

# Teacher's Guide 2

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**Everyday Science 2**



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# Introduction

Children want to know things. Early guidance and varied experiences do much to stimulate the development of their natural intelligence.

A teacher can play a very important role in arousing the interest of students by allowing them to discuss facts and ideas. The teacher can then help students draw conclusions from these facts and ideas as to why and how things happen.

The teacher can stimulate the thinking process of students by asking questions and encouraging them to ask their own.

Experiments allow students to test the facts that have been learnt by them for themselves, thereby clarifying the reasoning behind the activities that are done in class.

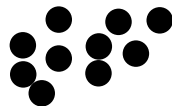
This course has been developed to provide information about the world around us, on which students can base their opinion, verify information, come to conclusions, and use the knowledge they have gained in their everyday lives. It will help gain and maintain the curiosity and enthusiasm of students who have just started studying science. Concepts developed at this stage will be of use later in their studies at an advanced level. It will help them develop a better outlook on life.

## **About the Pupil's Book:**

This science series, now completely revised, has been written especially for primary level students. It provides information suitable for each student's level of understanding and has a direct appeal to students who need engaging and easy to read material. Baring in mind the interests, abilities, curiosities, and needs of student, it provides stimulating learning experiences that offer enjoyable educational motivation, thus serving as a foundation base for future learning.

The keyword in science is curiosity. The material in this series is designed to create in a child the same urge that motivates a scientist; the desire to know the answer to a question. A wide range of topics were carefully selected that will interest and inspire students.

Teachers will come to see that this series deals with those broad areas about which, most students frequently express curiosity; that it provides answers to many of the questions they ask, and offers new and exciting information in many fields.



Everyday Science  
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The language is simple and easy to read, catering for the students range of abilities in each grade. Together, the text and illustrations motivate children to discuss, question, and explore.

The contents have been selected and presented in such a way as to capture and hold the interest of the students. The objective is to simplify complex ideas and present them in an interesting way. Every effort has been made to keep the language simple.

When it is necessary to use a specialized word, it has been used. When it is not self explanatory within the context, it has been defined. Clear and well-labelled illustrations have been included, which help identify and clarify the topics that are dealt with.

Good pictures and diagrams arouse and develop interest. These make lasting impressions. They help make the text clear. They also appeal to the child's imagination, while satisfying their curiosity and often provoke a favorable reaction.

Simple practical interesting and stimulating presentation of factual materials— offer every chance of successful learning experiences. Knowledge of problem-solving techniques, that if acquired can be applied in everyday life.

It is intended, through this series, to introduce children to many of the interesting and enjoyable things in science they can learn about and do for themselves. The series also intends to develop in them a quest for knowledge and an understanding of how science is shaping the world in which they live.

### **The role of the teacher:**

It is up to the teacher to devise ways and means of reaching out to the students, so that they have a thorough knowledge of the subject without losing interest.

The teacher must use his/her own discretion in teaching a topic in a way that he/she feels appropriate depending on the intelligence level as well as the academic standard of the class.

### **To the teacher:**

With your assurance and guidance the child can sharpen his/her skills. Encourage the child to share his/her experiences. Try to relate pictures to real things. Do not rush the reading. Allow students time to respond to questions and to discuss pictures or particular passages. It will enhance learning opportunities and will enable the child to interpret and explain things in his/her own way.

## Introduction

### Method of teaching:

The following method can be employed in order to make the lesson interesting as well as informative.

The basic steps in teaching any science subject are:

- (i) locating the problem
- (ii) finding a solution through observation and experimentation
- (iii) evaluating the results
- (iv) making a hypothesis and trying to explain it

Preparation by the teacher:

Be well-prepared before coming to the class.

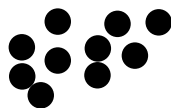
- (i) Read the text.
- (ii) Prepare a chart if necessary.
- (iii) Practise diagrams which have to be drawn on the blackboard.
- (iv) Collect all material relevant to the topic.
- (v) Prepare short questions.
- (vi) Prepare homework, tests, and assignments.
- (vii) Prepare a practical demonstration.

The following may also be arranged from time to time.

- (i) Field trips
- (ii) Visits to the laboratory
- (iii) A show of slides or films
- (iv) Projects

The common strategy which is easy as well as effective can be adopted:

- (i) Before starting a lesson, make a quick assessment of the students previous knowledge by asking questions pertaining to the topic.  
Relate them to everyday observations of their surroundings or from things that they have seen or read about in books, magazines, or newspapers.
- (ii) Explain the lesson.
- (iii) Write difficult words and scientific terms on the blackboard.
- (iv) Ask students to repeat them.
- (v) Help students read the text.
- (vi) Show materials, models, or charts.
- (vii) Make diagrams on the blackboard.
- (viii) Perform an experiment if necessary.



- (ix) Ask students to draw diagrams in their science manuals.
- (x) Students should tackle objective questions independently.
- (xi) Ask questions from the exercises.
- (xii) Answers to questions are written for homework.
- (xiii) The lesson should be concluded with a review of the ideas and concepts that have been developed or with the work that has been accomplished or discussed.

### **Conclusion:**

The teacher can continue the learning process not only by encouraging and advising the students, but also by critically evaluating their work.

It is not necessary that the lesson begins with a reading of the textbook. The lesson can begin with an interesting incident or a piece of information that gain interest of the students and they will want to know more about the topic.

The topic should then be explained thoroughly and to check whether the students are following or not, short questions should be asked every now and then.

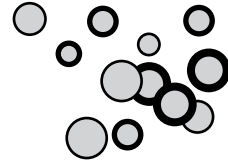
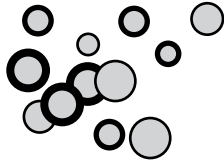
Sketches and diagrams on the blackboard are an important aspect to the teaching of science, but too much time should not be spent on them as the students lose interest. An alternative to drawing on the blackboard is a ready-made chart or one made by the teacher can be displayed in the class. The use of visual material keeps students interested as well as helps them make mental pictures which are learnt quickly and can be recalled instantly. Pupils should be encouraged to draw with the help of the teacher. Diagrams that are not in the text should either be copied from the blackboard or chart, or photocopied and distributed in the class.

Simple experiments can be performed in class. If possible, children may be taken to the laboratory occasionally and shown specimens of plants and animals, chemicals and solutions, and science apparatus, etc.

Practical work arouses interest in science. Class activities can be organized in such a way that the whole class participates either in groups or individually, depending on the type of work to be done or the amount of material available.

It is hoped that the above guidelines will enable teachers to teach science more effectively, and develop in their students an interest in the subject which can be maintained throughout their academic years, and possibly in their lives as a whole.

These guidelines can only supplement and support the professional judgement of the teacher but in no way can they serve as a substitute for it.



## Living things

### **Objectives:**

To know what living things are

To identify the characteristics of living things

### **Teaching strategy:**

Put some seeds, leaves, flowers, stones, feathers, nails, bottle caps, coins, pencils, rubber bands, pins, etc. on the table.

Ask children to sort them into things that are alive, and not alive.

Draw a butterfly and a chair on the blackboard.

Ask: Which one of these is alive?

Why is it a living thing?

Explain the characteristics of living things.

Ask: Is plant a living thing?

Explain the characteristics of plants as living things.

Ask the names of animal babies.

Explain that animal babies grow.

Explain that a seed grows to make a plant.

Ask: What do you eat?

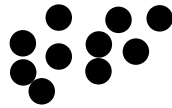
Why do you eat food?

Explain that food gives you energy to work and play. It helps you to grow.

Ask: What does a cow eat?

Explain herbivores with examples.

Ask: What does a lion eat?



Explain carnivores with examples.

Ask: What does a hen eat?

Explain omnivores with examples.

Ask: Do plants eat food?

Explain photosynthesis in green plants.

Ask: Have you seen a yellow plant?

Show the students a cuscuta stem.

Ask: What does a frog eat?

Explain that insectivorous plants also eat insects by trapping them in especially modified parts.

Ask: What is a mushroom? Is it a plant?

Ask: Why do we breathe? How do we take in air?

Explain the importance of breathing for all living things.

Explain that all living things breathe by taking in air into their bodies.

Ask: Do animals move?

Do plants move?

Ask: How do fish, birds, frogs, etc. move?

Show the students pictures of different animals.

Explain the movement of animals.

Ask: Can a plant hop and jump?

Explain the movement of roots, stems, leaves, and flowers.

Ask: Where does a chick come from?

What does a chick grow up to be?

Explain that all babies grow up and resemble their parents.

Ask: Do plants have babies?

Explain plants have flowers which make seeds.

Draw a germinating seed on the blackboard.

Explain that a seed grows to become a plant like the one it came from.

### **Answers to activities unit 1**

1. a) grow      b) eat      c) breathe      d) move  
e) have babies
2. a) Puppy - Dog      b) Caterpillar - Butterfly  
c) Tadpole - Frog      d) Seed - Plant



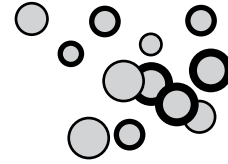
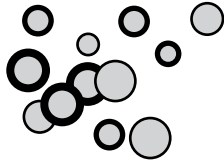
## Unit 1 Living things

3. a) by his nose and mouth.                      b) by small holes on its body.  
c) by its gills.                                      d) by small holes in its leaves.

### Additional activity

Choose the best answer:

- a) Which is the only planet in the solar system that is known to have living things ?  
Venus              Earth              Mars              [Earth]
- b) A tadpole grows into a \_\_\_\_\_.  
kitten              puppy              frog              [frog]
- c) All living things need \_\_\_\_\_ to grow.  
air              water              food              [food]
- d) Human beings eat \_\_\_\_\_.  
plants and animals      plants only      animals only      [plants and animals]
- e) Green plants make their own \_\_\_\_\_.  
water              food              air              [food]
- f) Plants that are not green cannot make their own food so they take food from \_\_\_\_\_.  
animals              green plants              soil              [green plants]
- g) Plants take in air through small holes in their leaves called \_\_\_\_\_.  
gills              lungs              stomata              [stomata]
- h) A fish swims in water by using its \_\_\_\_\_.  
wings              legs              fins              [fins]
- i) Seeds grow to make new \_\_\_\_\_.  
flowers              leaves              plants              [plants]
- j) A baby kangaroo is called a \_\_\_\_\_.  
nestling              joey              calf              [joey]



## Kinds of animals

### **Objectives:**

- To know that there are many different kinds of animals
- To know that animals are of different colours
- To know that animals have different coats
- To know that animals are of different sizes
- To know that animals live in different places
- To know some special animals which look different

### **Teaching strategy:**

Show students pictures of different kinds of animals.

Ask: What is the colour of a zebra, giraffe peacock, lion, etc?

Explain that animals have different colours.

Ask: Why do we wear clothes?

What do we have on our skin?

What is the body of a fish covered with?

Ask: Does a frog have hair?

Explain that animals' bodies are covered with different kinds of coats, which protect their bodies.

Ask: Which is the biggest animal in the world?

Which is the smallest animal in the world?

Explain that animals are of different sizes.

Show the students pictures of various animals.

Ask: Can a polar bear or seal live in a warm place? Why not?

Can seals live on a mountain?

Where do earthworms live?

Where can we see wild animals in a city?

Explain that animals live in different places, such as cold and hot places,

## Unit 2 Kinds of animals

in soil, in water, and on land.

Show pictures of some special animals. Tell them their names.

Ask: Where do you find such animals?

Explain their characteristics.

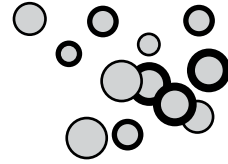
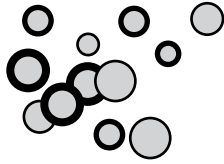
### Answers to Activities in Unit 2

2. a) scales      b) fur      c) feathers  
3. a. (i) elephant      (ii) giraffe  
    b. (i) spider      (ii) fly  
4. very cold places      very hot places      water      land and water  
    polar bear      camel      dolphin      frog

### Additional activity

Choose the best answer:

- a) Animals have different colours which help them to \_\_\_\_\_.  
    hide from their enemies      protect them from the sun  
    [hide from their enemies]
- b) The body of a fish is covered with \_\_\_\_\_.  
    feathers      scales      shells      [scales]
- c) The soft body of a snail is protected by \_\_\_\_\_.  
    feathers      scales      a shell      [a shell]
- d) An animal that can live in very cold places is a \_\_\_\_\_.  
    crocodile      polar bear      ostrich      [polar bear]
- e) An animal that lives in very hot places is a \_\_\_\_\_.  
    penguin      camel      polar bear      [camel]
- f) A sea anemone looks like a \_\_\_\_\_.  
    star      horse      flower      [flower]
- g) An animal that lives on land and in the water is \_\_\_\_\_.  
    crocodile      dolphin      jelly fish      [crocodile]
- h) An octopus has \_\_\_\_\_ arms.  
    5      6      7      8      [8]
- i) The body of a porcupine is covered with \_\_\_\_\_.  
    scales      fur      quills      [quills]
- j) A parrot can hide in the leaves of trees because their colour is \_\_\_\_\_.  
    blue      green      yellow      [green]



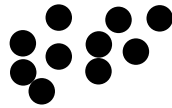
## Kinds of plants

### **Objectives:**

- To know that there are many different kinds of plants
- To know that plants are living things
- To know that most plants are green
- To know the parts of a plant
- To know the functions of each part
- To know that green plants can make their own food
- To know what a green plant needs to make food
- To know that plants are of different kinds
- To know the structure of some special plants

### **Teaching strategy:**

- Show the students pictures of different kinds of plants.
- Tell them the difference between trees, shrubs, herbs, and mosses.
- Ask: What is the colour of the leaves?
- Explain that plants are mostly green.
- Show the students a complete herb.
- Point to the various parts and name them.
- Draw a plant on the board and label the parts.
- Ask: What does a root do? Where does the root grow?
- What does a stem do?
- Where do leaves grow? Why are leaves green?
- Explain the function of each part.
- Show the students some flowers.



Explain that seeds are formed inside the flower. A flower turns into a fruit.  
Cut some fruits and show seeds inside them.

Ask: How do we eat? What do we eat? Do animals eat? Do plants eat?

Explain how green plants make their own food in sunlight.

Draw a tree, a shrub, and a herb on the blackboard.

Ask: Which is the biggest plant?

Which is the smallest plant?

Explain the structure and difference between a tree, a shrub, and a herb.

Ask: Do all plants have stems?

Show moss growing on a piece of brick or rock.

Explain that mosses are plants that have no stems. They grow in moist, shady places.

Ask: How does water from the soil go up to the leaves?

How does food from the leaves go to all parts of the plant?

Cut a longitudinal section of a carrot and show it to the students.

Explain that the yellow centre is made up of tubes which carry the water and food.

Dip some lettuce leaves in water coloured red. Ask the students to observe them after one day. The veins in the leaves will become coloured.

Explain that the coloured water has gone up the tubes that are in the stem and leaves.

Show pictures of different kinds of plants.

Explain that they have different shapes and colours.

Some plants catch insects.

Some plants eat dead plants.

Some plants grow on other plants and absorb food from them.

### Answers to Activities in Unit 3

1. stem - leaves - flowers - roots

2. a) Most plants are green.

b) Roots suck water and salts from the soil.

c) The stem takes water and salts from the roots to the leaves.

d) Flowers make fruits.

e) Leaves make food for the plant.

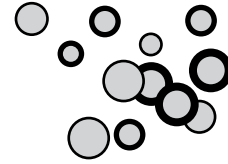
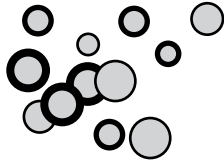
3. a) no            b) yes            c) no

4. a) venus flytrap            b) pitcher plant

## Additional activity

Choose the best answer:

- a) Most plants are \_\_\_\_\_.  
red            green            blue            [green]
- b) \_\_\_\_\_ of a plant sucks water from the soil.  
Roots        Stem            Leaves        [Roots]
- c) The green leaves of a plant make \_\_\_\_\_ for the plant.  
water        food            air            [food]
- d) Flowers help the plant to make \_\_\_\_\_.  
seeds        stems            roots        [seeds]
- e) The stems of trees are \_\_\_\_\_.  
short and branched        soft and weak        hard and woody  
[hard and woody]
- f) Plants that have soft, weak stems are called \_\_\_\_\_.  
herbs        shrubs            trees        [herbs]
- g) Mosses do not have \_\_\_\_\_.  
roots        stems            leaves        [stems]
- h) Special tubes carry water from the \_\_\_\_\_ to all parts of the plant.  
stems        roots            leaves        [roots]
- i) Special tubes carry food from the \_\_\_\_\_ to all parts of the plant.  
stems        roots            leaves        [leaves]
- j) The venus flytrap catches \_\_\_\_\_.  
insects        birds            fish        [insects]



## Roots

### **Objectives:**

- To know that roots grow in the soil
- To know that roots suck water and salts from the soil
- To know that roots store food
- To know that roots fix the plant in the soil
- To know that some roots are thick and strong
- To know that some roots are thin and weak
- To know the difference between taproots and fibrous roots
- To know that roots absorb water by root hairs

### **Teaching strategy:**

Draw a complete plant on the board. Indicate by arrows how water travels from the soil into the roots and through the stem up to the leaves.

Ask: What is the name of the lower part of the plant?

What is the function of the root?

Explain that the root grows in the soil. It sucks water and salts. If a root is thick, it has stored food in it.

Show the students some thick roots such as a carrot, radish, and beetroot.

Ask: Why do we eat carrots and beetroots?

Explain that these are roots that have stored food in them.

Show the students some grass roots and onion roots. Explain the difference between thick and thin roots.

Ask: What is the difference between a carrot and an onion's root?

Explain the difference between a taproot and a fibrous root.

Ask: How do roots suck water?

Explain the presence of root hairs that are microscopic. We cannot see them, but they help the root to absorb water.

## Unit 4 Roots

Ask: Why does a plant dry up if we pull it out of the soil and put it in another pot?

Explain that when we pull it out we break the root hairs and they cannot suck any water.

### Answers to Activities in Unit 4

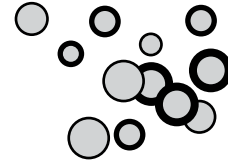
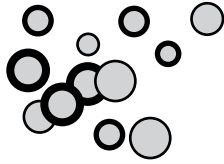
1. a) soil          b) food          c) thin  
3. a) water and salts from the soil.          b) the root tip.

### Additional activity

Choose the best answer:

- a) Roots grow in the \_\_\_\_\_.  
soil          sky          air          [soil]
- b) Roots suck \_\_\_\_\_ from the soil.  
food          air          water          [water]
- c) Roots which have one thick part are called \_\_\_\_\_.  
fibrous roots          tap roots          fat roots          [tap roots]
- d) Small roots of the same size are called \_\_\_\_\_.  
tap roots          cap roots          fibrous roots          [fibrous roots]
- e) The tip of the root is protected by \_\_\_\_\_.  
root hairs          root tips          root cap          [root cap]
- f) The kind of root which stores a lot of food is a \_\_\_\_\_.  
tap root          fibrous root          thin root          [tap root]
- g) The turnip is an example of a \_\_\_\_\_.  
root hair          tap root          fibrous root          [tap root]
- h) Water and salts are absorbed by the plant by \_\_\_\_\_.  
root cap          root hairs          tap root          [root hairs]





## Leaves

### **Objectives:**

- To know that leaves grow on the stem
- To know that leaves are flat and green
- To know the parts of a leaf
- To know the function of midrib and veins
- To know the arrangement of veins in different leaves
- To know the shapes of different leaves
- To know the difference between simple and compound leaves
- To know how leaves make food

### **Teaching strategy:**

- Collect different kinds of leaves. Show them to the students.
- Give each student one leaf and ask them to study it carefully.
- Draw a simple leaf on the board and label it.
- Explain the function of each part.
- Ask the students to trace around the shape of the leaf with a pencil and then draw lines to represent the midrib and veins.
- Draw a leaf having a network of veins and a leaf having parallel veins on the blackboard.
- Explain the difference between the two. Show the students actual samples.
- Ask children to copy the diagrams from the board.
- Show the students leaves of different shapes and sizes.
- Ask them to draw them and write their shapes.
- Show students how to make a leaf print by rubbing a pencil or crayon on a piece of paper placed over a leaf.
- Teach the students how to press leaves between sheets of newspaper.
- Show the students some simple and compound leaves. Point out the leaflets.
- Explain the difference between them.

## Unit 5 Leaves

Ask students to draw a simple and compound leaf.

Ask: What is the main function of a leaf ?

Why is a leaf green?

How does air enter a leaf ?

How does water come into a leaf ?

Why do leaves turn towards the Sun?

Explain how leaves make food.

Also explain that leaves make glucose which is the food of the plant.

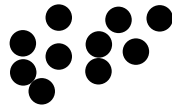
### Answers to Activities in Unit 5

- a) Leaves grow on the stem of a plant.  
b) A leaf is The green part of a plant.  
c) The green colour of a leaf is due to chlorophyll.
- a) lobed edges    b) smooth edges    c) saw-like edges    d) saw-like edges

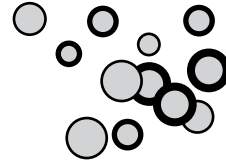
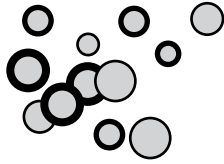
### Additional activity

Choose the best answer:

- All leaves grow on the \_\_\_\_\_ of plants.  
roots       stems       leaves       [stems]
- Chlorophyll is the \_\_\_\_\_ coloured substance in the leaf.  
yellow       red       green       [green]
- The at, green part of the leaf is called \_\_\_\_\_.  
leaf stalk    leaf blade    mid rib       [leaf blade]
- The mid rib and veins in the leaf carry \_\_\_\_\_.  
food only    water only    food and water    [food and water]
- When one leaf grows on a leaf stalk the leaf is called a \_\_\_\_\_.  
leaflet       simple leaf    compound leaf    [simple leaf]
- When two or more leaves grow on a leaf stalk the leaf is called \_\_\_\_\_.  
compound leaf    simple leaf    leaflet       [compound leaf]



- g) The process by which green leaves make food is called \_\_\_\_\_.  
respiration    photosynthesis    excretion    [photosynthesis]
- h) The food of the plant is \_\_\_\_\_.  
rice            butter            glucose            [glucose]
- i) A leaf makes food with the help of \_\_\_\_\_.  
air, water, sunlight  
water, sunlight, and chlorophyll  
water, air, sunlight, chlorophyll  
[air, water, sunlight, chlorophyll]
- j) Air enters a leaf through small holes called \_\_\_\_\_.  
pores            holes            stomata            [stomata]



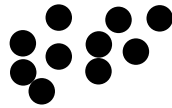
## Fruits and seeds

### **Objectives:**

- To know that a fruit is made from a flower
- To know the different kinds of fruits
- To know that fruits contain seeds
- To know that the number of seeds varies in different kinds of fruits
- To know that seeds are of different shapes and sizes
- To know the parts of a seed and their functions
- To know the functions of seed-leaves
- To know that the baby plant in a seed grows to form a new plant
- To know that a seed needs air, water, and warmth to grow

### **Teaching strategy:**

- Show the students an apple.
- Explain that an apple is a fruit. It grows on an apple tree.
- It contains seeds from which new apple trees can grow.
- Show the students the stem from where it was attached to the tree.
- Show them the bottom of the apple, which has the dried up parts of the apple flower.
- Cut the apple lengthwise and show the seeds inside.
- Ask students to name different fruits.
- Show them some soft and juicy fruits like an orange, a tomato, etc.
- Show them some dry fruits such as poppy fruit, pea pod, groundnut, etc.
- Explain the difference between them.
- Ask: How many seeds are there in a tomato, a pea pod, a groundnut, in an orange, an apple, etc?



Explain that some fruits have many seeds, some have few seeds, and some have only one seed.

Show the students different kinds of seeds. Explain that seeds are dry and hard. They can be small or big.

Give each student a groundnut.

Ask them to draw it.

Tell them to break it open and observe the seeds.

Ask them to locate the tiny hole on one end.

Now tell them to break it open.

Ask: How many seed-leaves does it have?

Can you see the baby plant?

Show them the baby plant with a magnifying glass.

Show the students maize grains.

Explain that it has only one seed-leaf.

Soak some bean seeds, gram seeds, and maize grains in water.

Put some cotton wool in a plastic dish. Pour water over the cotton wool and place the soaked seeds in it.

Place the dish in a well-lighted, airy place and water it every day.

Show the germination of seeds to the students and ask them to draw the various stages of germination of the seeds.

### Answers to Activities in Unit 6

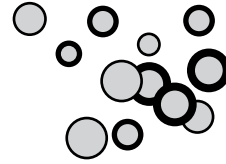
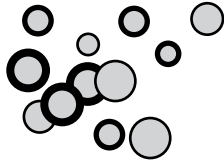
1. a) tomatoes      b) orange      c) grapefruit
2. a) few seeds      b) one seed      c) few seeds  
   d) few seeds      e) one seed
3. a) hard            b) seed          c) hole  
   d) plant
5. a) water           b) air            c) warmth

## Unit 6 Fruits and seeds

### Additional activity

Choose the best answer:

- a) A fruit is made from a \_\_\_\_\_.  
leaf      stem      flower      [flower]
- b) A mango is a \_\_\_\_\_ fruit.  
dry      juicy      hard      [juicy]
- c) Seeds are made inside the \_\_\_\_\_.  
fruit      flower      roots      [fruit]
- d) A \_\_\_\_\_ has many seed.  
papaya      mango      banana      [papaya]
- e) A seed has a hard outer covering called \_\_\_\_\_.  
skin      seed      coat      shell      [seed coat]
- f) A seed has a tiny hole through which \_\_\_\_\_ go into the seed.  
air and water      air and soil      air and food      [air and water]
- g) The seed has a \_\_\_\_\_ inside it.  
leaves      flowers      baby plant      [baby plant]
- h) The seed leaves have \_\_\_\_\_ for the baby plant to grow.  
air      water      food      [food]
- i) A bean seed has \_\_\_\_\_ seed leaves.  
1      2      3      4      [2]
- j) A maize seed has \_\_\_\_\_ seed leaf.  
1      2      3      4      [1]



## Work and machines

### **Objectives:**

To know what work is

To know that we use our muscles to do work

To know that we can move things by pushing or pulling them

To know that when we push and pull things we do work

To know that a push or pull is called force

To know that we have to apply force to start or stop something from moving

To know that we have to use more force to push or pull a heavy thing

To know what a machine is

To know what machines can do

To know that machines are big or small

To know that machines need fuel

To know why machines need fuel

To know that the fuel of our body is food

To know that food gives energy to the body

### **Teaching strategy:**

Throw a ball in the air and catch it.

Ask a student to carry some books.

Tell the students to stand up and jump at one place for a minute.

Ask: Did you get tired? Are you feeling hot?

Explain that work is any kind of action.

You are working even when you are playing.

Ask: What happens when you push or pull a heavy thing?

How do we push and pull things?

Explain that we use our muscles to do work.

Put a ball on the table.

Ask: Is it moving? When will it move?

## Unit 7 Works and machines

Push the ball slightly and explain that things cannot move unless we push them.

Slide the ball on a book. Place your hand at the end of the book to stop it.

Ask: Why did the ball stop?

If a big car comes rolling down, can we stop it with our hands?

Explain that more force is needed to pull and push big and heavy things.

Explain that when you lift a heavy box, you use your muscles. You need more force.

Show the students pictures of some big machines.

Show students a bottle opener and a pair of scissors.

Ask: Is this a machine?

Explain that machines help us to do work.

Open the lid of a tin can with a spoon handle.

Explain that machines make our work easy.

Explain how big machines like tractors and cranes help us to move heavy things.

Ask: Why do we eat food?

Explain that our body needs food to work.

Ask: How does a motor car and steam engine move?

Explain that the food of a machine is called fuel.

Fuel helps to make energy for machines to work.

### Answers to Activities in Unit 7

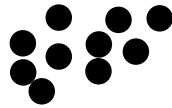
- a) work                      b) Machines                      c) crane
- a) to open a bottle      b) to hold two pieces together      c) to cut  
d) to dig                      e) lift heavy things
- The food of a machine is fuel.
- A steam engine needs coal.

### Additional activity

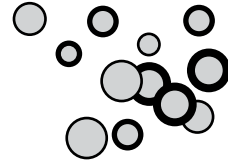
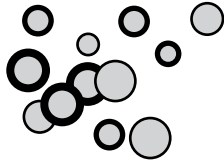
Choose the best answer:

- a) A push or a pull is called a \_\_\_\_\_.
- force      work      energy      [force]
- b) To push a heavy thing we need \_\_\_\_\_ force.
- no      more      less      [more]





- c) \_\_\_\_\_ help us to do work.  
Machines      Cars      Aeroplanes      [Machines]
- d) A bottle opener is a small \_\_\_\_\_.  
machine      car      crane      [machine]
- e) The food of a machine is called \_\_\_\_\_.  
food      fuel      water      [fuel]
- f) Fuel gives \_\_\_\_\_ to the machine to do work.  
work      energy      petrol      [energy]
- g) Small machines make our work \_\_\_\_\_.  
difficult      easy      hard      [easy]
- h) The fuel of our body is \_\_\_\_\_.  
petrol      gas      food      [food]
- i) A machine that helps us to lift heavy things is a \_\_\_\_\_.  
train      crane      screw      driver      [crane]
- j) The fuel of a steam engine is \_\_\_\_\_.  
petrol      oil      coal      [coal]



## Light

### **Objectives:**

To know what light is

To know that light on Earth comes from the Sun

To know that burning things produce light

To know that there is more light near the source

To know what luminous and non-luminous things are

To know how we can see non-luminous things

To know what transparent, translucent, and opaque things are

To know that light travels in straight lines

To know how a shadow is formed

To know that the size of a shadow changes with the change in the distance of the object from the light source

To know that shadows cast by sunlight change with the position of the Sun during the day

### **Teaching strategy:**

Switch off the lights in the classroom and light a torch.

Direct its beam on different objects in the class.

Explain that we can see things when light falls on them.

Ask: Can you see in the dark? Where do we get light from? How does the Earth get light?

Explain the main sources of light.

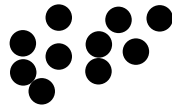
Hold up a candle.

Ask: Is it giving out light?

Light the candle.

Is it giving out light now?

Is there more light near the candle or away from the candle?



Explain the difference between luminous and non-luminous objects.

Explain that we can see non-luminous objects because light from luminous things falls on them.

Ask: Does the Sun give out light?

Do stars give out light? Does the Moon give out light?

Explain that the Moon is a non-luminous body. It only reflects sunlight.

Ask: Can you see through glass?

Hold up a glass of water.

Ask: Can you see through water?

Explain that things that allow light to pass through are called transparent.

Hold up a tracing paper?

Ask: Can you see through it?

Explain that things which allow light to pass, but through which we cannot see clearly, are called translucent.

Hold up a book or piece of cardboard.

Ask: Can you see through it?

Explain that opaque objects do not allow light to pass through.

Light a candle on a table near a wall. Hold a pencil near it. Show the formation of its shadow on the wall.

Explain that light travels in straight lines and the formation of shadows.

Ask children to make shadows of their hands on the wall.

Move the pencil backwards and forwards in front of the candle and show the students how the size of the shadow increases and decreases with change in distance.

Take the students outside on a bright sunny day.

Ask students to observe the direction of their shadows in relation to the position of the Sun.

## Unit 8 Light

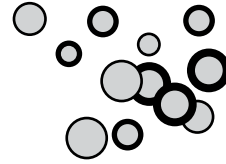
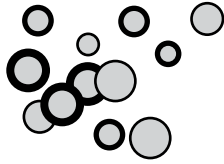
### Answers to Activities in Unit 8

- a) Light on the Earth comes from the Sun.  
b) A luminous object gives out light.  
c) A non-luminous thing cannot give out light.  
d) We cannot see things in the dark.  
e) We can see the moon because sunlight falls on it.
- a) transparent      b) translucent      c) transparent  
d) opaque          e) translucent      f) opaque

### Additional activity

Choose the best answer:

- We can see things when \_\_\_\_\_ falls on them.  
electricity      light      crane      [light]
- All the light on the Earth comes from \_\_\_\_\_.  
bulbs      candles      the Sun      [the Sun]
- Something which gives out light by itself is called \_\_\_\_\_.  
non-luminous      luminous      dark      [luminous]
- The moon is a \_\_\_\_\_ body.  
luminous      non-luminous      burning      [non-luminous]
- Things which let light pass through them are called \_\_\_\_\_.  
transparent      translucent      opaque      [transparent]
- We cannot see through \_\_\_\_\_ objects.  
transparent      translucent      opaque      [opaque]
- A beam of light travels in a \_\_\_\_\_ line.  
Curved      wavy      straight      [straight]
- The shadow of an object is of the same \_\_\_\_\_ as the object.  
size      shape      colour      [shape]
- If the object is near the light its shadow is \_\_\_\_\_.  
bigger than the object      smaller than the object  
of the same size as the object      [bigger than the object]
- When the Sun is over our heads, our shadow appears \_\_\_\_\_.  
on our left      on our right      under our feet      [under our feet]



## Heat

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### **Objectives**

To know that re produces heat

To know that heat is a form of energy

To know that heat can do work

To know the sources of heat

To know how we can use heat

To know that living things have different ways of keeping warm

To know that heat can be screened off by intervention of a suitable object

To know that things which allow heat to pass through are called good conductors

To know that things which do not allow heat to pass through are called poor conductors

To know the use of good and poor conductors of heat

### **Teaching strategy:**

Burn a piece of paper or light a candle. Ask a student to bring his hand near it.

Ask: What do you feel?

Explain that heat is a form of energy. We feel hot if we sit near a heater.

Ask: How does a steam engine work?

Explain that coal is used to heat water to make steam. The hot steam makes the engine move.

Ask: How can heat be made?

Tell students to rub their hands together.

Ask: Do your hands feel warm?

Explain that heat is produced by rubbing things together.

Ask: How do we cook food?

How do we iron clothes?

Why do we sit near a heater in winter?

Explain how heat is used by us.

## Unit 9 Heat

Ask: Why do we wear warm clothes in winter?

Ask: Why do we stand under the shade of a tree on a hot day?

Explain that intervention of a suitable object can screen off heat.

How do animals keep warm? Why does a bird have feathers?

Explain that fur and feathers keep the bodies of animals and birds warm.

Put a metal teaspoon in a cup of hot water. Touch the handle.

It feels hot.

Ask: How did the handle become hot?

Explain that heat can pass through some solids like metals.

Such substances are called good conductors of heat.

Ask: Why are handles of cooking pots and cooking spoons made of wood or plastic?

Explain that some materials do not allow heat to pass through.

They are called poor conductors of heat.

Give various examples of good and poor conductors.

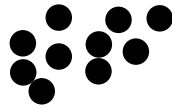
### Answers to Activities in Unit 9

1. a) heat      b) energy      c) work  
    d) burning    e) good
2. a) To cook.  
    b) To keep us warm.  
    c) To wash our clothes.  
    d) To run engines.  
    e) To produce electricity.

### Additional activity

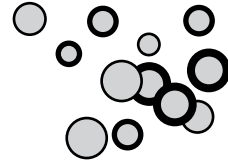
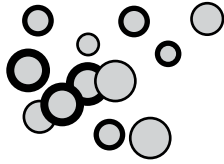
Choose the best answer:

- a) Heat makes us feel \_\_\_\_\_.  
    warm      cold      cool      [warm]
- b) Heat is a kind of \_\_\_\_\_.  
    energy      power      fuel      [energy]
- c) Animals have hair or fur on their bodies to keep \_\_\_\_\_.  
    cold      warm      wet      [warm]
- d) Heat energy comes from \_\_\_\_\_ things.  
    washing      burning      blowing      [burning]



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- e) Metals through which heat can pass are called \_\_\_\_\_.  
poor conductors    good conductors    semi-conductors    [good  
conductors]
- f) Plastic is a \_\_\_\_\_ conductor of heat.  
good                  poor                  weak                  [poor]
- g) Handles of cooking pots are made of \_\_\_\_\_ conductors of heat.  
good                  poor                  weak                  [poor]
- h) \_\_\_\_\_ is produced by rubbing our hands.  
Water                  Electricity                  Heat                  [Heat]
- i) We sit under a tree to protect ourselves from the heat of the \_\_\_\_\_.  
Sun                  moon                  stars                  [Sun]
- j) We feel \_\_\_\_\_ when we are close to a source of heat.  
cold                  wet                  warm                  [warm]



## The Sun and stars

### **Objectives:**

To know that stars are in the sky

To know that stars shine at night

To know that stars are big and spherical

To know that stars are very far

To know that stars are very hot

To know that stars give off light

To know that the Sun is a star

To know that the Sun is a small star

To know that the Sun is nearer to the Earth than other stars

To know the distance between the Sun and the Earth

To know that the Sun is a ball of hot burning gases

To know that the Sun gives heat and light to the Earth

To know the ways in which sunlight is useful

### **Teaching strategy:**

Show the students a picture of the night sky.

Point to the Moon and stars.

Ask: When do you see stars? Can you count the stars? Why do stars shine? Why do they look so small?

Explain that stars are very big, but they look small because they are very far away.

Ask: Have you seen a recracker?

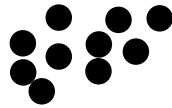
Explain that gunpowder inside the cracker burns. It becomes hot and it gives off light. This is how stars burn and give off light. That is why they seem to twinkle.

Show the students a chart of the Sun, the Moon, and the Earth.

Indicate the distance between the Sun and the Earth.

Explain the difference between the size of the Sun and the Earth.





Ask: How do plants use sunlight?

Explain the process of photosynthesis.

Ask: Why is sunlight good for us?

Explain that sunlight makes us strong and healthy because our skin makes vitamin D in sunlight.

Explain how sunlight helps in making clouds and rain.

Explain the water cycle with a diagram or chart.

Also explain how winds are caused by the heating of air by sunlight.

Ask: What would happen if there were no Sun?

Explain the importance of sunlight for the Earth and all living things.

### **Answers to Activities in Unit 10**

1. a) Stars shine at night.

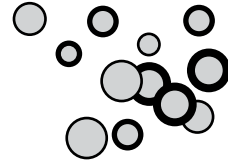
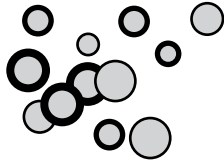
b) Stars are big.

c) Stars look small because they are very far away.

d) The Sun is a very small star.

e) The Sun is smaller than most stars.

2. a) yes      b) no      c) yes      d) no      e) yes



## The Moon

### **Objectives:**

- To know that the Moon is 400,000 kilometers away from the Earth
- To know that the Moon goes around the Earth in about four weeks
- To know that there are plains, mountains, and deep holes on the surface of the Moon
- To know that the Moon has no air or water
- To know that there are no living things on the Moon
- To know that the Moon does not have its own light
- To know that the Moon has different shapes during the month
- To know the different phases of the Moon

### **Teaching strategy:**

Show the students a picture of the night sky.

Point to the Moon and stars.

Ask: What is the difference between the Moon and the stars?

Does the Moon burn like the stars? Is the Moon hot?

Does the Moon have its own light?

Explain that the Moon is quite near the Earth, but it is not hot, because it does not burn like the Sun and stars.

Ask: Have you seen the full Moon? What do you see?

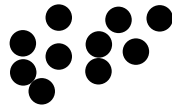
Explain that the grey patches on the Moon are deep holes called craters.

Also explain that there are high mountains and plains on the Moon.

Ask: Are there any living things on the Moon?

Explain that no living thing can survive on the Moon, because it has no air or water.

Explain that scientists who go to the Moon take air and water in special



tanks, so that they can live there for a little while.

Draw the different phases of the Moon on the board.

Write their names.

Ask: What is the shape of the Moon? What is the shape of the new Moon?

Why do we see different shapes of the Moon?

Explain that the Moon goes round the Earth. It takes about 28 days to go once round it. As it goes round, sunlight falls on it at various angles and so we can see different shapes at different times of the month.

### Answers to Activities in Unit 11

- The Moon is 400,000 kilometers away from the Earth.
  - The Moon takes about 28 days to go once around the Earth.
  - The deep holes are called craters.
  - The Moon has no air or water.
  - The Moon does not have its own heat and light.
- Crescent moon
  - Half moon
  - Full moon

### Additional activity

Choose the best answer:

- Stars shine in the sky \_\_\_\_\_.  
at night      in the morning      in the afternoon      [at night]
- Stars are big balls of burning \_\_\_\_\_.  
wood      coal      gases      [gases]
- The Sun gives us \_\_\_\_\_.  
Light and water      heat and light      air and water      [heat and light]
- The Sun is \_\_\_\_\_ million km away from the Earth.  
130      140      150      [150]
- The moon is \_\_\_\_\_ km away from the Earth.  
300 000      400 000      500 000      [400 000]
- Deep holes on the surface of the moon are called \_\_\_\_\_.  
wells      holes      craters      [craters]

## Unit 11 The Moon

g) Which one of the following statements about the moon is not true?

The moon has air and water.

The moon does not have its own heat and light.

The moon has many at plains and mountains.

[The moon has air and water]

h) The moon takes about \_\_\_\_\_ days to around the Earth once.

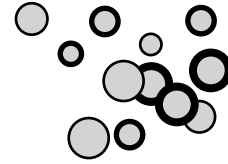
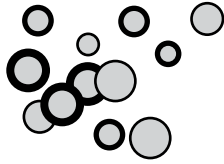
14            21            28            [28]

i) Sunlight helps our skin to make vitamin \_\_\_\_\_.

A            B            C            D            [D]

j) The Sun is a \_\_\_\_\_.

moon        star        planet        [star]



## The Earth

### **Objectives:**

To know that the Earth is round

To know that the Earth does not produce its own light

To know that the Earth gets light from the Sun

To know that the temperature of the Earth is just right for living things

To know that living things live on the Earth

To know there is a layer of air around the Earth

To know that air is necessary for living things

To know that three-fourth of the Earth is covered with water

To know that one-fourth of the Earth is made of land

To know that there are many oceans, seas, lakes, and rivers on the Earth

To know that there are many high mountains, at plains, and valleys on the Earth

To know how day and night are formed

To know about the different layers inside the Earth

### **Teaching strategy:**

Show the students a globe.

Light a table lamp on top of the globe.

Ask: Where does light on Earth come from?

Explain that light comes from the Sun.

Ask: Is the Earth hot or cold? Which parts of the Earth are hot? Which parts of the Earth are cold?

Explain that the Sun is at a suitable distance from the Earth, so it is neither hot nor cold.

Ask: What are the living things found on Earth?

Write some names of animals and plants living on Earth.

Ask: What do living things need to live?

## Unit 12 The Earth

Explain that there is a layer of air around the Earth, which helps living things to breathe.

Point to the oceans on the globe.

Explain that three-fourth of the Earth is covered with water.

Write the names of the oceans on the board.

Point to the continents on the globe.

Explain that one-fourth of the Earth is made up of land.

Explain that land is made of high mountains and at plains.

Draw a mountain on the board.

Place the globe on the table.

Light a lamp on one side.

Explain that the globe is the Earth and the lamp is the Sun.

Spin the globe. Explain that the Earth spins on its axis like the globe.

Now turn the globe slowly.

Show the students the part where the light falls.

Explain that the part that gets the light has day. It becomes hot.

The side that is away from the light has night. It is cool.

Explain that the Earth spins on its axis once in 24 hours.

Ask the students where is the Sun when they are coming to school?

Which side is it now? Where is it in the evening?

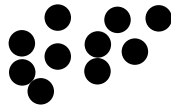
Explain that the side from where the Sun rises is called East, and the side where it sets is the West.

Draw the directions on the blackboard and write their names.

Show the students a compass needle. Explain how it is used to find directions.

### Answers to Activities in Unit 12

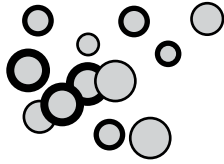
- |         |                    |          |
|---------|--------------------|----------|
| a) ball | b) plants, animals | c) water |
| d) axis | e) day             | f) four  |
- |          |         |          |         |
|----------|---------|----------|---------|
| a) north | b) east | c) south | d) west |
|----------|---------|----------|---------|



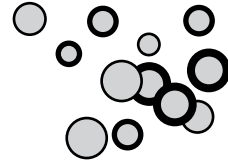
### Additional activity

Choose the best answer:

- a) The Earth gets heat and light from the \_\_\_\_\_.  
Sun      Moon      stars      [Sun]
- b) There is a layer of \_\_\_\_\_ around the Earth.  
water      air      smoke      [air]
- c) How much of the Earth is covered with water?  
1/2      3/4      1/4      [3/4]
- d) How much of the Earth is made of land?  
1/4      1/2      3/4      [1/4]
- e) The Earth turns on its axis once in \_\_\_\_\_.  
12 hours      18 hours      24 hours      [24 hours]
- f) The Earth goes round the Sun in about \_\_\_\_\_.  
30 days      6 months      365 days      [365 days]
- g) The innermost layer of the Earth is called the \_\_\_\_\_.  
crust      mantle      core      [core]
- h) The layer of the Earth which has many oceans, mountains, and continents is  
the \_\_\_\_\_.  
crust      mantle      core      [crust]
- i) The mantle is made of \_\_\_\_\_.  
sand      clay      rocks      [rocks]
- j) The hottest part of the Earth is called the \_\_\_\_\_.  
mantle      inner core      outer core      [inner core]



# UNIT 13



## The seasons

### **Objectives:**

To know the seasons in a year

To know the characteristics of each of the seasons

### **Teaching strategy:**

Ask: What are the names of the four seasons?

Is it hot or cold in winter?

What type of clothes do we wear in winter?

Explain that to keep warm we wear woollen clothes in winter.

Ask: What is summer like? How do we keep ourselves cool in summer?

Explain that we keep ourselves cool by wearing light clothes.

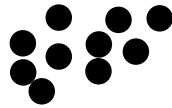
Show them pictures of trees with new leaves and trees with fallen leaves.

Explain what happens to trees in spring and autumn.

### **Answers to Activities in Unit 13**

1. a) There are four seasons in a year.  
b) summer, winter, autumn, and spring.  
c) There are no leaves in winter.
2. a) warm      b) leaves      c) cool





### Additional activity

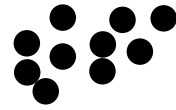
Choose the best answer:

- a) There are \_\_\_\_\_ seasons in a year.  
2            4            6            8            [4]
- b) In winter it is very \_\_\_\_\_.  
hot            cold            pleasant            [cold]
- c) People wear light clothes in \_\_\_\_\_.  
summer    winter            autumn            [summer]
- d) The Earth takes about \_\_\_\_\_ days to circle the Sun.  
165            265            365            [365]
- e) Leaves fall trees in \_\_\_\_\_.  
spring            summer            autumn            [autumn]
- f) When different parts of the Earth face the Sun for some time during the year, these periods are called \_\_\_\_\_.  
months    seasons            years            [seasons]
- g) In which season are the days longer than the nights?  
spring            winter            summer            [summer]
- h) In which season are the nights longer than the days?  
spring            summer            winter            [winter]
- i) In spring and autumn the length of the days and nights are \_\_\_\_\_.  
long            short            equal            [equal]
- j) In \_\_\_\_\_ there is less daylight and the days are shorter.  
summer            autumn            winter            [winter]

# Sample lesson plan

## Unit 1 : Living things

Topic	Time	knowledge		Resource material
		objectives	skills	
Differences between living and non - living things.	40 min	To know the differences between living and non - living things	Develop the ability to skillfully sort plants and animals into groups.	A collection of living and non - living things Pictures and charts of animals and plants
Characteristics of living things.	40 min	To know the characteristics of plants and animals	Develop the understanding that living things move, feed, and grow.	Pictures of structures of living things Charts of feeding habits of animals, green/ non - green plants
Reproduction in living things .	40 min	To know that plants and animals reproduce	Explain that plants and animals make new individuals of the same kind.	Pictures of animal babies; soaked bean seed; pots with soil and water to demonstrate germination
Assessment tasks		Homework		Teacher' evaluation
Q. 1 and Q.4 (a) to (e) to be done in class		Q.2,3, and 5		The students can identify the characteristics of plants and animals on the basis of movement, feeding habits, and growth. They can explain that reproduction produces living things of the same kind.



Assessment

1. Answer the following questions:

a) What do living things need to grow?

\_\_\_\_\_

b) What are the kinds of plants?

\_\_\_\_\_

c) What is glucose?

\_\_\_\_\_

d) What is the difference between a luminous and non-luminous body? \_\_\_\_\_

\_\_\_\_\_

e) Why do we need the sun?

\_\_\_\_\_

2. Fill in the blanks:

a) A fish swims in water with its \_\_\_\_\_ and \_\_\_\_\_. (fin, tail)

b) An octopus has \_\_\_\_\_ legs. (eight )

c) The pitcher plant traps \_\_\_\_\_ in its \_\_\_\_\_. (insects, pitcher)

d) \_\_\_\_\_ suck water and salts from the soil. (Root hairs)

e) A leaf makes food with the help of air, water, \_\_\_\_\_ and sunlight. (chlorophyll)

f) We can move things by \_\_\_\_\_ or \_\_\_\_\_. (pushing or pulling)

g) We can clearly see through \_\_\_\_\_ things. (transparent)

h) Sunlight helps our skin make \_\_\_\_\_. (vitamin D)

i) The Earth is turning on a point called the \_\_\_\_\_. (axis)

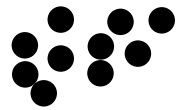
3. Name the following:

a) \_\_\_\_\_



b) \_\_\_\_\_





Assessment



c) \_\_\_\_\_



d) \_\_\_\_\_

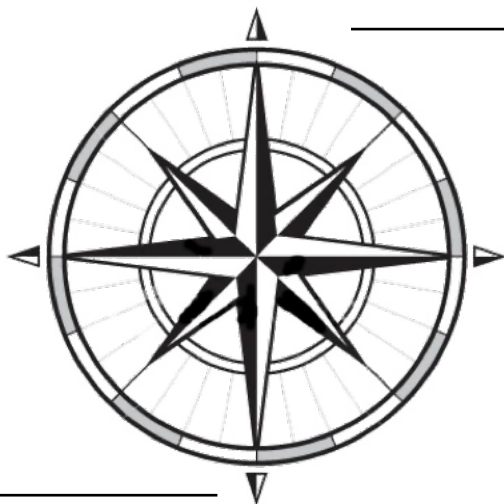
4. Label the following:

a)



\_\_\_\_\_

b)

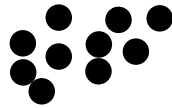


\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

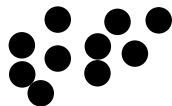
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## Assessment answers

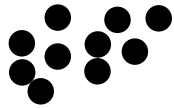
### **Assessment answers**

1. a) All living things need food, air and water to grow.  
b) The kinds of plants are trees, shrubs, herbs, mosses.  
c) Glucose is the food of plants.  
  
d) Luminous bodies give out light by themselves and non-luminous bodies do not.  
  
e) The Sun gives us light, which plants need to make food, and heat, which we need to keep warm.
3. a) Kangaroo  
b) Pitcher plant  
c) Sun  
d) Tadpole
4. a) 1. Baby plant, Seed plant, Hole, Seed coat  
B) North, East, South, West,



**Answers :**

1. a) hops on land.                          b) flies in the air with its wings.  
    c) walk with our legs.                 d) swims in water with flippers.
2. a) Plants only                          b) Plants only                          c) Animals only  
    d) Animals only                        e) Plants only                         f) Both plants and animals
3. a) very hot places                      b) water                                  c) land and water
5. a) yes                                      b) no
6. a) water, salts                            b) thick
8. a) walnut                                 b) apple                                 c) dates
9. a) bottle opener                      b) fuel                                      c) food                                      d) more                                      e) less
10. a) straight                                b) shadow                                 c) same
11. a) We wear clothes to keep warm.  
    b) They have feathers on their bodies.  
    c) A good conductor of heat is metal.  
    d) we sit under tree to protect ourselves from the heat of the sun.
12. a) Sunlight helps our skin to make vitamin D.  
    b) Stars are very hot.  
    c) The Sun is 100 million kilometers away from the Earth.  
    d) Plants use sunlight to make their food.
14. a) Sun  
    b) land  
    c) night  
    d) air



## Notes



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