Everyday Science

Level 3

Authors:
Afaf Al-hajjar
Arwa Hudeib

Editor:
Dr. Ray Patterson

Deposit No.: 1958 / 4 / 2018

Fifth Edition

2021

Tel. +962 6 4616436 - 4653671
Fax +962 6 4653641
P.O.Box 926141 Amman 11190 Jordan
e-mail : info@redwanpublisher.com

Introduction

Everyday Science is made up of six levels, each designed to meet the delicate educational requirements of the target age group. The structure of the series harmoniously balances four scientific branches: biology, chemistry, physics, and Earth sciences. The series promotes the importance of careful observation and experiments to verify facts and arrive at conclusions based on scientific methods. Through the variety of activities it provides, the series illustrates to young learners the connection between the subject studied and the real world, something that's often overlooked in teaching science.

Everyday Science is all about encouraging students to think about the world in terms of how & why. It directs youngsters' curiosity in the way of learning, discovering and understanding common occurrences and different natural phenomena.

Contents

Contents

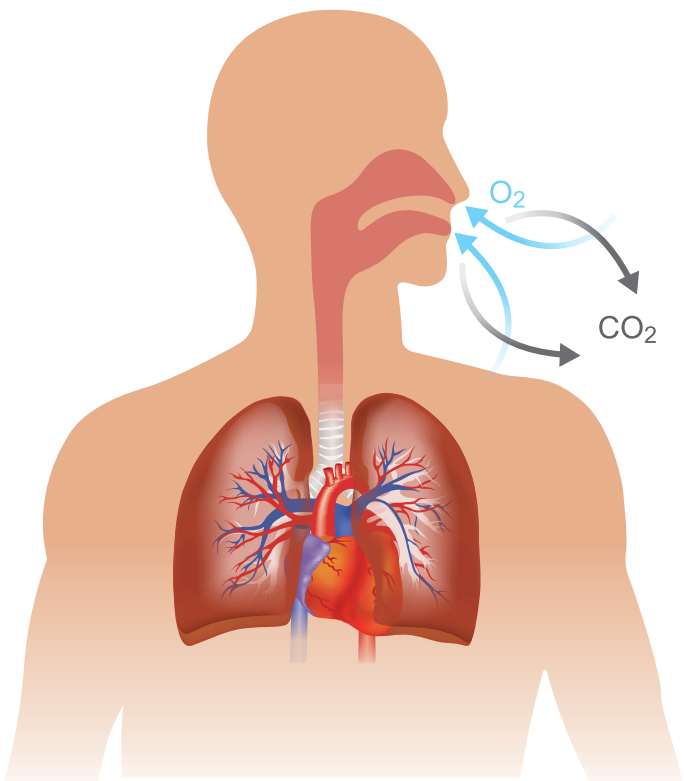
Unit 1

Living Things

The Earth has many kinds of living things on it. The Earth is the only planet which has water and a gas called oxygen. All living things need water and oxygen to live. They also need food.

Living things need air:

All living things need air. When we breathe in, we take in oxygen from the air. Oxygen helps to burn the food that is inside our bodies. This gives energy to our bodies. Energy helps living things to move and work.
The taking in of oxygen inside the body is called breathing. Fish absorb the oxygen that is in the water in which they live. They breathe though their gills. Animals living on land breathe by taking air into their lungs.



Living Things

Living things need water:

All living things need water. Every living thing is made up mostly of water. Three-fourths of our bodies are made up of water.

Living things need food:

All living things need food to stay alive.

Food gives them energy to grow and to stay healthy. Energy keeps their bodies moving and working.

Living Things

Green plants can make their own food in the sunlight.

Animals cannot make their own food.
Some animals eat plants. They are called herbivores.
Cows, mice, horses, rabbits and sheep are herbivores.

Animals that eat the meat of other animals are called carnivores.
Lions, tigers, dogs and cats are carnivores.

Living Things

Human beings and some other animals eat both plants and animals. They are called omnivores.

Human beings, hens and many birds like crows are omnivores.

The food that is taken into the body is broken down into simple particles. It is used by the body to grow. Some food is stored in the body. This stored food can be used later.

Living Things

Activities

1. Answer the following questions.

(a) What do living things need to live ? air, water and food

(b) How is oxygen useful for the body ? oxygen helps to burn the food that is inside our bodies, this gives energy to our body

(c) What happens to the food that is taken inside the body ? broken down into simple particles, some food is stored in the body

(d) Why is food important for the body ? it gives the energy to grow and stay healthy

2. Fill in the blanks to complete the statements.

(a) The Earth is the only planet that has water and oxygen.

(b) Living things need oxygen to breathe.

(c) Fish breathe by their gills .

(d) Three-Fourths of our bodies are made up of water .

(e) Animals that eat only plants are called herbivores .

(f) Animals that eat only the meat of other animals are called carnivores .

(g) Animals that eat both plants and animals are called omnivores .

3. Put ✓ in the correct column.

Animal	Herbivore	Carnivore	Omnivore
(a) rabbit	✓		
(b) lion		✓	
(c) hen			✓
(d) sheep	✓		
(e) tiger		✓	
(f) crow			✓
(g) horse	✓		
(h) dog		✓	
(i) human			✓
(j) mouse	✓		

Unit 2

Types of Living Things: Animals

All living things look different. We can divide living things into groups, then we can learn about each group. All animals can be put into one group- the animals group.

All plants can be put into another group - the plant group.
You can read about the plant group in the next unit.

Animals:

Animals can be further put into smaller groups called classes.
All animals that are alike can be put into same class.
For example, cat, tiger and lion can be put into one class.

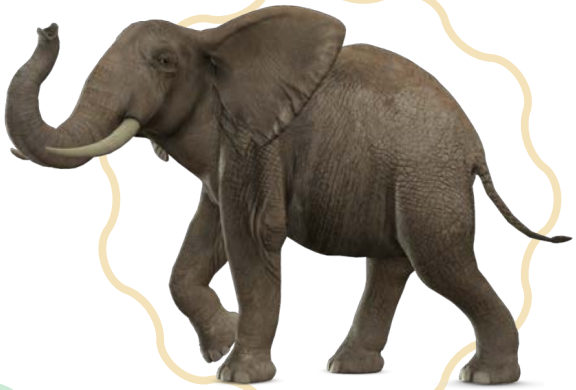
Types of Living Things: Animals

Animals with backbones:

There are five classes of animals which are alike in one important way. Each animal has skeleton. A skeleton is made up of bones that help to support the animal's body.

These animals have a backbone, which is made up of many small bones. The backbone helps the animal to bend and move.

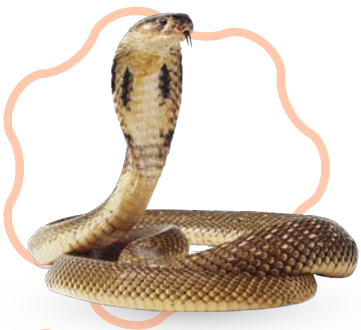
- Animals with backbones can be divided into five classes:



1 mammals

2 amphibians

3 birds



4 reptiles

5 fish

Types of Living Things: Animals

Animals without backbones:

These are small animals which do not have backbones. Some of them live in water. They can be divided into the following classes:

Animals with spiny skins:

They have rough skin with sharp needle-like spines.
Their bodies are divided into five parts.
Examples include starfish and sea urchins.

Animals with shells:

They live on land. They have soft bodies.
Most of them have a hard shell outside their bodies.
Examples include snails and oysters.

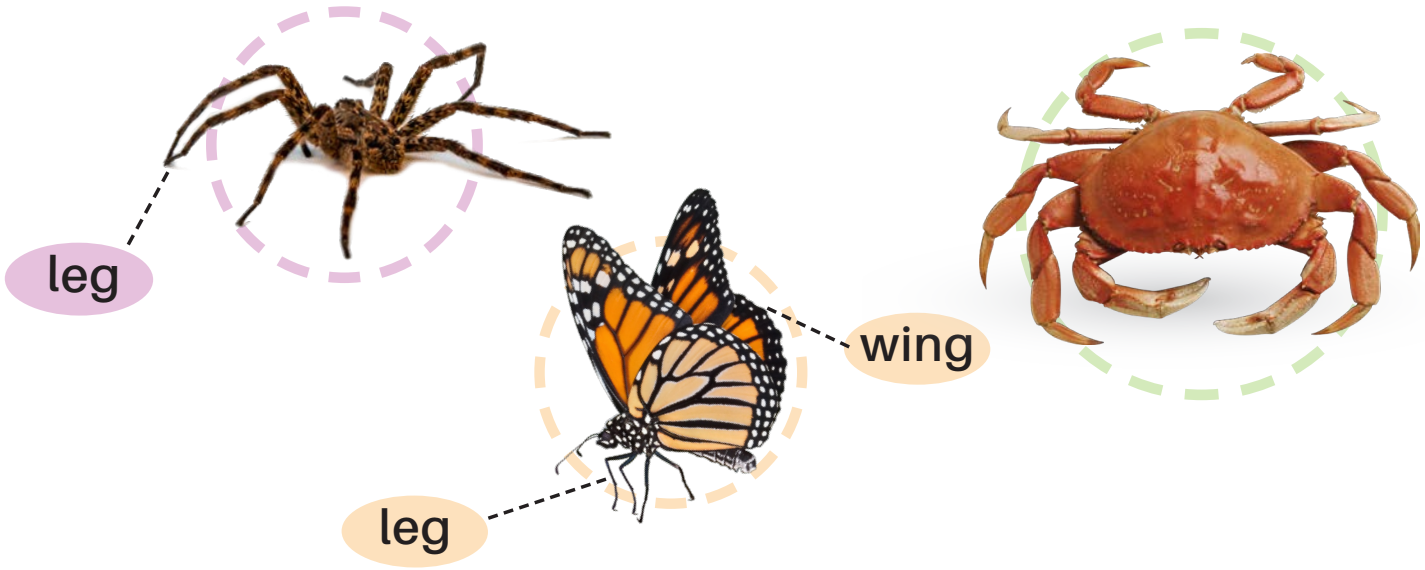
Worms:

All worms have soft bodies. They do not have legs. They live on land and in water.
Examples include earthworms, roundworms and tapeworms.

Types of Living Things: Animals

Animals with jointed legs:

All these animals have many legs with many joints. Their bodies are divided into many parts they have a hard outer skin.

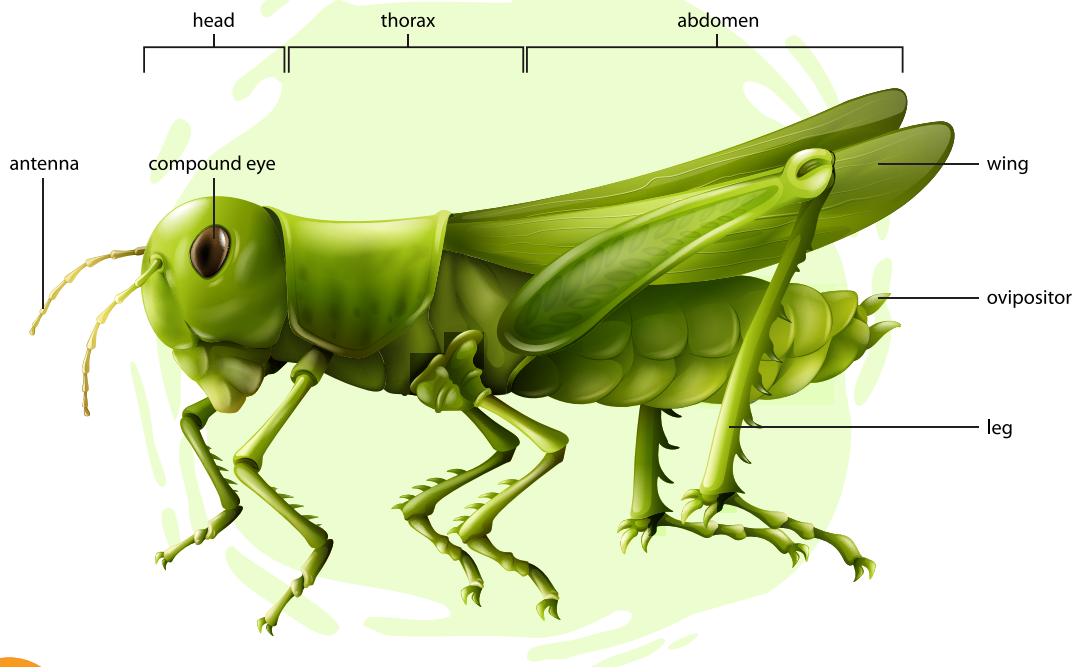


Structure of animals:

Insects:

The body of an insect has three parts: the head, the thorax and the abdomen.
It has two compound eyes and two Antennae on the head.
It has mouth parts that can chew or suck food.

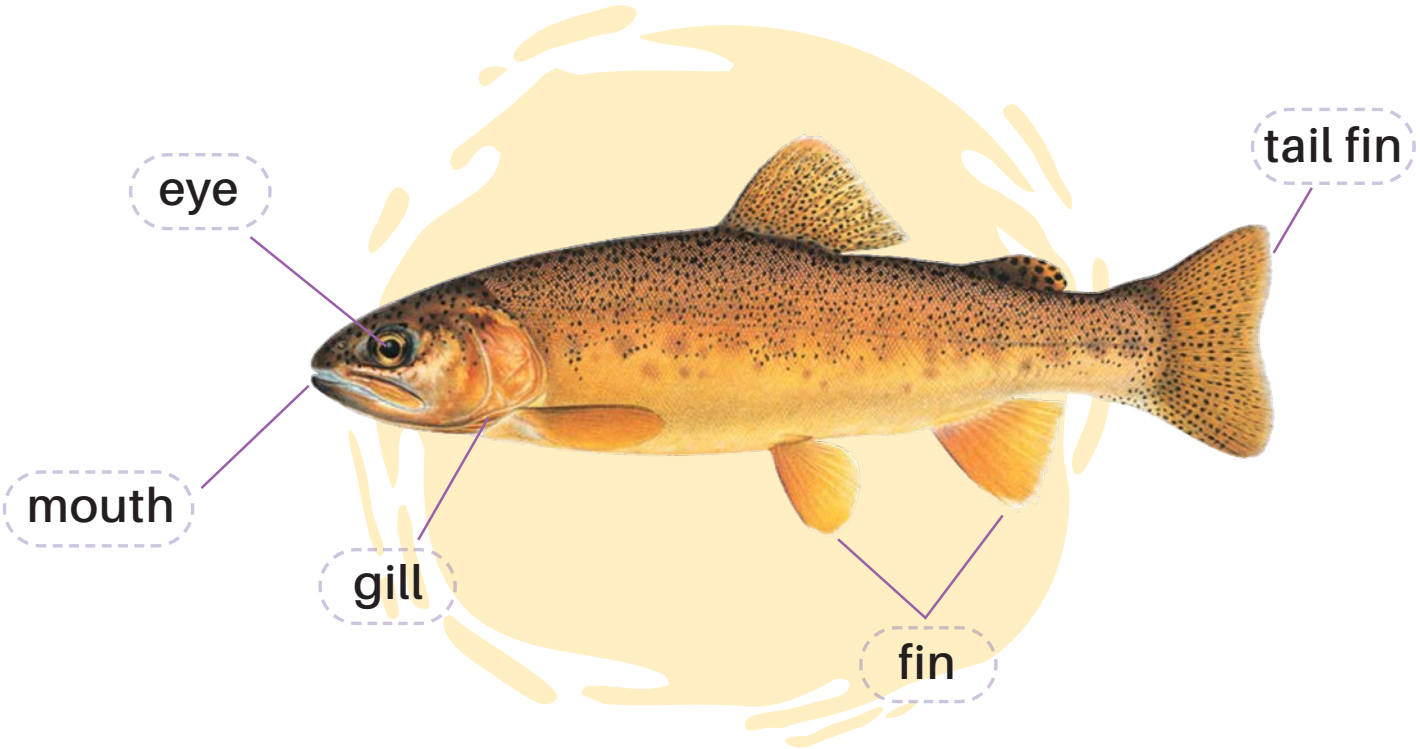
Grasshopper External Anatomy



Types of Living Things: Animals

Fish:

Fish live in water. They are of many shapes, colours and sizes. All fish have a backbone. They breathe in water through their gills. Most fish have scales on their skin. They swim in the water with their fins.



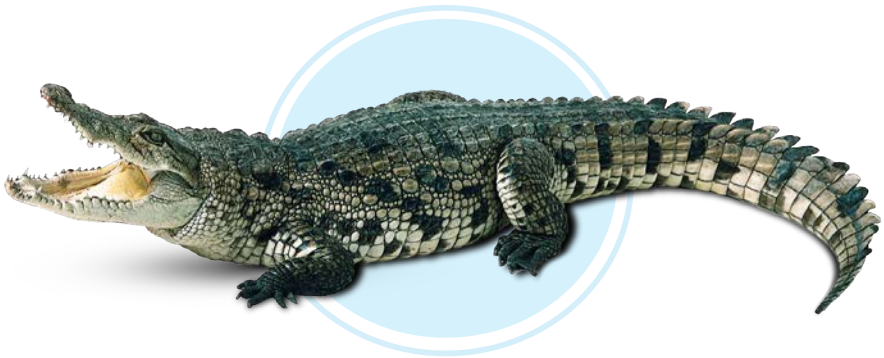
Amphibians:

An amphibian is an animal that spends part of its life in water and part of its life on land. Young amphibians live in water and breathe through their gills like fish. As they grow older, they breath through their lungs and live on land.

Types of Living Things: Animals

Reptiles:

Reptiles usually live on land. They have dry, scaly skins. They breath air through their lungs. They eat plants as well as insects and small animals.



Birds:

Birds live on land. Their bodies are covered with feathers. The arms of birds are shaped like wings. Most birds can fly with their wings. They have sharp beaks and claws.
Examples include sparrows, hens, ostriches, and eagles.

Types of Living Things: Animals

Mammals:

Most mammals live on land.
Their skin is covered with hair or fur.
They breathe through their lungs.
They eat different kinds of foods.
They eat plants and animals.
They do not lay eggs. They have babies. The mother feeds its babies on milk.
Examples include cats, cows, goats, humans and whales.

Activities

1. Fill in the blanks to complete the statements.

(a) We can divide living things into ....different.... groups.

(b) Smaller groups of animals are called ....classes.... .

(c) Some animals have a hard skeleton made of ....bones.... .

(d) The ....back.... bone is made up of many small bones.

(e) All worms have ....soft.... bodies.

(f) The starfish has rough skin with sharp, needle-like ....spines.... .

(g) A spider has ....eight.... legs and ....no.... wings.

(h) A butterfly has ....four.... legs and ....two.... wings.

(i) A crab has ....ten.... legs and ....no.... wings.

(j) Animals with backbones can be divided into ....five.... classes.

Types of Living Things: Animals

2. Choose the best answer.

(a) A starfish has (a shell\spines).

(b) A snail has (a shell\spines).

(c) Worms have (hard\soft) bodies.

(d) The middle part of an insect's body is called the (abdomen\thorax).

(e) Fish breathe through their (fins\gills).

(f) Amphibians live (on land\in water\on land and in water).

(g) Reptiles have (dry\slippery) scales on their skins.

Unit 3

Types of Living Things: Plants

Plants:

Thousands of plants live on Earth. Plants grow in different places.
Some plants grow in wet shady places, like the fern. Some plants grow in hot dry places, like the cactus. Most plants grow in sunlight, like the sunflower.
Most plants are green. Green plants can make their food.
They need air and water to make food. They also need a green substance called chlorophyll. Without chlorophyll, they cannot make food.
Green plants have chlorophyll in their leaves. The leaves of a plant make food.

Kinds of plants:

There are many different kinds of plants.

Plants without seeds:

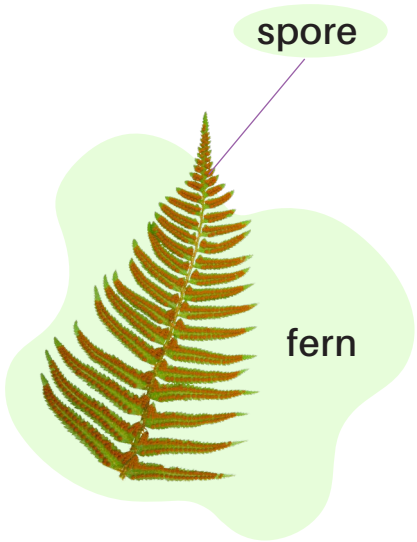
Some plants have roots, stems and leaves, but they do not have flowers.
They do not make fruits or seeds.

Types of Living Things: Plants

They have small brown spots on their leaves. Each spot has a brown powder. The brown powder is made of tiny spores. The spores fall out. Some spores fall on wet soil. They grow and make new plants. Ferns and mosses are plants that make spores.

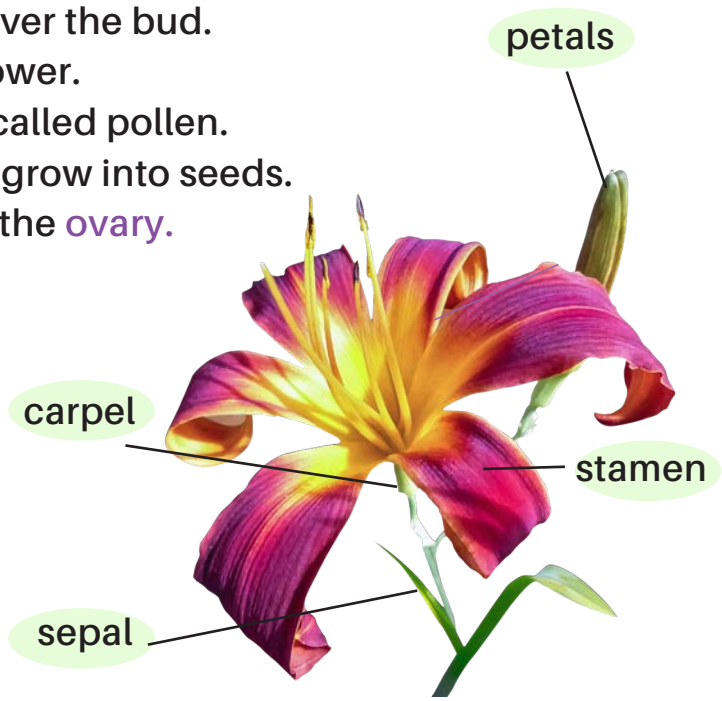
Plants that grow from seeds:

Plants that grow from seeds are called seed-bearing plants.
Seeds are made inside flowers.
Examples include the poppy, rose and sweet pea.



Structure of a flower:

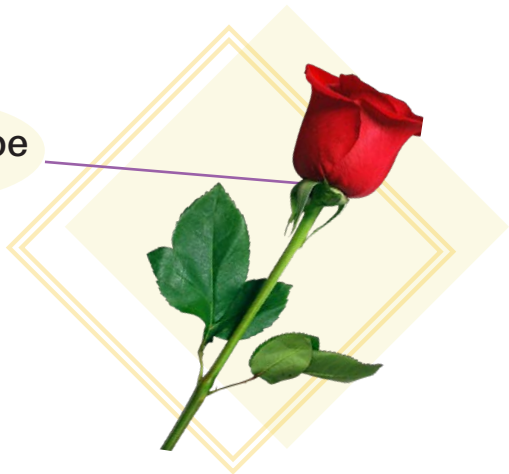
A flower has four parts.
Sepals are small green leaves that cover the bud.
Petals are the coloured leaves of a flower.
The stamen makes a yellow powder called pollen.
The carpel has eggs or ovules which grow into seeds.
The lower part of the carpel is called the ovary.
The ovary has ovules in it.



Types of Living Things: Plants

How a flower makes seeds:

When a bee sits on a flower, the yellow powder or pollen sticks to its body.
When the bee flies to another flower, the pollen from its body sticks to the sticky tip of the carpel.
A tube grows from the pollen. It goes into an ovule in the ovary.
The ovule grows into a seed.
The lower part, or ovary, of the carpel grows big to make the fruit.



Kinds of fruit:

Some fruits are soft and juicy, like oranges, apples, v and peaches.

Types of Living Things: Plants

Some fruits are dry and hard, like coconuts, groundnuts, walnuts, and bean pods.

Types of Living Things: Plants

Some trees do not have flowers and fruits, but they have seeds. Such trees have cones.

They have two kinds of cones. There are pollen cones which have pollen, and there are seed cones which make seeds.

Wind takes the pollen from the pollen cone to the seed cone. The pollen reaches the ovules of the seed cone. The ovules grow into seeds.

When the seeds are ripe, the seed cone opens up and the seeds fall out.

These seeds will grow into new trees of the same kind. Pine trees, for example, make cones.

Activities

1. Answer the following questions.

(a) Where do plants grow? in different places

(b) What do plants need to make their food? air and water

(c) How do plants without seeds make new plants? ANSWER HIGHLIGHTED ON PAGE 20

(d) Where are seeds made in seed-bearing plants? inside flowers

(e) What are the two kinds of cones made by a pine tree? pollen and seed cones

Types of Living Things: Plants

2. Fill in the blanks to show how a flower makes seeds.

(a) When a ..bee.. sits on a flower, the yellow powder called ..pollen.. sticks to its body. When it flies to another flower, the pollen sticks to the sticky tip of the ..carpel.. .

(b) A ..tube.. grows from the pollen. It goes into an ..ovule.. in the ovary. The ovule grows into a ..seed.. . The ovary grows big and makes the ..fruit.. .

3. Draw a pine cone.

4. Draw two soft and fleshy fruits.

Unit 4

Matter

Matter has many shapes and forms.

All things around us are made of matter.

Matter takes up space and has weight.

- Books, balloons, rocks, snowflakes and water are matter.

Solid:

A solid has a shape.

Matter can be solid.

Matter

An egg is oval.

A solid is hard.

A marble is round.

- The shape of a solid remains the same.

Liquid:

A liquid can flow.

A liquid can change its shape.

Matter can be liquid.

- Milk, water and oil are all liquids.
- It takes the shape of the vessel in which it is kept.

Matter

Gas:

Matter can be a gas. Air is a mixture of gases.
We cannot see a gas.
We cannot see air, but we can feel the wind blowing.
A gas has no shape.
A gas can move from one place to another.

Senses:

We learn about matter with our senses.
When we drink juice, we know whether it is orange juice or milk.
The colour, taste and smell of the juice help us to know the difference.

We cannot see or taste air, but we can feel it. When air is moving it makes wind.
We can feel the wind blowing. We can see how the wind moves things.
We can also hear the leaves rustling when the wind blows through them.

Matter

Molecules:

Matter is made up of molecules.
A molecule is very, very tiny.
It is much smaller than a grain of sand.
Different things are made up of different kinds of molecules.
Water is made up of water molecules.
Sugar is made up of sugar molecules.
Sugar and water molecules are not the same.
They are different.

Sugar and water molecules:

Put a teaspoon of sugar in a glass of water, and stir it.
We can taste the sugar in the water.
We can also taste salt in our food.

If you open a bottle of perfume in a room, you can smell the perfume.
The molecules of the perfume spread out in the room.
They mix with the molecules of air.

Matter

Matter and form:

Matter can change its form.
Put a glass full of ice cubes near a sunny window. After some time, you will see water in the glass.
The ice has melted. Ice is a solid. In a warm place it becomes water, which is a liquid. We can see that the form of the water has changed from a solid to a liquid.
Heat can change a solid into a liquid.
When we light a candle, the wax begins to melt.

A liquid can change into a solid by cooling.
If we put water in an ice tray and put it into the freezer, the water becomes solid ice.

Matter

Heat can change a liquid into a gas.
Heat some water in a pan. You will see steam coming out.
Water is changing into steam. Water is changing from a liquid to a gas.
This gas is called water vapour.

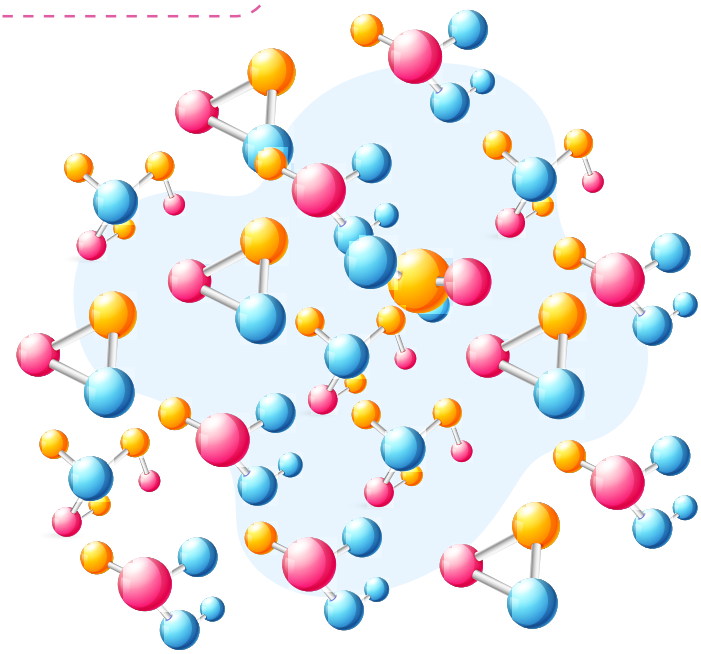
We cannot see it.

It has no colour.

The water vapour goes into the air.
Hold a cold plate above the steam.
You will see tiny drops of water on it.
Water vapour has changed back from a gas into tiny drops of liquid water.

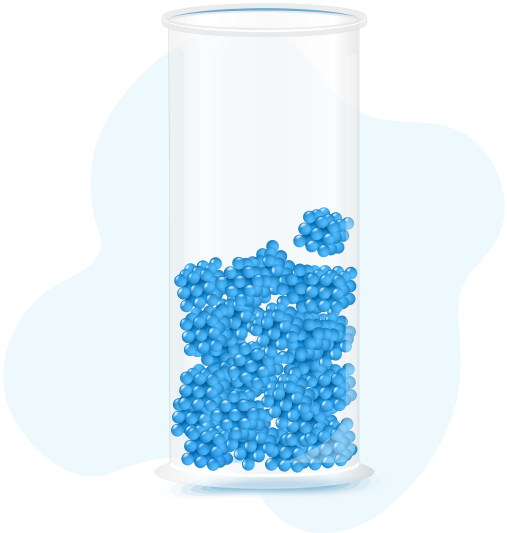
Molecules and movement:

Molecules can move.
Molecules are always moving.
They bump into each other.
They also slide over each other.



Matter

Molecules in a solid:

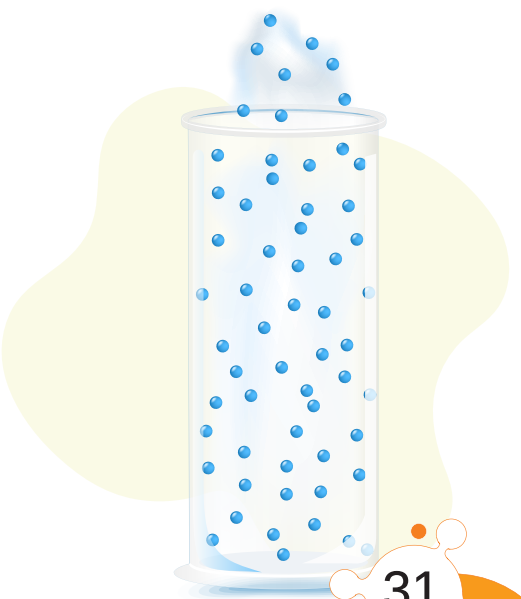


Molecules in a solid are very close together.
They can move backwards and forwards but they stay in the same place.
That is why a solid cannot change its shape easily.

Molecules in a liquid:

Molecules in a liquid are not very close to each other.
They can move.
They can also slide over each other.
They can move more than the molecules of a solid.
That is why a liquid can change its shape.

Molecules in a gas:



Molecules in a gas are very far away from each other.
They can move about freely.
They can move in any direction.
They bump into each other.
They also push each other away .
That is why a gas has no shape.

Matter

Activities

1. Answer the following questions.

(a) What is matter? matter has many shapes and forms

(b) How many forms of matter are there? three

(c) How do we learn about matter? with our senses

(d) What can change a solid to a liquid? heat

2. Write Yes or No.

(a) Matter takes up space. Yes

(b) The shape of a liquid does not change. No

(c) A solid can flow. No

(d) We cannot see air. Yes

(e) Water is made up of sugar molecules. No

(f) Heat can change a solid to a liquid. Yes

(g) Water changes into steam when we put it in the freezer. No

3. Write solid, liquid or gas.

(a) It has a shape . ....solid.....

(b) It can move from one place to another . .....gas.....

(c) It is hard . .....solid.....

(d) It takes the shape of the vessel in which it is kept . .....liquid.....

(e) Its molecules are very close together . .....solid.....

(f) Its molecules are not very close to each other .....liquid.....

(g) Its molecules are very far apart .....gas.....

(h) A stone is a .....solid..... .

(i) Milk is a .....liquid..... .

(j) Air is a .....gas..... .

Unit 5

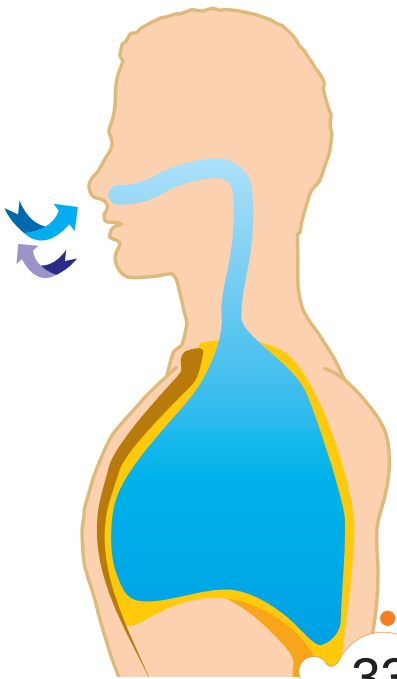
Air

The atmosphere:

There is a huge layer of air all around the Earth.
It covers the Earth like a thick blanket.

This layer of air is called the atmosphere. The atmosphere is more than 1000 kilometers deep. The atmosphere is made up of many gases. it has nitrogen, oxygen and carbon dioxide. It also has dust particles and germs.

The oxygen in the atmosphere is used by all living things. It is used for breathing and burning. Carbon dioxide in the atmosphere is used by green plants to make their food.



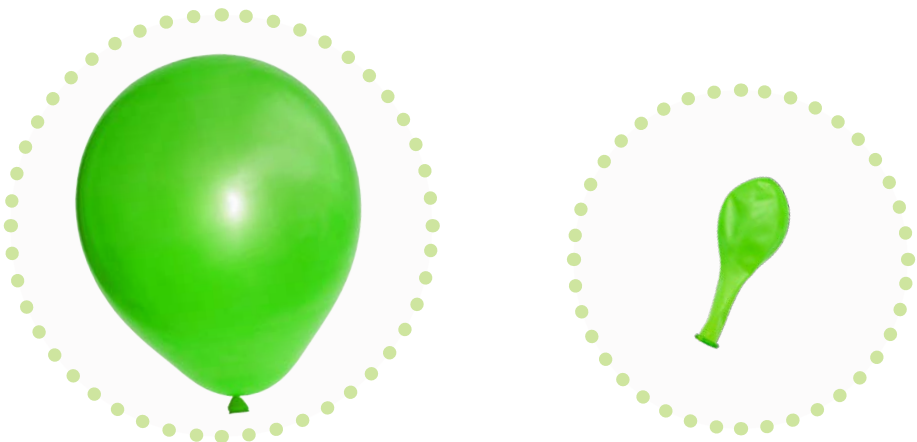
Oxygen is also given out by green plants.
All living things give out carbon dioxide when they breathe out.
Carbon dioxide is also given out when things burn.
Although we cannot see air, we can feel it.
Air is essential for life. Humans, animals and plants cannot live without it.

Air

In summer, the air is warm.
In winter, the air is cold.
In the rainy season, the air has a lot of water vapour.
On a bright sunny day, the air is dry.

Air pressure:

The atmosphere is pressing on us all the time. We do not feel the air pressing on us because we are used to it.
Weigh an empty balloon. Now fill the balloon with air and weigh it again.
You will see that the balloon with air in it weighs more than the empty balloon.
This shows that air has weight.
The way air presses down on all things is called air pressure.



This balloon proves that air occupies space.

Air pressure and weather:

Air pressure changes from day to day. Changes in air pressure affect the weather.
Air moves all the time due to air pressure. Moving air is called wind.
A light wind is called a breeze. A strong wind is called a gale. The strongest wind of all is called a hurricane. A hurricane can uproot trees and damage houses.

Air

We can measure changes in pressure by an instrument called a barometer. A wind-vane tells us the direction of the wind. An instrument called an anemometer tells us speed of the wind.

Barometer

Wind-vane

Anemometer

Air

Activities

1. Answer the following questions.

(a) What is the atmosphere made up of? gases

(b) What is oxygen used for? breathing and burning

(c) How do plants use carbon dioxide gas? to make their food

(d) What is air pressure? the way air presses down on all things

2. Fill in the blanks to complete the statements.

(a) The layer of air around the Earth is called the atmosphere.

(b) The atmosphere is more than 1000 kilometres deep.

(c) All living things breathe out carbon dioxide gas.

(d) In summer, the air is warm .

(e) In the rainy season, the air has a lot of water vapour.

(f) Moving air is called wind .

(g) A light wind is called a breeze .

(h) A gale is a strong wind.

(i) A hurricane is the strongest wind.

3. Draw a wind-vane.

Science and life

• A trip to the zoo:

A trip to the zoo with school, for the safety of the animals and children, abide by rules and safety guidelines:

1. Children must stay with their assigned teacher at all times.
2. Listen to the trainers & tour Guides.
3. Selfie-sticks, balloons, bicycles, glass containers or other items that could injure animals or people are not allowed on Zoo grounds.
4. Be respectfully quiet. Shouting disturbs animals and other guests.
5. For your safety in the Zoo, please walk. Don't run.
6. Feeding animals is prohibited throughout the Zoo except in Zoo approved areas!
7. Do not abuse animals or climb into animal containment areas.

• Poisonous Plant

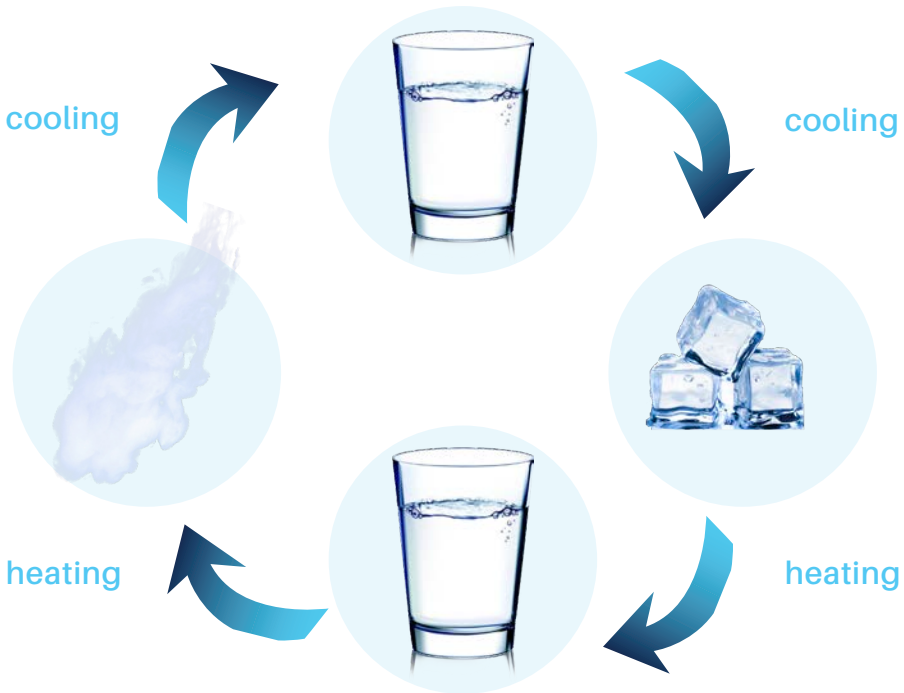
When a product is labeled all natural that doesn't mean it is good for you. Would you eat Hemlock?

After all, it is all-natural. Just as there are many common plants and flowers that are totally eatable, there are many that are actually poisonous to humans. Contact with or consumption of these flowers and plants can cause reactions varying from a mild rash to death.

Unit 6

Water

Water is found in all three forms of matter. Solid water is ice. Liquid water is water. Gas water is water vapour or steam. Water can be changed from one form to another by heating or cooling.



Water in the air:

Air has a lot of water in it. When the Sun shines on the sea, lots of water changes into water vapour and rises into the air. When water vapour is cooled by the air, it turns back into tiny drops of water which float in the air. High in the sky, it is very cold. The water vapour cools down to form clouds.

Clouds have millions of tiny drops of water. When clouds pass over a mountain, the tiny drops of water join up to form bigger drops of water. These bigger drops of water are too heavy to float in the air, so they fall to the ground as rain.

Water

Mist and fog:

Sometimes clouds may form near the ground on a cold clear night. They form fog. Mist and fog can also form over the sea.

Snow and ice:

When it is very cold, the tiny drops of water in the clouds can freeze. They form ice. Each little piece of ice forms a shape called a crystal. The ice crystals grow bigger. They fall to the ground as snowflakes.

Unit 6

Water

Groundwater:

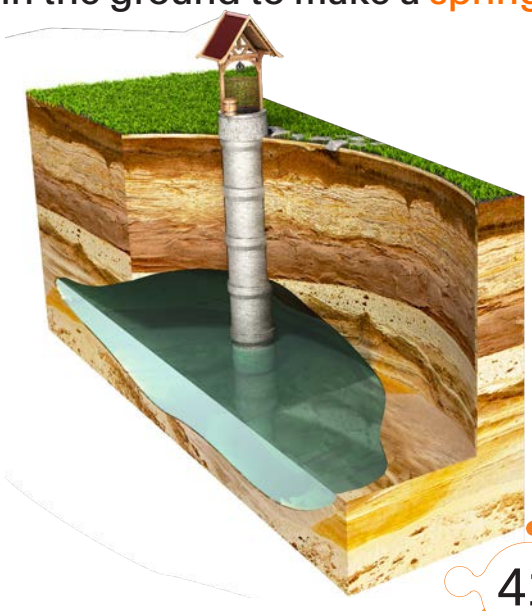
As rainwater flows along the ground, Some of it soaks into the ground.
It gathers in the spaces between the rocks. This water is called groundwater.

Springs:

Groundwater can come out of holes and cracks in the ground to make a spring.

Wells:

Sometimes we dig deep holes in the ground
to reach the groundwater.
These deep holes are called wells.



Unit 6

Water

- How do we use water ?

We use water in many ways. We use it for:

(a) drinking
(b) watering our gardens and fields
(c) fire-fighting
(d) boating and sailing
(e) bathing
(f) washing

Unit 6

Water

Activities

1. Answer the following questions.

(a) Name the substance which exists in all three forms of matter. water

(b) How can water be changed from solid to liquid? by heating

(c) How can water be changed from liquid to solid? by cooling

(d) What are clouds made up of? millions of tiny drops of water

(e) What is fog? clouds may form near the ground on a cold clear night

(f) What is groundwater? as rainwater flows along the ground, Some of it soaks into the ground It gathers in the spaces between the rocks

2. Fill in the blanks to complete the statements.

(a) Solid water is called ice .

(b) Steam is also called water vapour

(c) When the Sun shines on the sea, lots of water goes into the air.

(d) Big drops of water in the air fall to the ground as rain .

(e) A little piece of ice forms a shape called a crystal .

(f) Big ice crystals fall to the ground as snowflakes .

(g) ground water goes into streams and rivers.

3. We use water for:

(a) drinking	(c) fire fighting	(e) watering
(b) washing	(d) bathing	(f) boating

4. Write: heating or cooling on the dotted lines to show the change of state.

(a) ice heating water

(b) water heating steam

(c) steam cooling water

(d) water cooling ice

Unit 7

Force

Pushes and pulls are called forces. Forces are required to move things and also to stop things from moving. Forces are acting all around us. When we push a toy car, kick a ball, lift a heavy bag or blow up balloon, we are either pushing or pulling.

What does force do ?

Force can do many things. Force can move things. If we push a toy car it moves. Force can change the direction of moving thing. We can kick a ball coming towards us so that it moves in another direction.

Force can bend things. We can bend a piece of wire into any shape we like. Force can stretch things. If we pull a rubber band or a piece of elastic, it becomes longer.

Force

Force can break things. We can break a wooden ruler by bending it.
Force can tear things. We can tear a piece of paper into bits by pulling it.

Work:

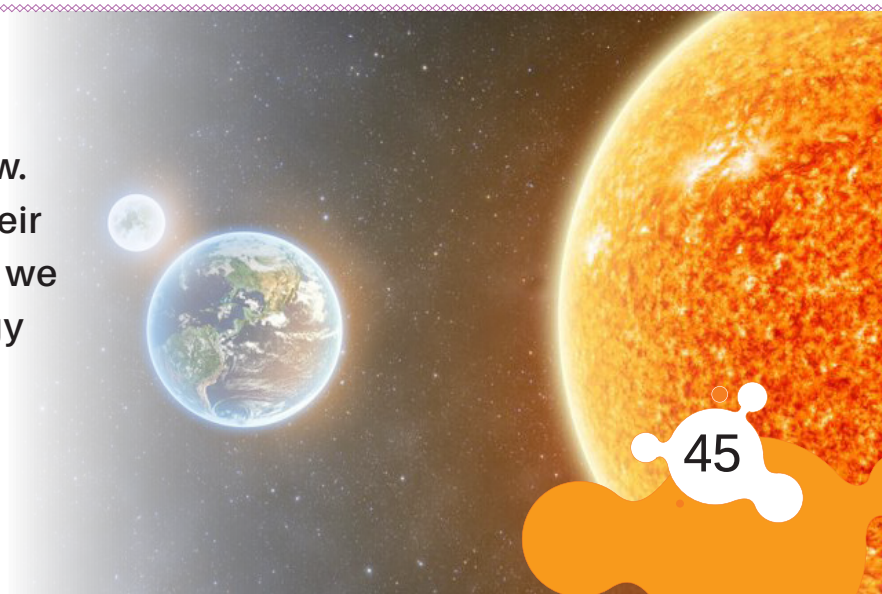
If we want to move something, we do it by pushing or pulling it. When an object is moved through some distance, we call it work.
Work is done when a push or pull makes something move. We need energy to do work.

A machine also uses energy to move.

Kinds of energy:

- Energy from the Sun

Energy from the Sun makes plants grow. Plants use the Sun's energy to make their food. This is called solar energy. When we eat fruits and vegetables, we get energy from them.



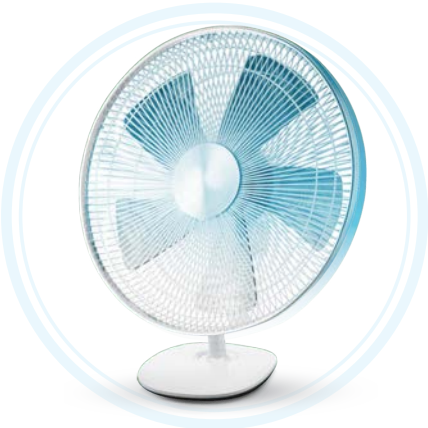
Force

Heat energy:

Heat energy comes from burning things such as wood, coal, gas, oil, etc. Heat can do work. It can make things move.

Electrical energy:

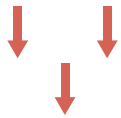
Electrical energy comes from power stations. It can make things move. It is used to move fans, toasters, washing machines and heaters.



Light energy:

Light energy comes from the Sun. It also comes from burning things. Bulbs, lamps and candles give out light. Light energy helps us to see things.

Force



Force of gravity:

There is a very interesting type of force in nature.
What happens when you throw an apple or a stone in the air? It falls down with the same force on the ground. All objects fall to the ground.

When you are on swing, what do you feel? It feels as if somebody is pulling you towards the ground.

This pull or force is called the force of gravity.
The Earth is round but things do not move away from the Earth.
The force of gravity pulls everything towards it.

Force of friction:

When we rub our hands together they become hot.
When we rub a matchstick against matchbox, the match lights up.
If we roll a glass marble on a glass table, it keeps on moving. If we roll a glass marble on the ground, it gradually slows down and then stops moving.

The force which slows down or stops a moving thing is called friction.
Friction helps us to run and to ride a bicycle.
It helps our shoes and the cycle tyres to grip the road.
We cannot walk on ice, for example, because there is less friction between our shoes and icy ground.

Force

Activities

1. Answer the following questions.

(a) What is force? pushes and pulls

(b) What is work? is done when a push or pull makes something move

(c) What are the different kinds of energy? solar energy - heat energy - electrical energy and light energy

(d) What is friction? the force which slows down or stops a moving thing

(e) Why do we put oil in the moving parts of a machine? to make them move

2. Fill in the blanks to complete the statements.

(a) We need ....energy.... to do work.

(b) A machine uses ....energy.... to move.

(c) Plants use ....solar.... energy to make food.

(d) ....heat.... energy comes from burning things.

(e) ....electrical.... energy comes from power stations.

(f) ....light.... energy comes from the Sun.

(g) ...friction... helps us to run and to ride a bicycle.

(h) We cannot walk on ice because there is very little ....friction.... .

Force

3. Name the kind of energy that is used in:

(a) a fan
electrical

(c) a plant to make food
light

(b) a torch
solar

(d) a steam engine
heat

4. Draw three things which need electricity to work.

Unit 8

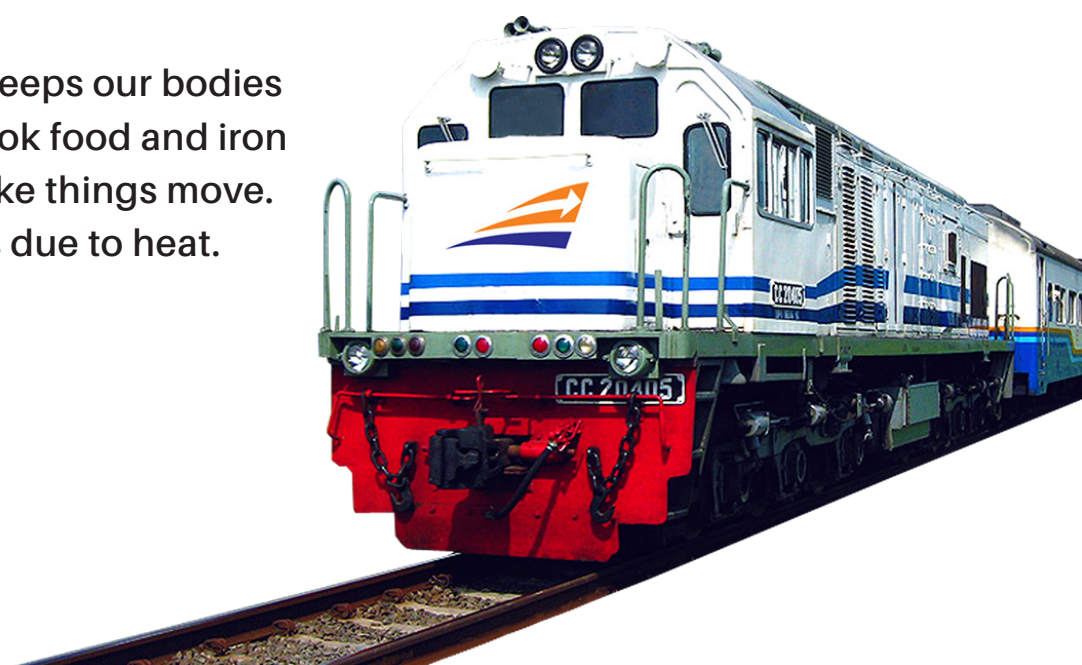
Heat

What is heat?

Fire gives us heat. It also gives us light. We can feel the heat coming from a fire on our face and hands. Heat makes us feel warm.

Heat comes from the Sun, and from burning wood, paper and other fuels such as oil and gas.

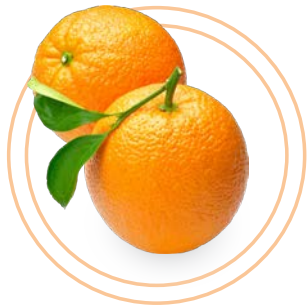
Heat is very useful. It keeps our bodies warm. It helps us to cook food and iron clothes. It can also make things move. A steam engine moves due to heat.



Heat

Anything which can do work has energy. Heat is a kind of energy. The heat energy which keeps our bodies warm comes from food. Our body uses up the food we have eaten to produce energy.




All things have heat. Some have more heat. Others have less heat. Cold water has less heat than boiling water.


Heat and molecules:

We know that molecules are always moving. Molecules move because they have energy. When the molecules of something move faster, they make that thing hot. We can feel the energy of the molecules as heat.

Heat

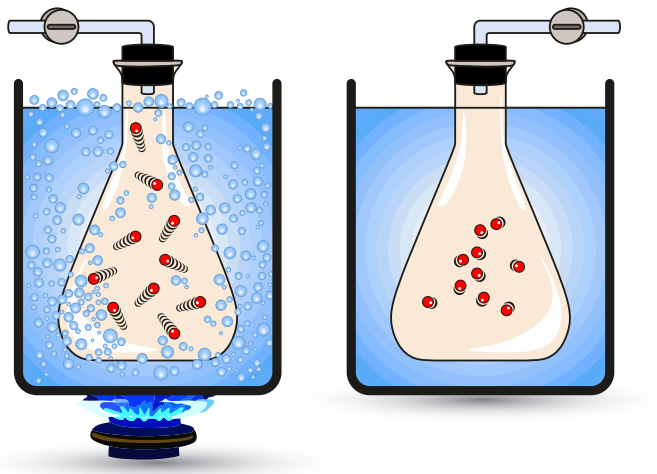
Hot molecules move faster than cold molecules

Fill one bowl with cold water.

Fill another bowl with hot water.

Put both bowls on a table. Put a few drops of red ink in both bowls with a dropper. Do not shake the table or the water.

You will see that the red colour will spread faster in the hot water than in the cold water.



hot cold

Heat and change:

Heat can change the state of things.

When we heat ice cubes in a pan, they change into water.

The water begins to boil and turns into steam.

Things become hot when they are heated.

The heat of the atmosphere changes daytime and night-time temperatures.

Heat

Why does ice melt ?

The heat of the stove makes the molecules of ice move faster.
As the molecules move, they bump into each other and begin to move away from each other. With more heat, they move faster and move farther apart and the solid ice becomes water. In the same way, liquid water becomes steam.
If the molecules are cooled, they slow down and move closer to each other.
When molecules of steam are cooled down, they turn into tiny drops of water.
When water is cooled further, its molecules slow down and move closer to each other. The water freezes into ice.

Thermometers:

To find out how hot something is we use an instrument called a thermometer.
A thermometer is a closed glass tube. At one end, it has bulb filled with a liquid called mercury. There are numbers marked on the tube.

If we dip the bulb in something warm, the liquid inside the tube goes up.
We can read the level of the liquid by the numbers on the tube. The level of the liquid shows how hot the thing is.
A doctor uses a thermometer to find out how hot our body is when we are sick.

Heat

Activities

1. Answer the following questions.

(a) Where does heat come from? from the Sun, and burning wood, paper and other fuels

(b) How is heat useful? it keeps our bodies warm. It helps us to cook food and iron clothes. It can also makes things move

(c) Where does the heat energy in our bodies come from? from food

(d) What is a thermometer? it's an instrument used to find out how hot somethings is

2. Draw three things from which we get heat.

3. Choose the best answer.

(a) Fire gives us (heat only\light only\heat and light).

(b) Anything which can do work has (energy\molecules).

(c) Cold water has (less\more) heat than boiling water.

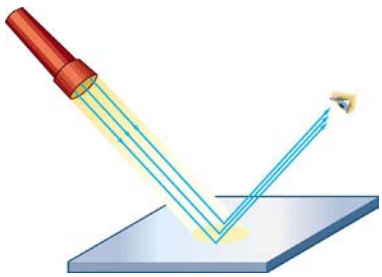
(d) When we heat ice cubes, they become (water\water vapour).

(e) A thermometer is filled with (mercury\oxygen).

Unit 9

Light

The Sun gives off heat and light.
A burning candle and a light bulb also give off heat and light.
We can see the Moon at night. It does not have its own light.
It shines because sunlight falls on it. Some of the sunlight bounces of the Moon and reaches the Earth.
The bouncing-off of light from a shiny object is called reflection.



Most of the things that we see are like the Moon. They do not give off light of their own. Light from the Sun, lamp or some other shining thing falls on them. Then we can see them. They reflect the light into our eyes. The reflected light tells us the size, colour and shape of the things that we see.

Light travels very fast:

When we turn on a lamp or bulb, the room becomes bright at once.
Light travels very fast. It can travel from the Moon to the Earth in less than a second.

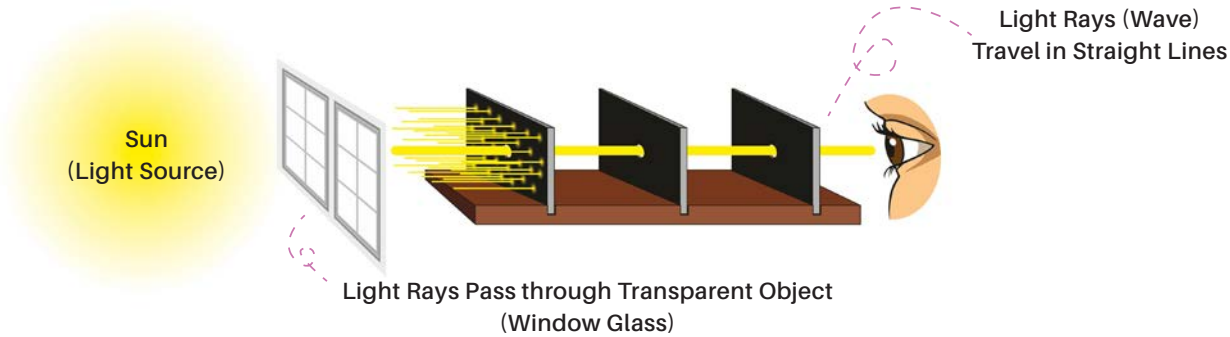
Unit 9

Light

Light travels in straight lines:

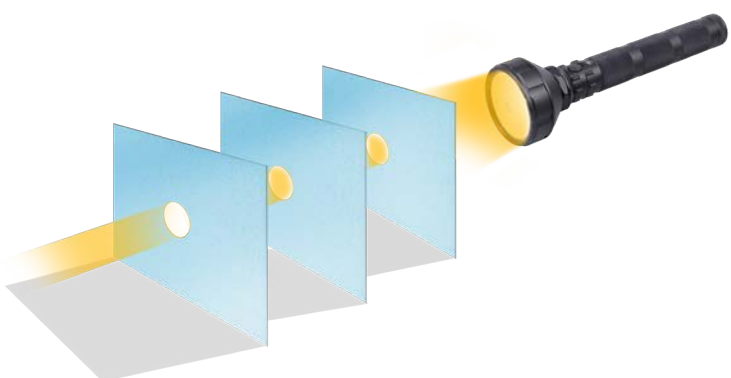
Light travels in straight lines called rays.

How Light Travels
Light rays (waves) travel from the light source in straight lines



Light travels in straight lines

Make slits in a piece of cardboard. Hold it on a table in front of a beam of light. You will see that light shines through each slit in a straight beam. The beams do not bend or touch each other.

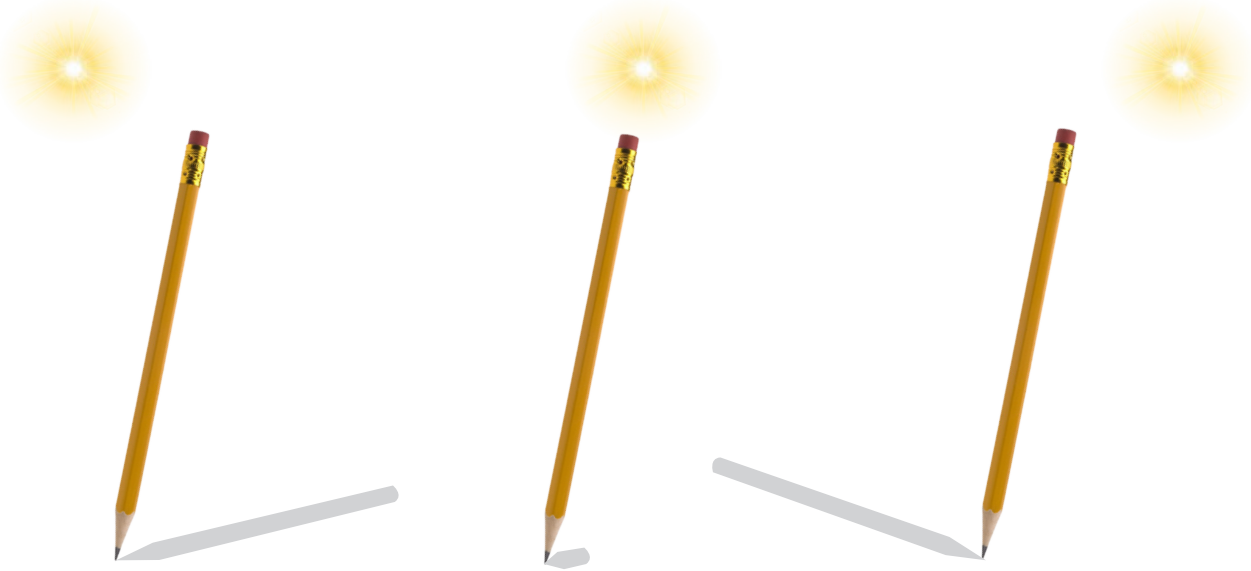


Shadows:

Hold a book in front of a beam of light.
You will see a dark space on the other side of the book. This dark space is like the book.
This dark space is called a shadow.
A shadow cannot be made without light.

Light

At sunrise, your shadow on the ground is very long. At sunset, your shadow is long again.
In the middle of the day, when the Sun is high in the sky, your shadow is short.
It is like a small dark spot around your feet.



Light and colour:

We see things of many colours.
A tomato is red, a leaf is green and an orange is orange.
We can see the colour of things because they reflect light.

Unit 9

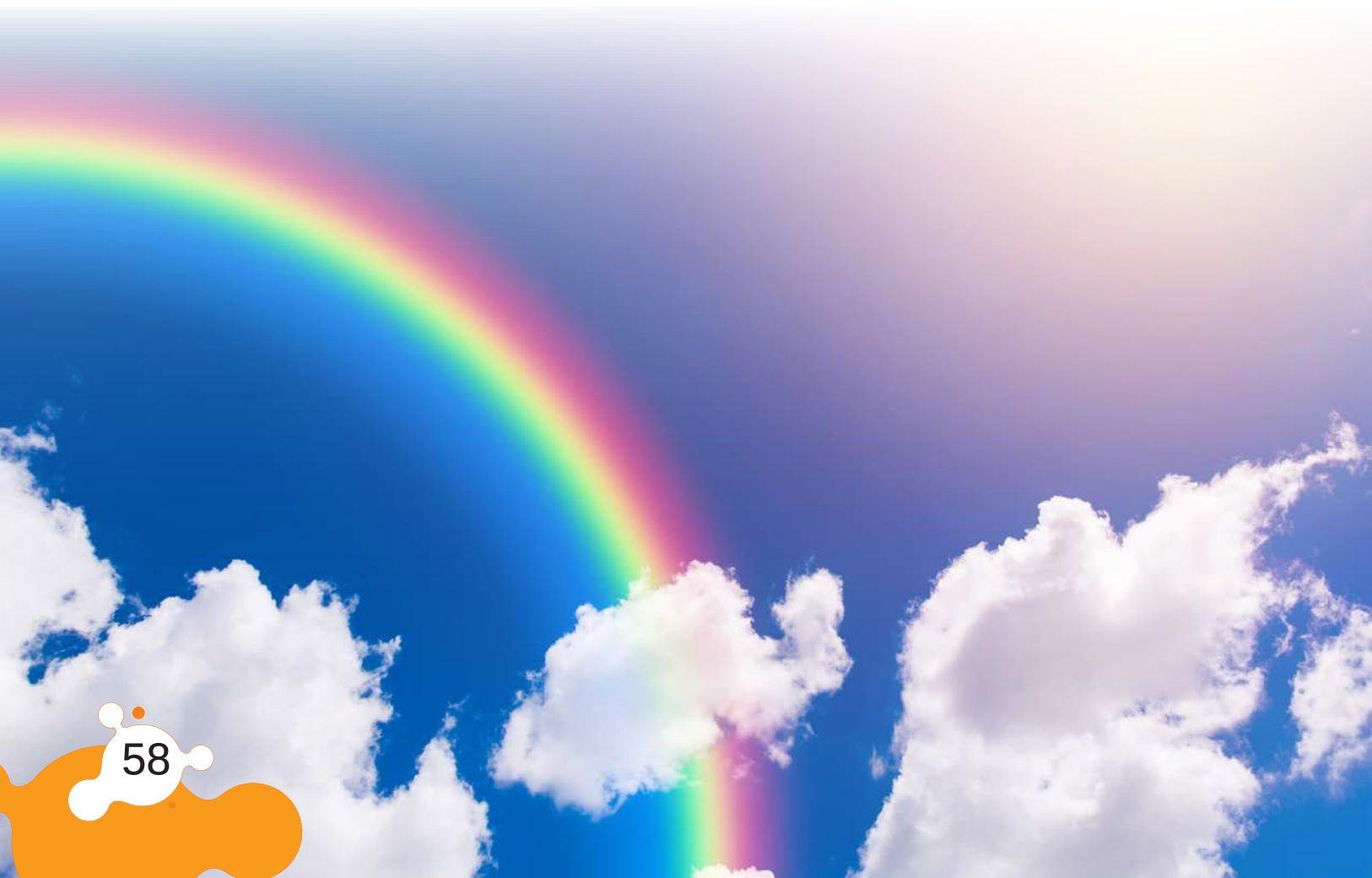
Light

Rainbows:

A rainbow is a big band of seven colours.
We can see rainbow in the sky after rain.
When sunlight shines through tiny raindrops in the air it breaks into seven colours. Together, they make a big rainbow in the sky.

Plants and animals need light and heat:

Light and heat are useful. Plants make their food in the presence of sunlight. They grow and become healthy when there is light. Animals need light to see in the dark.
They also need heat to keep themselves warm.



Light

Activities

1. Answer the following questions.

(a) Where do we get light from? Sun, burning candles and light bulb

(b) Where does the Moon get light from? from the Sun

(c) What is reflection? bouncing-off of light from a shiny object

(d) What is a ray? light travels in a straight line

2. Fill in the blanks to complete the statements.

(a) The Sun gives off heat and ....light..... .

(b) The ....Moon.... does not have its own light.

(c) The bouncing-off of light is called reflection .

(d) Light travels very ....fast..... .

(e) At sunrise, your shadow on the ground is very .....long..... .

3. What object does the shadow belong to?

guitar

Unit 10

Soil

Land is covered by a thin layer of soil.
In deserts and rocky places, there is very little soil.
Few plants grow in deserts and rocky places.
Some soils are good. Many plants grow in them.
Such soils are called fertile soils.

Unit 10

Soil

What soil is made of ?

Soil is made up of many particles of different sizes. It contains stones, sand, clay and the remains of dead plants and animals.
Soil also has air and water in between the soil particles.

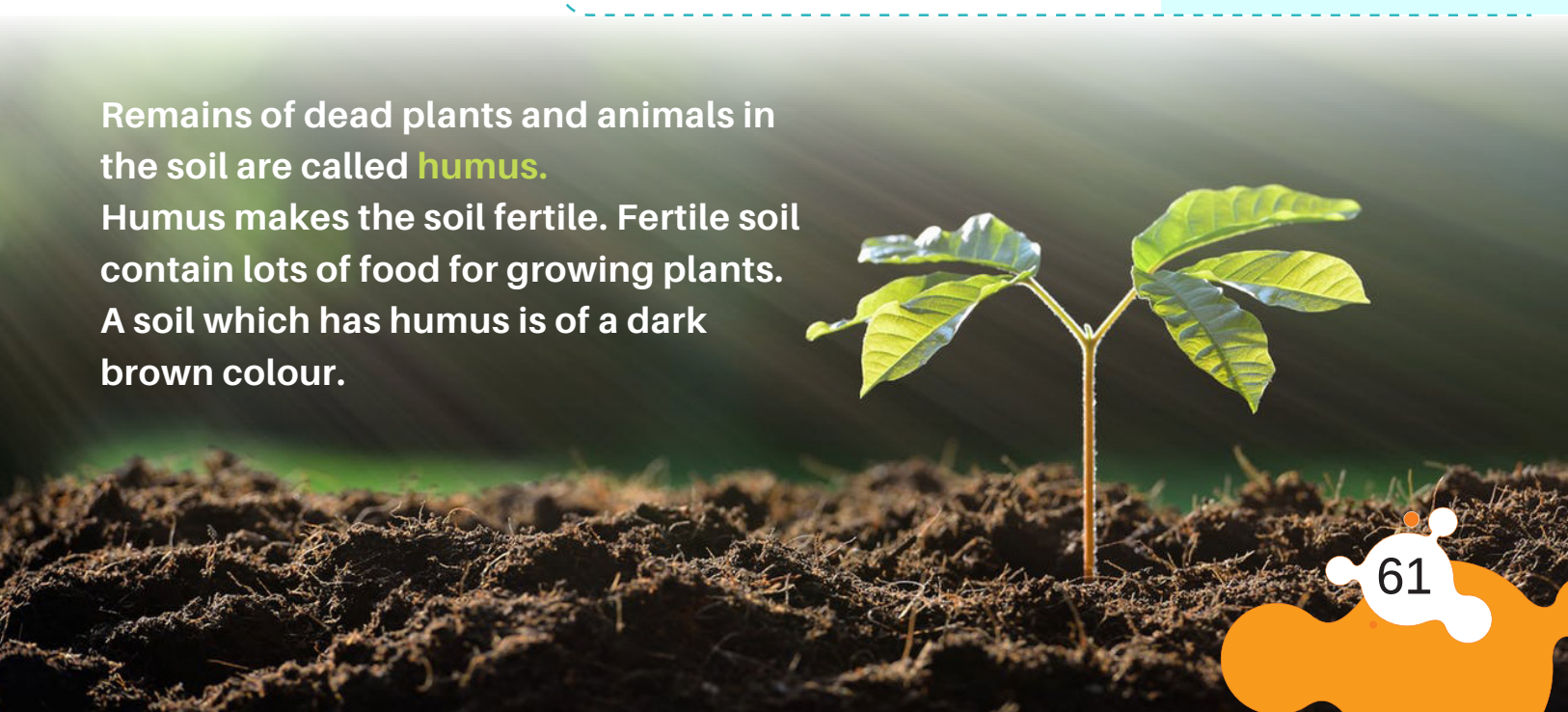
To find out what soil is made up of ...

Dig up some garden soil, and put it in a tall glass jar. Gently pour some water in it. You will see bubbles of air coming out.

Fill the jar with water. Stir it gently with a long stick, and place it on a shelf for some time.
You will see layers of different particles of soil Heavy particles such as stone will be at the bottom of the jar. Insects and plant roots will be floating on top of the water.

Fertile soil:

Remains of dead plants and animals in the soil are called **humus.**
Humus makes the soil fertile. Fertile soil contain lots of food for growing plants.
A soil which has humus is of a dark brown colour.



Unit 10

Soil

Air and water in the soil are useful for plant roots and for animals living in the soil. Humus helps the soil to hold air and water. Roots of plants hold the soil particles together.

If we cut down trees and other plants, the soil can easily be washed away by water or blown away by wind. The soil will not remain fertile any more. It can even turn into a desert.

Kinds of soil:

There are many kinds of soil.

Sandy soil:

- Sandy soil has more sand particles.
- It has a lot of air in it, but it cannot hold any water.
- Many plants cannot grow in sandy soil.

Clay soil:

- Clay soil has very tiny particles of clay.
- It has very little air, but it can hold a lot of water.
- Many plants cannot grow in clay soil.

Loam:

- Loam has a mixture of sand and clay particles.
- It is the best kind of soil.
- It has a lot of air and water.
- It is fertile soil. Plants grow well in fertile soil.

Unit 10

Soil

To find out which is the best type of soil for plants

Take three funnels and plug their stems with cotton wool. Put some sand in the first funnel, an equal amount of clay in the second and equal amount of garden soil in the third. Place beakers under each funnel. Pour equal amount of water in all the funnels.
See how much water was collected in each beaker after one hour.
You will see that water passes through the sand very quickly, water passes through clay very slowly, and water passes through loam at a medium pace. So loam (garden soil) is the best for plants.

Activities

1. Answer the following questions.
   (a) What is soil made of? many particles in different sizes
   (b) What is humus? remains of dead plants and animals in the soil
   (c) What happens to the soil if we cut down trees? the soil can be easily washed away by water or blown away by wind
   (d) What are the different kinds of soil? sandy soil - clay soil and loam
   (e) Which is the best kind of soil for plants? loam

2. Write the names of the different types of soil.

   (a) sandy (b) clay (c) loam

3. Choose the best answer.
   (a) Which soil holds the most water? (sand\clay)
   (b) Which soil holds the least water? (sand\clay)
   (c) Which soil has more air? (sand\clay)
   (d) Which soil has less air? (sand\clay)

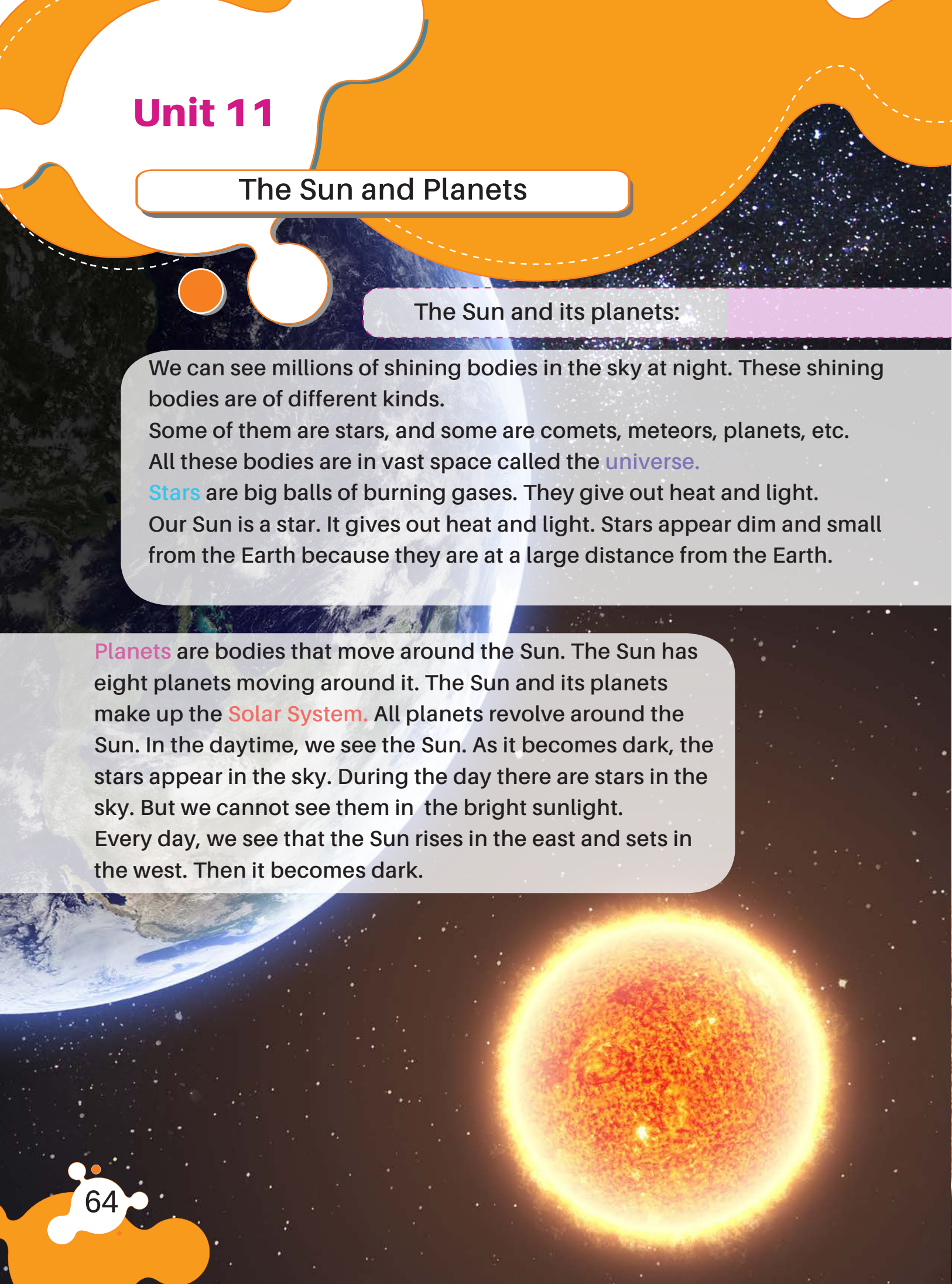
Unit 11

The Sun and Planets

The Sun and its planets:

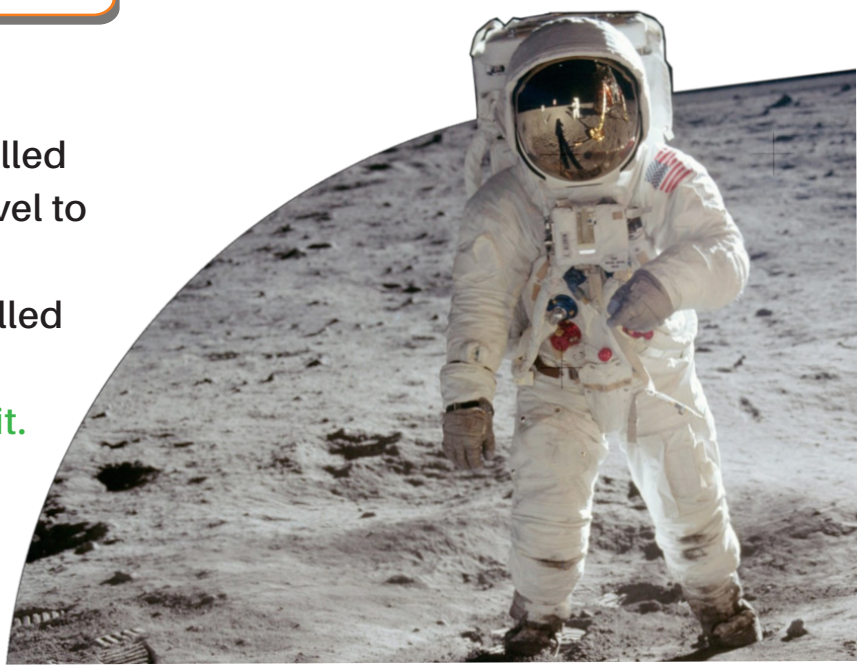
We can see millions of shining bodies in the sky at night. These shining bodies are of different kinds.
Some of them are stars, and some are comets, meteors, planets, etc.
All these bodies are in vast space called the universe.
Stars are big balls of burning gases. They give out heat and light.
Our Sun is a star. It gives out heat and light. Stars appear dim and small from the Earth because they are at a large distance from the Earth.

Planets are bodies that move around the Sun. The Sun has eight planets moving around it. The Sun and its planets make up the Solar System. All planets revolve around the Sun. In the daytime, we see the Sun. As it becomes dark, the stars appear in the sky. During the day there are stars in the sky. But we cannot see them in the bright sunlight.
Every day, we see that the Sun rises in the east and sets in the west. Then it becomes dark.

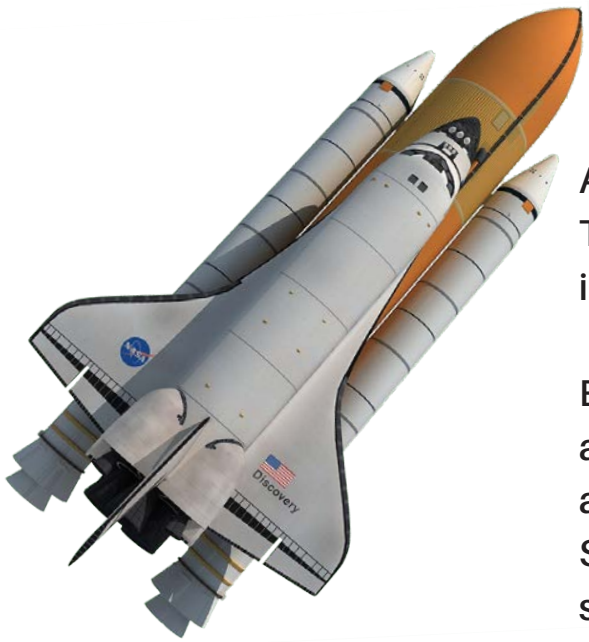


Unit 11

The Sun and Planets



Machines which travel in space are called spacecraft or spaceship. They can travel to the planets.
People who travel in spaceship are called astronauts. An astronaut wears a special kind of suit called a spacesuit.



Astronauts carry oxygen in special tanks. They need oxygen to breathe because there is no air in space.

Each planet spins like a top. It also goes around the Sun in its own path. The path of a planet around the Sun is called an orbit. Some planets move fast. Some planets move slowly.

Planets of the Solar System:

Unit 11

The Sun and Planets

Mercury

- Mercury is a small planet.
- It is closest to the Sun. It is very hot.
- It has dry valleys and mountains. No plants or animals live on it.

Venus

- Venus is the second planet closest to the Sun.
- It is almost as big as the Earth. It has mountains and plains.
- It is very hot and dry. so no plants or animals can live on it.
- It shines brightly in the sky in the evening, so it is called the evening star.

Earth

- Earth is the third planet from the Sun. It has air and water.
- Plants animals and people live on it.
- It is not too hot or too cold. It has one Moon.
- The Earth goes round the Sun in 365 days.

Mars

- Mars is called the red planet. Its soil is red.
- It is very cold at night.
- It has two small moons.
- Mars goes round the Sun in 700 days.

Jupiter

- Jupiter is the largest planet. It is 1400 times bigger than the Earth.
- It is covered with clouds. It has 79 moons.
- It has a ring around it. It takes 12 years to go once round the Sun.

Unit 11

The Sun and Planets

Saturn

- Saturn has many bright rings around it.
- It has 82 moons.
- It is colder than Jupiter.
- It takes 29 years to travel once round the Sun.

Uranus

- Uranus is very cold because it is very far away from the Sun.
- It has many rings and moons around it.

Neptune

- Neptune is colder than Uranus.
- It has 14 moons.
- It takes 165 years to go once round the Sun.

Activities

1. Answer the following questions.

(a) Can you name some shining bodies that you see in the sky at night? stars, comets, meteors, asteroids and planets

(b) What is the Universe? vast space

(c) What is a star? big balls of burning gases

(d) What is a planet? bodies that move around the Sun

(e) What is an orbit? the path of a planet around the Sun

2. Fill in the blanks to complete the statements.

(a) Machines which travel in space are called spacecraft.

(b) People who travel in spaceship are called astronauts.

(c) An astronaut wears a special suit called a spacesuit.

(d) There is no air in space.

(e) Astronauts carry oxygen for breathing in special tanks.

The Sun and Planets

3. Arrange the planets in the correct order starting from Mercury.

Mercury	Earth	Jupiter
1	3	5
Venus	Uranus	Saturn
2	7	6
Mars	Neptune	
4	8	

4. Write the name of the planet .

(a) It is very hot. It is closest to the Sun.
Mercury

(b) It is almost as big as the Earth. It is also called the evening star.
Venus

(c) Plants and animals live on it. It goes round the Sun in 365 days.
Earth

(d) It is called the red planet.
Mars

(e) It is the largest planet, and it has 79 moons.
Jupiter

(f) It has many rings and moons.
Uranus

(g) It has 14 moons. It goes round the Sun in 165 years.
Neptune

(h) It has many bright rings. It has 82 moons.
Saturn

Science and Life

• Being wise about water:

Accidents in water can be prevented if you see the danger:

1. Swimming without lifeguards means that if you should have problems in water, there is no one properly trained to help you.
2. It is dangerous to swim outside permitted areas (where the risks are higher).
3. When fishing or travelling in a small boat on the rivers and lakes, be aware of dangerous creatures (do not leave your hands or feet in the water).
4. Never dive into shallow water.

• Someone is Drowning

1. Get help

Notify a lifeguard, if one is close. If not, ask someone to call 911.

If you are alone, follow the steps below.

2. Move the person

Take the person out of the water.

3. Check for breathing

Place your ear next to the person's mouth and nose. Do you feel air on your cheek?

Look to see if the person's chest is moving.

4. If the person is not breathing, check pulse

Check the person's pulse for 10 seconds.

5. If there is no pulse, qualified person should start CPR (Cardiopulmonary resuscitation) Carefully place person on back.

Test Paper

1. Why is food important for the body?

It gives energy

2. Fill in the blanks to complete the statements.

(a) Three-fourths of our bodies are made of water .

(b) food gives us energy to grow and stay healthy.

(c) Animals that eat plants are called herbivores .

(d) Animals that eat the meat of other animals are called carnivores .

(e) Animals that eat both plants and animals are called omnivores .

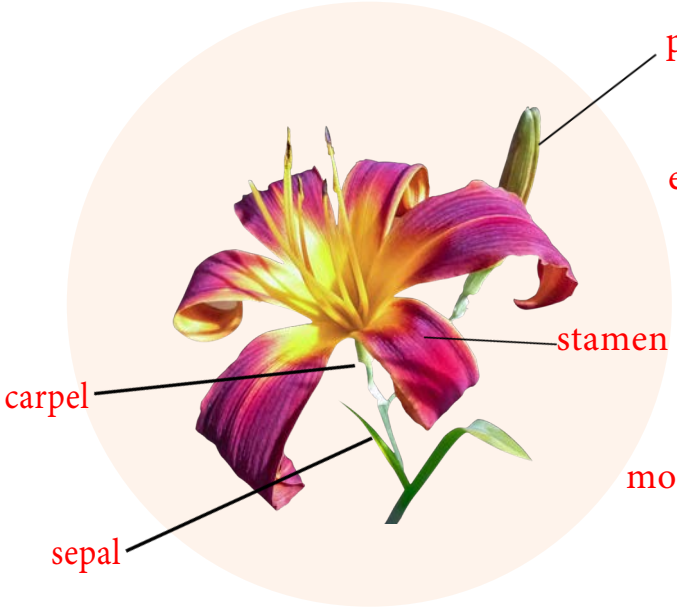
3. Choose the best answer.

(a) The body of a bird is covered with (fur / feathers)

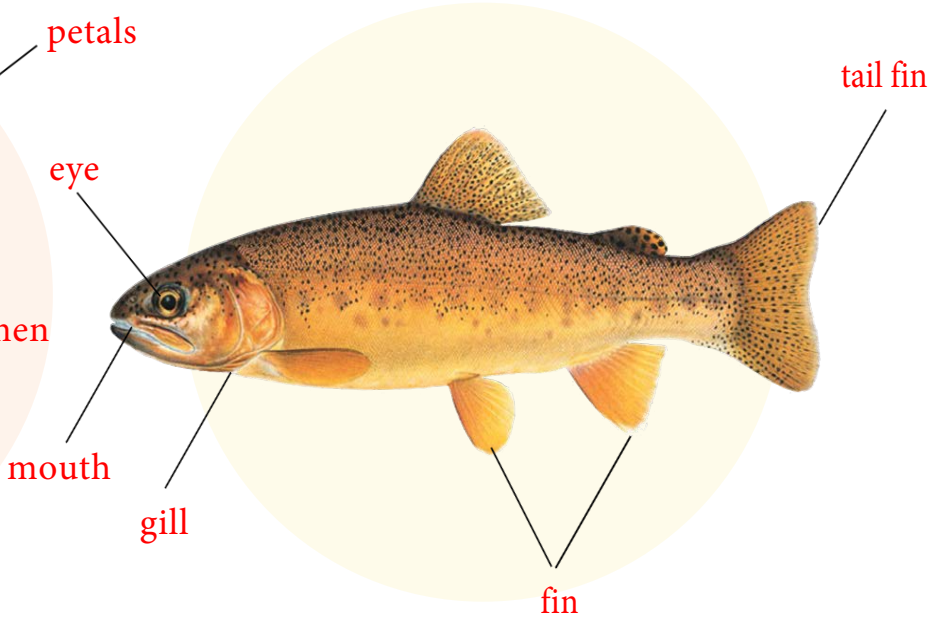
(b) A bird has teeth / a beak

(c) Mammals lay eggs / have babies

4. Label the parts of the flower.



5. Label the parts of the fish.



6. Name two hard and dry fruits.

(a) coconuts

(b) walnuts

Test Paper

7. What is matter made of?

molecules

8. Write true or false.

(a) Molecules are always moving. true

(b) The molecules of a solid are very far away from each other. false

(c) Molecules of a gas are very far away from each other. true

9. How can we measure changes in air pressure?

barometer

10. Draw a simple barometer.

11. Fill in the blanks to complete the statements.

(a) Rainwater which soaks into the ground and gathers between the rocks is called groundwater.

(b) Groundwater comes out of holes or cracks to make a spring.

(c) Deep holes dug in the ground to reach the groundwater are called wells.

12. Why do we put oil in the moving parts of a machine?

to make it moves

Test Paper

13. Things that force can do:

(a) Force can move things.

(b) Force can bend things.

(c) Force can break things.

(d) Force can tear things.

(e) Force can change the direction of things.

14. What happens when we heat things?

heat can change the state of things

15. Which instrument can we measure temperature with?

thermometer

16. Name the colours of the rainbow.

red - orange - yellow - green - blue - indigo and violet

17. Name three types of soil.

(a) sandy

(b) clay

(c) loam

Glossary

Anemometer: a weather tool that is used to measure the wind's speed.

Amphibians: animals that can live on both land and water.

Atmosphere: air that surrounds Earth.

Barometer: a weather tool that is used to measure air pressure.

Birds: animals that have feathers.

Carnivores: an animal that eats other animals.

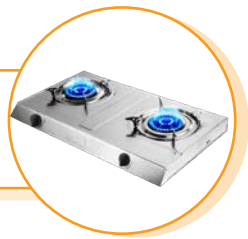
Evaporate: to change slowly from liquid to gas.

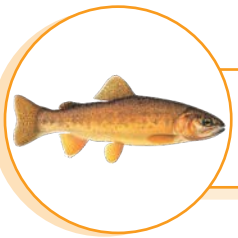
Herbivores: an animal that eats mostly plants.

Glossary

Hurricane: large spinning storm that has winds over 117 kilometers (73 miles) Per hour.

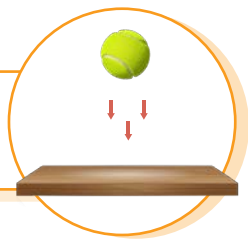
Gas: matter that spreads out to fill all the space of whatever it is in.





Gills: a structure that Help fish take in air from the water

Gravity: a force that pulls things toward each other.



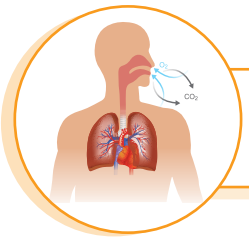
Flowers: the parts of plants that make seeds.

Fruit: the part of a plant that keeps seeds safe and helps them grow.

Life cycle: Steps that show how a living thing grows, changes, and makes new living things

Liquid: matter in a state that has a definite volume but no definite shape.

Glossary

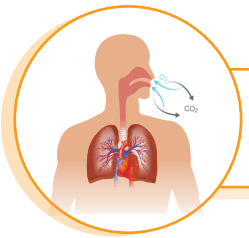


Lungs: one of the two organs that fills with air when you inhale.

Omnivores: an animal that eats both plants and animals.

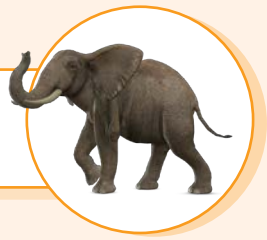
Planet: a large sphere, or ball, that moves around the Sun.

Pollen: a sticky powder inside flowers.



Mammals: animals that have hair or fur and feed their young milk.

Molecule: a particle that contains more than one atom joined together.



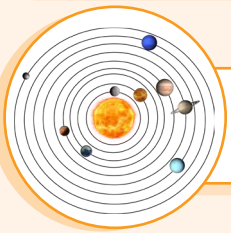
Seeds: the parts of plants that can grow into new plants.

Skelton: an animal's full set of bones.

Glossary

Soil: made up of tiny rocks and bits of plants and animals.

Solid: matter in a state that has a definite shape and volume.



Solar System: the system of objects of, or around, the Sun.

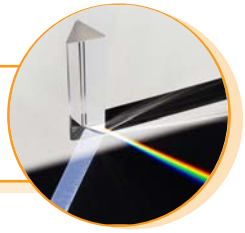
Star: a hot, glowing ball of gases.

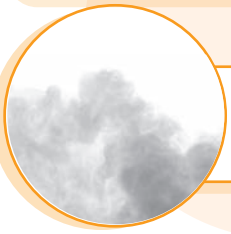
Stomata: a structure on the surface of a leaf that regulate gas exchange between the plant and its environment.

Thermometer: instrument used for measuring temperature.

Reptiles: animals that have scales and are cold-blooded.

Reflection: light that bounces off an object.





Water vapor: water in the form of an invisible, odorless gas.

Resources List

1. Gale Research Database
2. Michigan Science Center
3. J.L. Simpson Center
4. Comission Scolaire Sir-Wilfrid-Laurier
5. Teaching Engineering Organization
6. Ontario Ministry of Education
7. Virtual Learning Commons
8. Victoria State Government: Education and Training
9. EBSCO Research Database
10. Indian Ministry of Education
11. Saint Louis Science Center
12. Malaysian Ministry of Education
13. California Science Center

Everyday science