plants.

Activity 1 can be demonstrated in the class - to show the presence of oxygen in air, as it is consumed for burning (with the prior knowledge that oxygen is required).

Air occupies space - A student can be asked to blow a balloon - to show that air occupies space.

Air can be compressed - For this concept to be taught the teacher can suck water from a glass tumbler and explain it.

She can use an ink filler to fill a pen and explain air pressure.

Removal of impurities from water.

This too can be demonstrated in the class.

Procedure: Take a beaker of muddy water, allow it to stand for some time and pour out the clear water above the sediments into a conical flask through a funnel which has a filter paper, to get the clear filtrate. Terms like sediments, filtrate can be clearly taught.

Questions to be asked while teaching.

1. What does air contain?
2. What is atmosphere?
3. What are the different layers of the atmosphere?
4. Describe the troposphere.
5. How is the stratosphere important to us?
6. Which layer of the atmosphere do meteorites hit when they fall on the earth?
7. In which layer do space shuttles orbit?
8. Describe the exosphere.
9. How is the atmosphere useful to us?
10. How is nitrogen converted to usable nitrogen compounds?
11. What do we understand from Activity 1?
12. Though only 0.03% of air is carbon di oxide, plants get their supply of co_2 for photosynthesis. How?
13. What is humidity?
14. How does the air become humid?
15. Apart from oxygen, carbondioxide and nitrogen, what are the other gases present in the air?
16. What are the properties of air?
17. Compare the air pressure at sea level and on the mountains.
18. Why do we not feel the air pressure?
19. Explain how we are able to drink juice through a straw.
20. Why is water called the universal solvent?
21. What is the freezing point and what is the boiling point of water?
22. Which is our main water source?
23. What are the two types of impurities found in water?
24. Give suitable examples for each.
25. What are the three methods used to remove insoluble impurities?
26. What is sedimentation?

27. What is decantation?
28. What is filtration? What is filtrate?
29. What is residue?
30. Explain the process by which insoluble impurities can be removed from water by sedimentation, decantation and filtration.
31. Explain the process of purification of water by boiling it.
32. What is chlorination?
33. Explain how water is purified before it reaches our house.

Materials required

- a balloon
- a syringe
- a straw, a glass tumbler with water, ink filler.
- muddy water in a beaker, a conical flask, a funnel filter paper (all these to be obtained from the science lab).
- a candle and a plate.

Vocabulary

- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere
- Exosphere
- Compressibility
- filtrate
- residue

New concept

- The layers of the atmosphere.
- Composition of air.
- Properties of air.
- Use of air pressure.
- Chlorination

Assessment

1. What is ozone depletion? How does it affect us?

   Ans: When man-made CFCs(Chloro Flouro Carbons) are released (CFCs are used in the manufacture of aerosol sprays, packing materials, as refrigerant) into the atmosphere, they strike the ozone in the stratosphere and split it apart. This is ozone depletion. The ozone layer absorbs harmful UV radiations. When there is ozone

depletion, UV rays can strike us directly causing all kinds of skin-related problems including skin cancers.

2. In Activity 3, when cold water is poured over a closed tin of boiling water, it crushes why?

   Ans: When cold water is poured over a closed tin of boiling water, the steam within the tin condenses, reducing the pressure inside the tin. The pressure outside is more than the pressure inside,. so the atmospheric pressure acts on all sides of the tin, thus crushing it.

3. Why do deep sea divers, wear specially designed suits?

   Ans: The pressure exerted by the water in the oceans increases with depth. Deep down the sea, the pressure is enough to crush the human body. That is why deep sea divers wear special suits, which can withstand such high pressure and prevent their bodies from crushing.

4. Why do astronauts wear space suits in space?

   Ans: In space there is no air, so there is no atmospheric pressure to hold your body in place. If the astronauts don't wear space suits, the difference in pressure between space and your body will explode your body. Space suits also protect the astronauts from extreme cold conditions of space and the dangerous radiation present there.

5. How do we extract salt from sea water?

   Ans: Salt evaporation ponds or salt pans are shallow evaporation ponds designed to extract salt from sea water. The sea water is fed into these salt pans and the water is drawn out through natural evaporation which allows the salt to be subsequently harvested.

Answer key:

What I know

A.

1. insoluble 2. troposphere 3. oxygen 4. disilled water 5. chlorine

6. coal

B.

1. F 2. F 3. T 4. F 5. T

What I understand

A.

1. The process by which green plants prepare their food using carbon dioxide in the air, water from the soil in the presence of sunlight and chlorophyll.
2. Oxygen in the air is used for breathing and also for combustion.
3. The amount of water vapour in the air is known as humidity.

4. Water supplied to towns and cities undergo the processes of sedimentation, filtration and chlorination before being supplied to homes.

5. Drinking water should be purified as it contains germs.

B.

1. Stratosphere layer contains ozone gas which forms a protective layer against the ultra violet radiations of the sunlight.

2. Properties of air: 1. Air occupies space 2. Air has weight 3.Air exerts pressure.

Activity:

To show that air exerts pressure on objects.

Procedure: Take a tin can with a lid, fill a small amount of water in it and heat the water till it boils. When the water is boiling put the lid on the box and pour cold water on it.

Observation: We will see, as the tin cools that it becomes shapeless as the air pressure crushes the tin.

Inference: Air exerts pressure.

3. As many substances dissolve in water it is called universal solvent.

4. Sedimentation is the process by which insoluble impurities in liquid are allowed to settle down. The clear water above the sediment is carefully poured into another container and the sediment is left behind.

   The process of pouring out the liquid without disturbing the sediments is called decantation.

5. Distillation is the process of boiling water, condensing the vapour and collecting the condensed liquid.

Challenger

A. When a sky diver jumps out of the plane he uses a parachute. The air resistance increases greatly when the parachute is opened. The diver will reach a speed appropriate for safe landing (ie) the parachute slows down the speed at which the sky diver is falling.

B. The chronic effect of UV exposure can be serious, even life threatening, including premature aging of skin, suppression of the immune system, damage to the eyes, and skin cancer.

I can explore

The carbon di oxide gas that is given out as a result of the reaction of vinegar and baking soda, fills the balloon and inflates it.

Life skills

If statements 1, 3 and 4 are followed the ozone layer can be maintained.

UNIT - V LESSON - 12

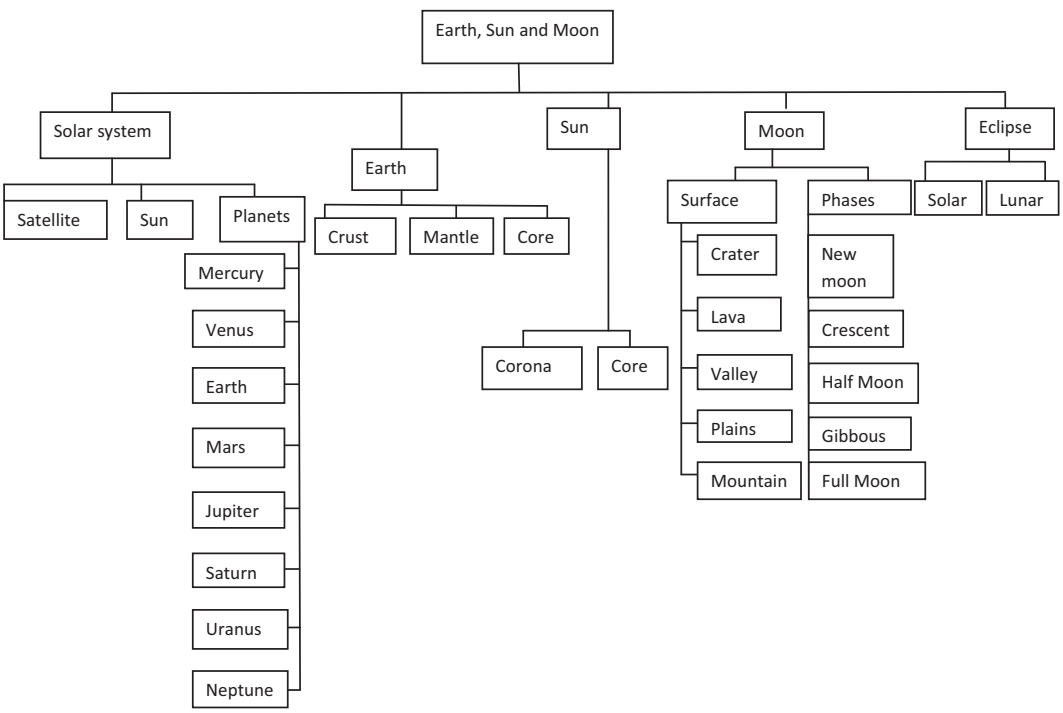
Earth, Sun and Moon

No of Periods: 5 or 7

Objectives

- To understand the solar system planets and satellites.
- To classify the inner parts of the earth and describe the same.
- To describe the sun and know how it is the basis for life on earth.
- To recognize the moon by its unique features.
- To identify and describe the phases of the moon.
- To know the people who have travelled to space and the moon.
- To understand and analyse the position of the earth, moon and sun for the two eclipses to occur.
- To be aware of the precautions adapted/to be followed during eclipses.

The lesson at a glance:



In brief

- The solar system and all its planets.
- The Earth and its inner parts.
- The moon, the natural satellite of the Earth.
- The surface of the moon and its gravity.
- Scientists who have landed on the moon.
- The phases of the moon.
- The solar and lunar eclipse.
- The precautions adapted/to be followed during eclipses.

Pre-requisite skills

- Name the eight planets in order of their proximity to the sun.
- Name the natural satellite of the Earth.
- What do you see when you look at the night sky?
- What are the three layers of the earth?

Motivation

Let Us Begin Answers.

The planet closest to the sun - Mercury.

The brightest planet - Venus.

The blue planet - Earth.

The red planet - Mars.

The largest planet - Jupiter.

The planet with rings - Saturn.

The planet next to Saturn - Neptune.

The last planet seen - Uranus.

The teacher can write a poem on the board on planets.

The can recite the given poem and this will make it easier for them to remember the names of the planet in the right order.

Planet Roll call

Eight planets around the sun

Listen as I call each one

Mercury? Here! Number one

Closest planet to the sun

Venus? Here! Number two

Shining bright, just like new!

Earth? Here! Number three,

Earth is home to you and me

Mars? Here! Number four,

Red and ready to explore

Jupiter? Here! Number five

Largest planet, that's no jive!

Saturn? Here! Number six

with rings of dust and ice that mix

Uranus? Here! Number seven

A planet tilted high in heaven

Neptune? Here! Number Eight

With one dark spot whose size is great

The teacher can ask her student to look at the night sky daily and observe the shape of the moon.

Eclipses can be taught with the globe, a small ball and a torch.

Materials required

- a globe
- a ball
- a torch light

New concepts

- The parts of the sun and the gases found.
- The phases of the moon.
- The solar and lunar eclipse.

Vocabulary

- umbra
- penumbra
- waxing and waning of the moon
- corona
- craters

Questions to be asked while teaching.

1. What are celestial bodies?
2. What constitutes the solar system?
3. What is a satellite?
4. Name the eight planets of the solar system?
5. Is Pluto a planet? What is it then?
6. Name the following:
   a. Smallest and closest planet to the sun - Mercury
   b. Hottest, brightest planet - Venus
   c. Blue planet - Earth
   d. Red planet -Mars
   e. Largest planet - Jupiter
   f. Planet with rings - Saturn
   g. Farthest planet from sun - Neptune
   h. Coldest planet - Uranus
7. Write a short note about Earth.
8. Name the three layers of the earth.
9. On which layer of the earth lie the continents and oceans? How thick is it?
10. From which layer of the earth does volcano erupt? What is its thickness? What minerals is it rich in?
11. What are the 2 layers in the core of the earth? What minerals are they rich in?
12. How does the Earth get the heat and light of the sun?
13. What are the two layers of the sun called?
14. Being a non-luminous body, how does the moon appear to be the brightest object in the night sky?
15. How is the surface of the moon?
16. The footsteps left by the astronauts on the surface of the moon will be seen for a million years to come. How is it possible?
17. Compare the gravity of the moon to that of the earth.
18. Why can't we hear any sound on the moon?
19. Who were the first astronauts who landed on the moon? Name the space craft in which they travelled.
20. How do you define the phases of the moon?
21. When does new moon occur?
22. When do we see a full moon in the night sky?
23. What is waning and waxing of the moon?

24. What are the different phases of the moon?
25. What is a tide? What are the two tides?
26. Which is India's first mission to the moon?
27. When does an eclipse occur?
28. When does a lunar eclipse occur?
29. When does a solar eclipse occur?
30. What protection do you take while viewing a solar eclipse?
31. What should be avoided during a spring tide?
32. Why are artificial satellites launched into space?
33. Name some of the Indian satellites that have been launched.
34. What are the different purposes for which the satellites are launched?
35. What is space science?
36. What is special about Mangalyan?
37. Name the first satellite launched by India?

Assessment

1. The sun's solar energy is the basis for life on Earth. Explain.

   Ans: The main gases found in the sun are hydrogen and helium. In the core, hydrogen is continuously converted into helium and during this a lot of heat and light is released. This forms the solar energy which the earth's surface receives. Without this solar energy there would be no life on the earth.

2. The gravity on the moon is 1/6 that of the earth. Why do I feel lighter on the moon (ie) 1/6 of the weight that I have on the earth?

   Ans: The weight of an object is the force of gravity acting on the object. Since the force of gravity is less on the moon my weight is also less.

3. What is Hubble space Telescope?

   Ans: In 1990, the Hubble space Telescope, named in honour of astronomer Edwin Hubble, was launched into orbit around the Earth. The telescope, a basic reflector with a mirror, was packed with instruments that would give astronomers clear views of the universe, in visible, infrared and ultra violet light.

4. How does a navigation satellite work? Have you heard the word GPS?

   Ans: A satellite navigation device, uses the global positioning system(GPS) to pin point exactly where you are on the planet. It detects signals from at least three satellites orbiting the earth.

Anser key:

What I know

A.

1. eight 2. moon 3. sputnik I 4. earth 5. new moon day

B.

1. First woman in space
2. First artificial space satellite
3. Hydrogen and Helium
4. Aryabhatta
5. First man to land on moon

C.

1. tides
2. satellite
3. eclipse
4. forecast
5. astronaut

What I understand

A.

1. The picture is solar eclipse

It occurs on new moon day.

B.

1. The sun, different planets their satellites and other objects in the sky are called celestial bodies.
2. The blanket of air around the earth is called atmosphere.
3. The mantle is the middle layer of the earth between the core and the crust. Its outer part is hard rock while the inner part consists of molten rock.
4. The thin outer layer of the sun is called the corona.
5. The scientific satellites are used to collect information about space. Communication satellites help to send telephone calls, radio, television programme and computer information from place to place. The Navigation satellites help to move from place to place in airplanes, ships and cars by giving information.

Challenger

A. Sound needs a medium for propagation. Sound can travel through solid, liquids and gases but they cannot travel in a vacuum.

The atmosphere on the moon is negligible. Since there is no air on the moon, no sound can be heard on the moon.

B. Weather satellites carry instruments called radio meters (not cameras) that scan the Earth to form images. These instruments usually have some sort of small telescope or antenna, a scanning mechanism, and one or more detectors that detect visible, infrared or micro radiations for the purpose of monitoring the weather system around the world. The measurements these instruments make are transmitted to receiving stations on the ground. The data are then relayed over the internet in the form of images.

I can explore

Astronauts float around in space because there is no gravity in space. Everyone knows

that the farther you get from Earth, the less the gravitational force is and the astronauts are so far from the Earth that gravity is so little. This is why NASA calls it micro gravity.

Values for me

Statements 1, 2, 4 and 5 help in promoting awareness about eclipse.

Life skills

Statements 1, 3 and 4 could be the reason why nobody fell inside the pool in spite of a power cut.

UNIT - V LESSON - 13

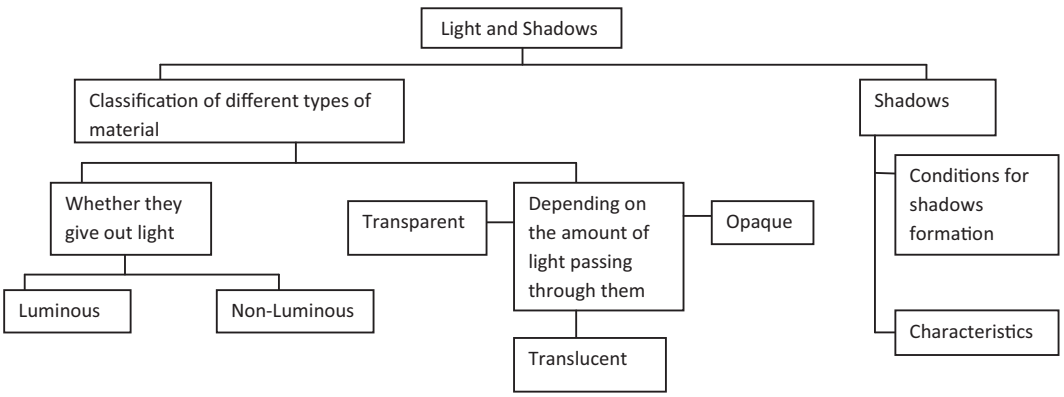
Light and shadows

No. of Periods: 5 or 7

Objectives

- To know that light is emitted from luminous objects.
- To classify materials as transparent, translucent and opaque.
- To understand that shadows form when light travelling from a source is blocked.
- To list out the conditions required for a shadow to be formed.
- To analyse the characteristics of a shadow.

Lesson at a glance:



In brief

- Light - luminous and non-luminous objects.
- 3 types of materials depending on the amount of light that passes through them.
- How shadows are formed.
- Conditions required for shadow formation.
- Characteristics of a shadow.

Pre-requisites skills

- How can we see the things around us?
- How does light travel?
- Name some natural things that give out light?
  Ans: sun, stars, firefly, jelly fish

- Name some man-made things that give out light.

  Ans: torch, bulb, tube light, cell phone, microwave, TV, projector, computer

- Close your eyes can you see anything?
- If the room is dark with no light, can you see anything?
- There is bright light, I can see clearly but still I cannot see my cycle which is at home. Why?

  Ans: To see any object, three things are required.

  The object to be seen

  The observer (eyes)

  The source of light

Motivation

The 'Let us Begin' activity can be done.

Answers:

glass door of window **L**

Wooden door **NL**

black board **NL**

chair **NL**

water bottle **NL**

- Three transparent glass tumblers are taken, In one water is taken, in the second, orange juice is taken and in the third, honey is taken. Place a white sheet of paper on the teacher's table. Now the teacher takes the glass with water and holds it above the white sheet of paper and flashes a torch light from above. Now she can ask the students. Answer 'No'. Now the teacher holds the glass tumbler with the orange juice above the white sheet of paper and flashes the light and asks her students if a shadow is formed, for which the student would reply that a light shadow is formed on the paper. She does the same with a glass of honey. Now the students are able to see a clear shadow of the glass tumbler.

  From the above activity and the activity given in the book the teacher can teach about transparent, translucent and opaque objects and also explain that opaque objects cast a shadow.

Materials required

A sheet of white paper, a glass of water, a glass of orange juice, a glass of honey.

The teacher gives a lighted torch to a student and asks another student to hold a different object in front of the torch light. Let the shadow of these fall on a wall, now the teacher can lead a discussion and explain the properties of a shadow. The teacher can clearly explain that no matter what the colour of the object is the shadow is always black and that the shadow only casts the outline of the object and not the details.

New concepts

- Condition required for a shadow formation.
- Characteristics of a shadow.

Questions to be asked while teaching the lesson.

1. What are luminous objects? Give examples.
2. Give examples of luminous objects.
3. How are we able to see non-luminous objects?
4. Depending upon the amount of light that passes through them, materials can be classified into 3 types. What are they?
5. What are transparent objects? Give examples.
6. Why is an object said to be opaque? Give examples.
7. What type of object casts a shadow?
8. What are the conditions required for shadow formation?
9. On which side of the objects is a shadow formed?
10. What is the colour of a shadow?
11. How does the distance between the object and the source of light affect the size of the shadow?
12. Does the distance between the screen and the object alter the size of the object? How?

Questions for assessment

1. We all know transparent objects do not cast a shadow, translucent objects cast a light shadow and opaque objects cast a dark shadow. Can you explain why?

   Ans: A shadow is cast only when the path of light is blocked by an object.

   If a transparent object is in the path of light a shadow is not cast because the transparent object allows all the light to pass through it. In the case of a translucent object, only part of the light passes through the object, the rest is blocked. So a light shadow is formed. For an opaque object, all the light that falls on the object is blocked by the object, so a dark shadow is formed. Thus we see that only if light is blocked a shadow is cast.

2. I am studying in a dark room, will I be able to see an object that is in the opposite room, that is lit properly.

Ans: Yes, even if I am standing in the dark room still I can see the object that is in another room(opposite)well lit. This is because we are able to see things when light falls on it and it is reflected to our eyes.

3. The phenomenon of eclipse is because of the formation of shadows, when light falls on an object. In solar and lunar eclipse - Explain which is the light source, object and screen.

Lunar Eclipse light source - sun

opaque object - earth

screen - moon

Lunar eclipse occurs when the earth comes between the sun and the moon

Solar Eclipse light source - sun

opaque object - moon

screen - earth

Because in solar eclipse the moon comes in between the sun and the earth.

Answer key:

What I know

A.	**B.**	**C.**
1. luminous	1. T	1. F
2. light	2. F	2. T
3. shadow	3. T	3. F
4. firefly	4. F	4. T
5. transparent	5. F	5. F
	(i). 365 days and 6 hours	
	(ii). atmosphere	
	(iii). constellation	

What I understand

A.

1. Objects that emit light of their own are called luminous.
2. Three conditions for shadows to form are,
   a. Source of light
   b. A surface on which shadow can be formed.

c. A translucent or opaque object.

3. Characteristics of a shadow formed.

   a. Shadow is always formed on the opposite side of the source of light.

   b. A shadow is always dark.

   c. Shadow only shows the shape of the object but not its detail.

4. Translucent objects are those that allow only some amount of light to pass through them.

5. Size of the shadow varies during the day, smallest during the midday when the sun is just above the head. Stars have their own light whereas planets do not have light of their own.

B.

1. Luminous objects are those that emit light of their own, example: sun, lamp.

   Non luminous do not have light of their own, example: moon.

2. Transparent objects are those that allow light to pass through them completely, example: glass, clean water.

   Opaque materials are those that do not allow light to pass through them, example: wooden box, wall.

3. Shadow at 9 a,m will be much longer than shadow at 12 noon as the sun is just above at noon.

Challenger

A. A transparent object allows all the light falling on it, to pass through. Shadows are formed only when an object blocks the path of light falling on it.

B. In the dark room all the object placed near the lighted candle can be seen as the lighted candle is a source of light. A lit candle is a luminous object because the flame of the candle gives out light, where as when the candle is not lit, it no longer gives out light so it is a non-luminous object.

I can explore

We can more or less tell the time though not exactly by looking at the length of the shadow during the day. When the sun rises and we are facing north our shadow will be long at about six o'clock and as the sun keeps rising the shadow becomes shorter, when at about 9 am my shadow is moderate in length. At 12 noon my shadow is the shortest when the sun is directly over head and as the sun keeps moving further the shadow again starts becoming longer, when at 3 pm it is moderate in length and shadow is longest at around 6 pm. This is during summer when the sun sets late.

Values for me

1. The wall - cement and brick, Reason - these make the wall strong and opaque

2. The window - the frame is made of wood and the Reason - The frame has to be strong so it is made of wood.

   The window is made of glass so that it allows sunlight into the room as glass is transparent.

3. The door - is made of strong, thick wood. Reason - The doors should be strong for protection so it is made of opaque wood.

Life skills

Statements 1 is the reason why we wear spectacles.

UNIT - V LESSON - 14

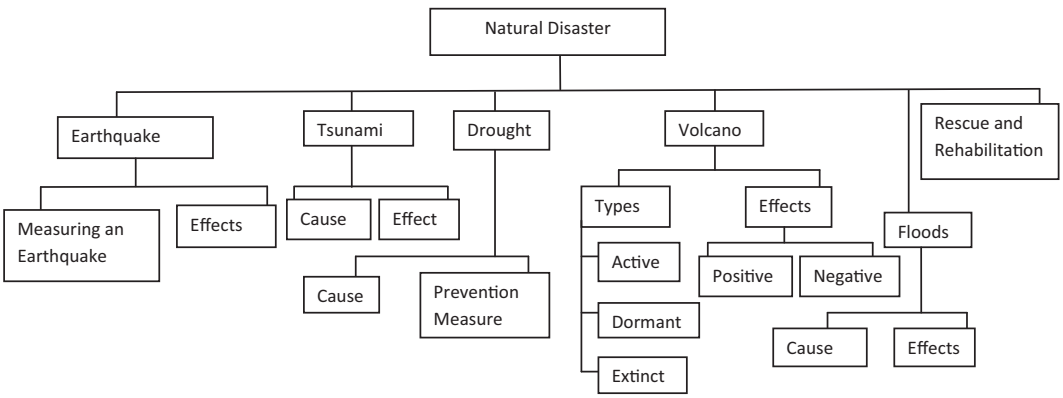
Natural phenomenon- Natural disasters

No. of Periods: 5 or 7

Objectives

- To Identify various types of natural disasters.
- To analyze whether the natural disaster is weather related or geology related.
- To know how a natural disaster is caused.
- To understand the effects as a result of these disasters.
- To analyse and state the preventive measures for each of the natural disaster.
- To recollect the natural disaster of the recent past of our country.

Lesson at a glance:



In brief

- The natural disasters and different types.
- How earthquakes are caused, measured and the effects of earthquakes.
- Tsunami and its causes.
- Volcanoes and the type of volcanoes.
- The positive and negative effects of volcanoes.
- Floods, its cause, effects and preventive measures.
- Droughts leading to famine.
- Effect of droughts and preventive measures.
- Rescue and rehabilitation following natural disasters.

Pre-requisites skills

- What was the recent natural disaster in Tamil Nadu? (Floods)
- Have you experienced an earthquake?

- What happens when there is an earthquake?
- Which place has frequent earthquakes?(Japan).
- Have you heard of the word Tsunami? Where does a Tsunami take place? (under the water, in seas).
- How does a place look like when there is a drought? (barren, dry, with any vegetation, no water)

Motivation

The teacher can start with the 'Let Us Begin' activity.

Some parts of Tamil Nadu experienced flood. Before chennai was flooded, how was the weather?

Ans: Chennai along with some of the coastal areas of Tamil Nadu experience very heavy rainfall which lasted for one or two weeks, in December 2015. Very heavy and continuous rains for 3-4 days in the first week of December resulted in floods. The Adayar River overflowed its bank, flooding residential areas and other parts of Chennai.

The teacher can then go on to ask her students if anyone was affected by the December 2015 floods or talk about related stories news channel coverage etc.

Assessment

1. After the on set of a major earthquake, why have we, still to be cautious and stay away from huge buildings?

   Ans: Earthquakes are usually followed by aftershock which can occur 2 or 3 days after the major earthquake. These aftershocks can cause even more damage to the already weakened buildings and roads.

2. What happens during a 7 Richter Scale magnitude earthquake?

   Ans: An earthquake that measures 7 on Richter Scale will result in the following:- It can cause serious damage over large areas. Major damages in all structures, ground cracking, pipes breaking, and shift in foundation. We can imagine the number of lives lost.

3. Just imagine an earthquake of magnitude of 20-24 on the Richter Scale.

   Ans: It will be a rebirth of earth, certainly it will be a total extinction of humans, animals etc.

4. Is it a wise choice to live near a dormant volcano?

   Ans: No, it is rather risky to live near a dormant volcano. This can be supported by an example:- The latest eruption of Mount Sinabung in Sumatra killed seven people and injured two others. After lying dormant for 400 years, Sinabung has erupted several times since 2010 and is now Indonesia's most active volcano.

5. Can you think of any other natural disasters?

   Ans: (i). Tornadoes

(ii). Hurricanes

(iii). Wildfire

(iv). Landslides & debris flow

(v). Agricultural diseases and pests

(vi). Winter and ice storm

(vii). Sinkhole

6. What is a sinkhole?

   Ans: A sinkhole is a hole in the ground created by erosion and the drainage of water. Some can be large enough to swallow entire buildings. They typically occur in areas where the rock beneath the surface of the land is porous, usually when it is made of limestone, sandstone or another soft rock.

Vocabulary

tectonic plates aftershock magma crater lava dormant volcano

extinct volcano

New concepts

- The different natural disasters.
- Earth and its cause and effect.
- Tsunami its cause and effect.
- Types of volcanoes.
- How floods occur?
- Factor leading to drought and then famine.

Questions to be asked while teaching.

1. What are the natural disasters? Name some of the natural disasters?
2. When does an earthquake take place?
3. What is an epicentre?
4. What is an aftershock? When does an aftershock take place?
5. Which instrument measures an earthquake?
6. What is a Richter Scale?
7. What are the effects of an earthquake?
8. What is a Tsunami? What does it mean in Japanese?
9. Describe a Tsunami.
10. What is a volcano? Describe a volcanic eruption?
11. When is magma called lava?
12. How are the volcanoes classified? Give the 3 types?

13. What is an active volcano? Give example.
14. Why is a volcano called dormant? Give examples.
15. When is volcano said to be extinct? Give examples.
16. Give the positive and negative effects of volcano.
17. What leads to a flood?
18. How is deforestation a cause for floods?
19. What are the harmful effects of floods?
20. What are the ways in which flood can be prevented?
21. Give an account of the recent floods of our country?
22. What is a drought? How does a drought lead to a famine?
23. Suggest methods to prevent droughts.
24. Give an account of the rescue and rehabilitation centres.
25. What should we do to survive a natural disaster?

Answer key:

What I know

A.	**B.**	**C.**
1. Barren Island	1. Richter scale	1. Mt. Kilimanjaro in Tanzania
2. tsunami	2. extinct	2. Seismograph
3. epicentre	3. afforestation	3. Barren Island
4. extinct volcano	4. lava	4. Mauna Loa in Hawaii
5. waterborne	5. aftershocks	5. Mt. Kenya

What I understand

A.

1. Natural disasters are unexpected sudden events caused by environmental factors that cause extensive damage to life and property.
2. These are plates under the earth moving along the surface slowly and continuously.
3. Dormant volcanoes are those that have not erupted in recent years but may erupt in future.
4. Richter scale is used to measure the intensity of the earthquake.
5. The drought prone areas of India are Andhra Pradesh, Orissa, Rajasthan, Gujarat, Northern Karnataka and some parts of Maharashtra.

B.

1. Some of the ways to survive the disasters:

   a. We should not panic but remain calm and to stay positive.

b. We must help people in whatever way possible.

c. We must seek help and contact any source for help.

d. We must approach rescue and relief workers as soon as possible.

2. After volcanic eruptions, the soil becomes very fertile and good for the growth of plants.

   The places of volcanic eruptions can be used to generate alternate sources of energy.

3. Huge waves which result from underwater earthquake or a volcanic eruption cause series of underwater disturbances called Tsunami. This means harbour wave in Japanese.

4. Causes of floods

   a. When it rains very heavily for days together, water bodies overflow and submerge the surrounding areas.

   b. Due to soil deforestation, soil erosion takes place. When it rains heavily it causes this soil to get washed out and causes the silting of rivers. Rivers change their course resulting in flooding.

   c. Melting of snow on mountain peaks and glaciers also increases water level in seas and oceans.

5. Molten rock material inside the earth is called magma, once it reaches the earth's surface it is called lava.

Challenger

Flood water is not just a nuisance, it also can contain potentially dangerous materials, such as fecal matter from overflowing sewage systems, agricultural runoff and chemicals from industrial areas. Wading in flood waters can also be a cause for infections. Floods can increase the transmission of communicable water-borne diseases, such as typhoid, fever, cholera, leptospirosis and hepatitis A, malaria, dengue etc.

I can explore

Huge shock absorbers, walls that slide and Teflon foundation pads that isolate buildings from the ground all explain why medium and high-rise structures in Japan remain standing in the wake of large earthquakes.

Strong Japanese building codes specify rules for short medium and tall buildings.

Values for me

To help people in an emergency, statements 1, 2 and 3 can be followed.

Life skills

To stay in an earthquake, statements 1 and 4 can be followed.

UNIT - VI LESSON - 15

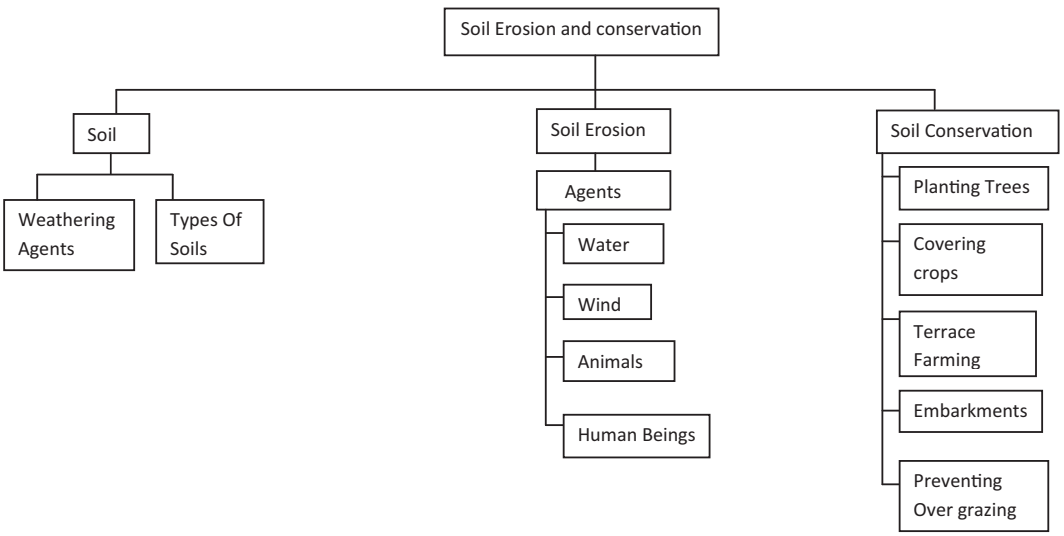
Soil erosion and conservation

No of Periods: 5 or 7

Objectives

- To know what is weathering.
- To identify the different types of Soil.
- To define Soil Erosion.
- To identify the many causes of soil erosion.
- To propose numerous way to enable soil conservation.

Lesson at a glance:



In brief

- Weathering and weathering agents.
- The different types of soil.
- The definition of soil erosion.
- The agents of soil erosion.
- The steps to be followed for soil conservation.

Pre-requisite skill

- Why is soil important for us?
- What are the different colours of the soil that you see?
- Have you touched and felt the texture of the soil?

- Have you seen farming done on the hill side? How does it look?
- What are the harmful effects of deforestation?
- Is the soil in your garden and that in the beach side the same type of soil?
- What are the different types of soil?
- Which soil is the best soil for the growth of plants? Why?
- Does soil contain air and water?

Motivation

The teacher can start with the 'Let Us Begin' activity. A week before the lesson is taught, the teacher can ask her students to collect different types of soil from different places. They can be from the beach, garden, park, school ground etc.

Clayey soil is soft and fine and red in colour.

Garden soil is black or dark brown and has a lot of lumps and humus. It is the fertile soil.

Beach soil(sand) is coarse and lose and light brown in colour.

1. Can you see apple trees and orange trees in and around your neighbourhood. Where can you see these trees?

   Ans: Orange trees are found in subtropical countries like United States. Apples are grown in European countries. In India they are found in the north western states of Jammu and Kashmir, Himachal Pradesh and hills of Uttar Pradesh. In India oranges are grown in Karnataka, Maharastra, Punjab and Rajasthan.

2. What kind of fruit trees do you see in Tamil Nadu?

   Ans: Coconut and mango trees, banana plants, chikoos, guava and neem trees.

3. Where is tea, and coffee grown?

   Ans: Coffee and tea are grown on the hills.

4. What soil is cotton grown in?

   Ans: Cotton needs black soil.

So from the above-mentioned examples it is clearly seen that different trees and different plants grow in different soil and different climate.

Now the teacher can go on to tell about the importance of soil and how it can be lost by soil erosion, and that soil erosion can be prevented by the different soil conservation methods.

Vocabulary

vermicomposting

New concepts

- Different agents of soil erosion.

- The various steps that can be followed to prevent soil erosion.
- The definition of silting.
- The meaning of vermicomposting.

Question to be asked while teaching the lesson.

1. What is weathering? What are the weathering agents?
2. What is humus?
3. Why are earth worms called the farmer's friend?
4. What is vermicomposting?
5. What are the three types of soil?
6. What is sandy soil?
7. What is clayey soil?
8. What is special about loamy soil?
9. What is soil erosion? What does it result in?
10. What is silting and how does it result?
11. What are the four agents of erosion?
12. Why is the Kosi River called the sorrow of Bihar?
13. Why is the Yellow River of China called the sorrow of China?
14. Give an account about the erosion caused by wind.
15. How is erosion caused by animals?
16. How is man responsible for soil erosion?
17. What is soil conservation?
18. Suggest some ways in which soil can be conserved.
19. How does afforestation help in soil conservation?
20. What are cover crops?
21. Explain terrace farming?
22. How do embankment or bunds aid in soil conservation?
23. Does prevention of overgrazing help in prevention of soil erosion?

Assessment (questions asked)

1. Which soil is best for plant growth?

   Ans: The best soil for most plants for optimum growth is a rich, sand loam. Loam or loamy soil is an even mixture of three main types of soil. In most cases, you will need to amend your soil with compost.

2. What plants are grown in sandy soil?

   Ans: Sandy soils do not hold nutrients. Lavender and cacti grow best in sandy soil. Sandy soil is low in nutrients content but is useful for growing trees such as coconut, cashew and casuarinas in areas of heavy rainfall.

3. What type of plants grow in clayey soil?

Ans: Lettuce grows in clayey soil. Its shallow roots benefit from clayey soil's ability to retain moisture. Brussels sprouts, cabbage often grow better in clayey soil than in loamy soil because their roots enjoy firm anchorage.

4. What is the difference between weathering and erosion?

Ans:

Weathering	Both	Erosion
The process of breaking large rocks into smaller rocks over time	Wind Ice Gravity Water	The movement of weathered rock and soil from one place to another

Answer key:

What I know

A.	**B.**	**C.**
1. soil	1. weathering	1. soil conservation
2. deforestation	2. deforestation	2. soil erosion
3. humus	3. afforestation	3. afforestation
4. soil erosion	4. silting	4. humus
5. earthworm	5. cover crops	5. friend of farmer

What I understand

A.

1. Agents of weathering are wind, water and changes in temperature.
2. In rainy season, running water loosens the soil and washes away the top soil causing erosion. In dry places, like deserts and semi deserts wind is major cause of erosion. Strong wind blows away the top soil leaving the infertile soil.
3. To protect hills and mountains from soil erosion terrace farming is done. The slopes of the hill are cut into steps or terrace for growing plants. Crops slow down the flow of water and prevent erosion.
4. Overgrazing of land by herbivores also leaves it barren as the soil is eroded without vegetation.
5. Forests protect soil. Roots of the trees bind the soil and prevent erosion.

   Soil conservation is the protection of soil against erosion. The 3 Rs are reduce, reuse, recycle.

B.

1. Weathering is the process of breaking down of rock to form soil bythe action of various natural agents.
2. Top fertile layer of the soil is called humus.
3. Deposition of soil by running water is called silting.
4. Crops like grasses and creepers that are grown between two successive harvests to protect soil fertility and prevent erosion are called cover crops.

   Embankments are small bunds built along the river sides to prevent the washing away of soil during heavy rains.

Challenger

A. Humus soil promotes plant growth in a number of ways. First, it provides most of the nutrients plants need along with trace amounts of metals and minerals. Secondly, humus contains a range of micro organisms that break down plant wastes and help roots absorb nutrients from the soil.

B. Roots of grass and weed are fibrous and are spread out as they branch out. They are slender and thread like. They extend into the soil like fingers so it is difficult to uproot them.

I can explore

Sandy soil drains out the water the fastest. Here the soil particles are large and coarse so the ability to retain water is less.

Water drains out the slowest in clayey soil as its soil particles are fine and the water molecules hold more tightly to it.

Values for me

Statements 1, 3 and 5 help in protecting the soil.

Life Skill

Statements 1,2,3 & 4 protect the land from soil erosion.

UNIT VI - LESSON - 16

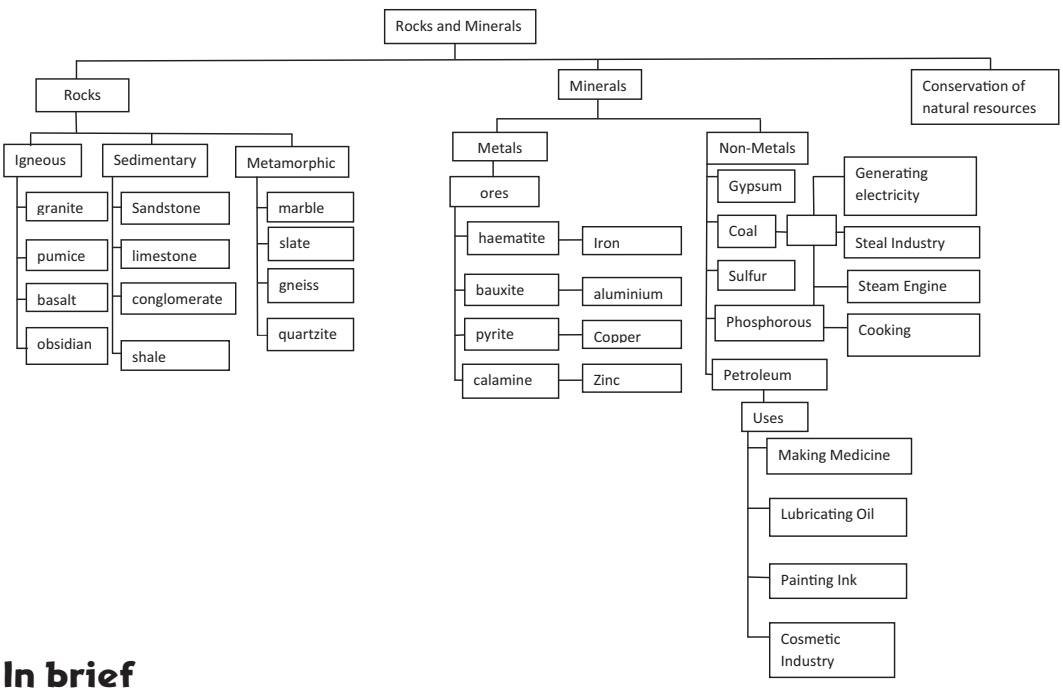
Rocks and Minerals

No of Periods: 5 or 7

Objectives

- To know the three different types of rocks.
- To identify the rocks that fall into the category of Igneous, Sedimentary and Metamorphic rocks.
- To understand the materials make up of each of these rocks along with their texture and uses.
- To classify minerals as metal and non-metal.
- To understand the formation of coal and petroleum and their uses.
- To be aware of the importance of conserving our natural resources.

The lesson at a glance:



In brief

- The three different types of rocks found.
- The types of igneous rock and their material make up and uses.
- The types of sedimentary rocks, their materials make up and uses
- The types of metamorphic rocks, their material content and uses.
- The two types of minerals

- The different types of metallic minerals and uses.
- The formation of coal and its uses.
- The formation of petroleum and its uses.
- The need for conservation of resources.
- The ways to conserve resources.

Pre-requisite skill

- How are our houses constructed? What is used to construct houses?
- What kind of flooring do the modern day houses have?
- Have you been to Mahabalipuram? Have you seen the rocks there?
- What do you see on the rocks?(Carvings)
- Have you seen the Taj Mahal? What is it built from? (White marble)
- The crockery that you have what is it made from?
- What is the fuel used by vehicles? (petrol, diesel)
- Where is petrol and diesel got from? (Petroleum)
- The expensive jewellery that you wear on special occasions. What do you think it is made from? (gold, silver and diamond)

Motivation

The teacher can begin the class with the 'Let Us Begin' activity.

Answers

slate - metamorphic rock got from sedimentary rock, shale.

chalk - is made from sedimentary rock, chalk (same name).

precious stone - created from rocks and minerals.

marble - metamorphic rock.

The teacher can start the lesson this way.

Does anybody have the habit of collecting rocks or shells? Have you seen an aquarium? A colourful variety of pebbles and rocks are placed at the bottom. We can even see some beautifully shaped shells.

Assessment

To make the class interesting - divide the class into four groups and for each group select the main character - Igneous rock, Sedimentary rock, Metamorphic rock and Minerals. Let the other members of the group take up the characters of the types of rocks. For eg. The members of igneous rock group are granite, pumice, basalt and obsidian. Involve the entire class in this activity. The student should learn about their character thoroughly and also know about the other member of the group.

The following day, each group comes in front of the class and tries to explain themselves in an innovative manner. The other two groups who are watching can ask the enacting group questions like.

- How are you useful?
- Do you think you are better than other rocks?
- Where were you born?
- Explain your colour and texture?

This way the entire class is involved and monotony of the lesson is broken.

Questions to be asked while teaching the lesson.

1. What are rocks?
2. How can rocks be classified?
3. How are igneous rocks formed? Give examples.
4. How is granite formed? What are its uses?
5. Give an account of pumice with its uses?
6. What is the colour of basalt? How is it used for?
7. What do sedimentary rocks contain? Give examples.
8. What is the colour of sandstone? Name the famous building built of sandstone?
9. What are the uses of lime stone? What does it contain and how does it look?
10. Give an account of conglomerate.
11. What is shale? What is it used for?
12. How are metamorphic rocks formed? What are its types?
13. What is marble used for?
14. How is slate formed? What are its uses?
15. Why does gneiss have a striped appearance?
16. What is special about quartz? What is it used to make?
17. What are minerals? How can they be classified?
18. Name the metallic ores from which metals can be extracted.
19. What are the mineral resources contained in non-metallic minerals?
20. Name two fossil fuels.
21. How is coal formed?
22. What are the uses of coal? Name some variety of coal.
23. Where in India do we get coal?
24. How is petroleum formed?
25. What are the by-products of petroleum?
26. Names some uses of petroleum?
27. When it comes to the usage of fossil fuel, what should you keep in mind?
28. What are the alternative sources of energy? What are their benefits?

Vocabulary

- Igneous rocks
- Sedimentary rocks
- Metamorphic rocks

New concepts

- The different types of rocks.
- Different types of minerals.

Answer key:

What I know

A.

1. igneous rocks
2. metamorphic rock
3. lime stone
4. sedimentary rocks
5. iron

B.

1. Porous
2. Quick cooling of the lava
3. Bricks and cement
4. Striped or streaked
5. Slow cooling of the lava

What I Understand

A.

1. Three types of rocks are igneous rocks, sedimentary rocks and metamorphic rocks.
2. Minerals are chemical substances that occur in nature in rocks and soil. They may have a simple or a complex form.
3. Examples for metamorphic rocks: marble, quartzite
4. Gold is the metal used for making jewellery.
5. Coal is found in Dhanbad in Jharkand and Neyveli in Tamil Nadu.

B.

1. Granite is a kind of igneous rock which is formed by the slow cooling of lava. It is very hard and is used as flooring in building and for counters in kitchen.
2. Slate is a kind of metamorphic rock formed from the sedimentary rock shale. It is generally used for making slates, blackboards and tiles.
3. Ores are minerals from which metals are extracted profitably. Haematite and bauxite are ores of iron and aluminium respectively.
4. Petrol and diesel are petroleum products. Both are used as fuel in vehicles. Petroleum products are also used for dry cleaning and lubricating oil.

5. Coal is used as fuel, for running steam engines and for generating electricity.

Challenger

A. Pumice has an average porosity of 90% and initially floats in water. Pumice is full of air bubbles, making it less dense than water and hence it floats in water.

B. The energy in coal comes from the energy that was stored in giant plants that lived hundred of millions of years ago in swamp forests, even before the dinosaurs. When these giant plants and ferns died, they formed layers at the bottom of the swamps. Water and dirt began to pile up on the top of the dead plant remains, which eventually got converted into coal.

C. Jaya is a wise kid. By commuting to school by cycle she is saving fossil fuel. These fuels have taken millions of year to be formed under the earth. By going, by vehicles like bikes, cars, vans etc which use fuels like petrol and diesel there is also the threat of the air getting polluted. Moreover cycling is a good form of exercise for Jaya, to keep her fit and fine.

I can explore

Coal and petroleum are non-renewable resources which were formed millions of years ago from the degradation of biomass. Once they are used up it takes millions and millions of years for them to be formed again. If they are not used judiciously, then these reserves would not be available for our future generation. Moreover burning of these fuels is a major cause for air pollution. Their use is also linked to global warming.

Values for me

Statements 1,2,4 & 5 can help in saving the monument (Taj Mahal)

Ans: If the instructions as per the statements 1, 2, 4 and 5 are followed, LPG can be used carefully and judiciously.

Get Creative

A. List of precious stones - opal, amber, peridot, amethyst, tourmaline, spinal, aquamarine, citrine, tanzanite, topaz, turquoise, crystal quartz, zircon

List of precious stones - Diamond, ruby, sapphire and emerald.

A diamond is a mineral compound made of pure compound.

All the precious and semiprecious rocks are got from minerals and rocks (Igneous, sedimentary, metamorphic)

B. Coal deposits are primarily found in eastern and south-central India. Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Telangana and Maharashtra account for 98.5870 of the total known coal reserves in India.

Assam, Tripura, Manipur, West Bengal, Mumbai, Gujarat, Jammu and Kashmir, Himachel Pradesh, Tamil Nadu, Andra Pradesh, Coastal Kerala, Andaman and Nicobar are the places where oil and gas fields are found in India.

UNIT - VI LESSON - 17

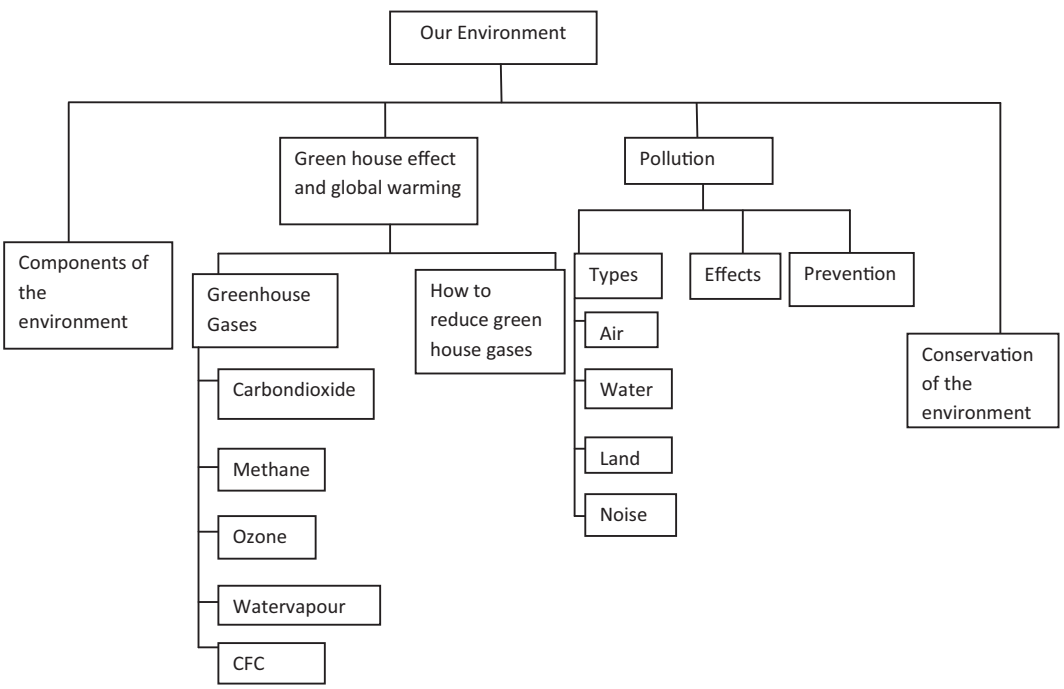
Our Environment

No of Periods: 5 or 7

Objectives

- To comprehend the interdependence of abiotic and biotic components of the environment.
- To understand the havoc man has caused to the environment in the name of industrialization.
- To understand greenhouse effect and global warming.
- To identify the greenhouse gases and know how they are caused.
- To know the ways to reduce greenhouse gases.
- To understand the cause and effect of pollution.
- To state the ways to prevent pollution in all its form.
- To be aware of the simple things that can be practiced in order to conserve the environment.

The lesson at a glance:



In brief

- The biotic and abiotic components of the environment and how they complement each other.
- Man's role in harming the environment.
- Greenhouse effect leading to global warming.
- The greenhouse gases and how they are generated.
- Ways to reduce green house gases.
- How the different types of pollution are caused.
- Effects of pollution.
- The different ways to prevent or reduce pollution.
- The simple thing that we can practice in order to conserve the enviornment.

Pre-requisite skills

- How are we dependent on plants?
- What are the components of the environment?
- What happens when trees are cut for industrialization purpose?
- Is it good to use plastics? Is plastic biodegradable?
- What do you mean by the 3Rs? How can we incorporate the 3Rs in our lives?
- What do you understand by car pooling? How does it help?
- What are the ways to reduce noise pollution?

Motivation

'Let Us Begin' activity (answers).

Biotic factor - The family of father, mother and children, the dog, cat, bird, rabbit, duck, plants and trees.

Abiotic factors - The sun, mountains, clouds.

The teacher can ask the students the following questions.

Is our environment safe? If not how can we preserve the environment?

The teacher can encourage her student to volunteer and answers the above questions.

Help

1. Stop using plastic - instead will use paper or cloth bags.

   a. Follow the 3Rs Reduce, recycle and reuse.

   b. Will take care to switch off the lights and fans when leaving the room.

   c. Will not waste paper. News papers and magazine papers can be made into paper bags.

2. Separate garbage into biodegradable and non-biodegradable. Making compost in the garden or back yard.

   a. Using steel plates, cup and spoons instead of plastic cup, plates and spoons.

   b. Following the idea of carpooling.

   c. Not throwing away aluminum tins into the bin, instead giving it away for re-cycling

   d. Not wasting water.

   The above discussions will make it easier of the teacher to proceed with the lesson.

Vocabulary

- biotic
- abiotic
- chlorofluorocarbon(CFC)

New concepts

- Green house effect and global warming.
- Green house gases.

Questions to be asked while teaching.

1. How do biotic and abiotic factors complement each other?
2. What has man done to the environment in the name of development and industrialisation?
3. What is greenhouse?
4. What is greenhouse effect?
5. What is global warming?
6. What is the ill effect of global warming on the earth's surface?
7. Name some of the green house gases.
8. What increases the amount of Co_2 in the air?
9. How is methane given out?
10. How is CFC produced?
11. What are the measures to follow in order to reduce greenhouse gases?
12. What is pollution? What are the different types of pollution?
13. What are the things that have led to air pollution?
14. How are water bodies polluted?
15. How is land and noise pollution caused?
16. What are the ill effects of air, water, land and noise pollution?
17. How can vehicles be restricted on the roads?
18. How can water bodies be protected from sewage water?
19. How can noise pollution be reduced?

20. Where and how should factories be built?
21. How should we dispose off garbage at home?
22. Suggest ways you can follow to conserve the environment.
23. What is the Kyoto Protocol?
24. When is world Soil Day celebrated?

Assessment

1. Why is there a large hole in the ozone layer over Antartica?

   Ans: The ozone hole results from ozone-depleting chemical (eg. Chloroflorocarbon(CFCs)) are more readily formed in the extreme cold region of Antarctic's stratosphere. This is why ozone holes are first formed and are deeper, over Antarctica.

- How to reduce the emission of greenhouse gases?
- Reduce, reuse and recycle.
- Use Heaters and air - conditioners less.
- Replace light bulbs to energy saving bulbs ((CFL) compost fluorescent light)
- Drive less and drive smart (car pooling) walk or cycle if possible.
- Switch 'off' electronic appliances when not in use.
- Plant a tree.
- Encourage the conservation of energy.

Answer key:

What I know

A.	**B.**
1. carbon dioxide	1. global warming
2. heat rays	2. deforestation
3. atmosphere	3. green house effect
4. afforestation	4. afforestation
5. recycled	5. pollution

What I Understand

A.

1. Global warming increases the temperature of earth. This has resulted in melting of polar ice caps which in turn increase the water in ocean causing floods.
2. Some atmospheric gases trap the heat rays from the sunlight not allowing them to escape. This warms up the earth and is called greenhouse effect. Some of the greenhouse gases are carbon dioxide, methane, nitrous oxide and water vapour.

3. Land pollution makes the place look bad and gives out bad smell which is unpleasant to inhale.
4. Protection and restoration of our environment is called conservation of environment.
5. Air pollution results in asthma and skin diseases.

B.

1. Global warming is an increase in temperature of the earth caused by the greenhouse effect.
2. Smoke released by factories and vehicles along with carbon dioxide, and other harmful gases cause air pollution. Burning garbage in the open also causes pollution.
3. Vehicles and loudspeakers in public places and playing audio players and television at a very high volume in our homes cause noise pollution. Noise pollution leads to deafness, irritation and nervous trouble over a period of time.
4. Some of the ways to conserve our environment.

   a. Plant more trees.

   b. Save water and electricity and use them judiciously.

   c. Use renewable resources and reduce the use of fossil fuels.

   d. We must reuse and recycle material like paper, glass and metal.

   e. Reduce the use of chemical fertilisers.
5. Chlorofluorocarbon or CFC is produced by industries manufacturing perfumes, refrigerators and air conditioners.

Challenger

A. Most of the Earth's atmosphere is made up of nitrogen and oxygen, which do not have much effect in regulating the climate. Other gases that occur in trace amounts have a much bigger impact even though they occur in relatively small quantities. These are known as the greenhouse gases.

Energy (light) from the sun passes through the Earth's atmosphere and is not absorbed by the greenhouse gases. The Earth absorbs this energy and radiates heat energy at a longer wavelength back into the atmosphere. The greenhouse gases absorb some of this energy and radiate much of it back towards the surface whilst the rest is radiated out to space. This plays an important role in keeping the Earth's surface warm and in a position to sustain life. Without this greenhouse effect the Earth would be much colder and life on this planet would be very different. This effect is called the greenhouse effect, because it acts a bit like a glass greenhouse that traps heat creating a warmer environment inside the greenhouse.

B. When trees are cut down and burned or allowed to rot, their stored carbon is released into the air as carbon dioxide. And this is how deforestation and forest degradation contribute to global warming. According to the best current estimate, deforestation is

responsible for about 10 percent of all global warming.

A. Without greenhouse gases the Earth would be too cold for us or any living thing, to survive. Naturally occurring greenhouse gases, such as carbon di oxide, methane allow solar radiations to reach the Earth's surface, while trapping radiations from the Earth on its way back out to space.

B. Forests absorb greenhouse gases that fuel global warming, keeping soil moist by blocking the sun, producing oxygen and absorbing carbon di oxide during photosynthesis.

When forests are cleared or burnt stored carbon is released into the atmosphere, mainly as carbon di oxide. Deforestation accounts for a good percentage of all global greenhouse gas emission due to human activities.

C. You shouldn't waste paper because paper is from trees and oxygen comes from the trees which keeps us humans and animals alive, so the more paper you waste the more trees need to be cut down.

I can explore

1. Use of chemical fertilizers can be substituted by natural manure obtained from compost.
2. Burning of garbage can be replaced by sorting them as reusable and recycled articles as it will reduce pollution.
3. Plastic bags can be substituted by cloth bags which can be reused.
4. Fossil fuels can be replaced by solar cells which is easily available and also reduces pollution.

Use of fossil fuel - The environment friendly alternatives to fossil fuel are those resources based on constantly replenishing flow of energy such as solar, wind, hydro and geothermal as well as quantities grown by nature in the form of bio mass.

Use of chemical fertilizers.

1. Composed manure is a fertilizer that is used for killing weed seeds, killing parasites and also concentrate nutrients within the soil. This type of fertilizer is environmental friendly and won't cause water pollution like chemical fertilizer does.
2. Burning of garbage - First of all garbage can be segregated biodegradable and non-biodegradable. All the biodegradable waste which includes dry leaves, kitchen vegetable scarp, shredded paper etc is put in a compost pit dug in the garden and covered with soil. This can be kept wet while decomposing and when decomposed it turned to manure.

   The non-biodegradable wastes which include aluminium cans, bottles, plastic products and metal scraps can be recycled.

   This way burning of garbage can be avoided.

Plastic bags - Alternative to plastic bags is paper and cloth bags.

Values for me

1. ×
2. ✓
3. ×
4. ×

Life skills

1. ×
2. ×
3. ✓
4. ✓
5. ✓
6. ✓

Statements 3,4,5 and 6 will help me to keep my environment clean and green.

Get Creative

Disadvantages of using plastics can be.

1. polluting the environment.

2. posing a danger to wild life (if swallowed accidently).

3. donot degrade quickly.

4. posing difficulties during recycling.

5 clogging waterways.

6 Contaminating wild life habitat.