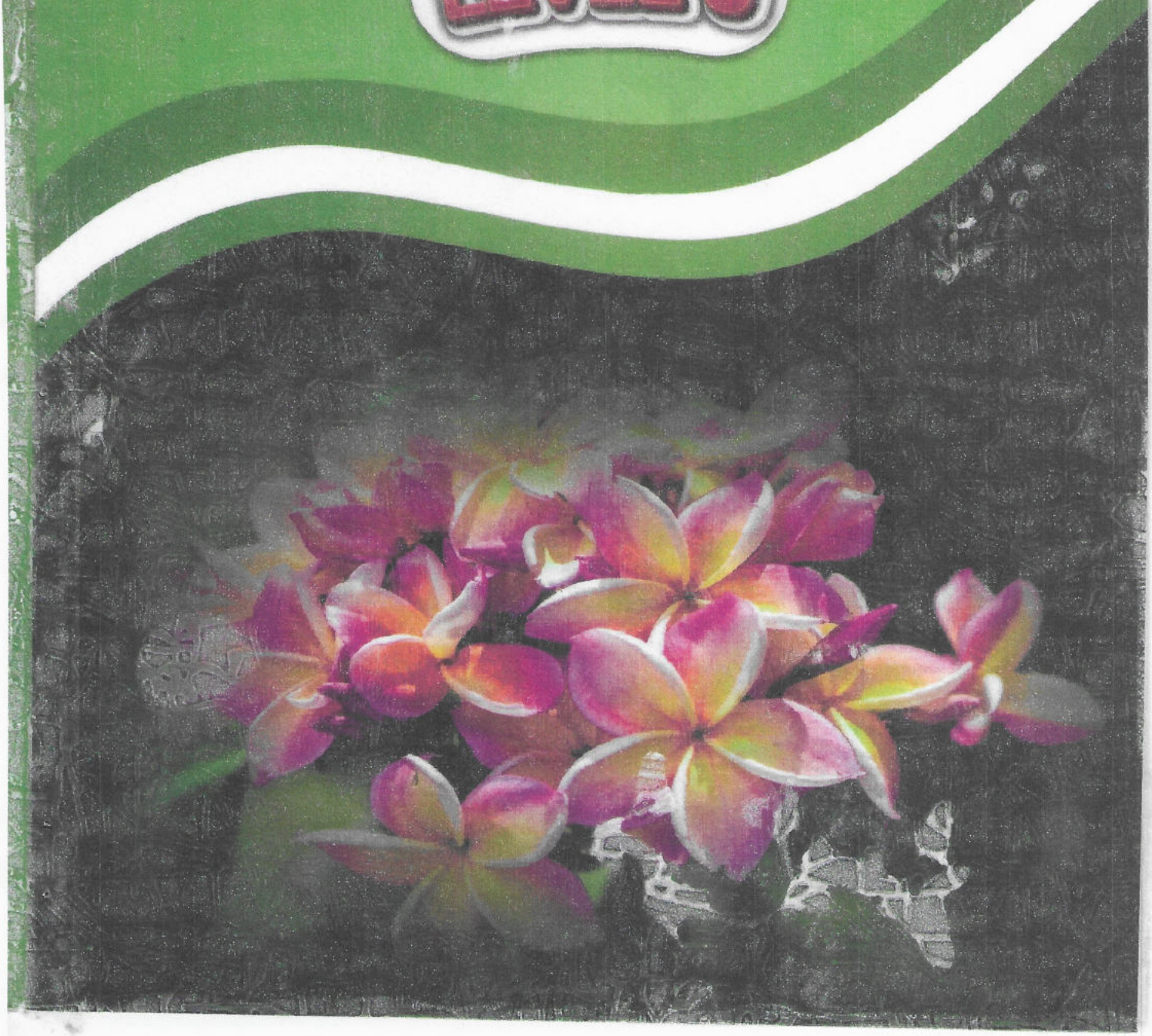
WORLD'S KEY

COMMON CORE State Standards

Science

LEVEL 3





WORLD'S KEY

SCIENCE

LEVEL 3



شركة البشرى للتربية والعلوم
المدارس الدولية

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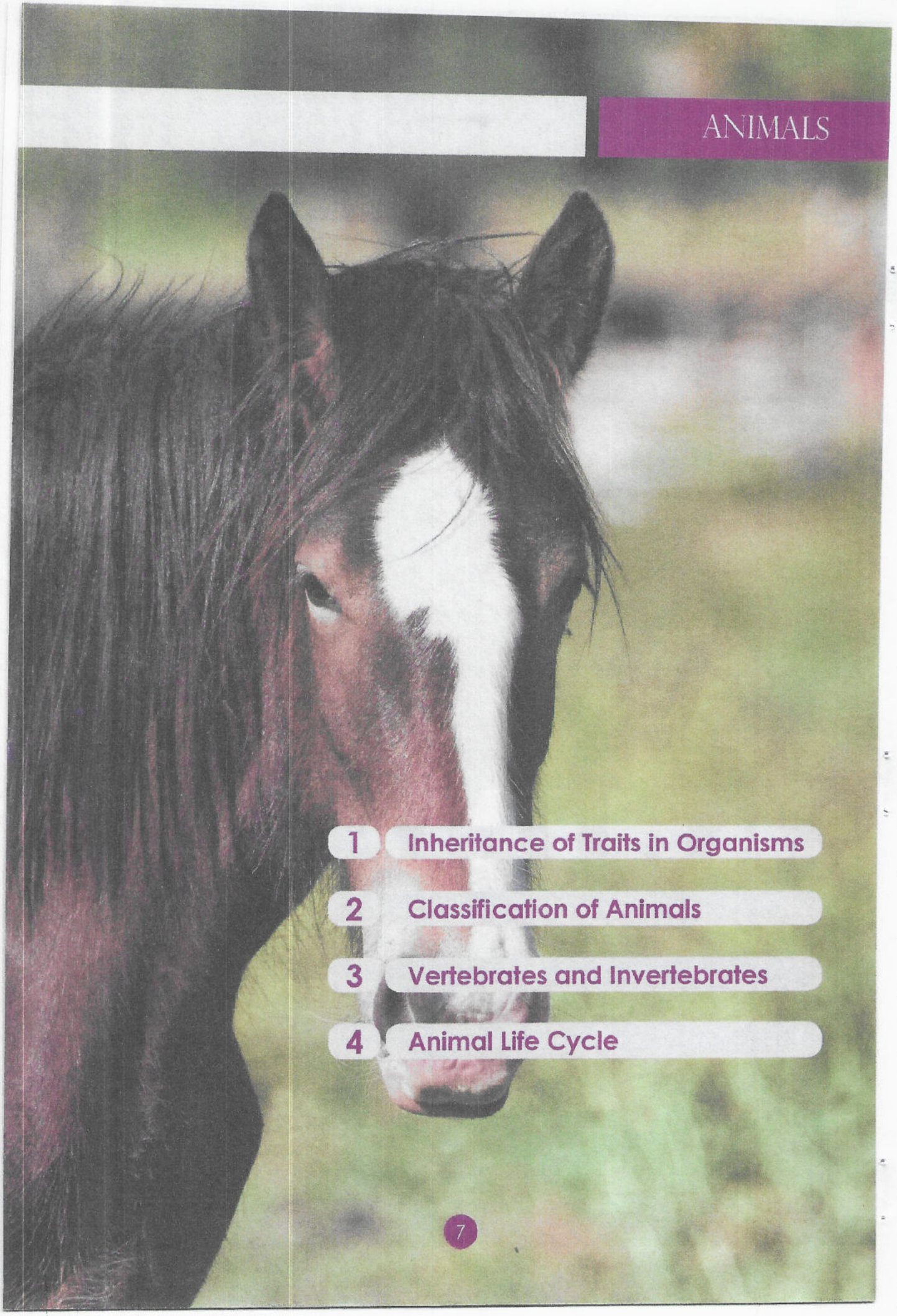


WORLD'S KEY

UNIT 1

ANIMALS

ANIMALS



1 Inheritance of Traits in Organisms

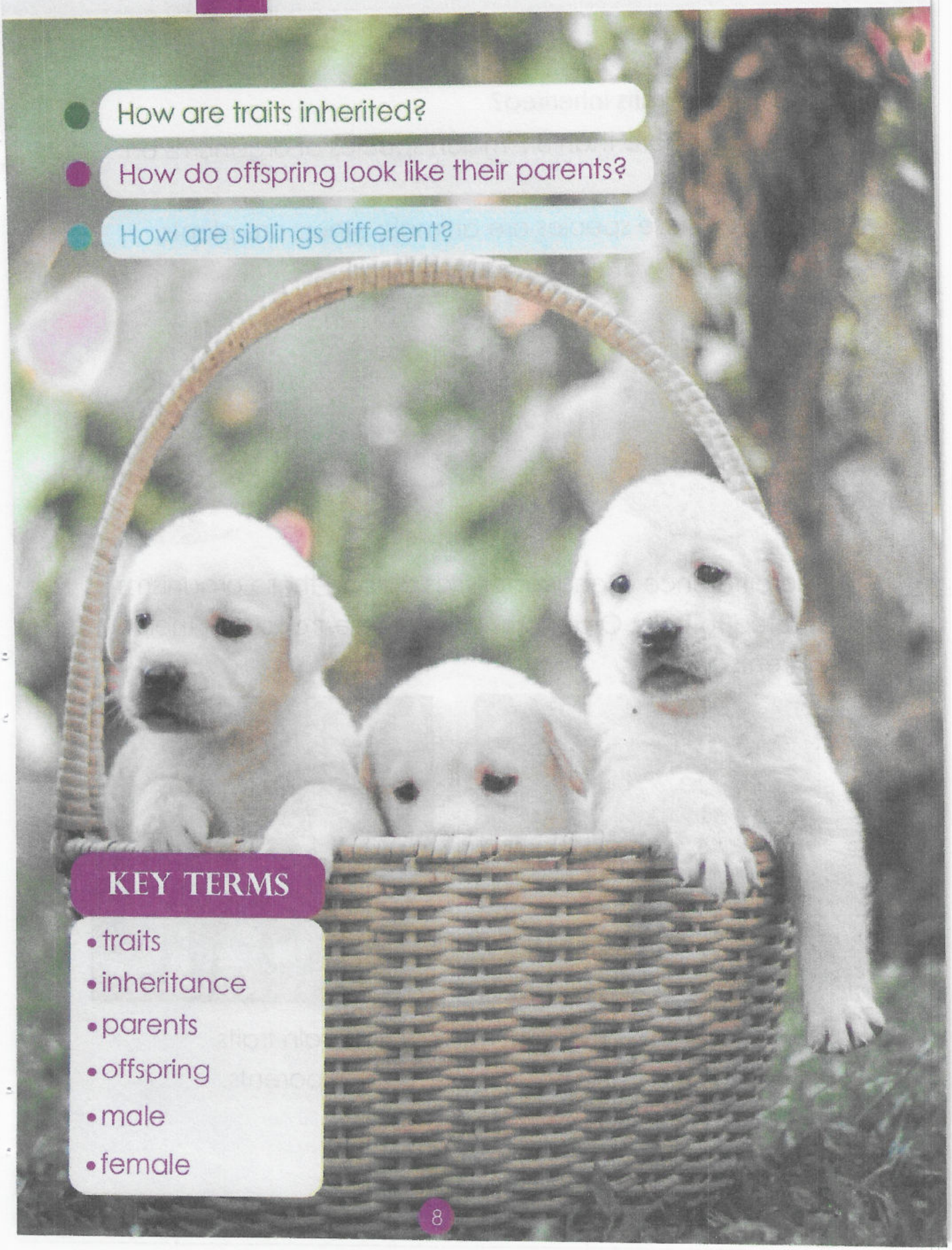
2 Classification of Animals

3 Vertebrates and Invertebrates

4 Animal Life Cycle

LESSON 1 INHERITANCE OF TRAITS IN ORGANISMS

- How are traits inherited?
- How do offspring look like their parents?
- How are siblings different?



KEY TERMS

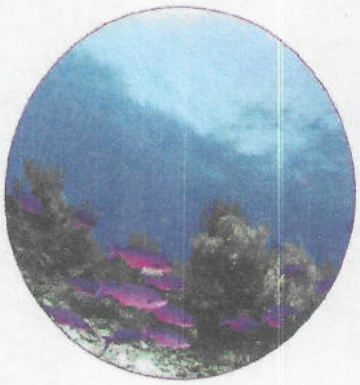
- traits
- inheritance
- parents
- offspring
- male
- female

How are traits inherited?

There are more than 8.7 million species of organisms on Earth.

Some of these species are animals; others are plants.

Some live in water; others live on land.





The difference in characteristics among these organisms is related to traits. Organisms inherit these traits from their parents.




Zebras differ from horses by certain traits.

Zebras inherit the stripes of their parents.

- **How do offspring look like their parents?**
- **How are siblings different?**



female cat



male cat



Some kittens never look like their parents, while others of the same breed do.
Some siblings are alike, while others are different.

The first scientist who studied the inheritance of traits in organisms was Gregor Mendel.



He worked in his garden with pea plants and proved that traits are inherited by the offspring from their parents.

Mendel crossed pea plants of violet flowers with pea plants of white flowers, which he called parents.



He obtained in the offspring pea plants of violet flowers.





During Day



During Night

Although some traits are inherited from parents, others can be affected by the environment.
For example, the tulip flowers open during the day and close at night.

A Write true or false. Then correct the false statements.

Animals inherit traits only from their mothers.

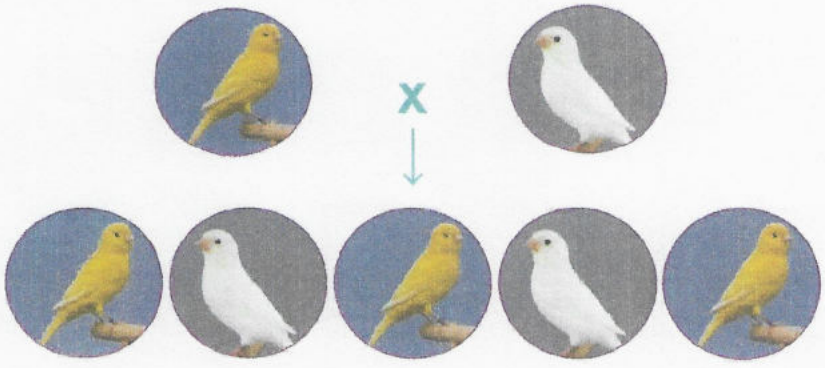
Some traits can be affected by the environment.

All animals look like their parents.

All siblings are alike.

Mendel worked in his garden with carrots.

B Consider the cross below between a pair of canaries.



1. Indicate the color of the parents. _____
2. Indicate the trait inherited. _____
3. Indicate the total number of the offspring. _____

C Match the parent to its offspring.





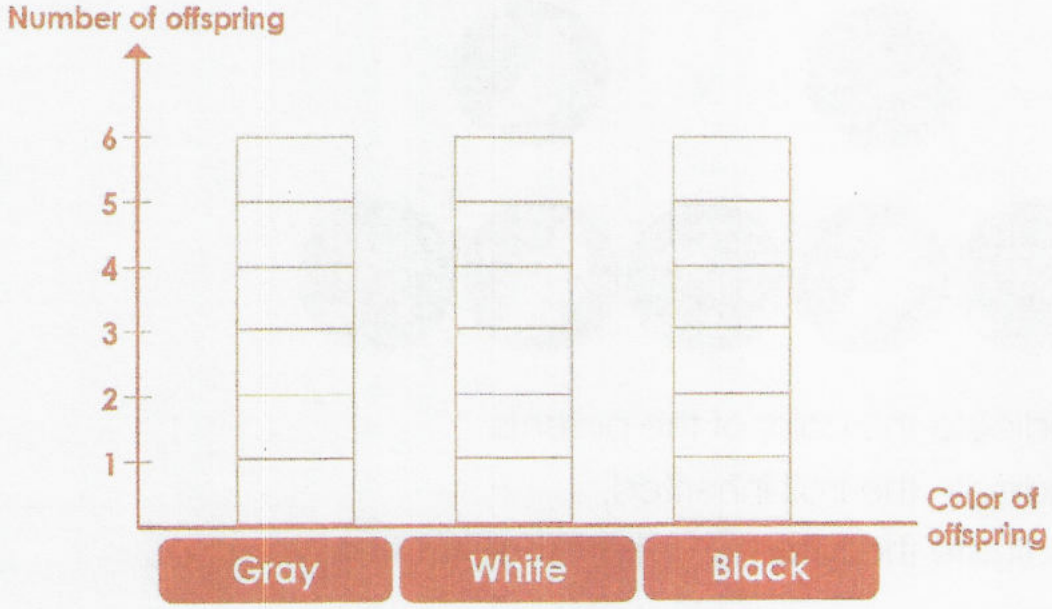




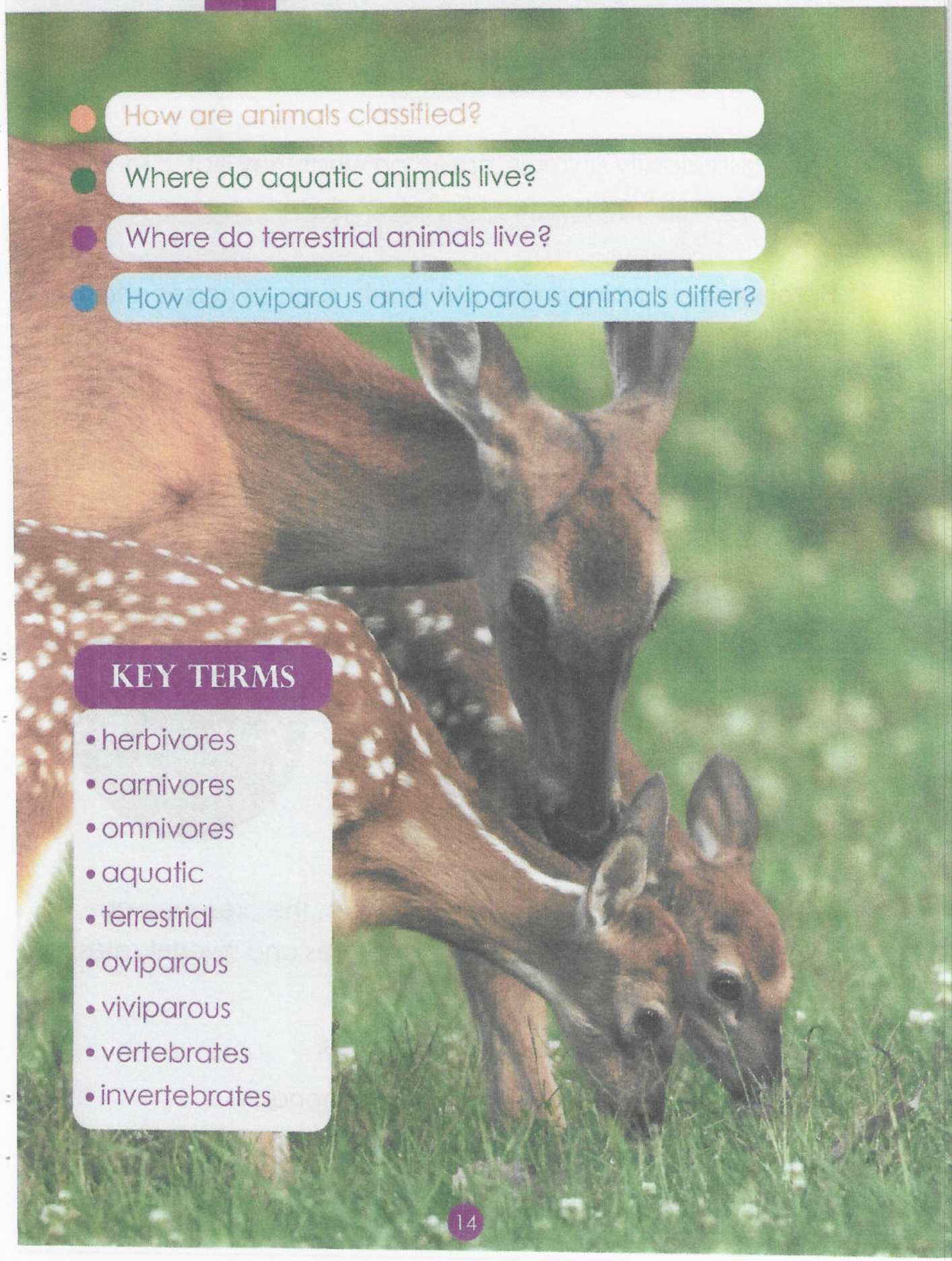

D Bar Graph

A gray male rabbit and a female gray rabbit got 6 gray, 3 white, and 4 black offspring.

Classify the offspring in the bar graph below.



LESSON 2 CLASSIFICATION OF ANIMALS



- How are animals classified?
- Where do aquatic animals live?
- Where do terrestrial animals live?
- How do oviparous and viviparous animals differ?

KEY TERMS

- herbivores
- carnivores
- omnivores
- aquatic
- terrestrial
- oviparous
- viviparous
- vertebrates
- invertebrates

How do zoologists classify animals?

Zoologists classify animals, based on what they eat, into three types: herbivores, carnivores, and omnivores.

Herbivores are animals that eat plants, such as horses and rabbits.

Carnivores are animals that eat only other animals, such as tigers and sharks.

Omnivores are animals that eat both plants and other animals, such as squirrels and raccoons.



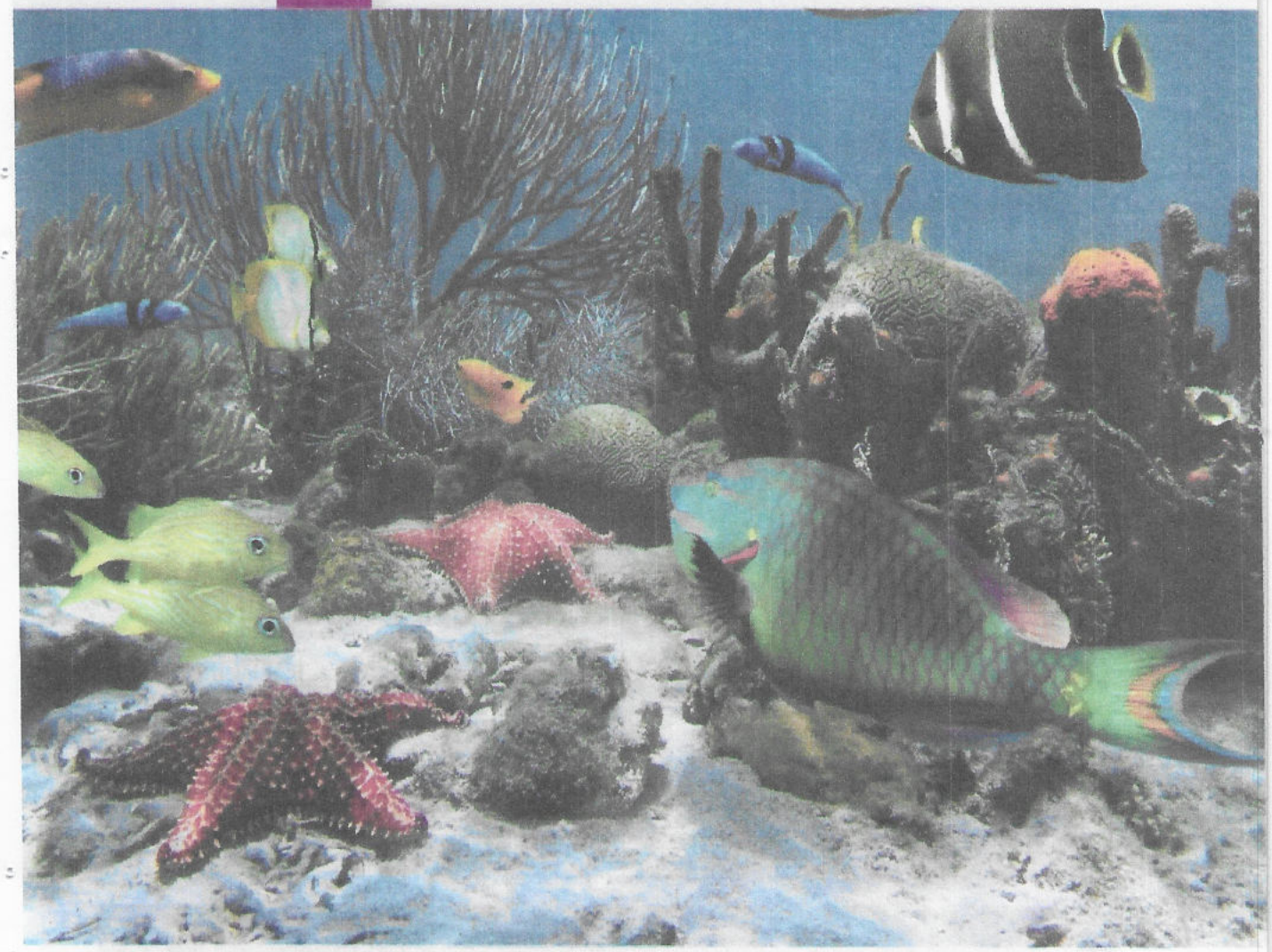




Zoologists also classify animals, based on the presence or absence of a backbone, into vertebrates and invertebrates.

Vertebrates are animals with backbones.

Invertebrates are animals without backbones.



Animals can also be classified according to where they live.

Animals that live in water are called **aquatic** animals. Examples of aquatic animals are sharks, dolphins, and squids.

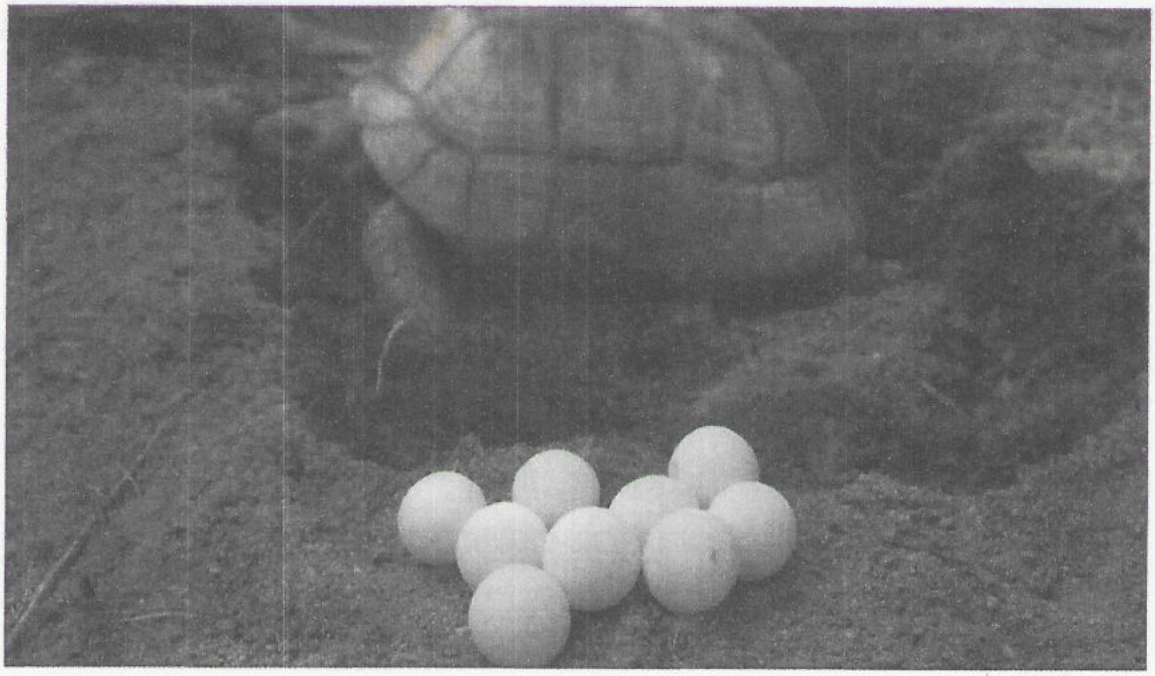
Animals that live on land are called **terrestrial** animals. Examples of terrestrial animals are cheetahs, bears, and eagles.

Animals can also be classified based on their mode of reproduction.



Animals that give birth to young ones are called **viviparous** animals. Lambs and cows are viviparous animals.

Animals that lay eggs are called **oviparous** animals. These eggs develop and hatch into young animals. Turtles and fish are oviparous animals.



A Write true or false. Then correct the false statements.

The squirrel is a herbivorous animal.

The cow is a herbivorous animal.

Oviparous animals lay eggs.

The tiger is an oviparous animal.

Vertebrates are animals without backbones.

B Match.

omnivore	•	• shark
		• horse
herbivore	•	• raccoon
		• goat
carnivore	•	• hen

C Classify the following animals as aquatic or terrestrial.

whale - dog - fish - octopus - cat - deer

Aquatic Animals	Terrestrial Animals

D Place a tick (√) under the appropriate heading in the table below.

Animal	Aquatic	Terrestrial	Oviparous	Viviparous
Sheep				
Shark				
Dolphin				
Fish				
Turtle				
Bear				
Spider				
Goat				

- What is the difference between vertebrates and invertebrates?
- What are the classes of vertebrates?
- What are the classes of invertebrates?



KEY TERMS

- vertebrates
- invertebrates
- vertebral column
- mammals
- reptiles
- birds
- amphibians
- fish
- mollusks
- sponges
- insects

What are vertebrates?

Vertebrates are animals that have vertebral columns. They are classified into five groups.

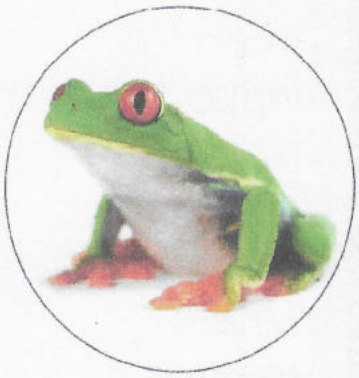
1. Mammals are animals with hair or fur. They can swim, hop, or run. Cows, deer, and tigers are mammals. Bats are the only mammals that can fly. Mammals give birth.

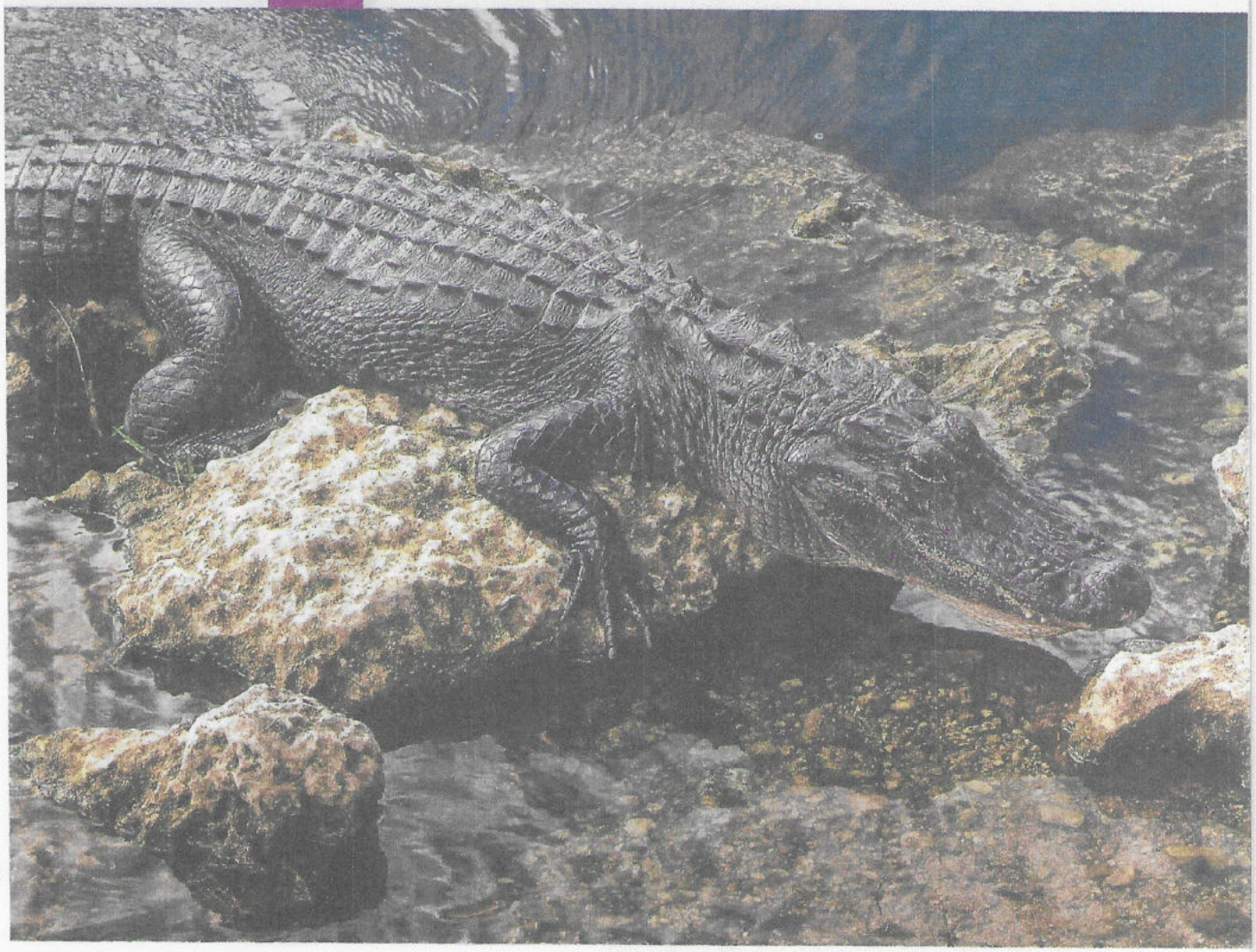
2. Birds are animals with feathers, two legs, and two wings. Birds have beaks that help them eat. Birds lay eggs.

3. Amphibians are animals that live on land and in water at the same time. Amphibians have smooth, moist skin. Amphibians lay eggs in water. When they are adults, they move to live on land. Salamanders and frogs are examples of amphibians.



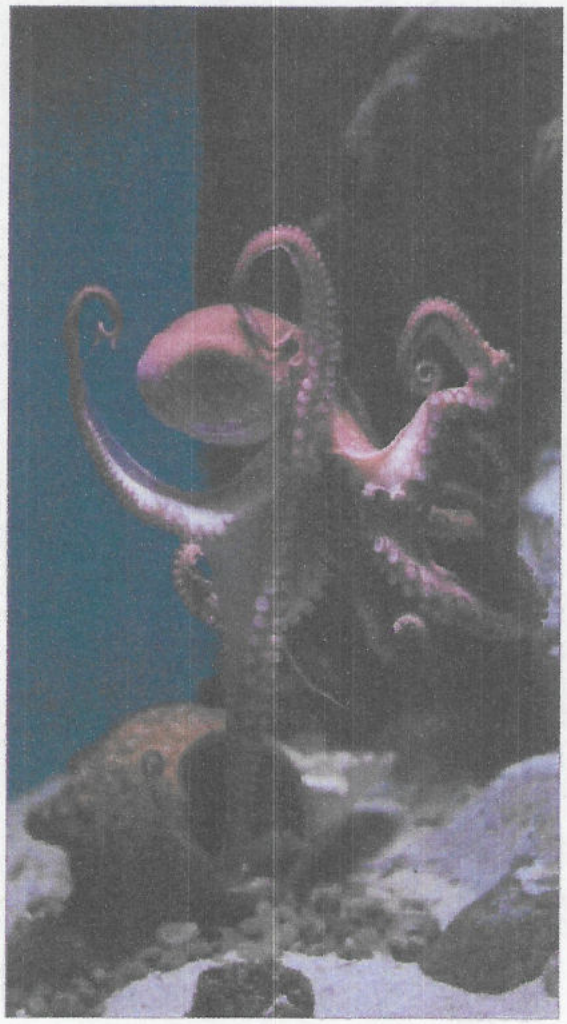






4. Reptiles are animals that have dry skin. Some reptiles have shells that keep them safe. Reptiles lay eggs. Snakes, turtles, and alligators are examples of reptiles.

5. Fish are animals that live underwater. Fish have scales. Fish have fins that help them swim and gills that help them breathe. Fish lay eggs.



What are invertebrates?

Invertebrates are animals that do not have vertebral columns. Some invertebrates include:

1. Mollusks are invertebrates that have soft bodies. Some have eight legs, like the octopus. Some have shells on their back, like the snail.

2. Sponges do not move. They have pores to trap food.

3. Insects are animals that have three body parts and six legs. Insects lay eggs.



A Write true or false. Then correct the false statements.

The lion is a vertebrate.

Insects are vertebrates.

The turtle is a mammal.

Birds have feathers.

Insects have six legs.

B Match.

fish	•	•	animals that have feathers
mammals	•	•	snakes and crocodiles
amphibians	•	•	animals that live on land and in water
birds	•	•	animals that have fins
reptiles	•	•	animals that are covered with hair

C Classify the following animals as vertebrates or invertebrates.

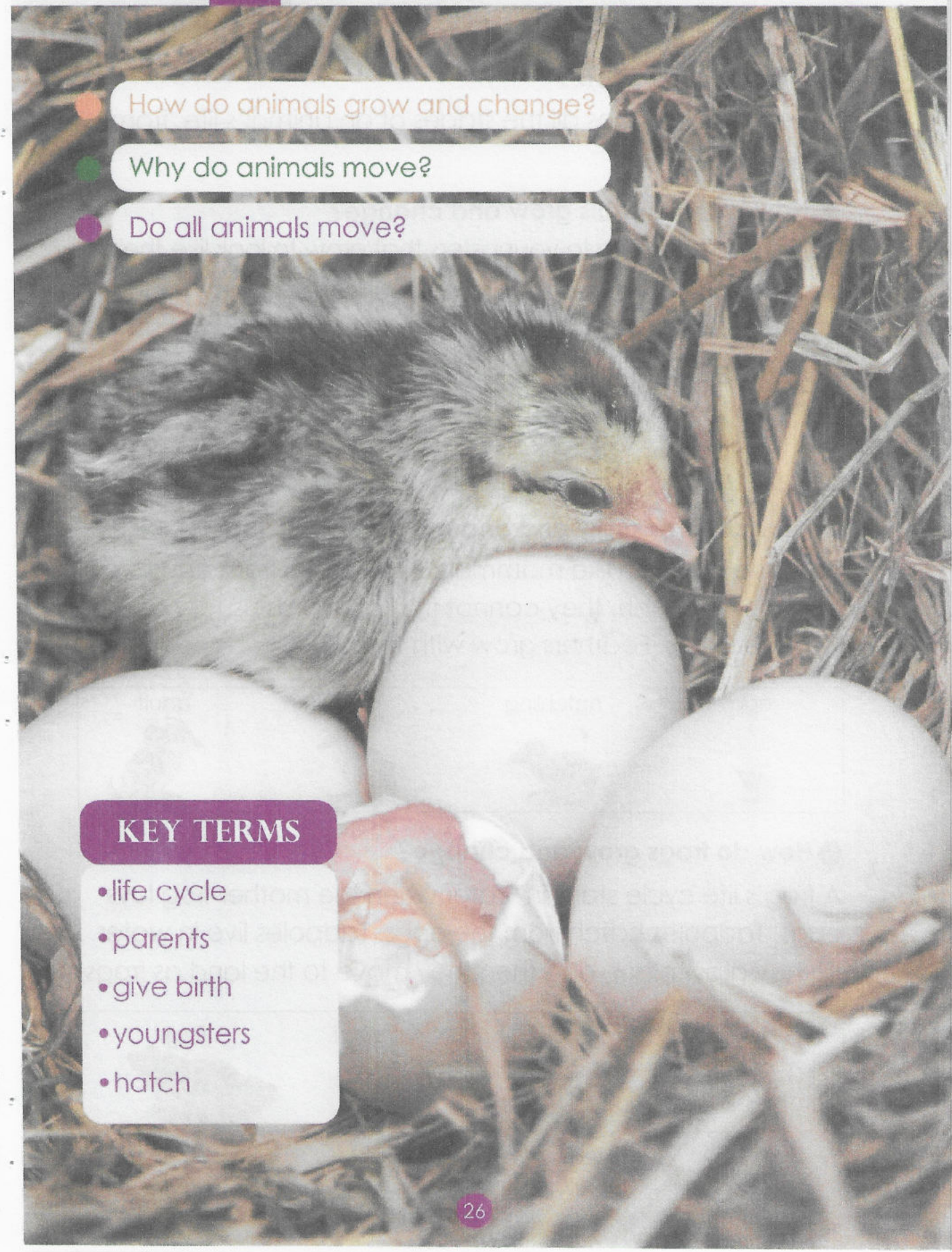
lion - ant - snail - crocodile - snake
frog - salamander - canary - sponge - octopus

Vertebrates	Invertebrates

D Compare the following two animals by writing (yes) if the characteristic applies to the animal. Then write their type.

	Pigeon	Bat
can fly		
has a beak		
has feathers		
lays eggs		
gives birth		
type		

LESSON 4 ANIMAL LIFE CYCLE



- How do animals grow and change?
- Why do animals move?
- Do all animals move?

KEY TERMS

- life cycle
- parents
- give birth
- youngsters
- hatch

What is a life cycle?

A life cycle includes all the stages of an animal's life, from birth to death.

How do mammals grow and change?

Mammals give birth to youngsters that grow to look like their parents. Parents take care of their youngsters till they mature.



How do birds grow and change?

Birds are not born like mammals. Birds hatch from eggs. When birds hatch, they cannot fly. Baby birds usually do not have feathers. Feathers grow with time.



How do frogs grow and change?

A frog's life cycle starts in water when the mother frog lays eggs. Tadpoles hatch from the eggs. Tadpoles live in water till they grow older, and then they move to the land as frogs.





Most animals move from one place to another in search of food and shelter. Some birds fly to warmer places during winter seeking food and protection.

However, some animals do not move and remain fixed in their places.

Sponges are animals that stay fixed in their position.





A Write true or false. Then correct the false statements.

Mammals lay eggs.

Newborn birds cannot fly.

Tadpoles hatch from eggs.

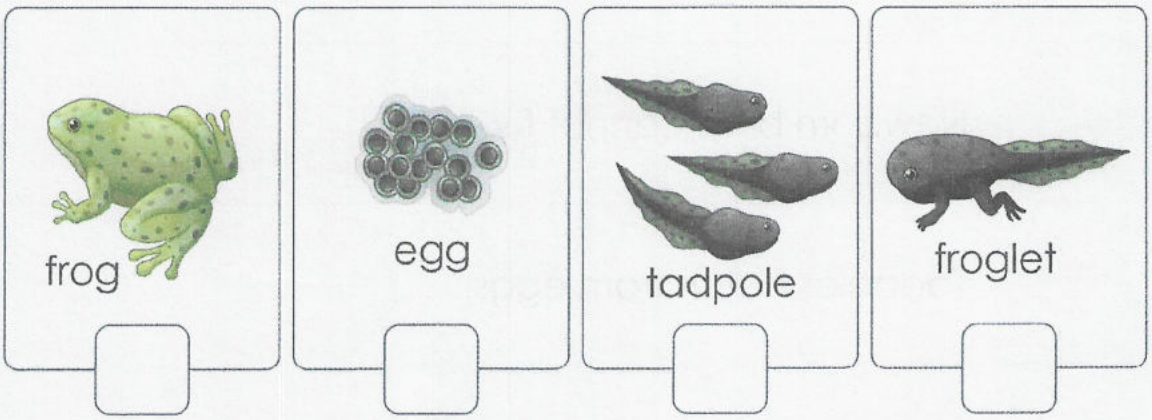
Sponges move in search of food.

Sea turtles move in water by swimming.

B Match.

tadpoles	•	• look like their parents at birth
sponges	•	• do not have feathers at birth
mammals	•	• do not look like their parents at birth
birds	•	• remain fixed in their places

C Arrange the different stages of the frog's life cycle in chronological order.



D Read the text well. Then fill in the table below.

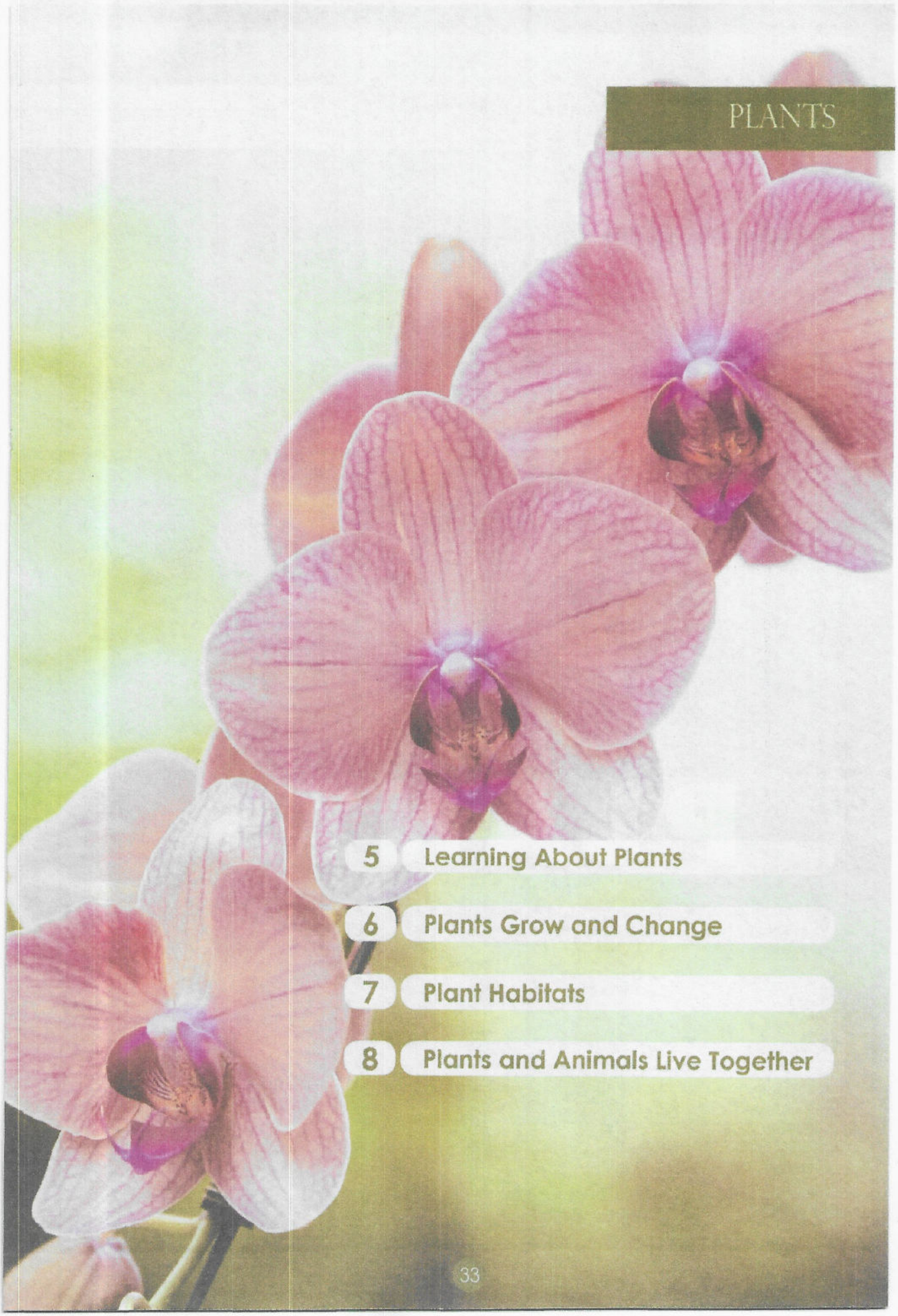
The butterfly has 4 stages of growth. The egg stage lasts for 3 days. Then the egg hatches to become a caterpillar and remains a caterpillar for 14 days. Afterward, it turns into a chrysalis for 10 days before it becomes an adult butterfly that lives for 30 days.

Stage	Period

WORLD'S KEY

UNIT 2

PLANTS



PLANTS

5 Learning About Plants

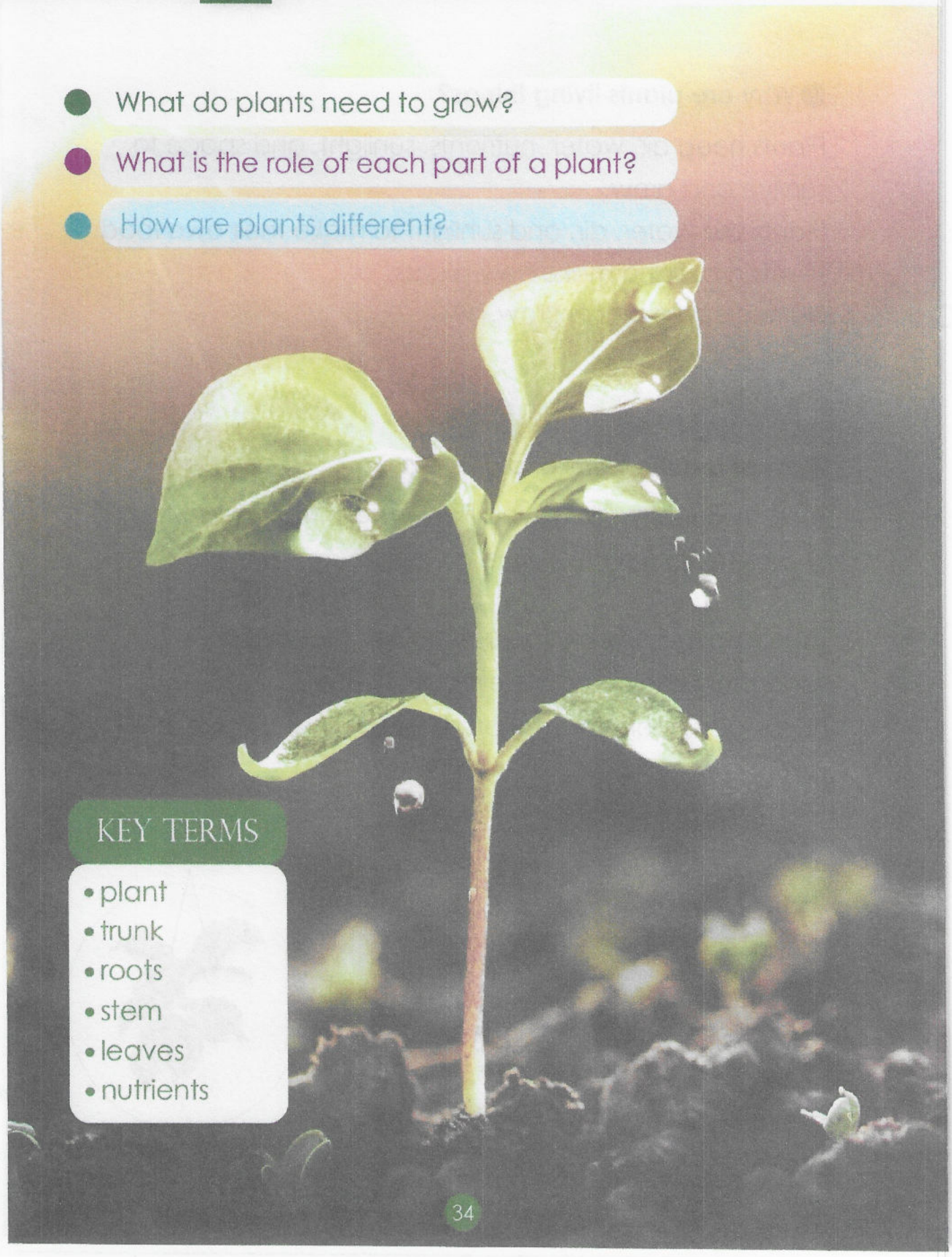
6 Plants Grow and Change

7 Plant Habitats

8 Plants and Animals Live Together

LESSON 5 LEARNING ABOUT PLANTS

- What do plants need to grow?
- What is the role of each part of a plant?
- How are plants different?



KEY TERMS

- plant
- trunk
- roots
- stem
- leaves
- nutrients

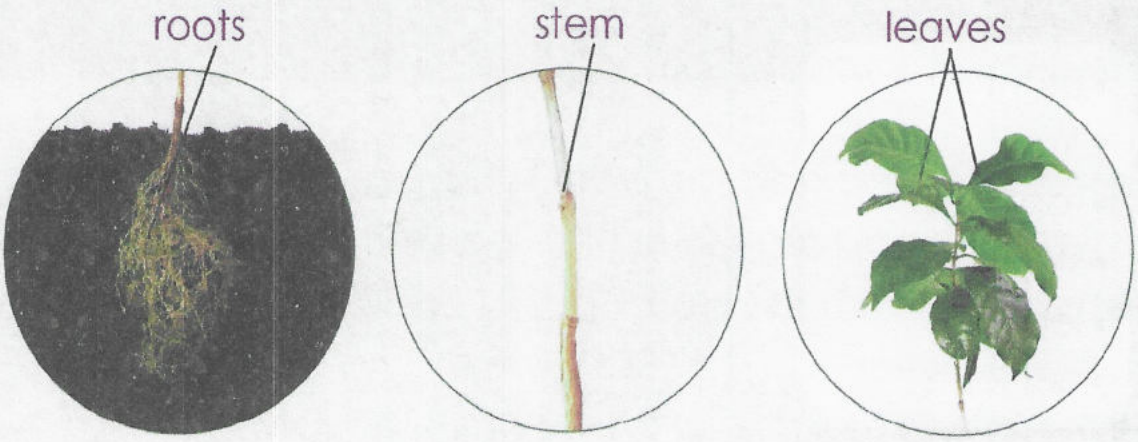
Why are plants living things?

Plants need air, water, nutrients, sunlight, and space to survive and grow.
Plants use water, air, and sunlight to make their own food.
Plants grow and make new plants.
Nutrients help plants grow.

What are the parts of plants?

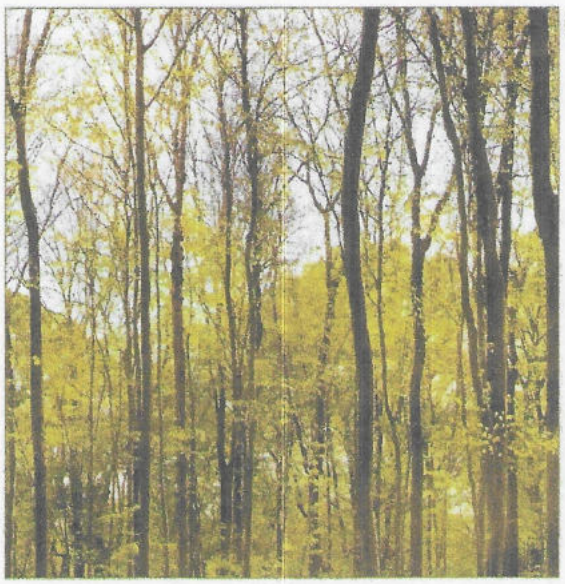
Plants cannot walk around like humans. They have to get their needs from the space around them.

Plants have parts that help them get their needs.
Most plants have roots, stems, and leaves.
These parts look different on different kinds of plants.





- The roots help hold the plant in the soil. They also take in water and minerals to nourish the plant.
- The stem holds the plant up and carries water from the roots to the leaves.
- The leaves make food for the plant to survive.



How do plants look different?

Not all plants look the same.

Some plants have colorful flowers, while others are only green.

Different plants can also have different types of leaves.



Stems can be thin as in herbs or thick as the trunk of a tree.

Some plants are tall, while others spread along the ground.



A Write true or false. Then correct the false statements.

Plants move around.

Most plants have leaves, stems, and roots.

A tree has a thin stem.

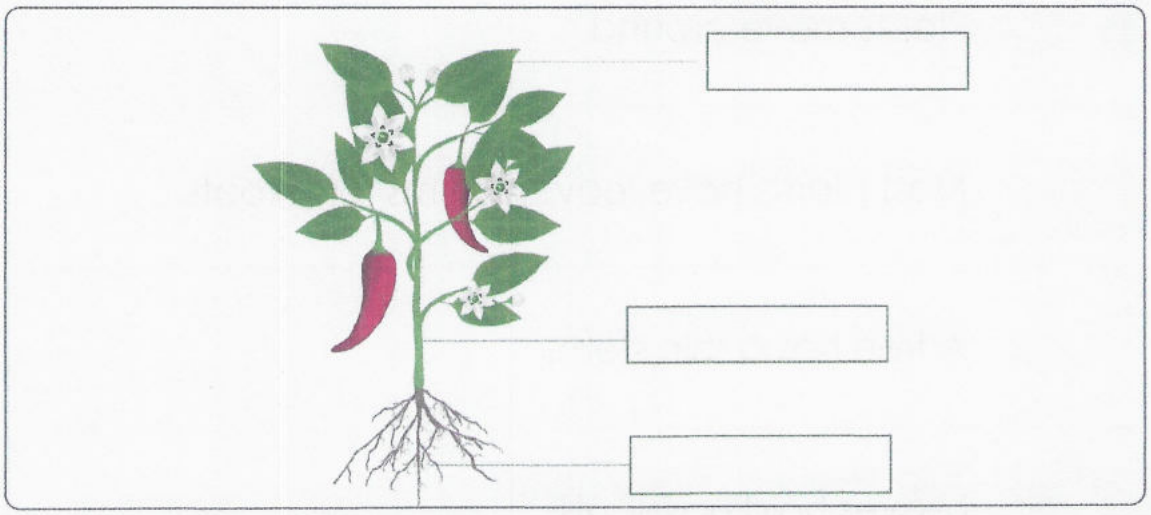
Leaves hold up plants.

Roots hold the plant in the soil.

B Match.

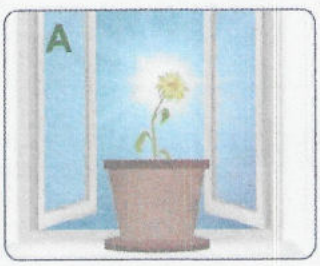
roots	•	•	holds the plant up
leaves	•	•	hold the plant in the soil
stem	•	•	make food for the plant

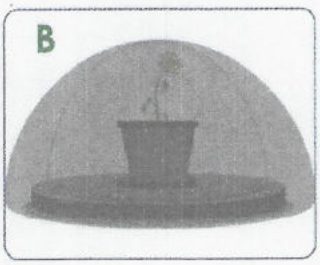
C Label the different parts of this plant.

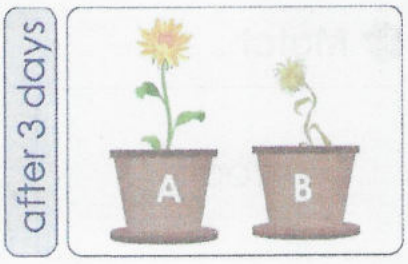


D Let's experiment.

-Place pot (A) of a flowering plant in the Sun.
-Place pot (B) of a flowering plant in the darkness.
-Watch the 2 pots for 3 days.







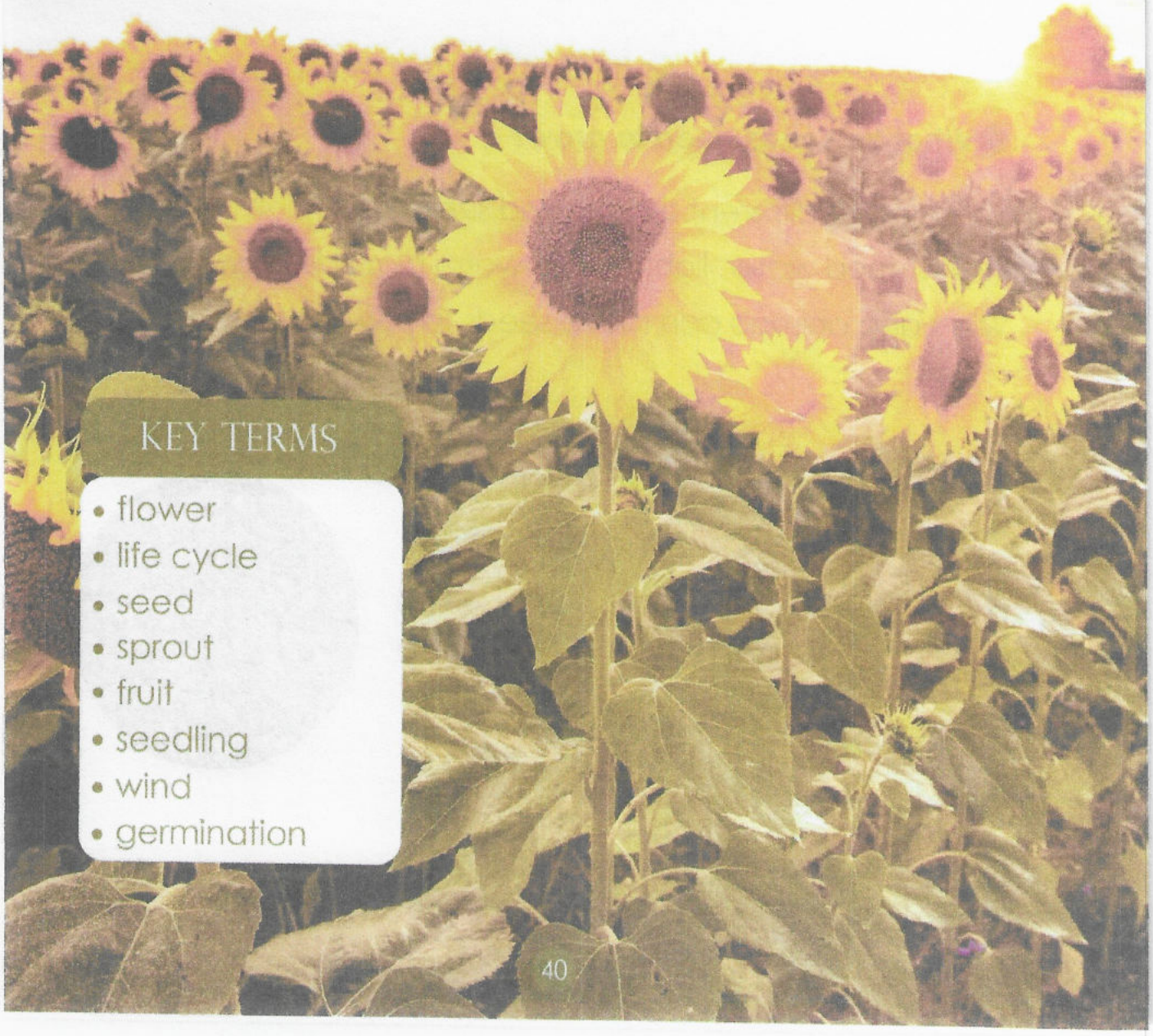
1. What happens to the plant in pot (A)?

2. What happens to the plant in pot (B)?

3. What do you conclude?

LESSON 6 PLANTS GROW AND CHANGE

- What are the important parts of a flowering plant?
- How do plants grow?



KEY TERMS

- flower
- life cycle
- seed
- sprout
- fruit
- seedling
- wind
- germination

How are seeds, flowers, and fruits important to plants?

Flowering plants, like other living things, have different parts.

1. A flower is part of a plant that makes seeds.
2. A seed is part of a plant that grows into a new plant. Seeds are protected by fruits.
3. A fruit is part of a plant that grows around a seed and is often edible.

What do seeds need to grow?

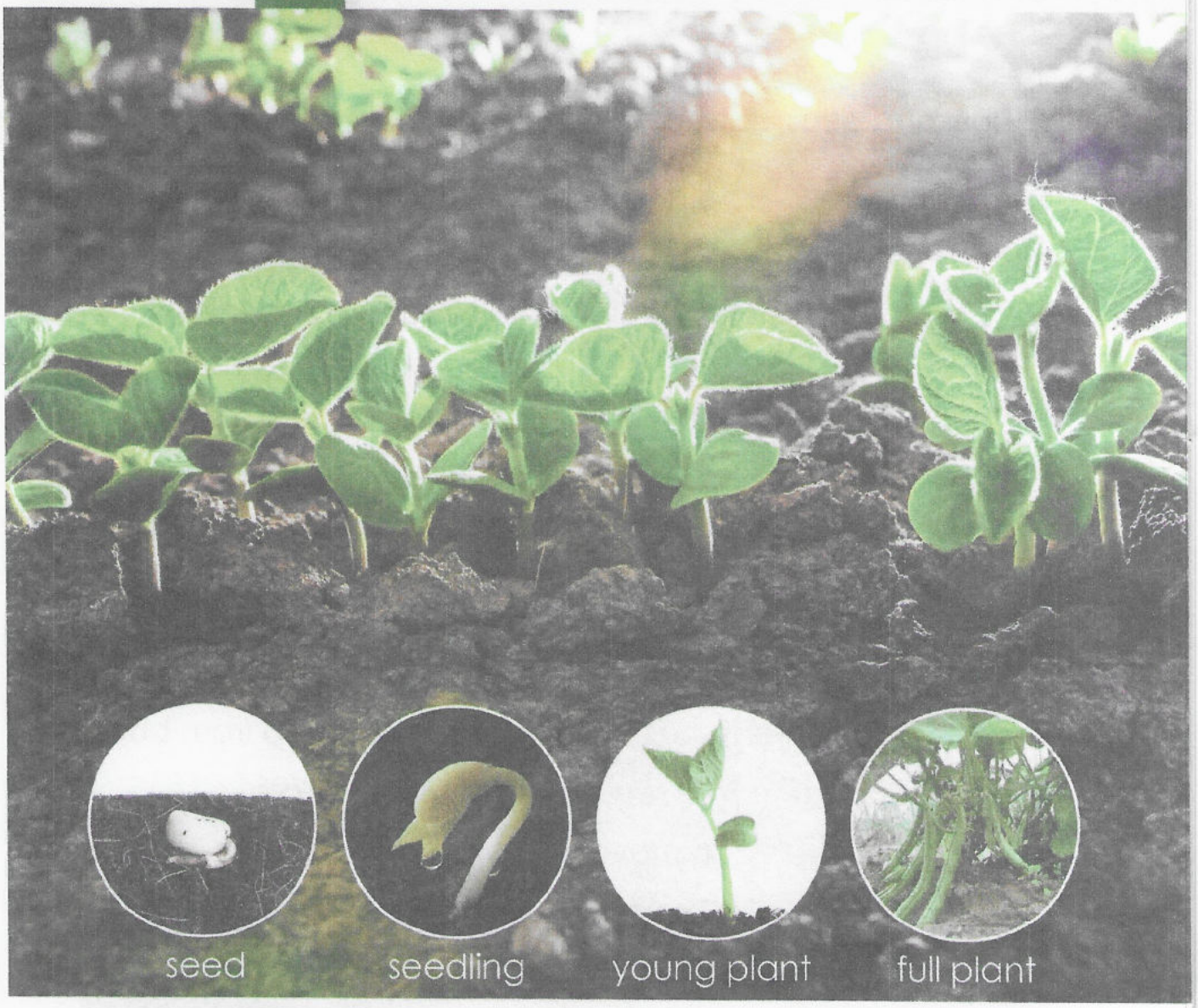
Seeds have different shapes and sizes.

Seeds need water, light, and a warm place to grow.

Wind and animals can move seeds to new places.







How do seeds become plants?

The life cycle of some plants starts with a seed.
A seed grows when it gets the right amount of water and nutrients. It sprouts and becomes a seedling. Later, the seedling grows and resembles the plant it has come from. This is called germination.



What are some other ways for plants to grow?

Plants do not always grow from seeds. Strawberries produce runner stems called stolons. These stems grow at the surface of the soil, producing roots that develop into new strawberry plants.

Other plants, such as potatoes, develop from buds called potato eyes.



A Write true or false. Then correct the false statements.

Seeds have different shapes and sizes.

A seed grows into a flower.

Wind can move seeds to new places.

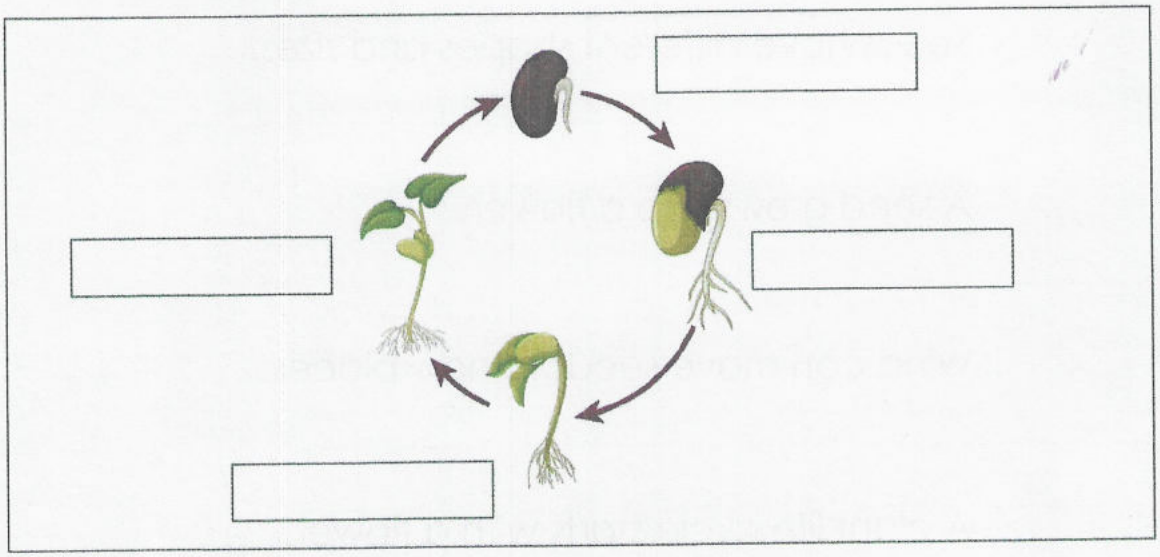
A plant life cycle starts with a flower.

Plants always grow from seeds.

B Match.

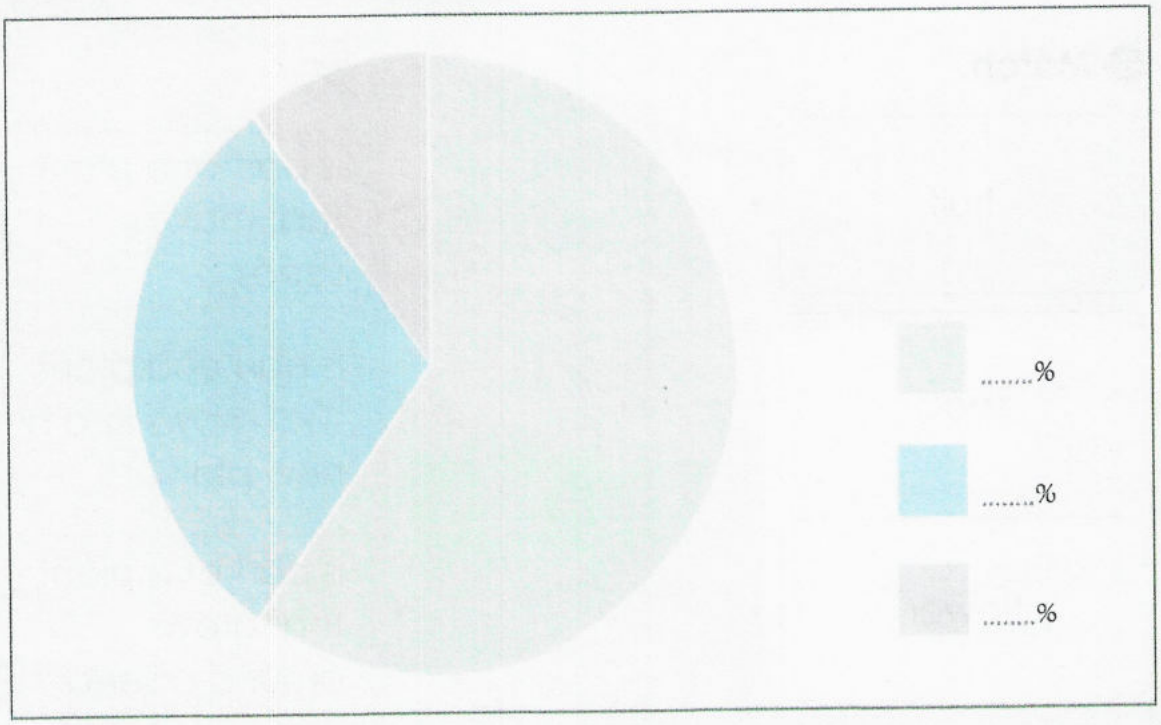
fruit	•	• is part of a plant that makes seeds
seed	•	• is part of a plant that grows into a new plant
flower	•	• is part of a plant that grows around a seed

C Label the life cycle of this plant.

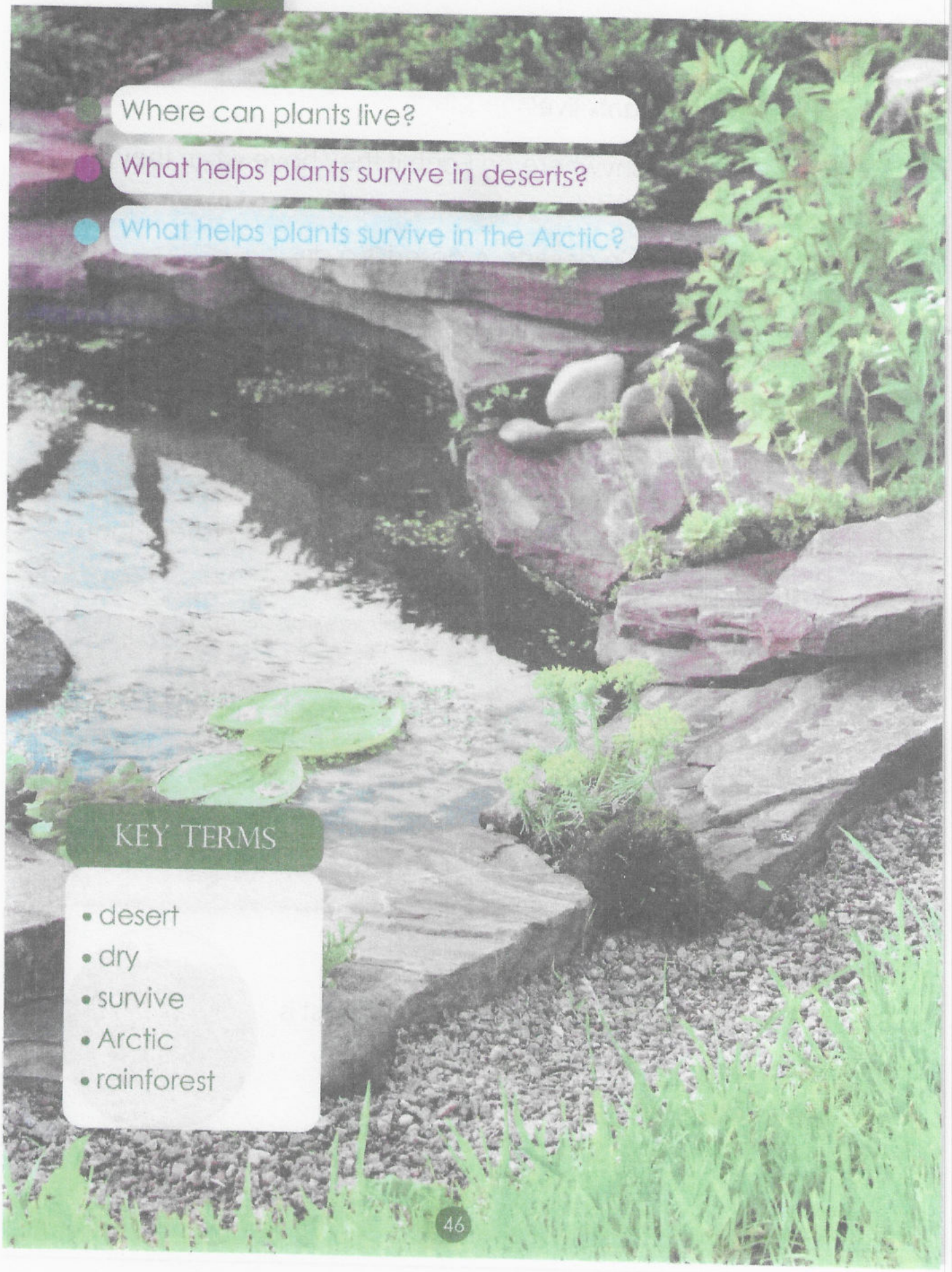


D Circle Graph

A garden includes 60% damask roses, 30% lily flowers, and 10% jasmine flowers. Fill this data in the following circle graph.



LESSON 7 PLANT HABITATS



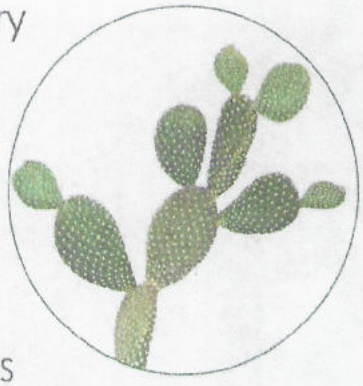
- Where can plants live?
- What helps plants survive in deserts?
- What helps plants survive in the Arctic?

KEY TERMS

- desert
- dry
- survive
- Arctic
- rainforest

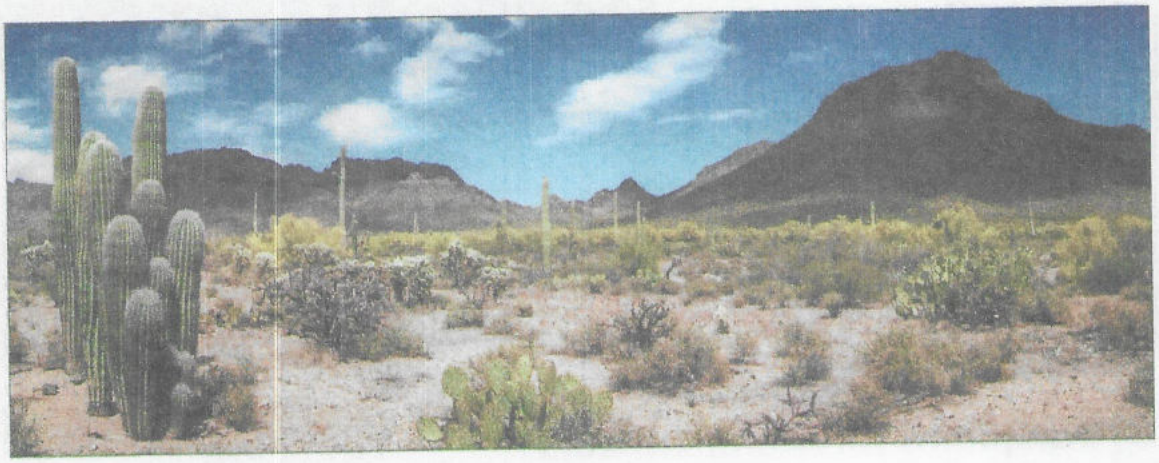
Where can plants live?

Plants can live anywhere on Earth if they have what they need to survive.



Some plants live in deserts. A desert is a dry place that is very hot. Plants that survive in the hot weather of the desert have parts that help them store food and water for long periods.

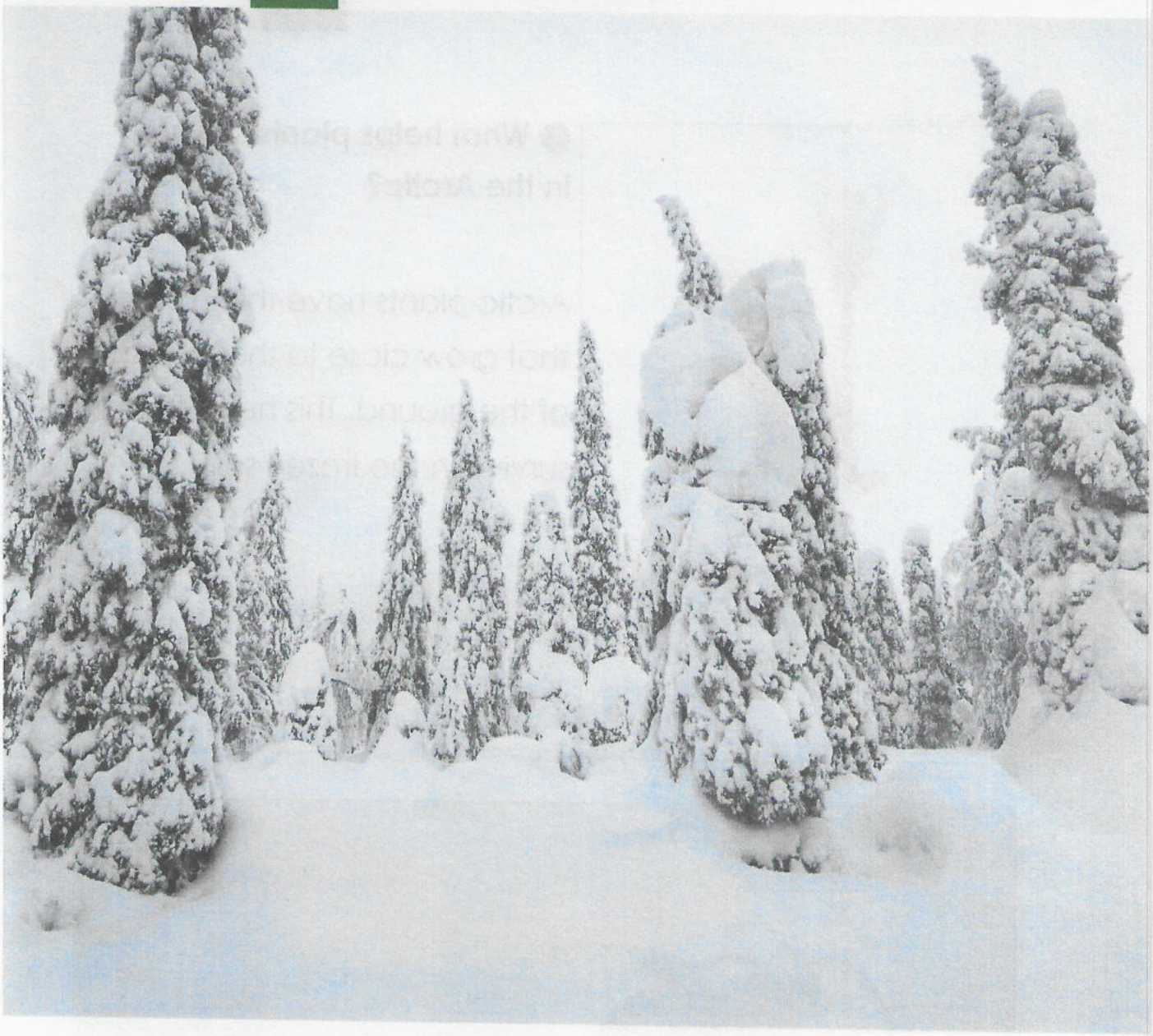
Many desert plants have thick waxy stems that help them store water and spiky leaves to protect them from animals.



Do plants live in other places?



Other plants live in rainforests. A rainforest is a hot, wet place. Most plants that live in rainforests have long, thin leaves.



Can plants survive in the cold?

Some plants live in the Arctic.
The Arctic is an icy and cold place near the North Pole.
Arctic plants grow close to each other to stay safe from the cold and the wind.



What helps plants survive in the Arctic?

Arctic plants have thick roots that grow close to the surface of the ground. This helps them survive in the frozen soil.



A Write true or false. Then correct the false statements.

Plants cannot survive in deserts.

Desert plants have spiky leaves.

Rainforest plants have short leaves.

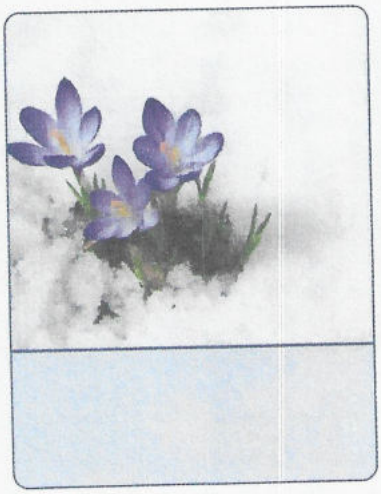
The Arctic is a hot place.

Arctic plants have thin roots.

B Match.

rainforest	•	• an icy, cold place near the North Pole
Arctic	•	• a hot, dry place
desert	•	• a wet place

C Name the following habitats.



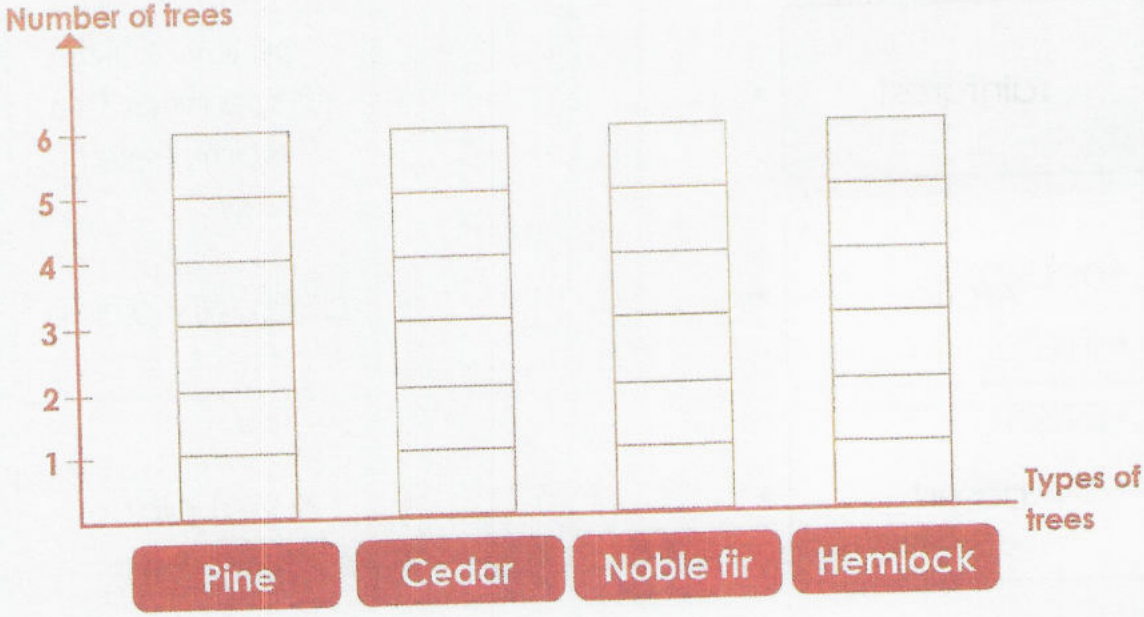




D Bar Graph

A garden has 6 pine trees, 2 noble fir trees, 1 hemlock tree, and 4 cedar trees.

Classify the trees above in the following bar graph.



LESSON 8 PLANTS AND ANIMALS LIVE TOGETHER

- How do animals and plants live together?
- What is a food chain?
- What happens when a habitat changes?



KEY TERMS

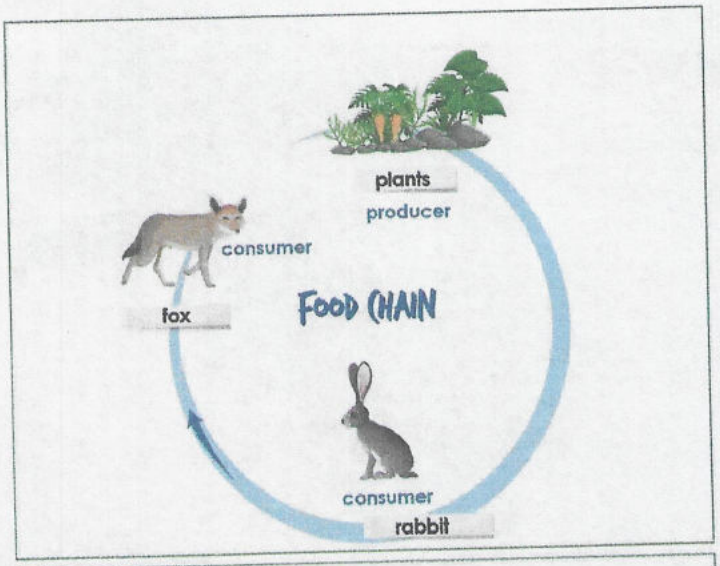
- habitat
- shelter
- pollen
- food chain

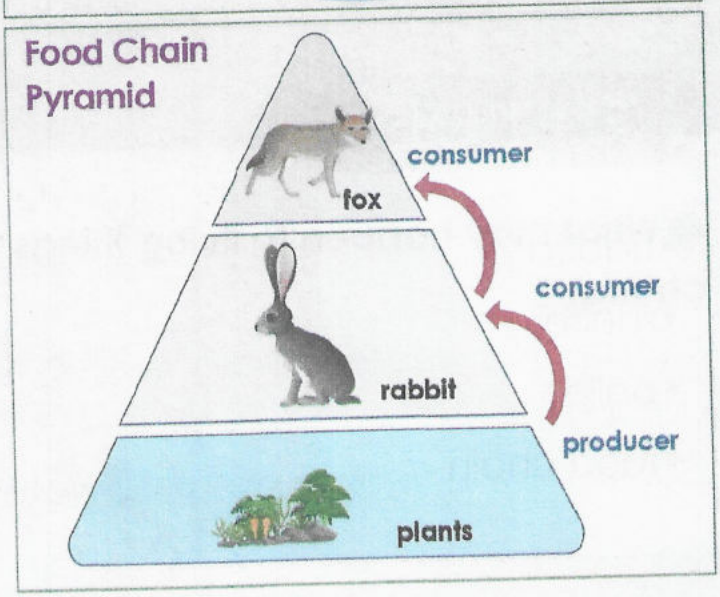
Why do plants and animals live together?

Plants help animals survive in their habitats. Animals use plants for shelter and food. Animals help plants grow in their habitats, too. For example, bees help in spreading pollen from one flower to another. Pollen is a powder inside the flower that helps in making seeds.

What is a food chain?

All living things need food to survive. A food chain shows the order in which living things get food. The Sun is the beginning of all food chains. Without the Sun, plants could not grow, and there could be no food for animals. Plants are the producers, and other creatures are the consumers, as shown in the figures.







● What may happen to living things when habitat conditions change?

People and weather may cause a habitat to change or get damaged.

Cutting down trees or polluting water may change habitats.



- When habitat conditions change, animals and plants may not get what they need to grow.

Some animals may move to other habitats, and others may die. Some kinds of plants may wither, too.



A Write true or false. Then correct the false statements.

Plants are necessary for animals.

Pollen is a powder inside seeds.

The Sun is not necessary for the food chain.

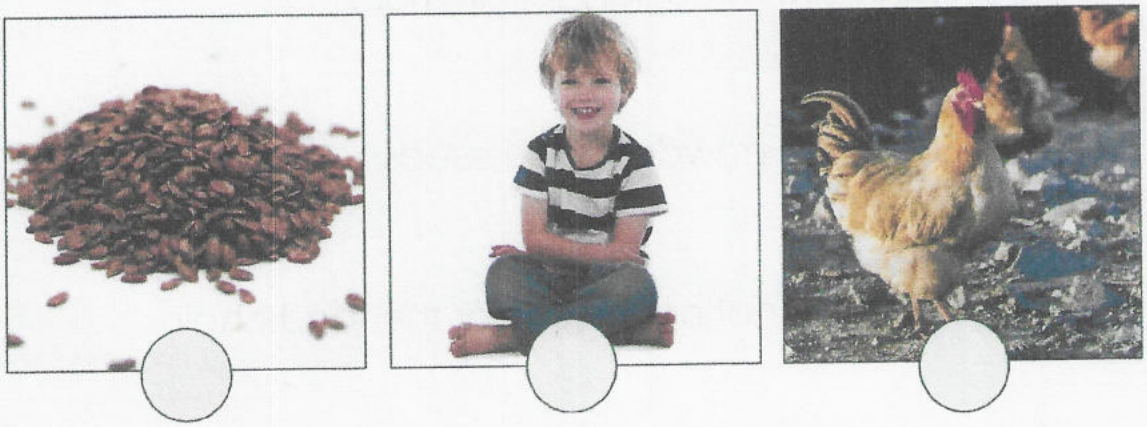
Bees help in spreading pollen.

Cutting down trees is good for the food chain.

B What happens to living things when habitat conditions change? Color the bubbles of the correct answers.

Some animals move to other habitats.	Plants do not get all their needs.	Some animals die.
All animals survive.	Some kinds of plants wither.	Some animals do not get what they need to survive.

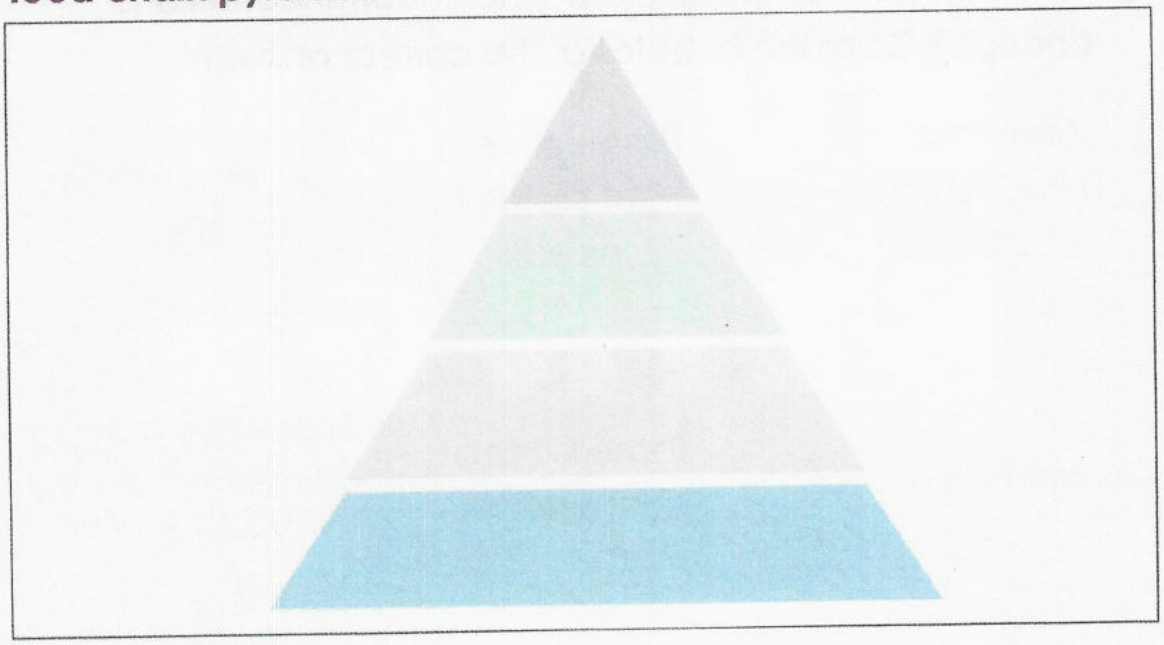
C Arrange the following pictures in the correct order of a food chain.



D Food Chain Pyramid

In a desert, cacti are eaten by aphids. Aphids are eaten by wasps. Lizards eat wasps.

Based on the above information, complete the following food chain pyramid.



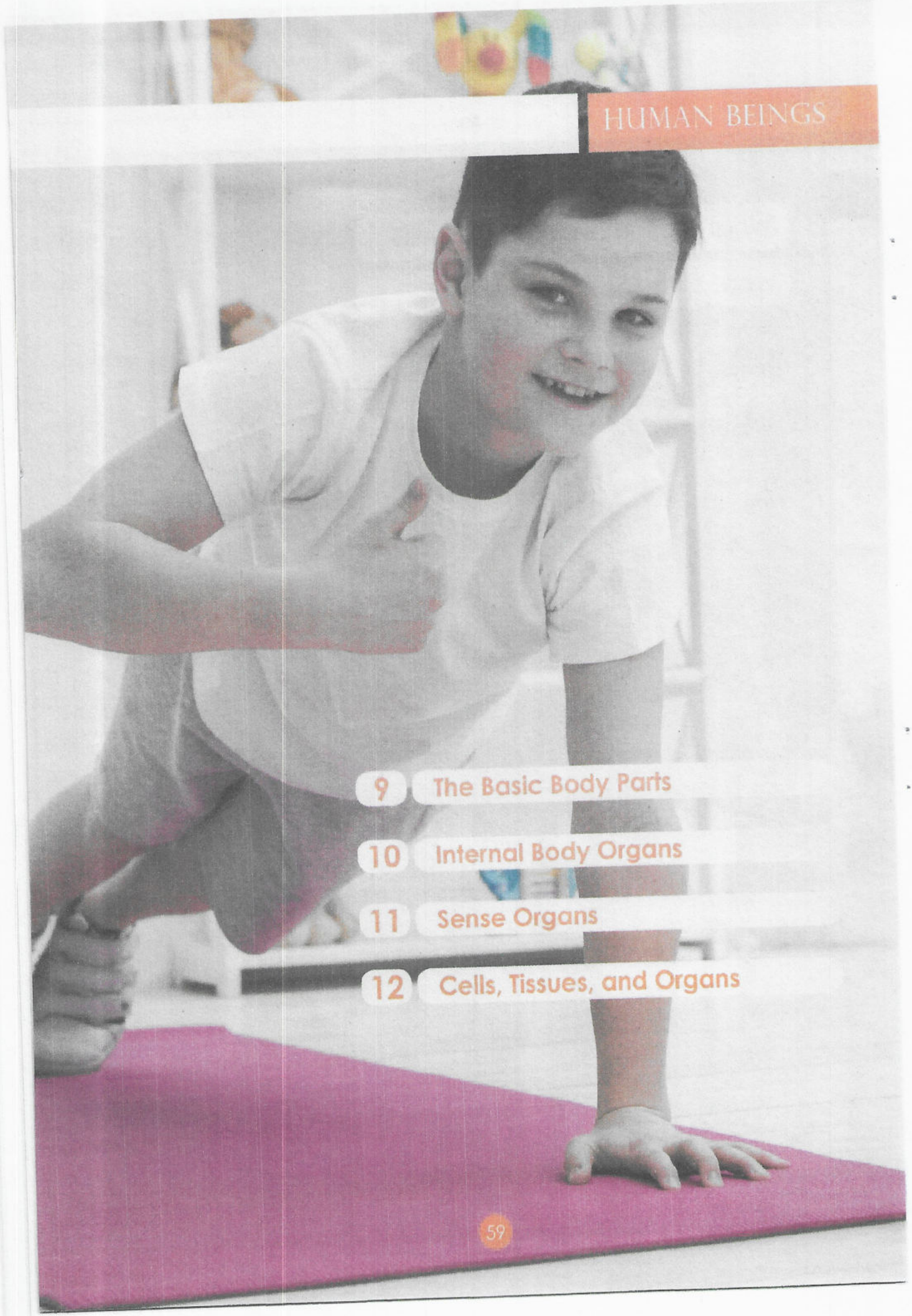


WORLD'S KEY

UNIT 3

HUMAN BEINGS

HUMAN BEINGS

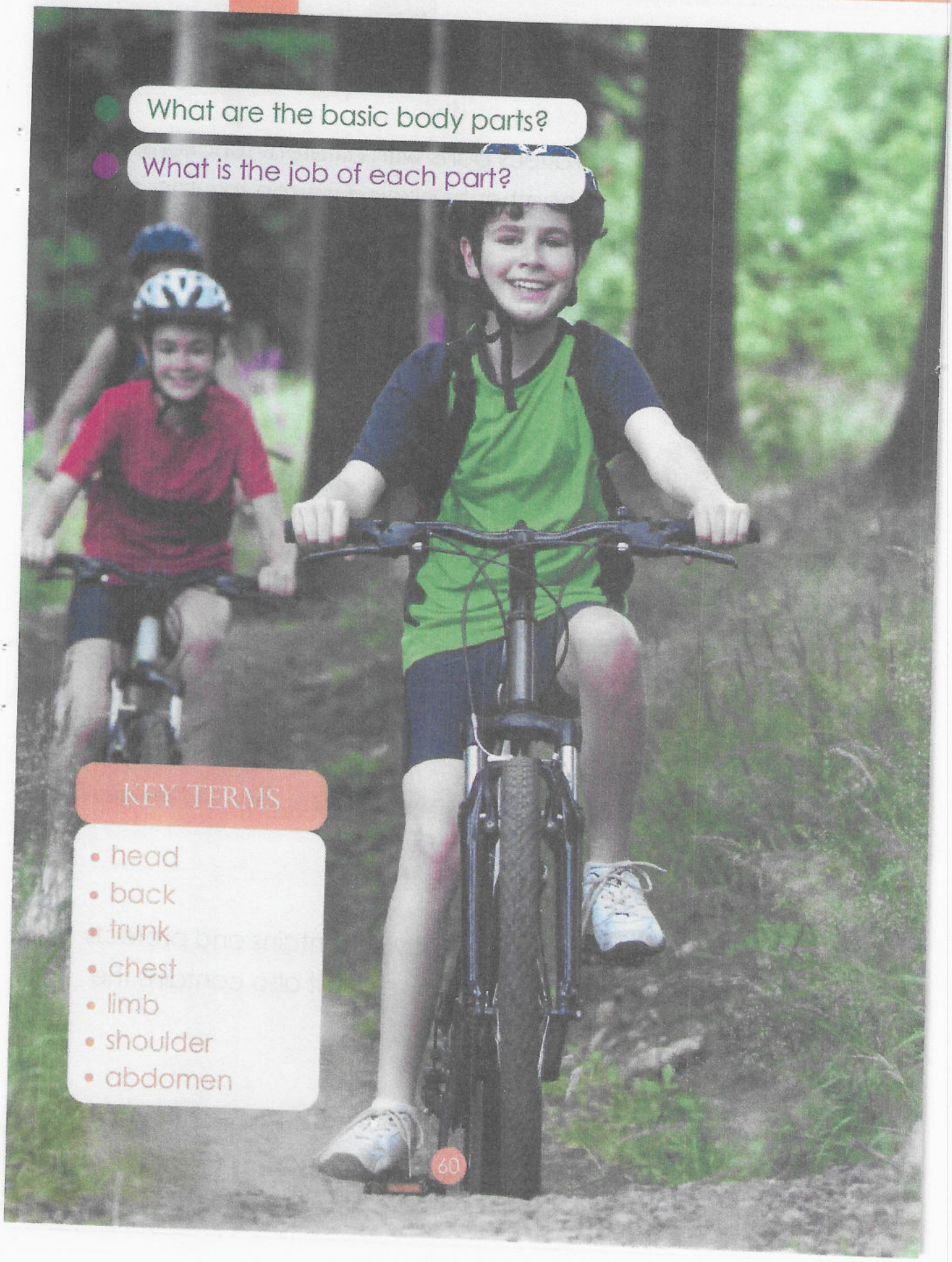


9 The Basic Body Parts

10 Internal Body Organs

11 Sense Organs

12 Cells, Tissues, and Organs



- What are the basic body parts?
- What is the job of each part?

KEY TERMS

- head
- back
- trunk
- chest
- limb
- shoulder
- abdomen

What are the parts of the body?

The body consists of various parts with different functions, but all of them work together to allow a person to jump, sit, eat, and play with others.
The major body parts are the head, trunk, and limbs.



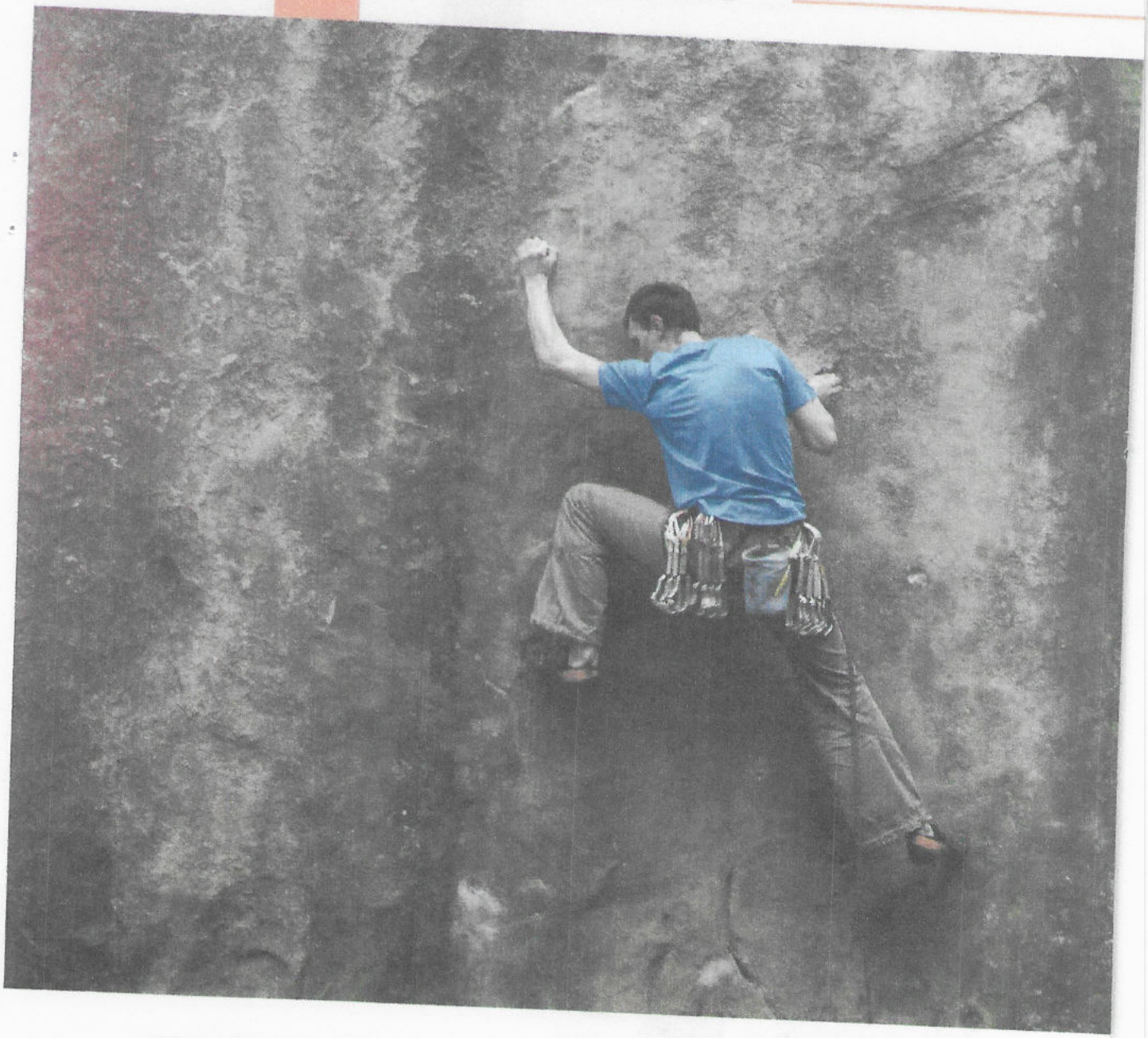






What is the job of the head?

The head is at the top of the body. It contains and protects the brain, which controls all body parts. It also contains the sense organs.



What is the job of the trunk?

The trunk is the central part of the body. It includes the chest, back, abdomen, and shoulders.
The trunk gives support to the body and determines its shape.



What are the limbs?

The limbs include the upper and lower limbs in the human body.

The upper limbs are the arms. The arms are connected to the trunk by the shoulders.

The lower limbs are the legs. The legs are connected to the trunk by the hips.



It is important to care for the body by eating healthy food, getting enough sleep, and exercising regularly.

Caring for the body can prevent sickness and reduce future diseases.

A Write true or false. Then correct the false statements.

The hand is responsible for controlling the body.

The head protects the brain.

The hand is the central part of the body.

The trunk gives support to the body.

The legs are the upper limbs.

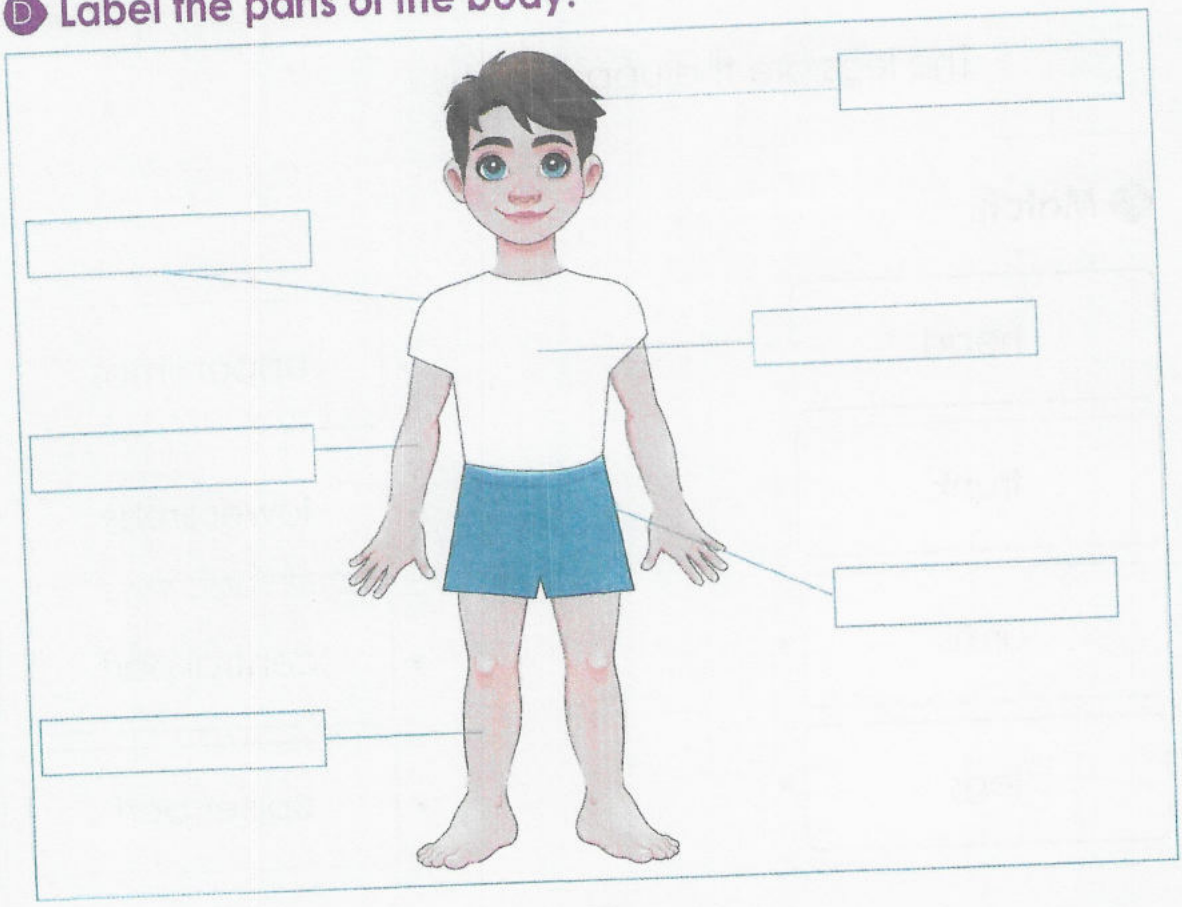
B Match.

head •	• upper limbs
trunk •	• lower limbs
arms •	• central part
legs •	• upper part

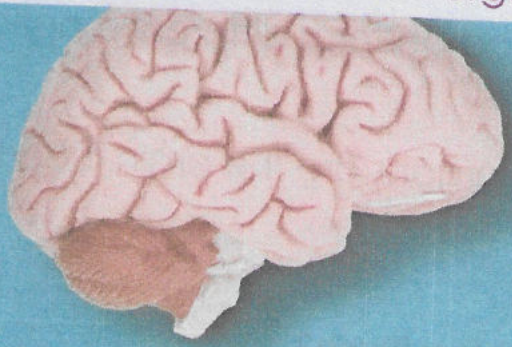
C Fill in the blanks.

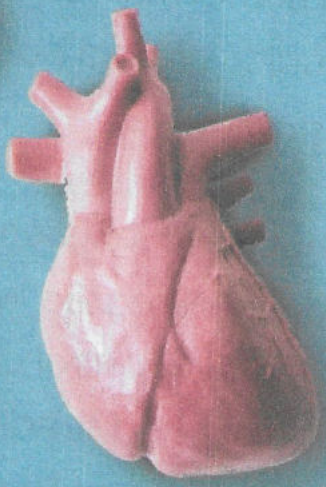
- The ..... contains and protects the brain, which controls all body parts.
- The shoulders connect the ..... to the arms.
- The ..... are connected to the trunk by the hips.
- The ..... limbs are the legs, and the ..... limbs are the arms.

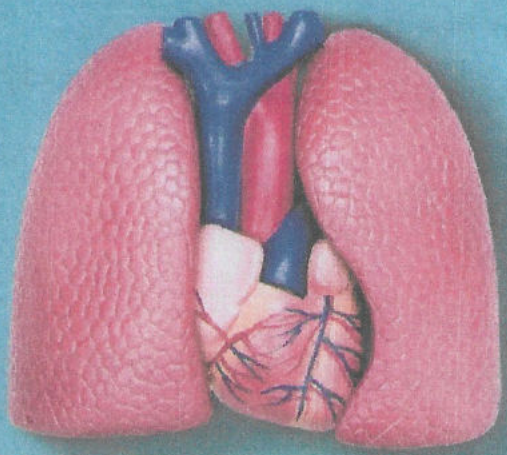
D Label the parts of the body.

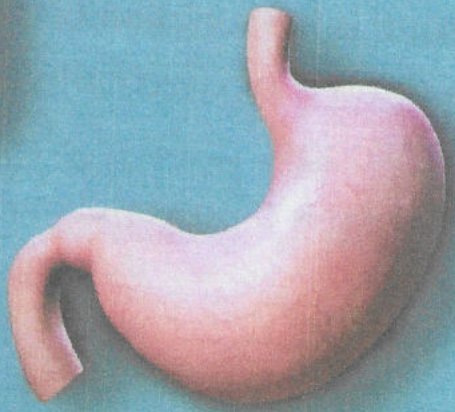


- What are the internal body organs?
- What is the function of each organ?









KEY TERMS

- organs
- brain
- heart
- lungs
- stomach

What are the internal organs?

Body organs come in different shapes and sizes.
They all work together and perform different functions to keep humans alive.
The major internal body organs are the brain, heart, lungs, and stomach.

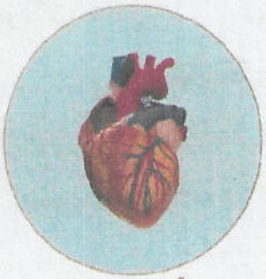
What is the function of the brain?

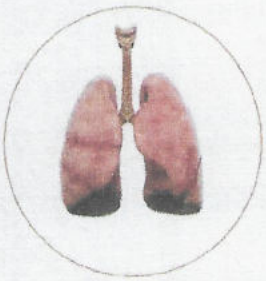
The brain is located in the head and is protected by the skull. It is the control center of the body.
It responds and sends signals to other parts of the body, telling them what to do.

What is the function of the heart?

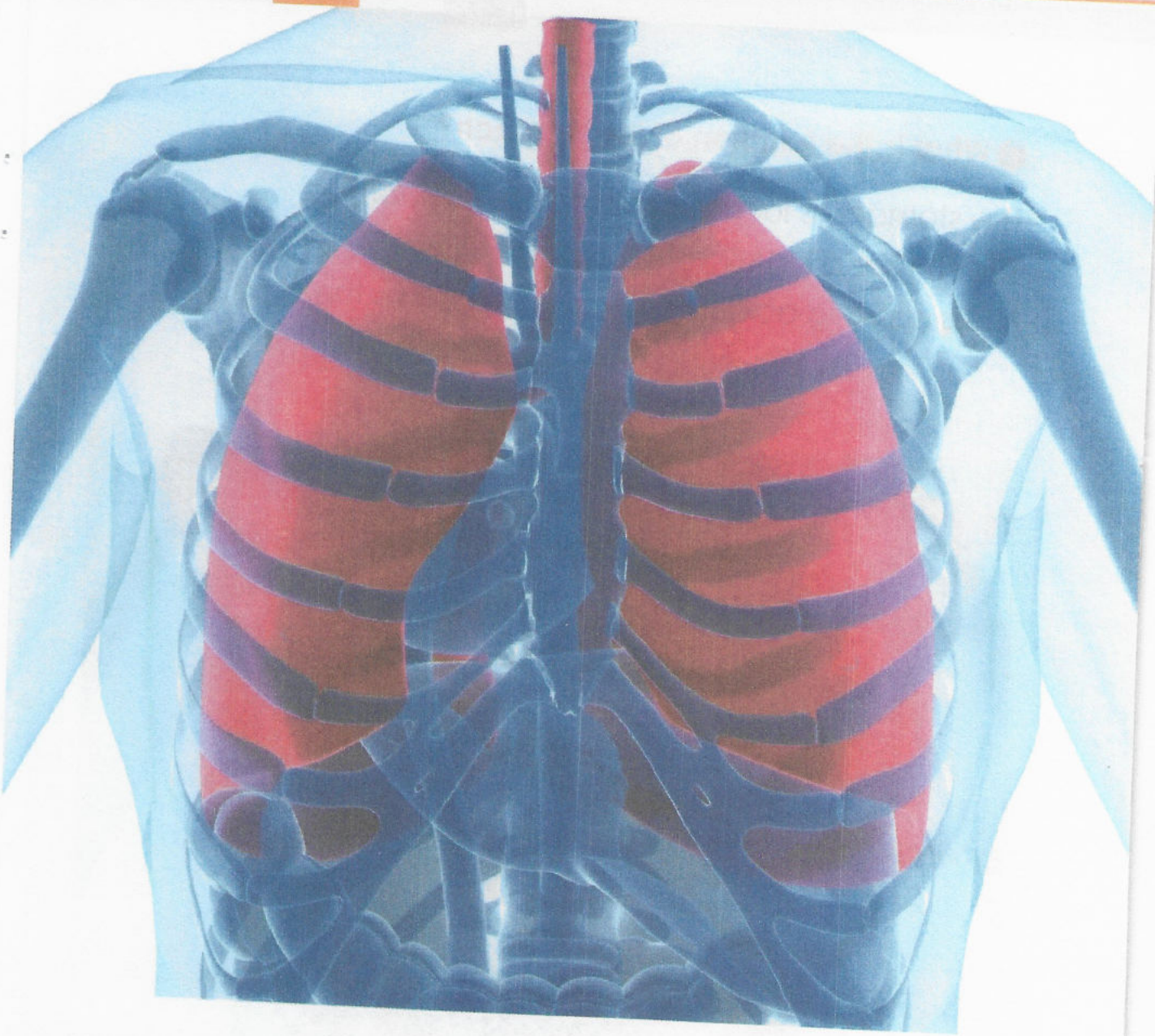
The heart is located between the lungs and is protected by the rib cage.
The heart is a powerful muscle that pumps blood throughout the body.


brain


heart


lungs


stomach



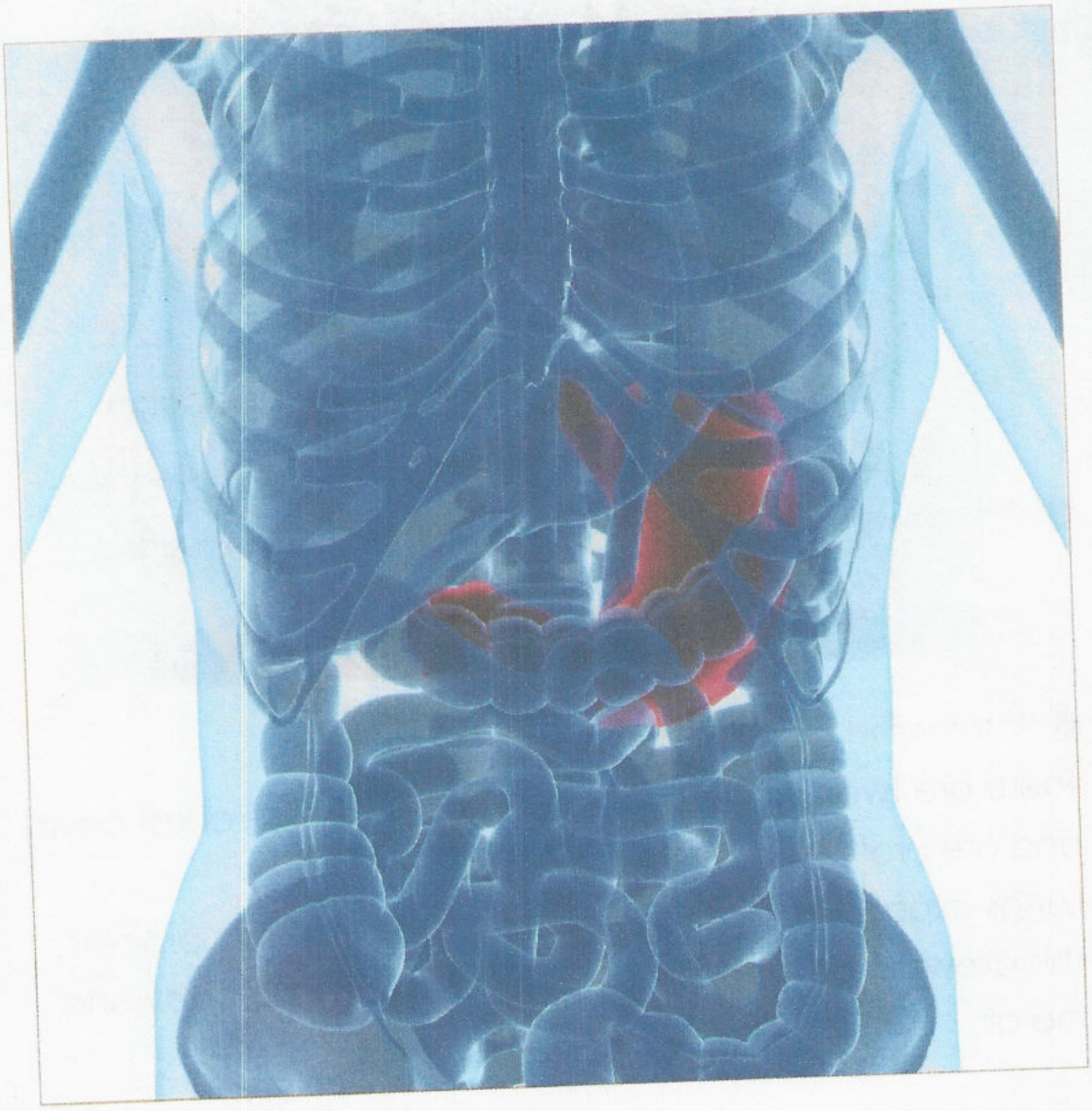
What is the function of the lungs?

There are two lungs in our body. They are in the chest cavity and are protected by the rib cage.

Lungs expand and contract during the breathing process. This allows the exchange of gases between the body and the air.

What is the function of the stomach?

The stomach is located in the upper abdomen.
The stomach is a digestive organ.
It has a strong acid that helps break down the food.



A Write true or false. Then correct the false statements.

_____ The stomach helps in digesting food.

_____

_____ The heart is located in the head.

_____

_____ The brain is the control center of the body.

_____

_____ The heart pumps blood throughout the body.

_____

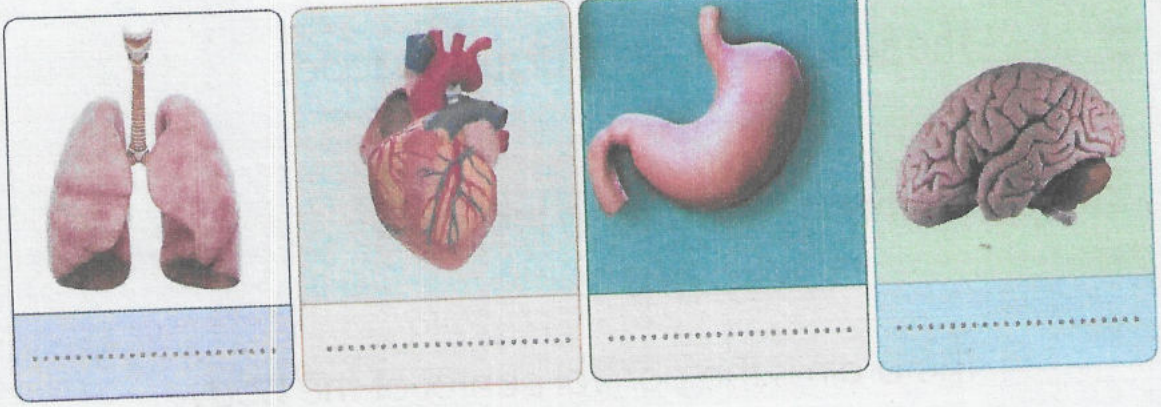
_____ The stomach is located in the lower abdomen.

_____

B Write the protective part of each of the following organs.

Body Organ	Protective Part
brain	
heart	
lungs	

C Name the following internal body organs.



.....

.....

.....

.....

D Bar Graph

- Indicate the heartbeats per minute at rest.

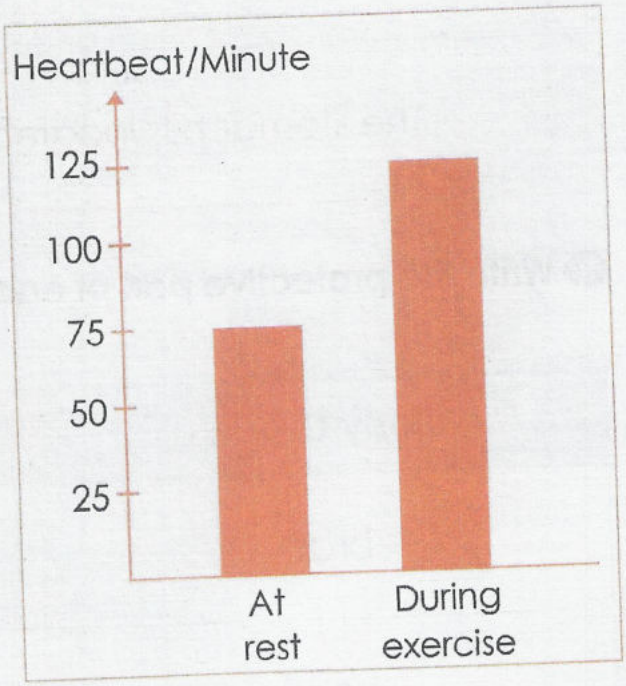
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- Indicate the heartbeats per minute during exercise.

.....

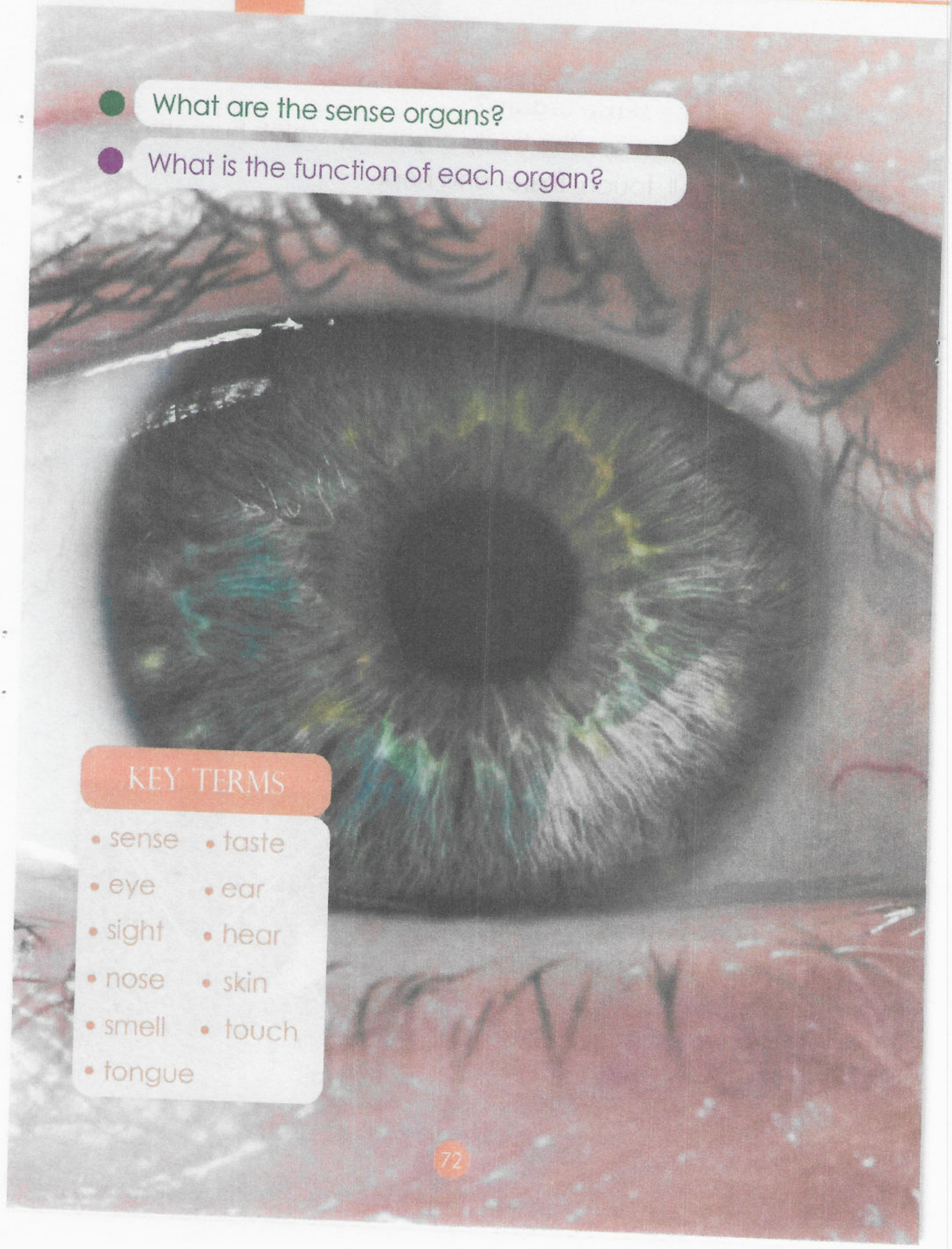
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- What do you conclude?

.....

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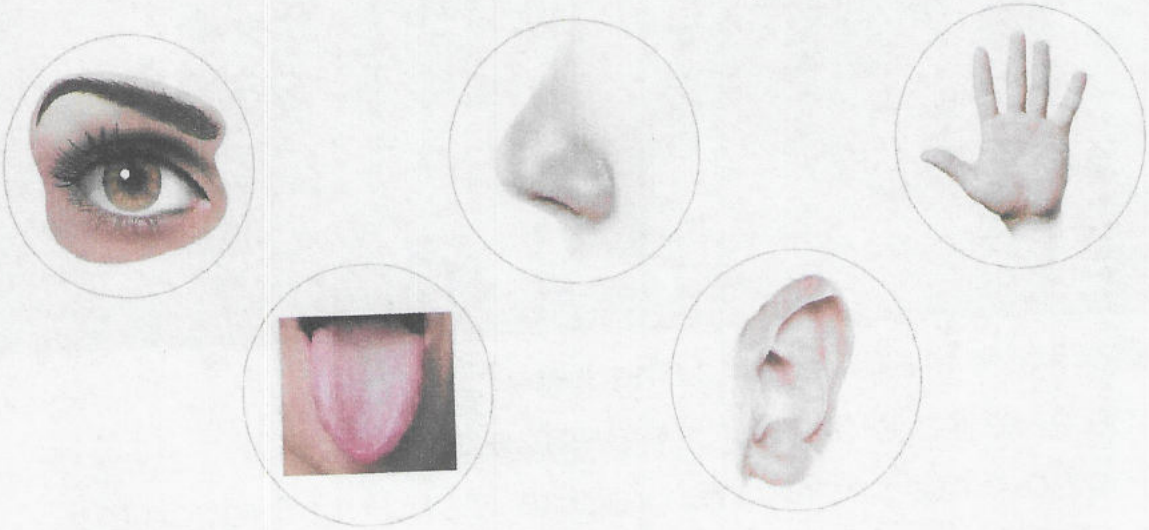
- What are the sense organs?
- What is the function of each organ?

KEY TERMS

- sense
- eye
- sight
- nose
- smell
- tongue
- taste
- ear
- hear
- skin
- touch

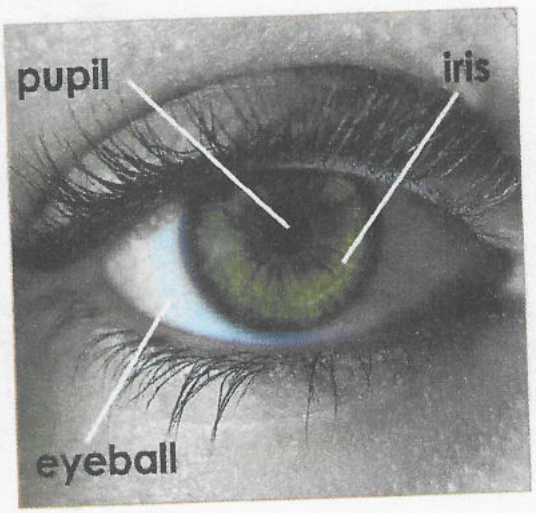
What are the sense organs?

The sense organs are the body organs by which humans can see, smell, touch, taste, and hear.
The sense organs are the eyes, nose, skin, tongue, and ears.
Sense organs enable humans to interact and respond to their environment.



What is the function of the eye?

The eye is the organ for the sense of sight. It is sensitive to light. Human beings can have various eye colors.
The three basic parts of the eye are the eyeball, the iris, and the pupil.





What is the function of the nose?

The nose is the organ for the sense of smell.
The nose has nostrils. We breathe in and out through the nostrils. Humans can detect thousands of scents and aromas.

What is the function of the skin?

The skin is the organ for the sense of touch.
The skin is the largest organ because it covers the whole human body.



What is the function of the tongue?



The tongue is the organ for the sense of taste.
The tongue has various receptors that can detect whether the food is salty, sweet, bitter, or sour.

What is the function of the ear?



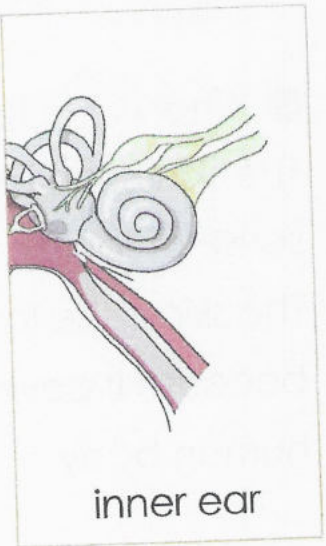
The ear is the organ for the sense of hearing. Hearing is the ability to receive sounds.
The three major parts of the ear are the outer ear, middle ear, and inner ear.



outer ear



middle ear



inner ear

A Write true or false. Then correct the false statements.

People see with their eyes.

The nose is responsible for hearing.

The ear is made up of three main parts.

The skin is the sense organ of touch.

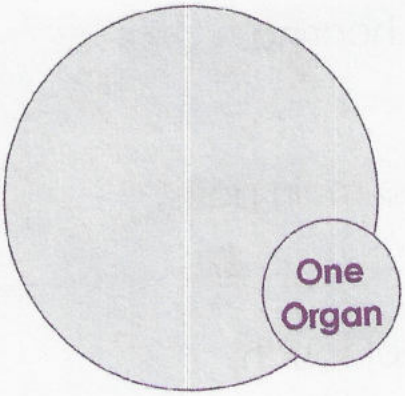
The tongue has one receptor.

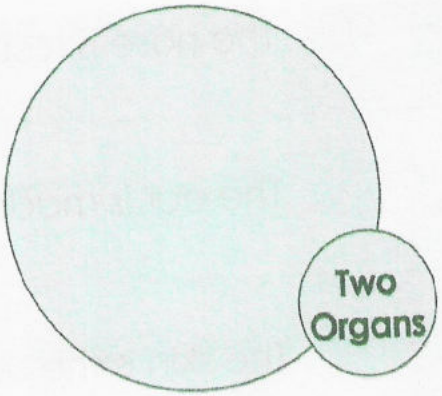
B Complete the following table.

Sense Organ	Function
eye	
ear	
nose	
tongue	
skin	

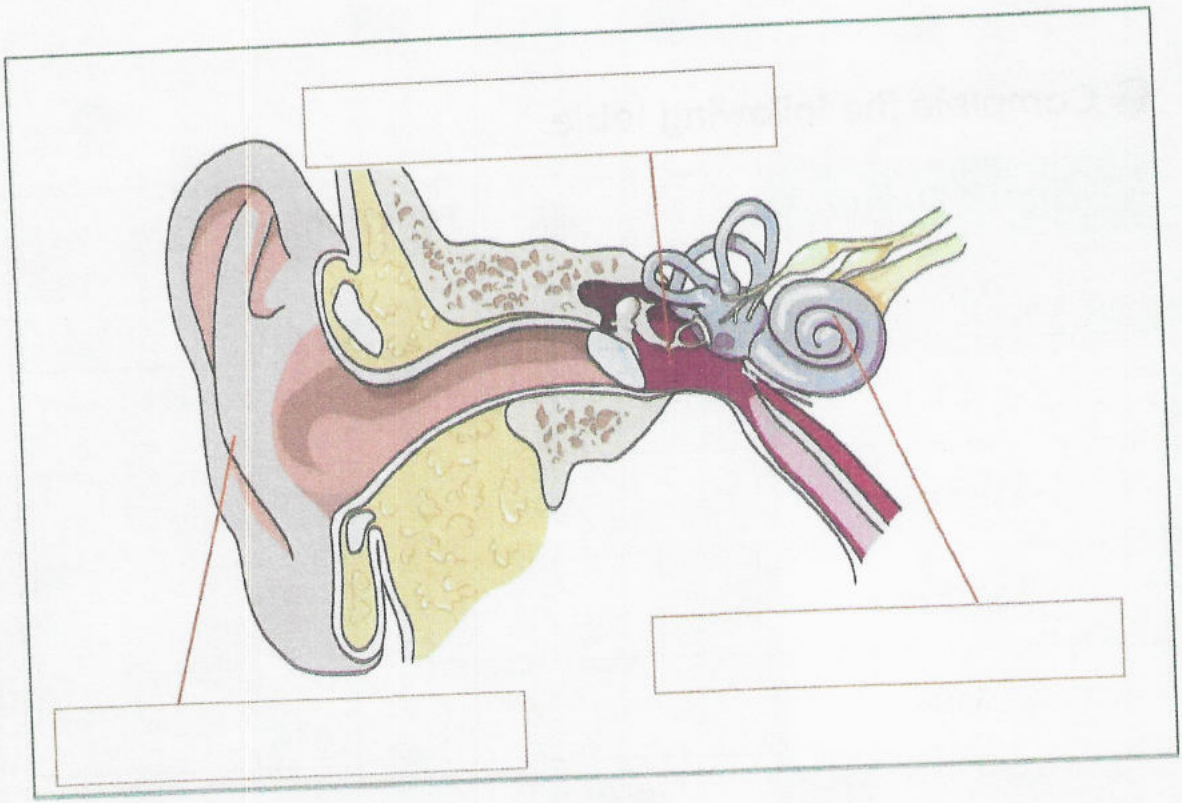
C Classify the sense organs according to their number in the human body.

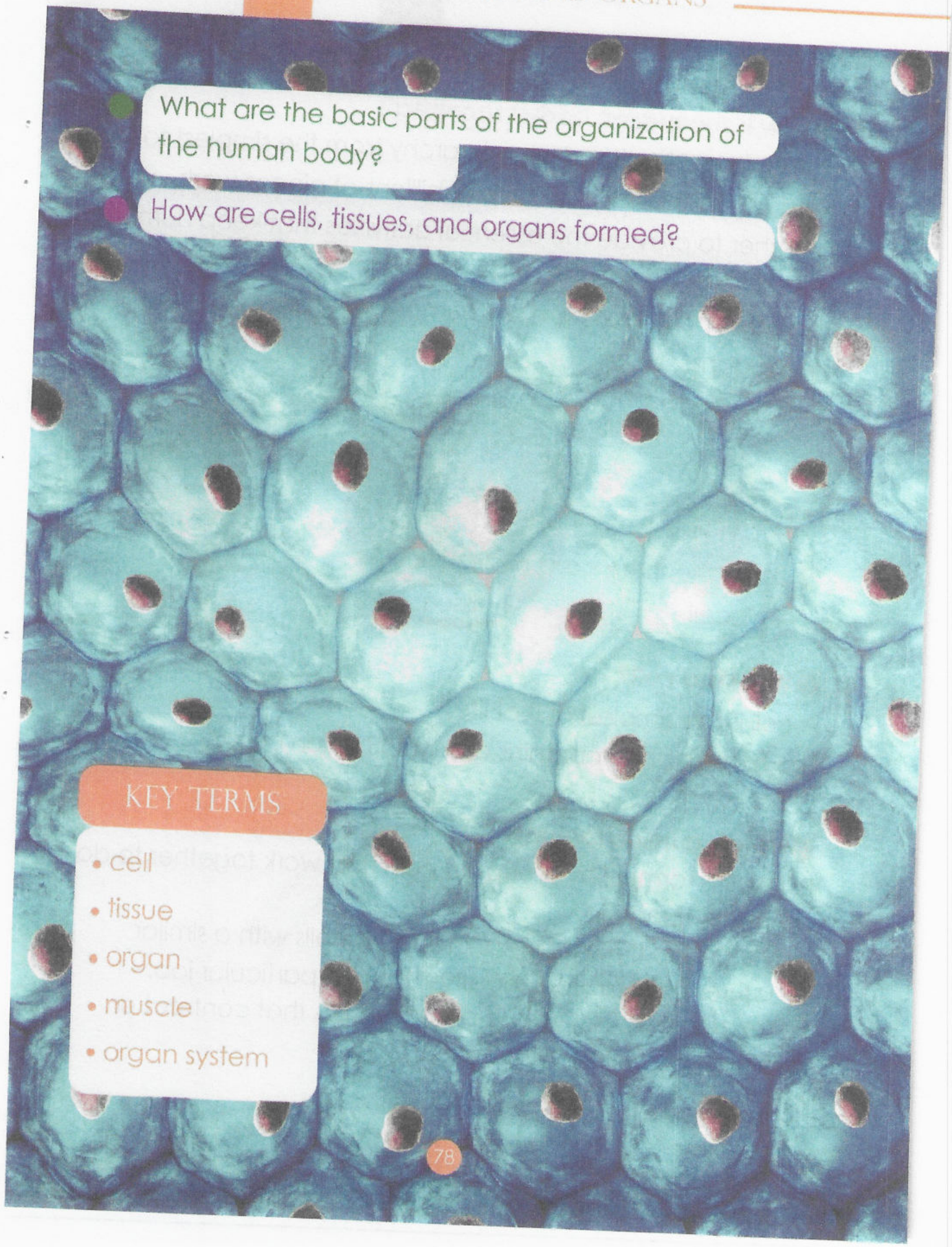
eye	ear	nose	tongue	skin





D Label the three parts of the ear.





- What are the basic parts of the organization of the human body?
- How are cells, tissues, and organs formed?

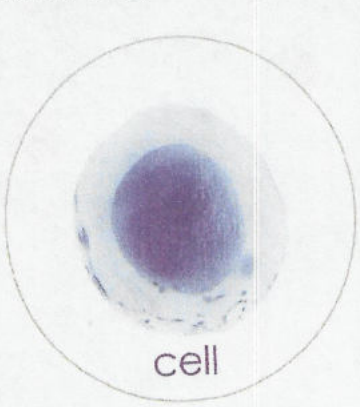
KEY TERMS

- cell
- tissue
- organ
- muscle
- organ system

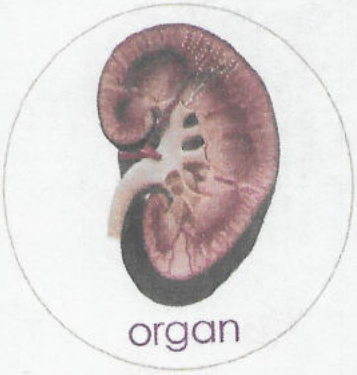
How is the human body organized?

Humans are structured in a hierarchy from the simplest to the most complicated. Hundreds of billions of pieces work together to provide the essential activities that keep humans alive.

The basic parts that form the human body are cells, tissues, and organs.


cell


tissue


organ

What is a cell?

A cell is the simplest unit of life.

The human body contains around 30 trillion cells.

How is a tissue formed?

A tissue is formed by groups of cells that work together to do a specific function.

A living tissue is made up of groups of cells with a similar structure. They all work together to do a particular job.

For example, muscle tissue contains cells that contract or expand.



How is an organ formed?

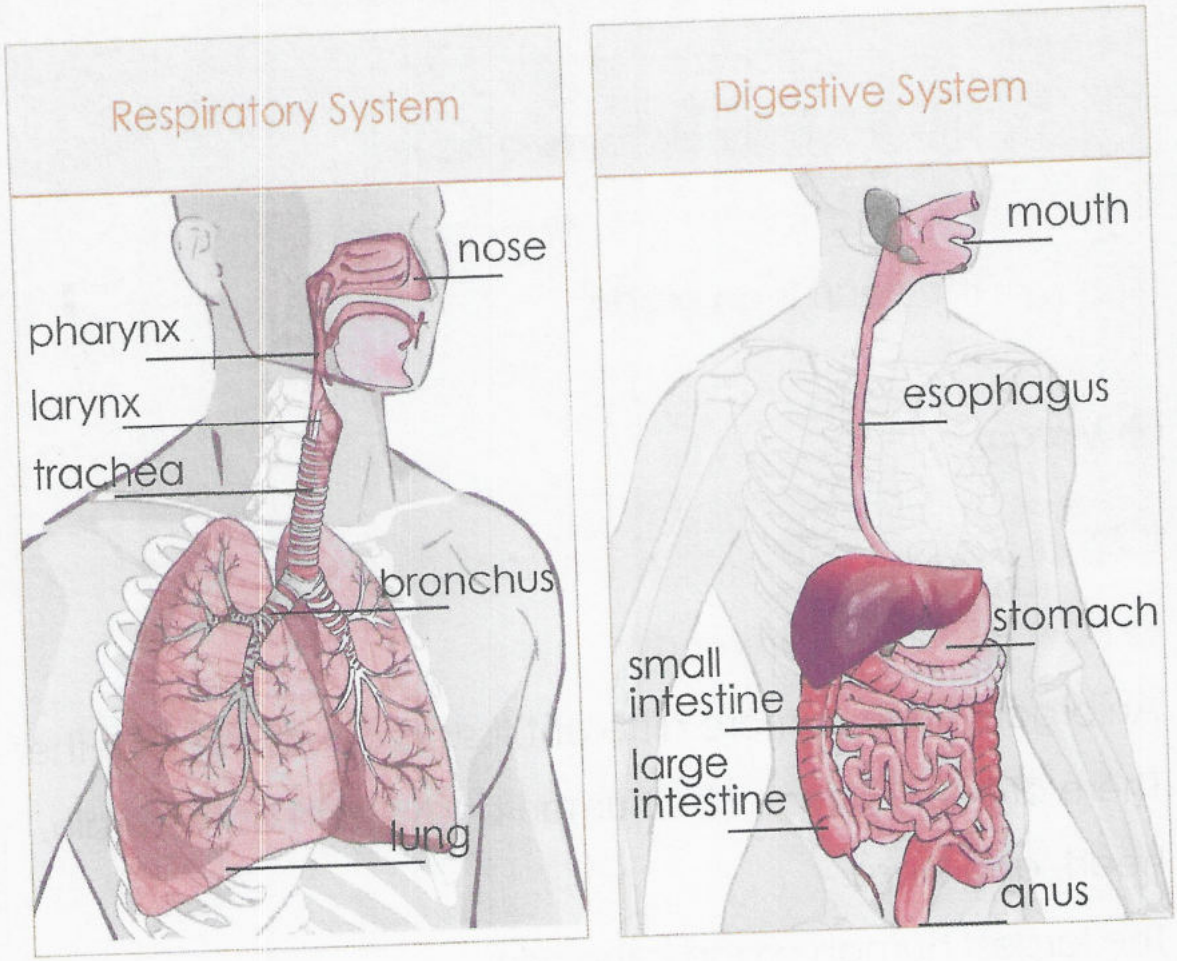
An organ is two or more different tissues operating together. There are 78 organs in the human body, such as the brain, heart, and lungs.

The largest human organ is the skin.

How is an organ system formed?

An organ system is made up of a collection of organs that work together to provide a certain function. The organism is made up of a group of organ systems.

Examples:



A Write true or false. Then correct the false statements.

The tissue is the simplest unit of life.

The human body contains around 30 cells.

There are 78 organs in the human body.

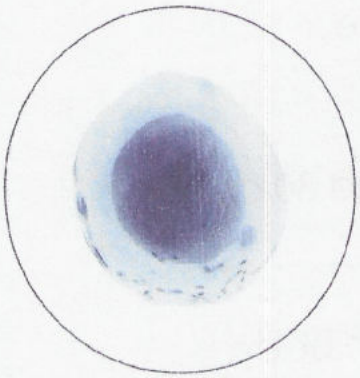
The group of cells forms a tissue.

The heart is an organ.

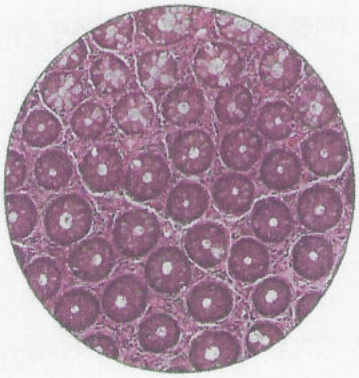
B Match.

organ	•	•	group of cells
tissue	•	•	group of tissues
organ system	•	•	group of organs

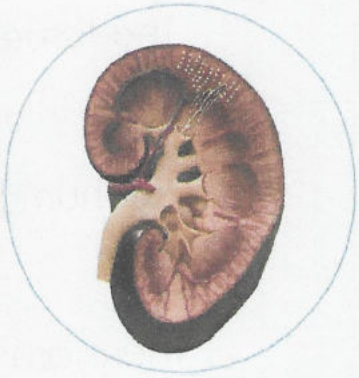
C Name the following figures.



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.....



.....

D Read the following passage. Then fill in the charts.

The digestive system is composed of the mouth, esophagus, stomach, small intestine, large intestine, and anus. The respiratory system is composed of the nose, pharynx, larynx, trachea, bronchi, and lungs.

The Digestive System Organs

The Respiratory System Organs

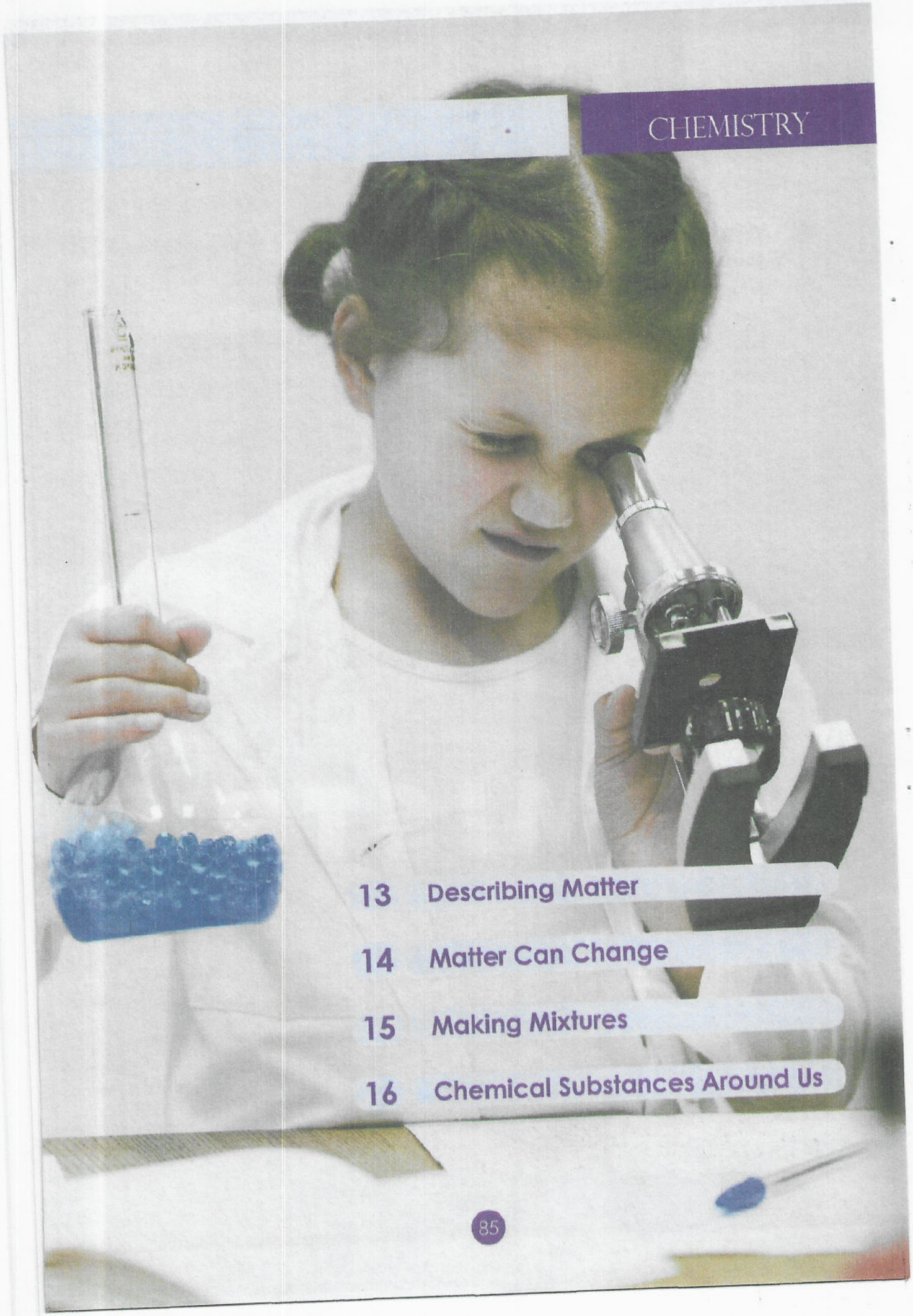


WORLD'S KEY

UNIT 4

CHEMISTRY

CHEMISTRY



13 Describing Matter

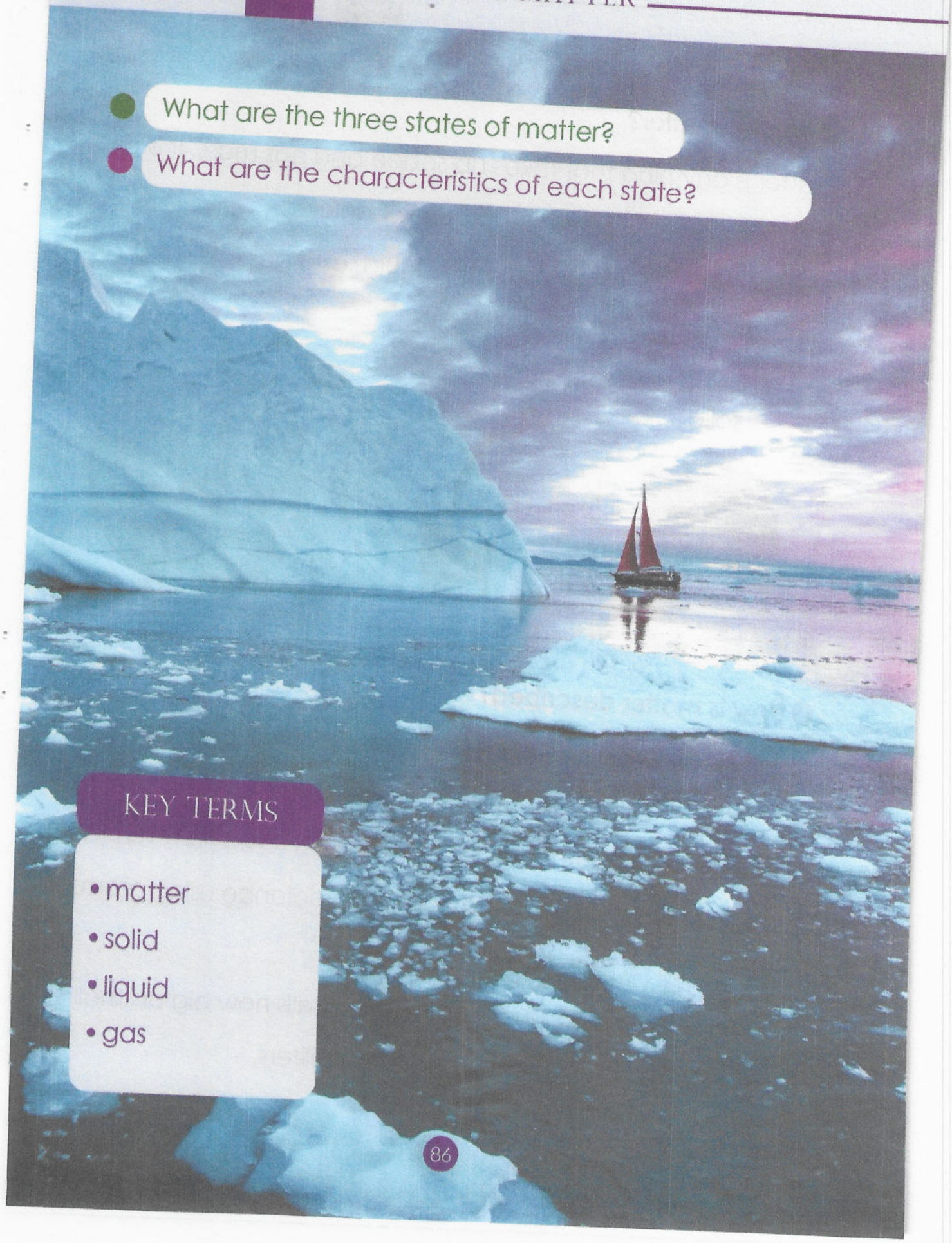
14 Matter Can Change

15 Making Mixtures

16 Chemical Substances Around Us

LESSON 13 DESCRIBING MATTER

- What are the three states of matter?
- What are the characteristics of each state?



KEY TERMS

- matter
- solid
- liquid
- gas

What is matter?

Matter is anything that takes up space and has mass. It is all around us. Matter is made up of tiny particles.

Matter exists in three states, solid, liquid, and gas.



How is matter described?

Matter is described with respect to its properties, like color, texture, mass, and volume.

Mass is the amount of matter in an object. It tells how heavy or light an object is. It is measured by a balance using grams or kilograms as mass units.

Volume is the space an object takes. It tells how big or small an object is. It is measured in liters or milliliters.



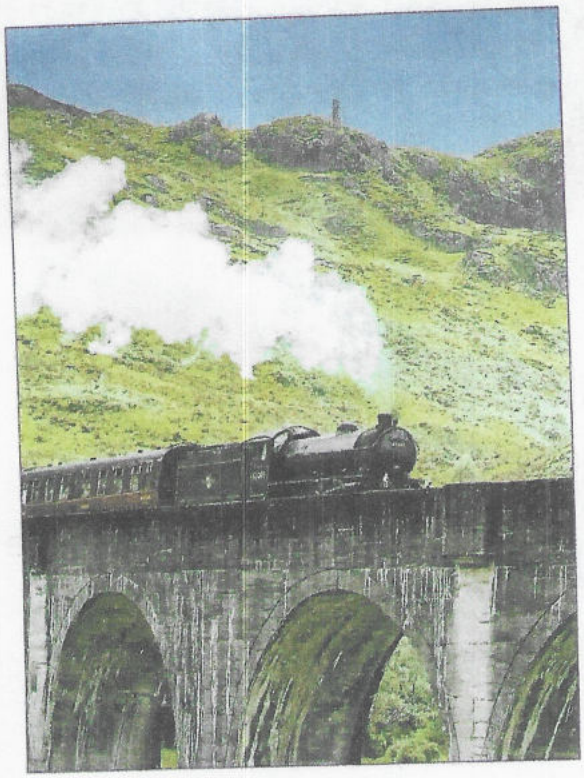
What is solid?

Solid is a form of matter with a definite volume and shape. Every solid has a definite shape because the particles in a solid are too close and do not have enough space to move around. Solids also have different textures. For example, wood and rocks are hard solids, while clay and dough are soft solids.



What is liquid?

Liquid is a form of matter with a definite volume and an indefinite shape. A liquid takes the shape of its container. If you pour water from a bottle into a glass, the water flows and takes the shape of the glass.



What is gas?

Gas is a form of matter that has neither a definite shape nor a definite volume of its own.

Gas spreads in all directions to fill the available space.

A Write true or false. Then correct the false statements.

Matter is what things are made up of.

Solids and liquids are the only forms of matter.

Matter is anything that takes up space and has mass.

Seawater is solid.

Air is a gas.

B Match.

liquid	has a definite shape
gas	takes the shape of the container
solid	fills the available space

C Classify the following things under the correct heading.

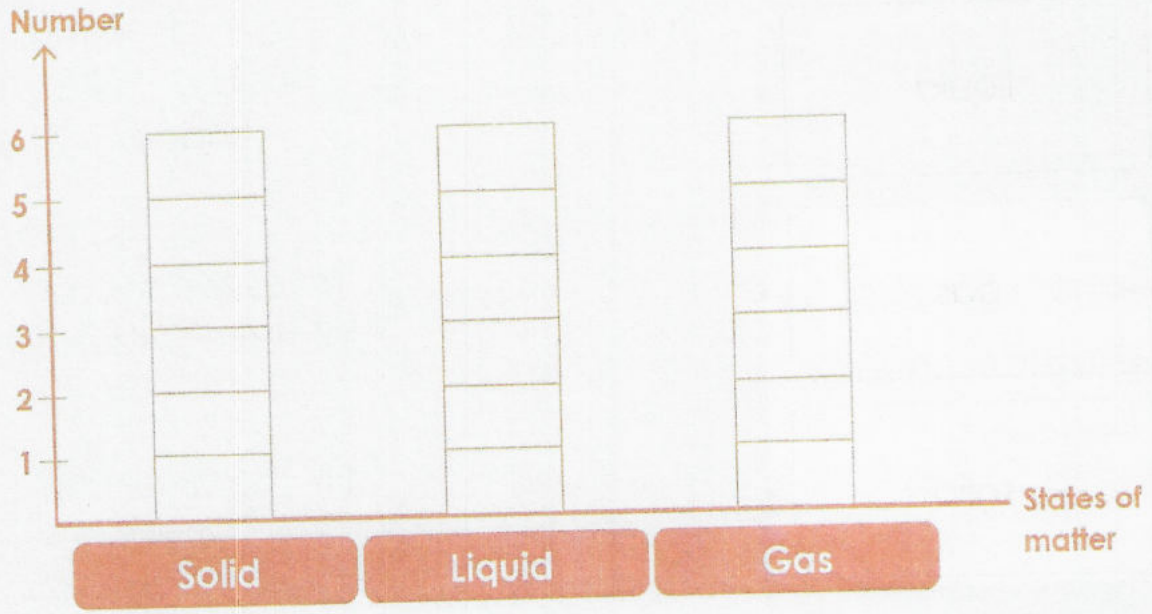
oil - table - air - chocolate bar - marble
orange juice - seawater - pencil - oxygen

Solids	Liquids	Gases

D Bar Graph

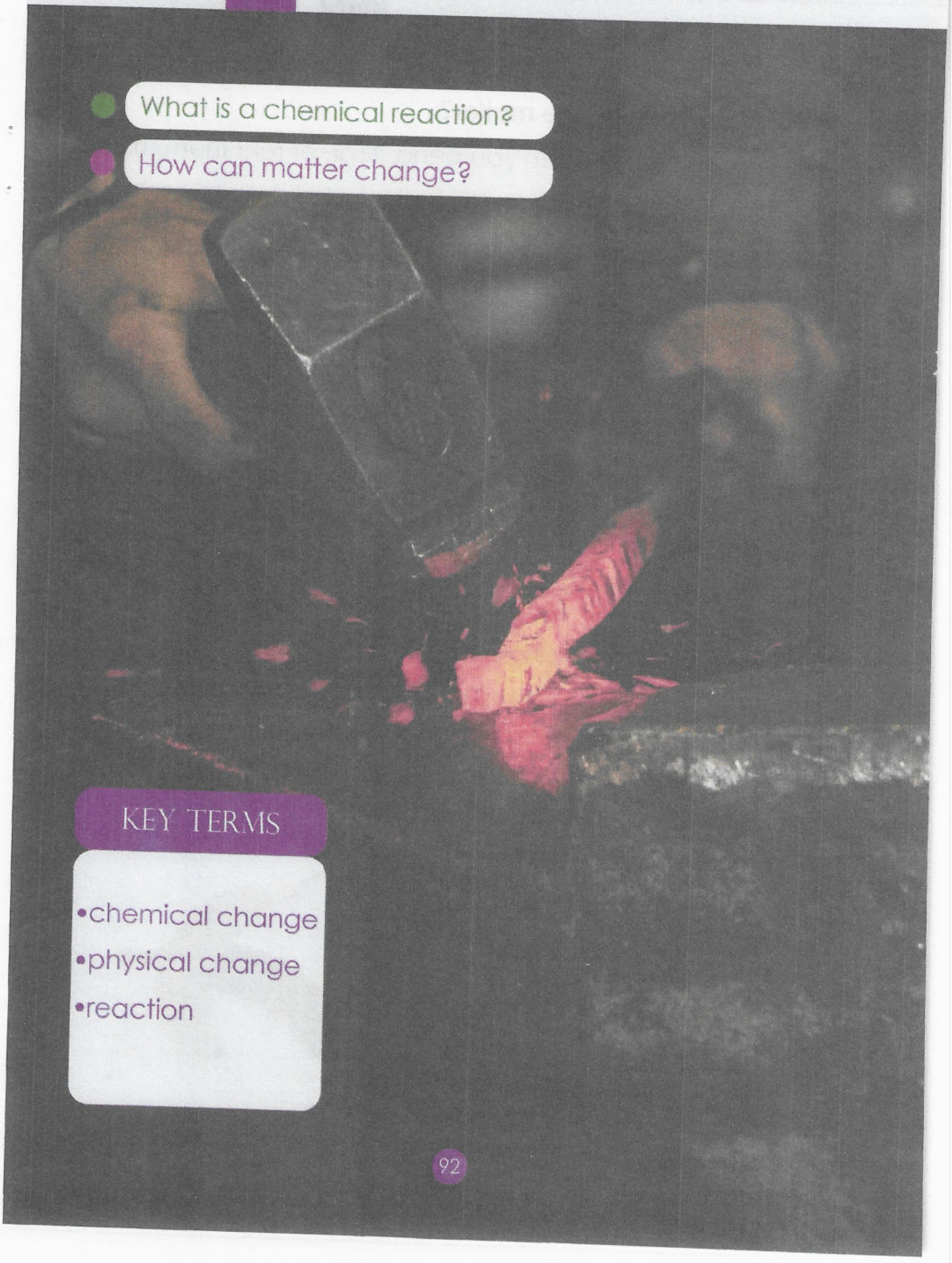
Fadi has three apples, two bananas, two bottles of water, one bottle of milk, and four helium balloons.

Classify the states of matter in the bar graph given below.



LESSON 14 MATTER CAN CHANGE

- What is a chemical reaction?
- How can matter change?

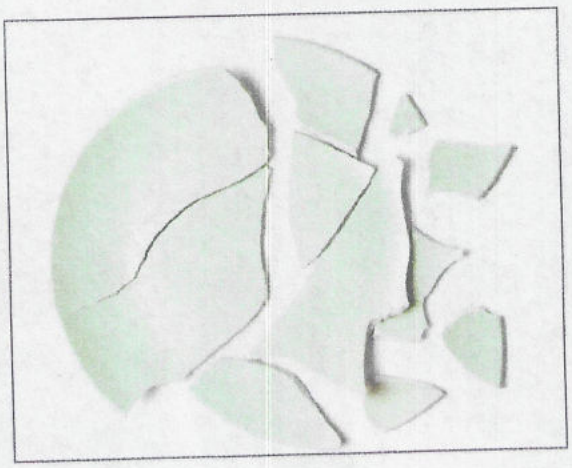


KEY TERMS

- chemical change
- physical change
- reaction

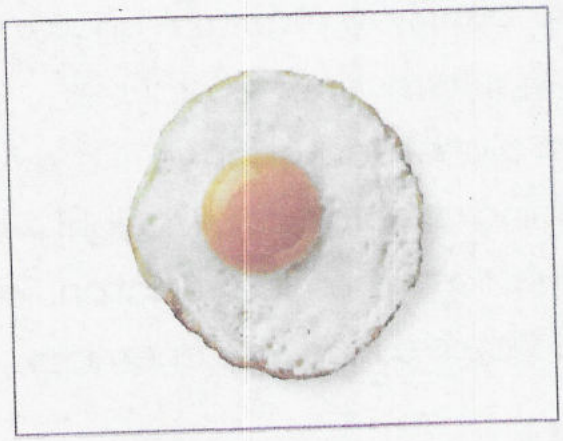
How can you change matter?

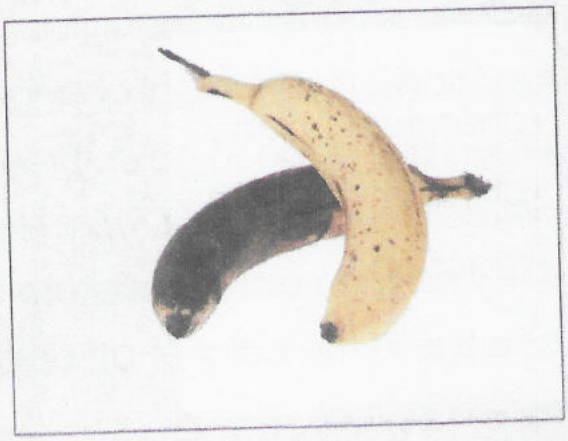
Solids look different when you bend, tear, or fold them. These changes are physical changes that can be determined without changing the identity of matter.





However, you can change matter into something else with different properties. When you fry an egg, it smells and looks different. This is a chemical change that causes a change in the identity of matter. The ripening of bananas is a chemical change, too.







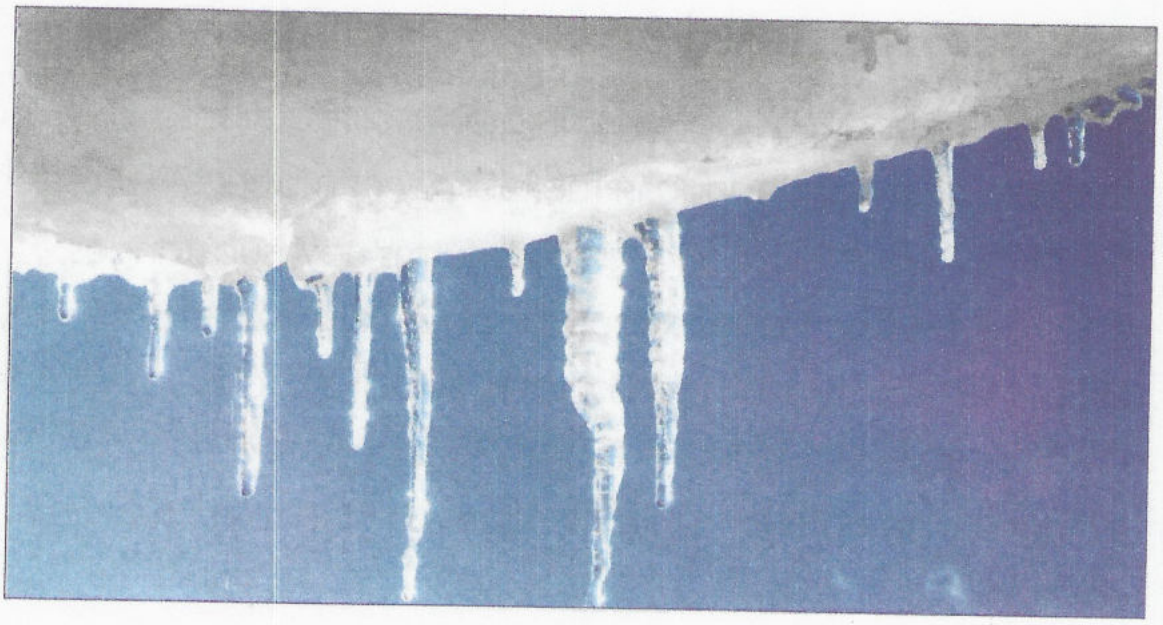
What is a chemical reaction?

We are surrounded by millions of chemical reactions. Chemical reactions cause a change in the identity of matter. A chemical reaction is a chemical change that forms new substances. When a substance goes through a chemical change, it is very difficult to get it back. Upon burning a matchstick, the light we see and the heat we feel are clues to a chemical reaction. The change in the color of an apple slice is a clue to a chemical reaction, too.



What is a physical change?

Matter can change in different ways. You can change its shape, design, or size. When you break a concrete block, it looks different, but it is still concrete. This change is a physical change. Even the state of matter that changes because of temperature is a physical change, like the freezing of water.



A Write true or false. Then correct the false statements.

The freezing of water is a chemical change.

Chemical reactions cause a change in the identity of matter.

When a substance goes through a chemical reaction, it is so easy to get it back.

A change in the state of matter is a physical change.

Matter can change only in one way.

B List two differences between a chemical change and a physical change.

Chemical Change	Physical Change
1.	1.
2.	2.

C Classify the following changes under the correct heading.

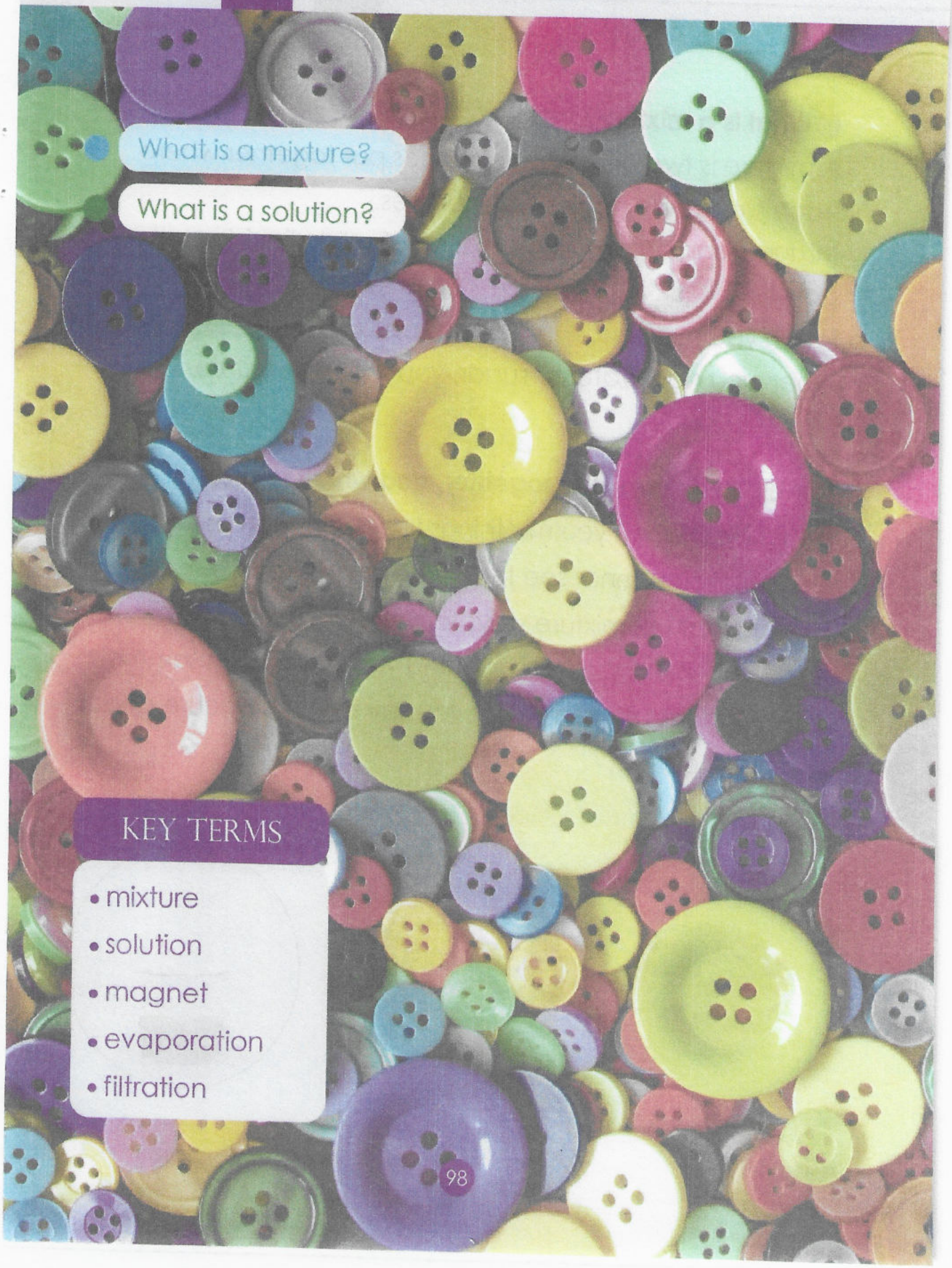
bending a rubber band - frying eggs - freezing water - changing the leaves' color

Chemical Change	Physical Change
.....	.....
.....	.....

D Follow the example to fill in the chart.

Example	Change	Clue
burning a matchstick	chemical	release of heat
breaking a pencil		
forming a clay statue		
rotting of a banana		

LESSON 15 MAKING MIXTURES



What is a mixture?

What is a solution?

KEY TERMS

- mixture
- solution
- magnet
- evaporation
- filtration

What is a mixture?

A mixture is two or more substances put together where each substance retains its properties.

Mixtures can be any combination of solids, liquids, and gases.

When you put pencils in a pencil case, you make a mixture.

When you add water to sugar, you make a mixture.

Which mixtures stay together, and which do not?

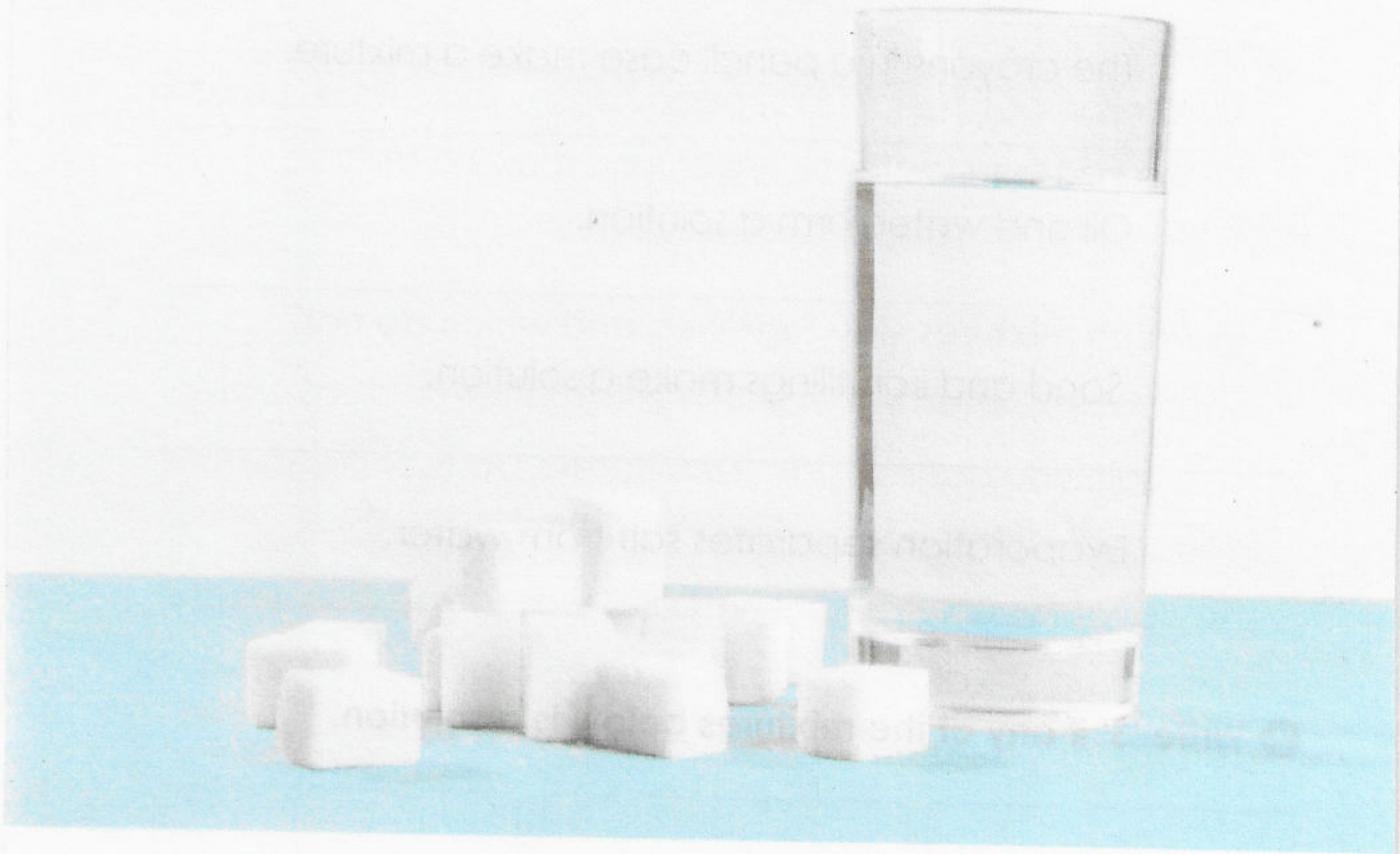
Sometimes, when you mix things together, such as water and salt, you cannot see the different parts of the mixture; you say that this mixture stays together.

However, when you mix sand and water, you can see the different parts of the mixture; you say that this mixture does not stay together.









What is a solution?

A solution is a mixture where a substance is dissolved in another substance. Sugar and water make a solution. The sugar dissolves completely in water.

Sand and water do not make a solution, as the sand does not dissolve in water.

A Write true or false. Then correct the false statements.

A mixture is two or more substances put together.

The crayons in a pencil case make a mixture.

Oil and water form a solution.

Sand and iron filings make a solution.

Evaporation separates salt from water.

B Write 'S' if any of the mixtures below is a solution.

tea	salt + water	sand + water
milk + cereals	fruit salad	sugar + water

C Match each mixture to its separation technique.

salt + water	•	• magnet
sand + water	•	• evaporation
sand + iron filings	•	• filtration

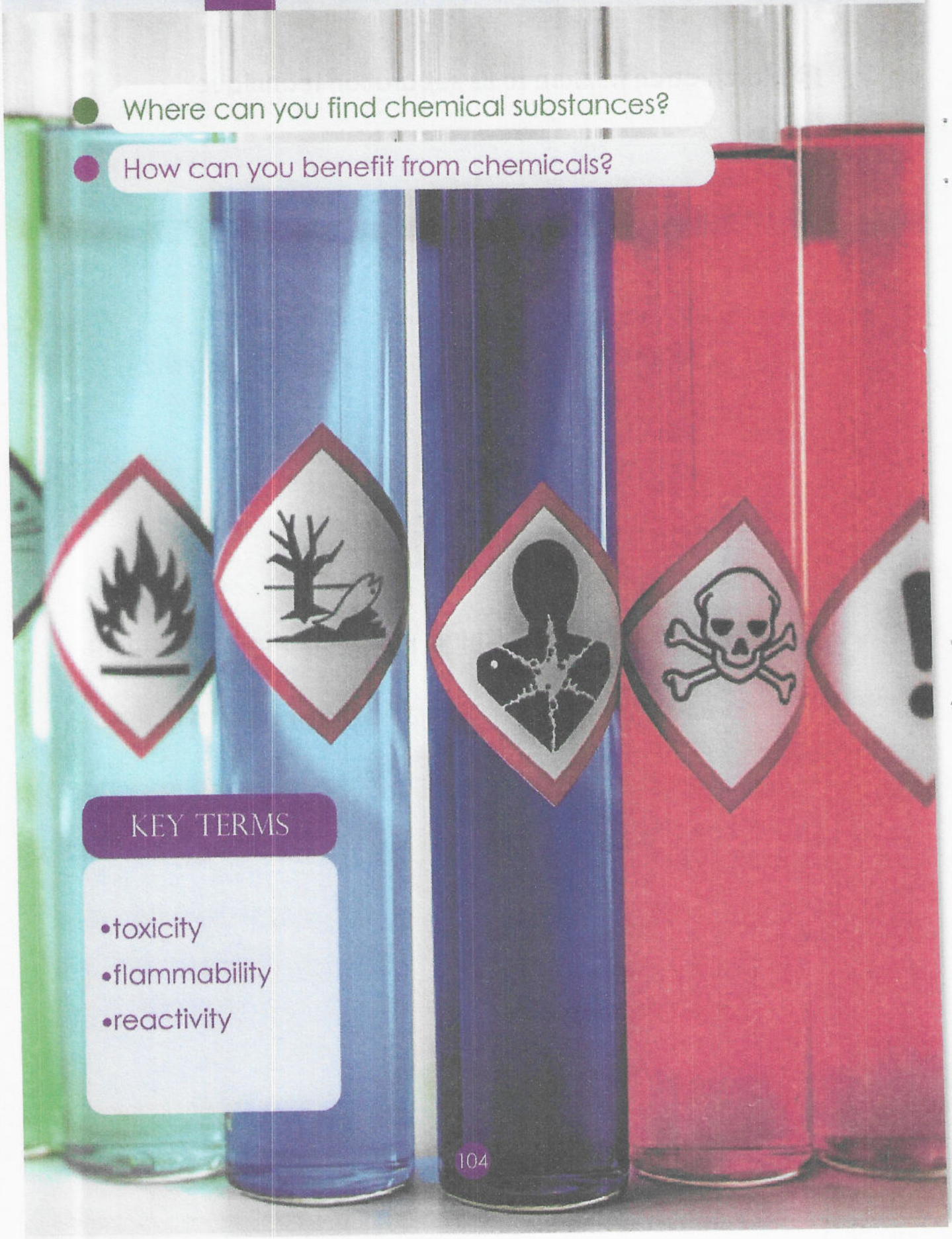
D Classify the following mixtures under the correct heading.

stone and sand - sugar and water - marbles and rice - salt and water - chalk and rubber - alcohol and water

Not a Solution	Solution
.....	.....
.....	.....
.....	.....

LESSON 16 CHEMICAL SUBSTANCES AROUND US

- Where can you find chemical substances?
- How can you benefit from chemicals?



KEY TERMS

- toxicity
- flammability
- reactivity

What is a chemical substance?

A chemical substance is any material with a known chemical composition. Typical chemical substances found in the house include salt, sugar, and vinegar. Chemical substances exist as solids, liquids, or gases.

What are some properties of chemical substances?

- Toxicity is the degree to which a substance is harmful to humans, animals, and plants.
- Flammability is the ability of a substance to burn or catch fire. Some chemical substances can burn easily, like alcohol.
- Reactivity is the ability of a substance to combine chemically with other substances. You should never mix chemical substances because they may react and produce harmful substances.

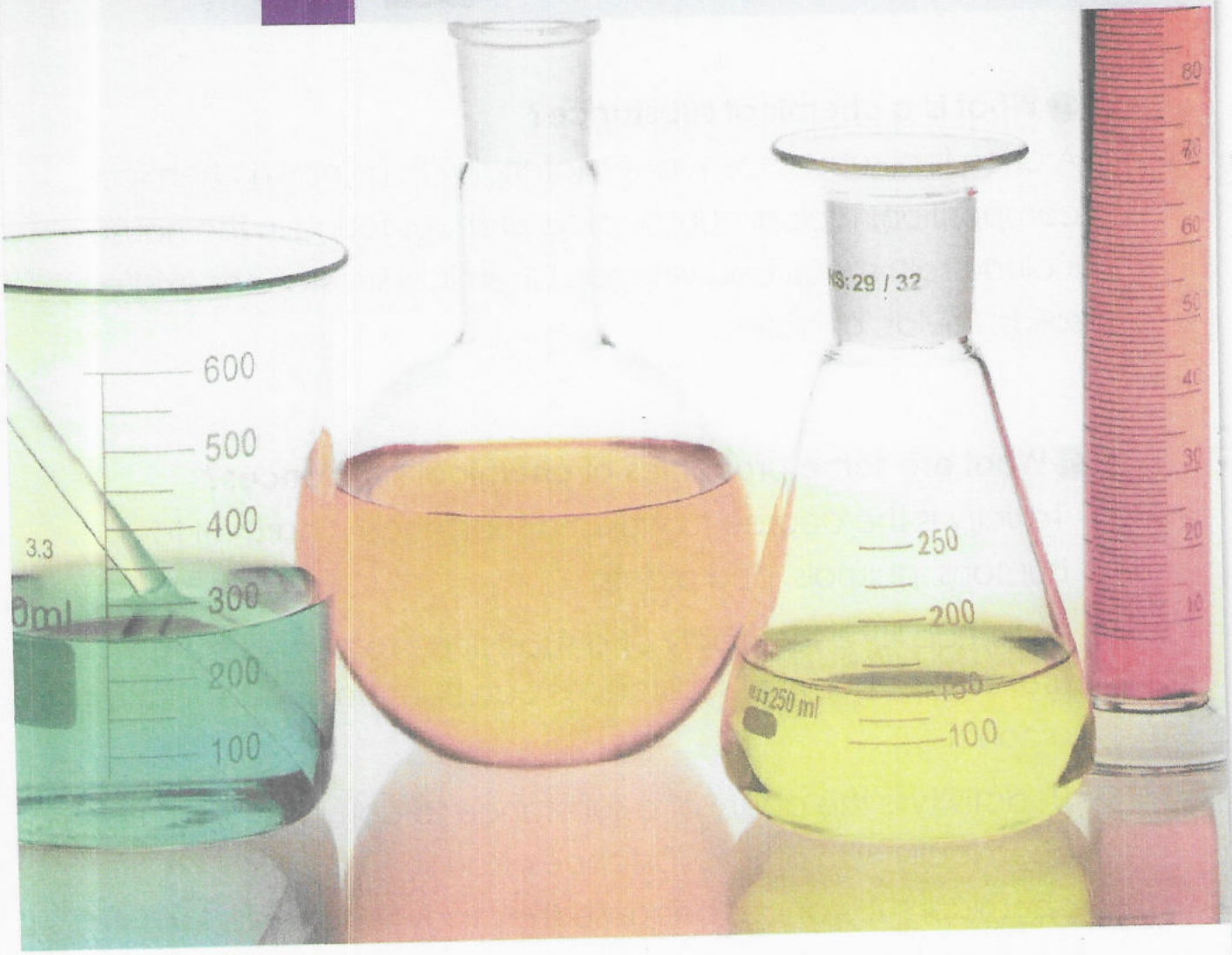
For example, mixing bleach with vinegar produces chlorine gas, a toxic gas that should never be inhaled.







LESSON 16 CHEMICAL SUBSTANCES AROUND US



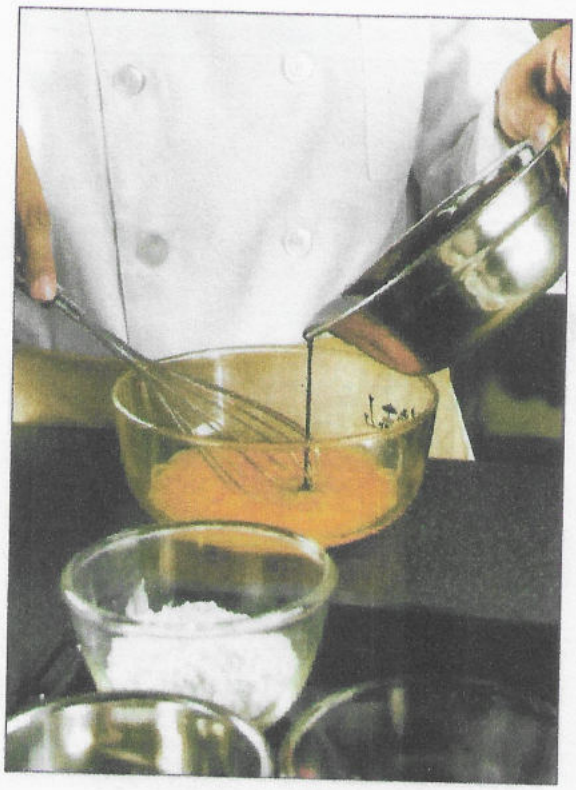
Where can you find chemical substances?

Chemical substances are everywhere. All types of chemical substances surround us. For example, cleaning detergents, drugs, food, and toothpaste contain chemical substances.

What are the uses of chemical substances?

We use chemical substances in our daily life. Detergents are used to remove dirt. Even in cooking, many chemical substances, such as salt and baking powder, are used.

Chemical substances are essential because we use them in our everyday chores, from the food we eat to the clothes we wash.





A Write true or false. Then correct the false statements.

Alcohols burn easily.

All chemical substances are solid.

Drugs are chemical substances.

It is safe to mix any two chemical substances.

Chlorine is a non-toxic gas.

B Match the property to its definition.

toxicity	•	• the ability of a substance to combine with other substances
reactivity	•	• the degree to which a substance is harmful
flammability	•	• the ability of a substance to burn or catch fire

Collecting Data

Observe the kitchen at your home, and find five things that contain chemical substances. Write their names and fill in the chart.

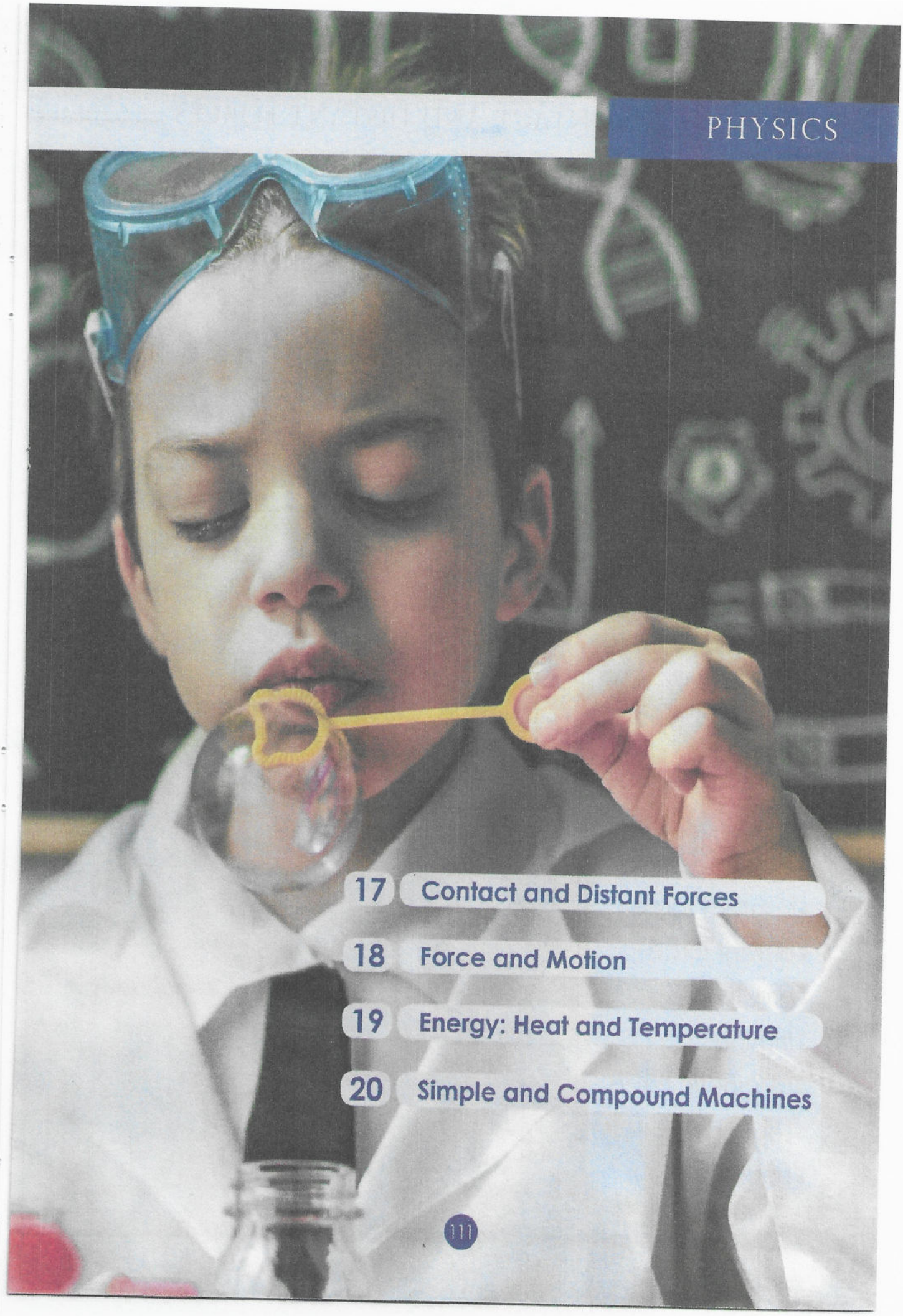
Name	Usage	Property



WORLD'S KEY

UNIT 5

PHYSICS



17 Contact and Distant Forces

18 Force and Motion

19 Energy: Heat and Temperature

20 Simple and Compound Machines

LESSON 17 CONTACT AND DISTANT FORCES



- What is a force?
- What is a contact force?
- What is a distant force?

KEY TERMS

- contact force
- distant force
- gravity
- friction
- magnetic force
- south pole
- north pole



What is a force?

Most things cannot move on their own. They need a force to do so.

Force is the push or pull to make things move.

A push is a force that moves an object away.

A pull is a force that moves an object toward you.

Forces can be classified as contact and distant forces.

What is a contact force?



A contact force is a force that exerts its effect upon direct contact with an object.

Kicking a ball and pulling a rope are examples of contact forces.



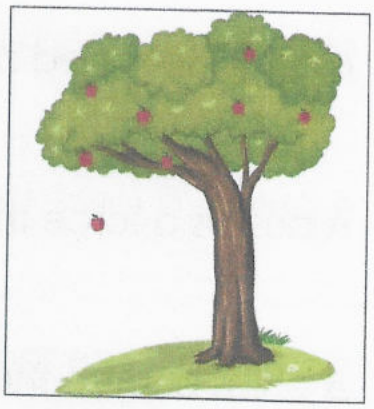
Friction is also a contact force that slows objects down. When two surfaces rub together, we get friction.

Friction makes you stop when you drag your feet against the ice when skiing or playing ice hockey.

What is a distant force?

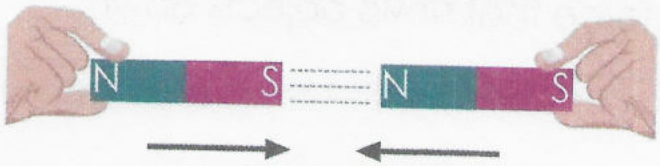
A distant force is a force that exerts its effect through a distance.

Magnetic force and gravity are distant forces.



A magnet has two poles: a south pole and a north pole. Magnets can exert pull or push forces on each other.

The north pole pulls the south pole toward it.



Two north poles or two south poles push away from each other.





Magnets can also pull iron and nickel toward them.

A Write true or false. Then correct the false statements.

Most things need a force to move.

A push is a force that moves an object toward you.

A pull is a force that moves an object away.

A contact force is a force that exerts its effect upon direct contact with an object.

Friction is a force that slows objects down.

B Match.

friction	makes things move away
pull	makes things move toward you
push	slows things down

C Observe the following magnets. Then choose the correct answer.





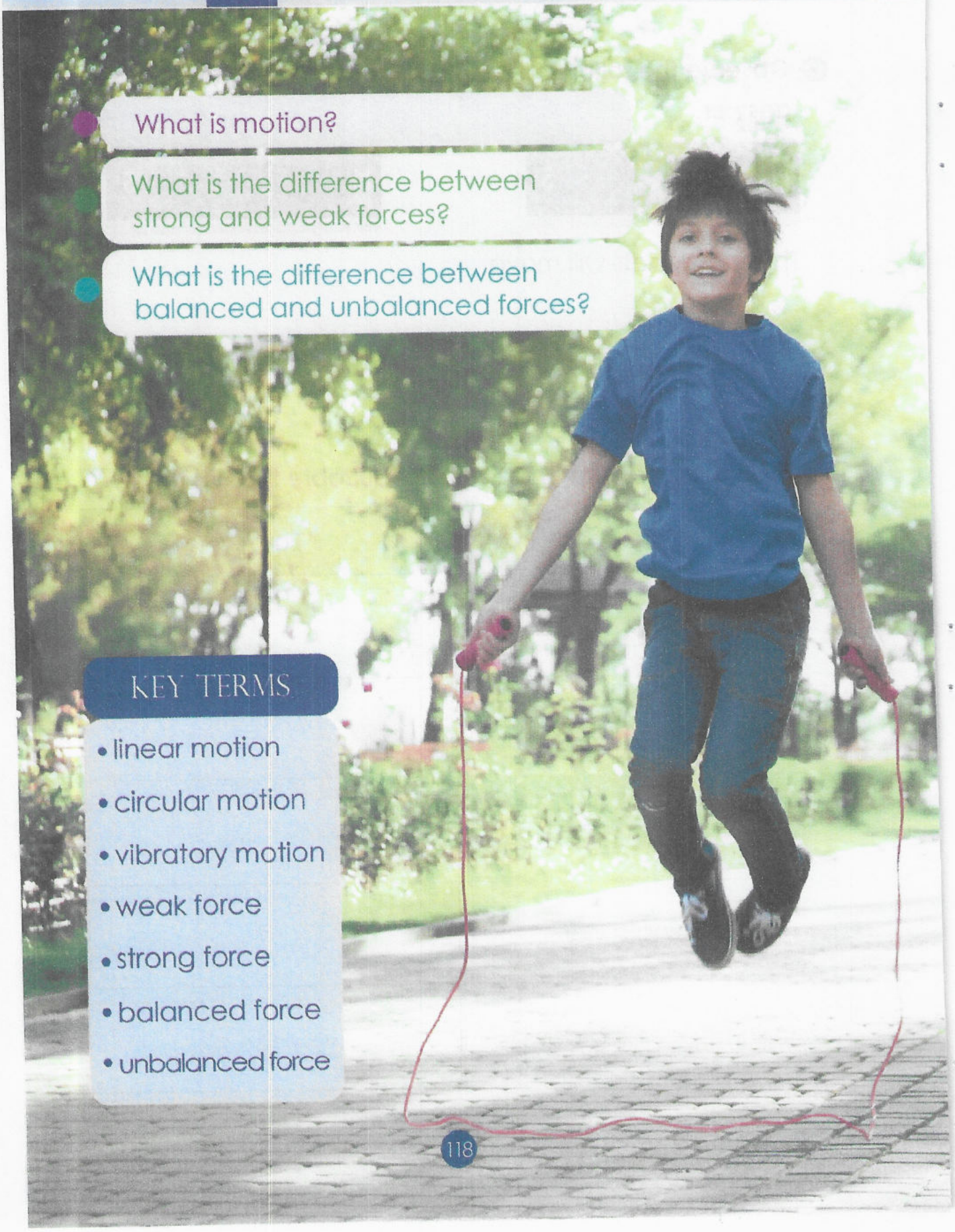
These magnets will move ..... .

○ toward each other ○ away from each other

D Fill in the following chart with the suitable type of force.

Situation	Force
an apple falling down from a tree	
skating on the ice	
pulling a rope	
pushing a car	
raindrops falling down	

LESSON 18 FORCE AND MOTION



- What is motion?
- What is the difference between strong and weak forces?
- What is the difference between balanced and unbalanced forces?

KEY TERMS

- linear motion
- circular motion
- vibratory motion
- weak force
- strong force
- balanced force
- unbalanced force

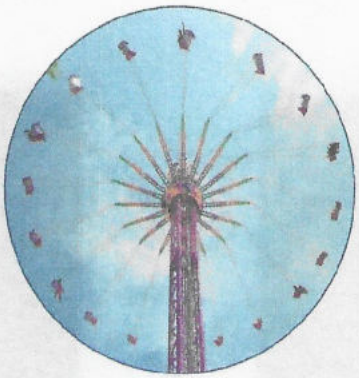
What is motion?

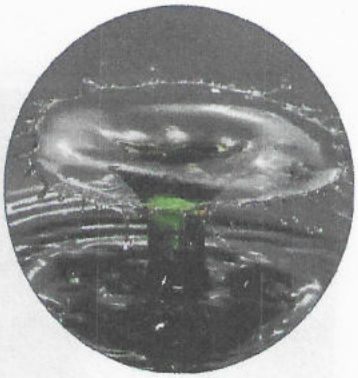
Motion is a change in an object's position. Objects move when their position changes.

Objects move in different ways:

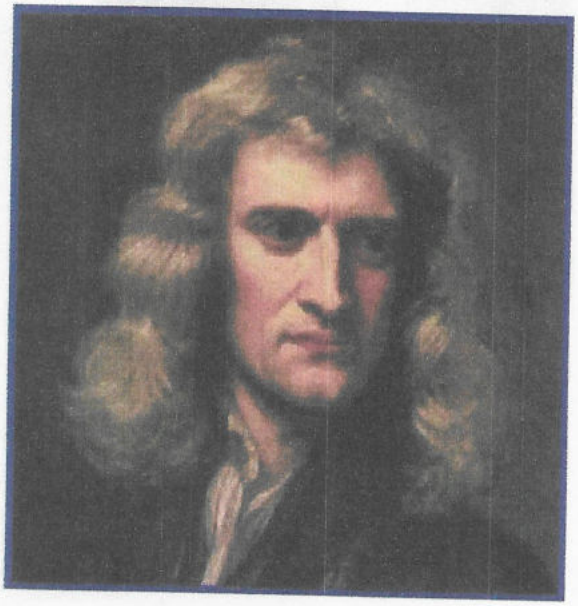
- Linear motion
- Circular motion
- Vibratory motion







- The English scientist Isaac Newton came up with three laws that describe motion. In one of his laws, Newton showed that a strong force makes an object move faster than a weak force acting on the same object.

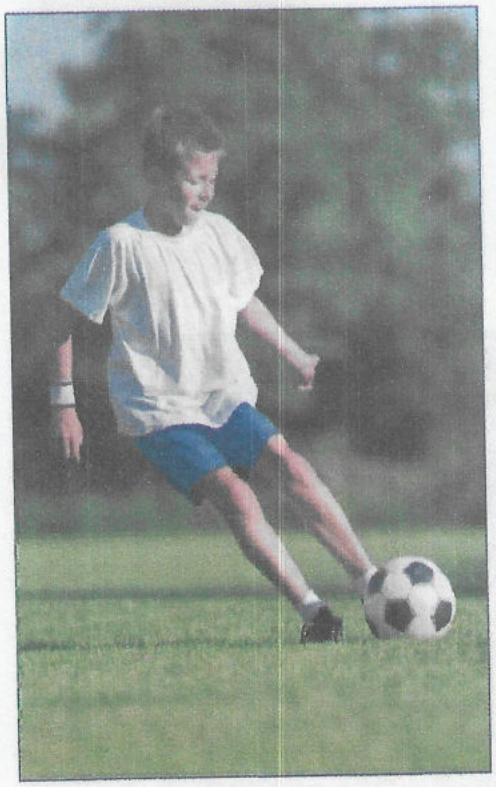


● What is the difference between strong and weak forces?

Objects cannot move on their own. They need a force that might cause them to move.

A force can be either weak or strong.

A weak force might cause a ball to move slowly, but a strong force might cause the same ball to move faster.





- **What is the difference between balanced and unbalanced forces?**

In a tug of war game, balanced forces keep the rope in the same position.



If a team wants to win, it must exert a bigger pull force than the other team. In this case, we say that the forces are unbalanced.



A Write true or false. Then correct the false statements.

Motion is a change in an object's position.

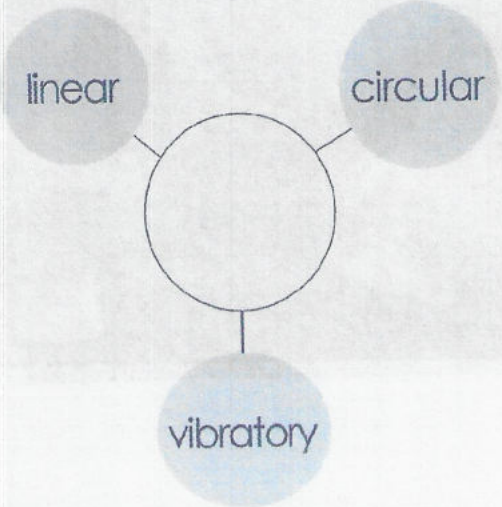
Objects move in a linear way only.

Objects move on their own.

Strong forces make an object move fast.

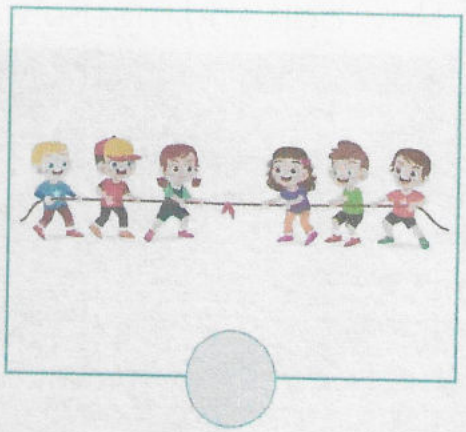
In a tug of war game, balanced forces keep the rope in the same position.

B Write the clue word that matches the word web below.



C Tick (√) the picture that shows a balanced force.





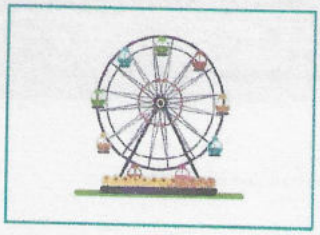
D Match each picture to the correct way of motion.

vibratory motion

linear motion

circular motion

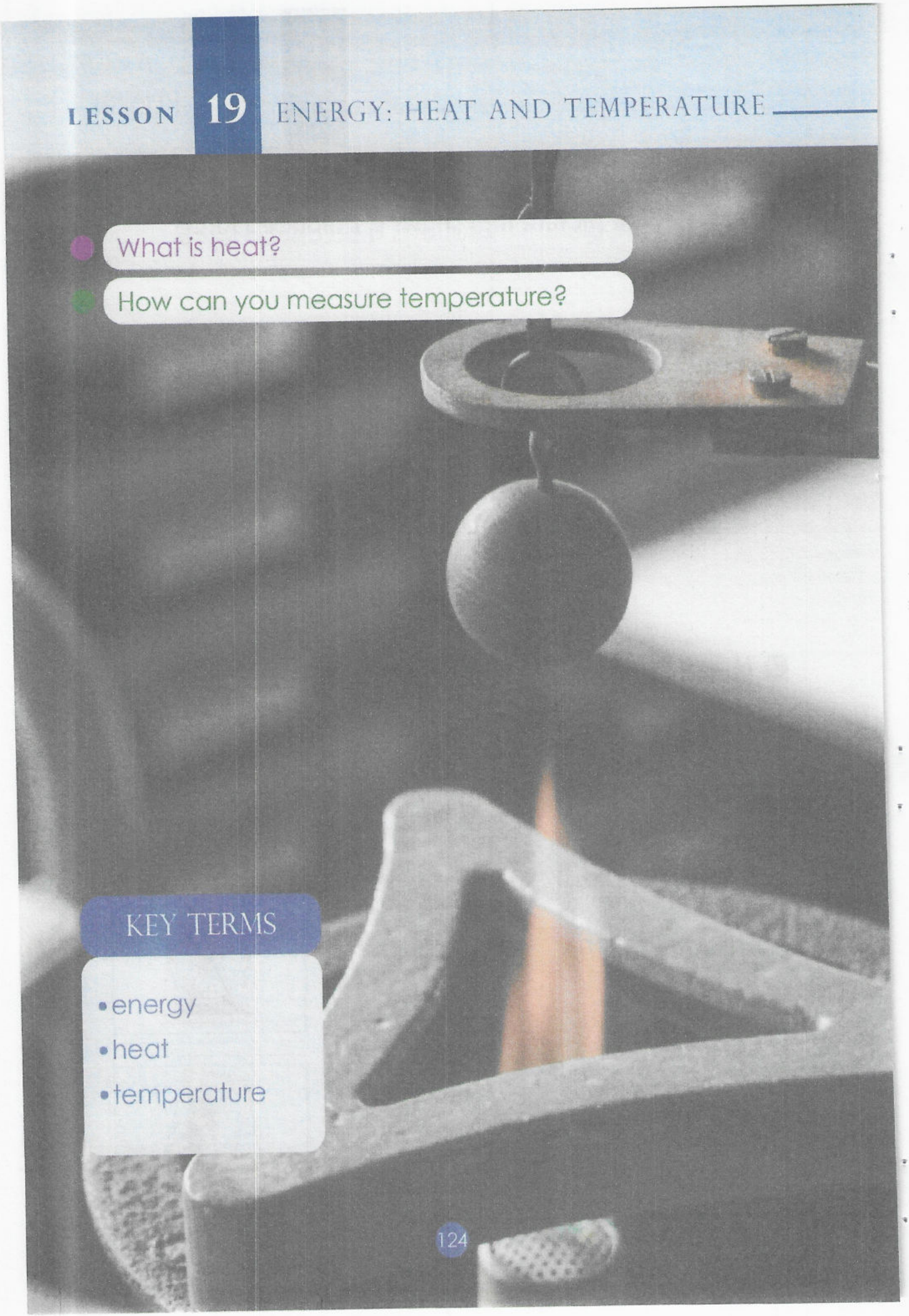






LESSON 19 ENERGY: HEAT AND TEMPERATURE

- What is heat?
- How can you measure temperature?



KEY TERMS

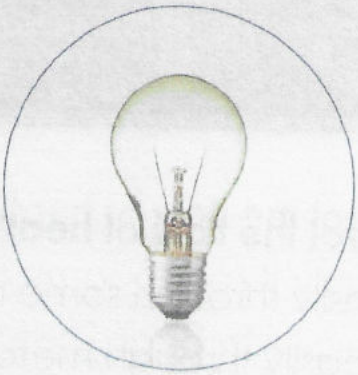
- energy
- heat
- temperature

What is heat?

If you touch a hot object, your hand gets warm. Thus, heat moves from the hot object to your hand. Heat is the flow of energy between objects. Heat travels through solids, liquids, and gases.

What are the sources of heat?

The Sun is Earth's main source of heat. Without the Sun, it is impossible for living things to survive on Earth.
Fire, light bulbs, and stoves are some other sources of heat.

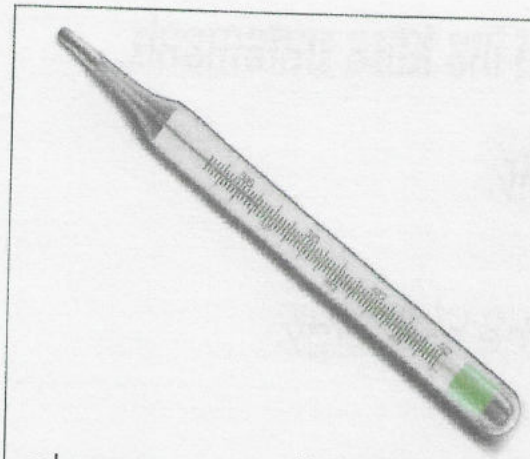






How can you control the flow of heat?

Heat moves more easily through some materials than others. It can move easily through metals. That is why we cannot touch a hot metallic spoon.

On the contrary, heat does not move through other materials, such as wood.



glass mercury thermometer

Temperature is measured by thermometers.
Thermometers are of different types. They can be glass mercury thermometers, digital thermometers, or plastic strip thermometers.

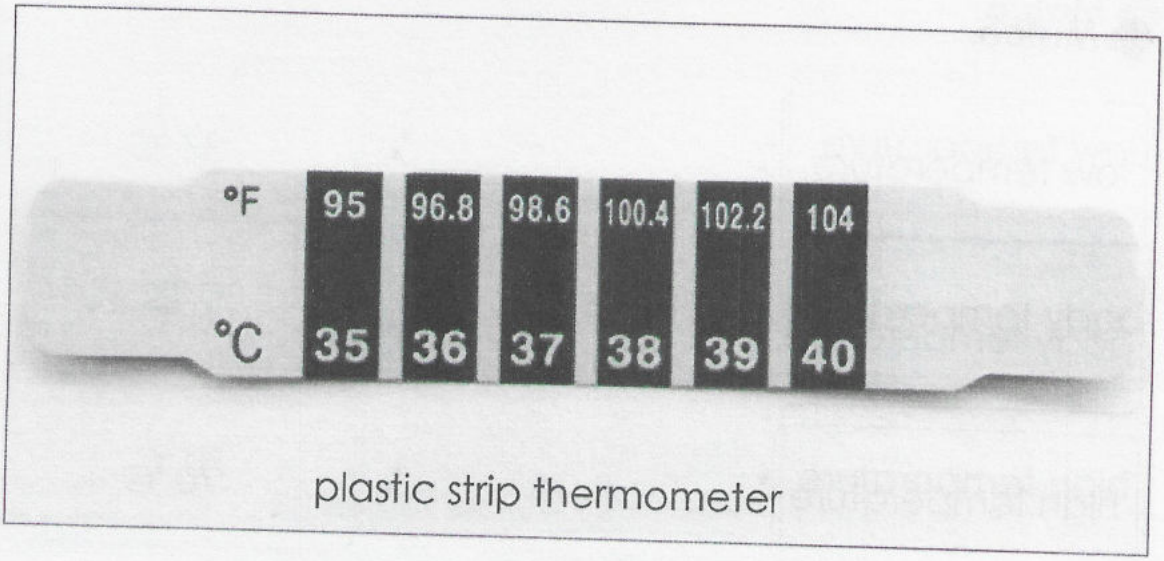
The three temperature scales used worldwide are:

- Kelvin (K)
- Celsius (°C)
- Fahrenheit (°F)



digital thermometer

The normal body temperature is 37 °C.



plastic strip thermometer

A Write true or false. Then correct the false statements.

Heat is the flow of energy.

The Sun is the main source of energy.

Heat moves easily through metals.

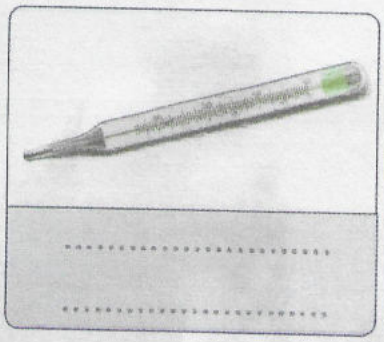
The normal body temperature is about 50 °C.

Temperature can be measured by a digital thermometer only.

B Match.

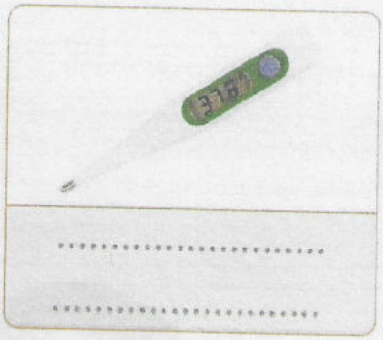
low temperature	•	• 37 °C
body temperature	•	• 0 °C
high temperature	•	• 70 °C

C Name the following thermometers.



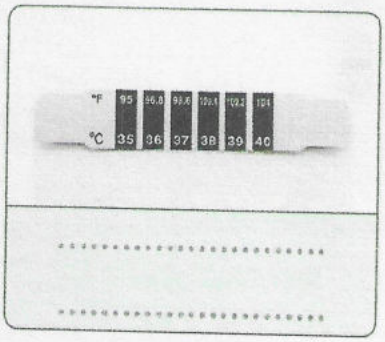
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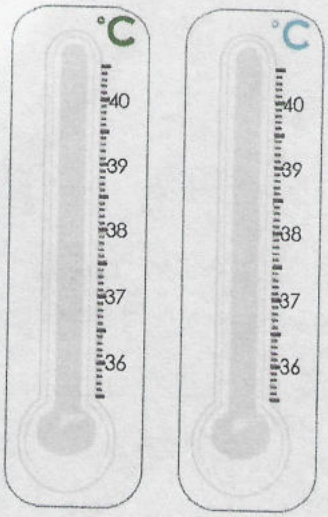
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D Analyze

Two girls are sick and have a fever.
Sarah's body temperature is **38 °C.**
Reem's body temperature is **40 °C.**

1. Color the following thermometers according to the girls' body temperature.



Sarah Reem

2. Mark the right statement.

- ◯ Reem has a higher body temperature.
- ◯ Sarah has a higher body temperature.
- ◯ Sarah and Reem have the same body temperature.

LESSON 20 SIMPLE AND COMPOUND MACHINES

- What is a machine?
- What are some types of machines?



KEY TERMS

- machines
- lever
- pulley
- inclined plane
- wedge
- screw
- axle
- wheelbarrow
- scissors
- fishing rod

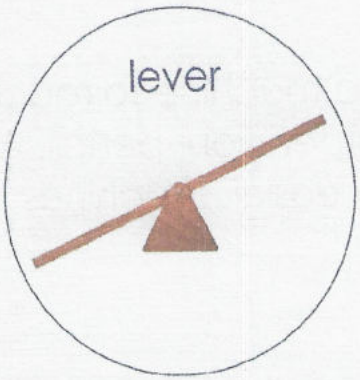
What is a machine?

You use machines every day. You use a machine to reach your school. You use a machine to sharpen your pencil. A machine is something that makes work easier. Machines can be simple or compound.

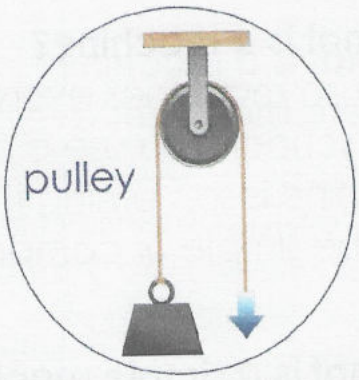
What is a simple machine?

A simple machine is a machine with one or a few moving parts. There are six types of simple machines: the lever, the pulley, the axle, the inclined plane, the screw, and the wedge.

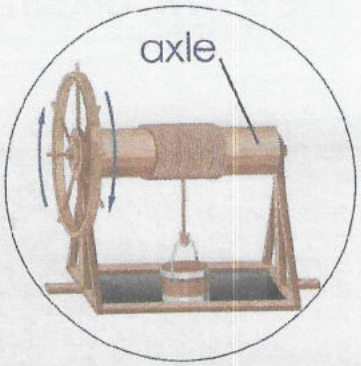




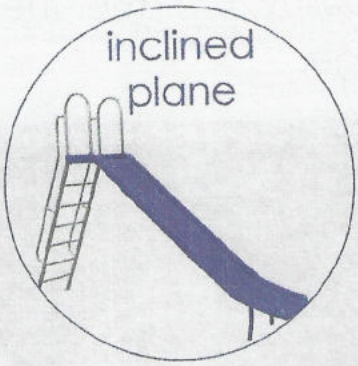
A lever is used to lift a heavy material sideways.



A pulley is used to lift a heavy material upward.



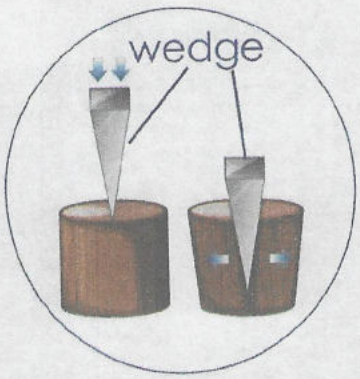
A wheel and axle are used to move a bicycle faster.



An inclined plane is used to slide on.



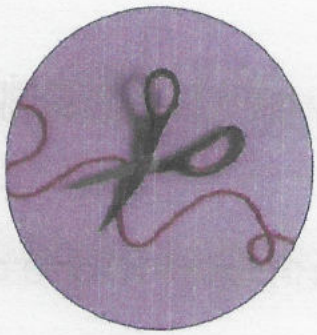
A screw is used to hold things together.



A wedge is used to split a piece of wood into two parts.

What is a compound machine?

A compound machine is a machine made up of two or more simple machines working together to make work easier.


- A wheelbarrow uses a lever, a wheel, an axle, and an inclined plane to reduce the effort needed to do a job.
- A pair of scissors uses a lever and a wedge to force the wedges (blades) onto something to cut it.
- A fishing rod uses a lever, a pulley, and an axle combined together to catch a fish.

A Write true or false. Then correct the false statements.

A machine makes work easier.

There are five types of simple machines.

A lever is a straight bar machine.

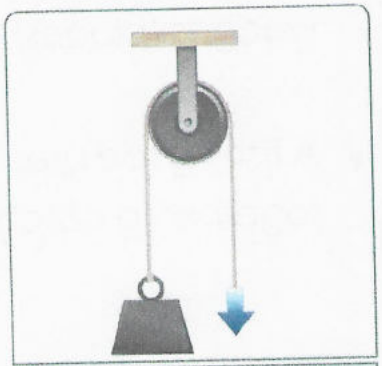
A pulley is made up of a rope and a wheel.

A wedge is used to lift heavy objects upward.

B Name each of the following simple machines.



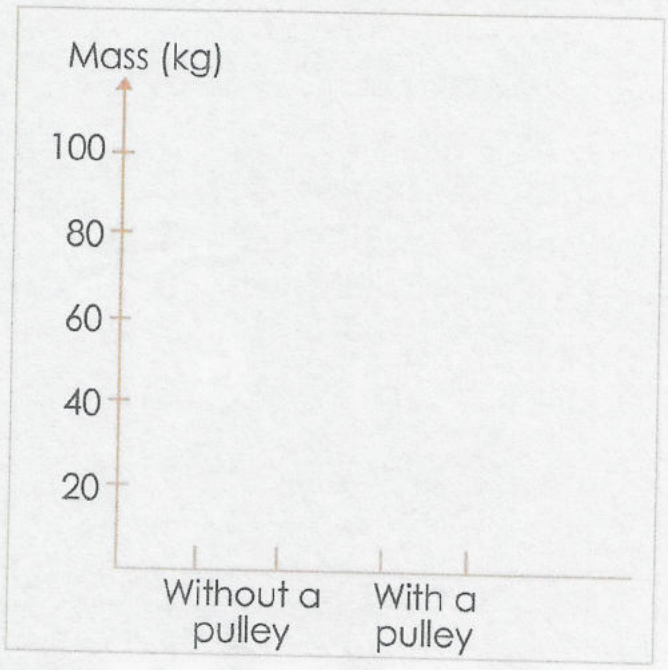




C The Use of a Pulley

Jad can lift a bag that weighs 20 kg. Using the pulley, he is able to lift 60 kg with the same effort.

1. Represent the given data on the bar graph given below.



2. Compare Jad's effort with and without the pulley.

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3. What do you conclude?

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WORLD'S KEY

UNIT 6

EARTH

EARTH

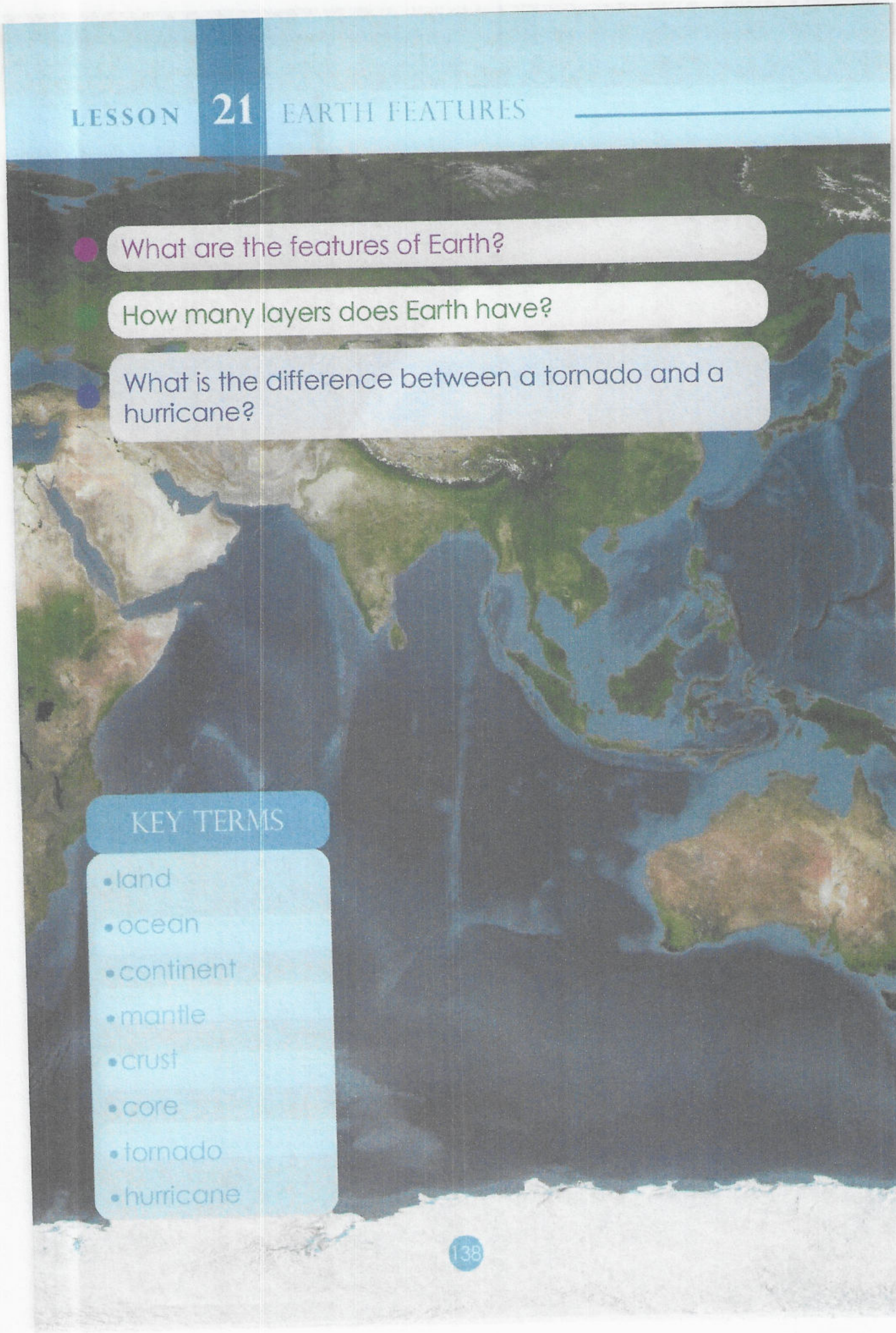


21 Earth Features

22 Earth Events

23 The Ecosystem

24 Main Resources



- What are the features of Earth?
- How many layers does Earth have?
- What is the difference between a tornado and a hurricane?

KEY TERMS

- land
- ocean
- continent
- mantle
- crust
- core
- tornado
- hurricane

Three-fourths of Earth is covered with water. Most of the water areas are oceans. Large bodies of saltwater are called oceans.

What land features are in the oceans?

The land below the ocean is called the ocean floor and has similar features to those of the land, like mountains, valleys, and plains.

Rivers, streams, lakes, and ponds are some water features of Earth.

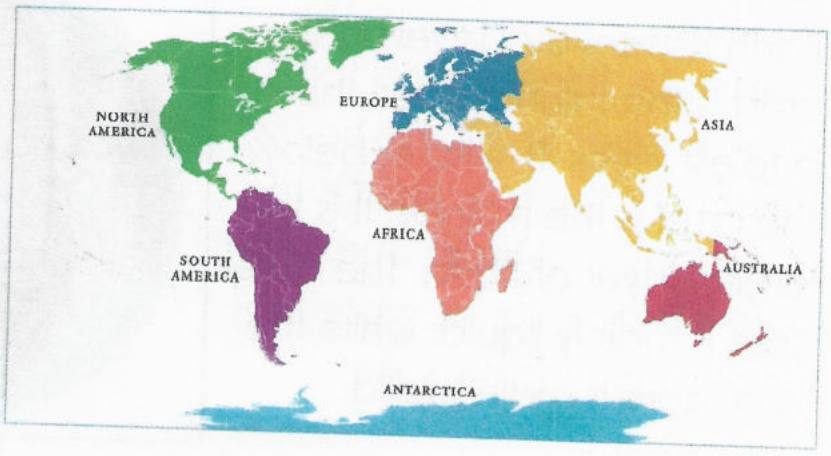


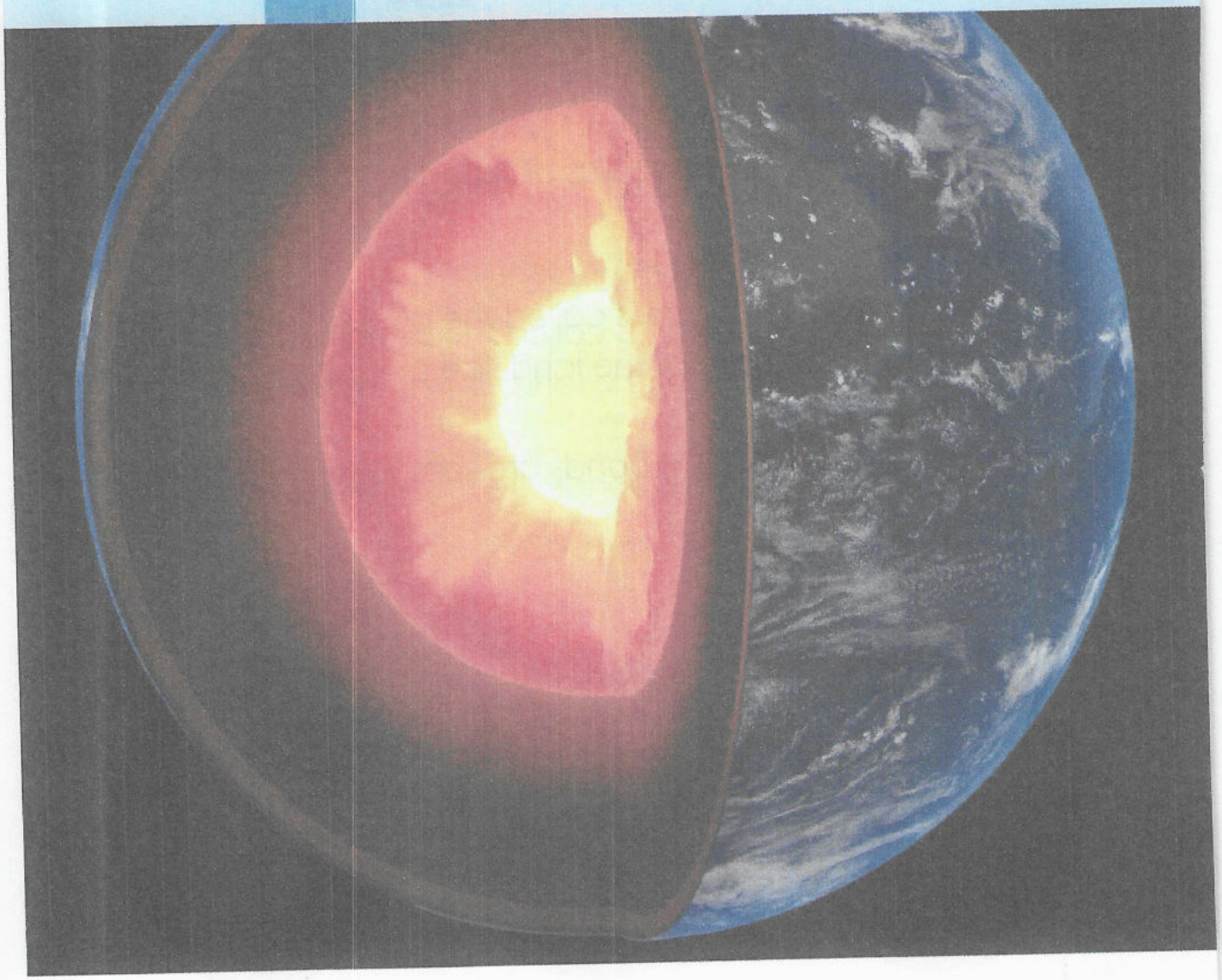




Earth has seven great areas of land called continents.

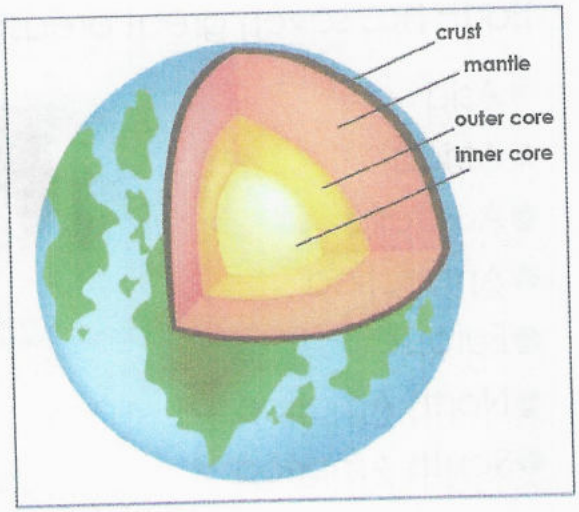
- Asia
- Africa
- Australia
- Antarctica
- Europe
- North America
- South America





What are the layers of Earth?

Earth has several layers. The crust is the thinnest and the coolest layer. The layer below the crust is the mantle. It is the largest layer of Earth. The outer core is mainly liquid, while the inner core is mainly solid.



Other features of Earth are tornadoes and hurricanes. Hurricanes are larger and more devastating. Their origin is a body of water. Tornadoes are smaller than hurricanes, and their origin is on land. Both of them are highly destructive in nature.

What is a tornado?



A tornado is a destructive and violent windstorm. This windstorm is known to occur on land and is seen as a cone-shaped cloud.

What is a hurricane?



A hurricane is formed when the air is warm in the tropics. It starts as a weak storm, called a tropical storm, and then grows stronger by collecting energy from warm ocean water. It travels over the ocean in swirls with a very high speed and power.

A Write true or false. Then correct the false statements.

Half of planet Earth is covered with water.

Oceans are large bodies of freshwater.

Planet Earth has seven continents.

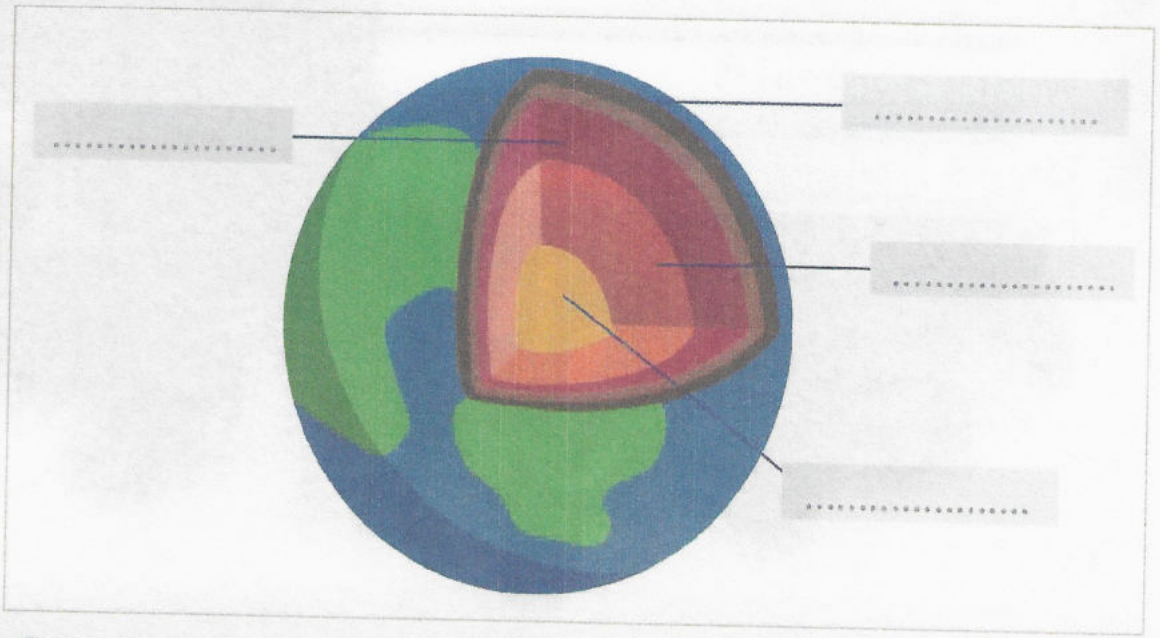
The continents and the oceans are on the crust.

The core is the deepest layer of planet Earth.

B Match.

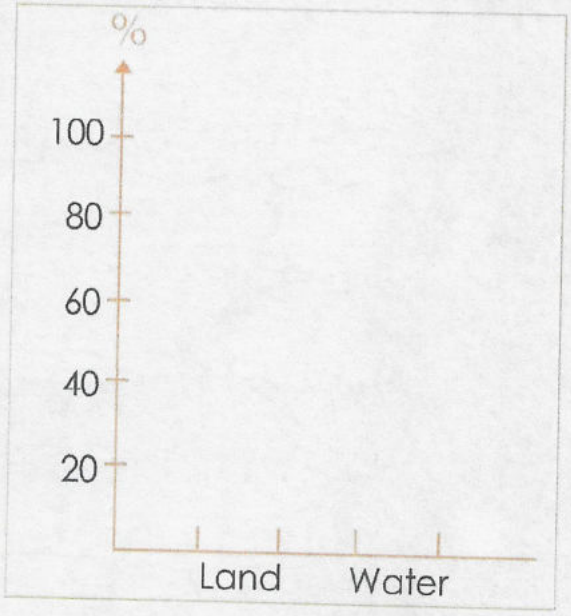
crust •	• largest layer
mantle •	• thinnest and coolest layer
inner core •	• solid core
outer core •	• liquid core

C Label the layers of Earth.

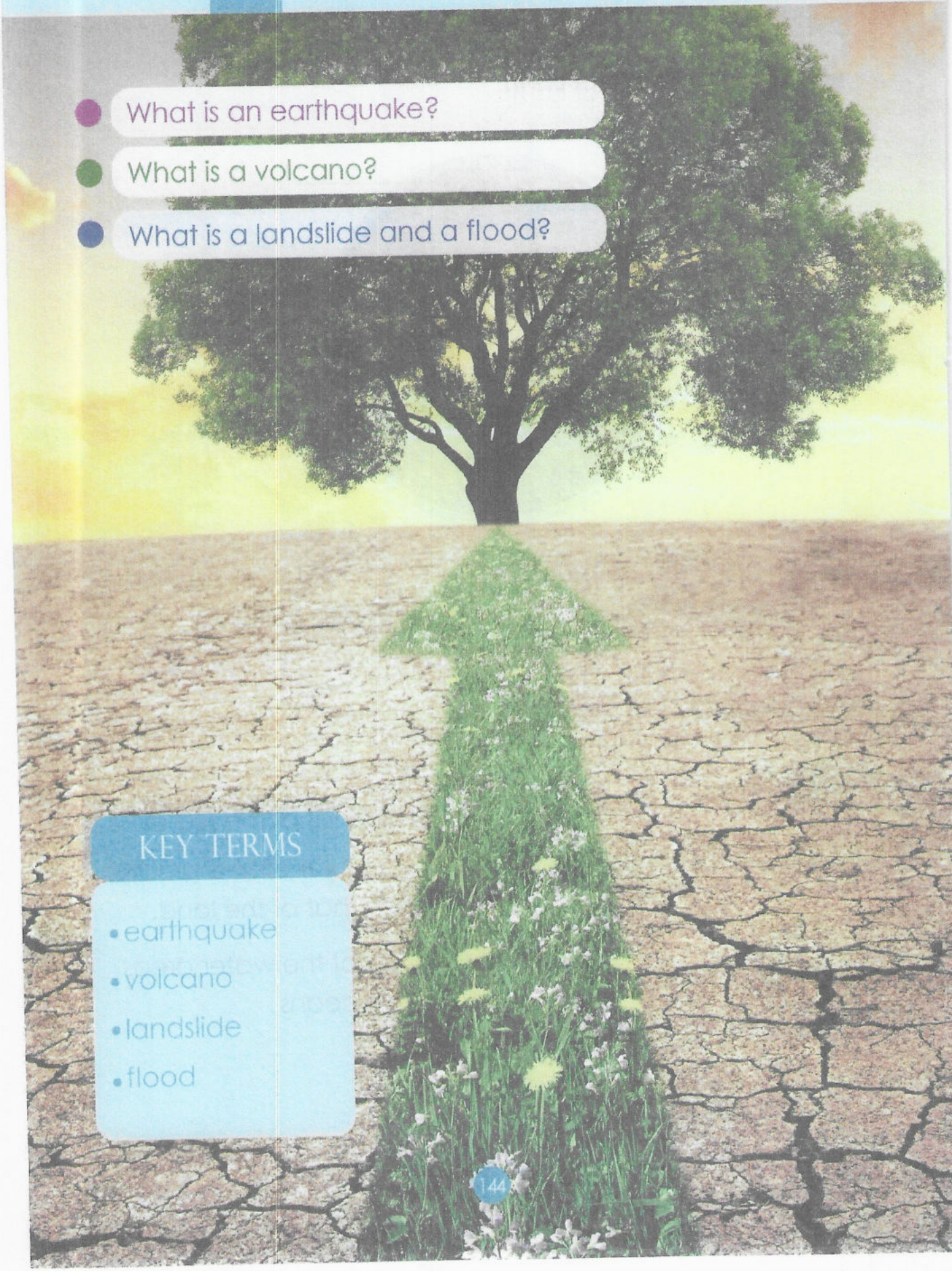


D Making a Bar Graph

Planet Earth is around 70% water and 30% land.
Draw a bar graph representing the composition of Earth.
Choose the correct information.



- ○ The land area is greater than that of the water.
- ○ The water area is greater than that of the land.
- ○ Most of the water areas are oceans.



- What is an earthquake?
- What is a volcano?
- What is a landslide and a flood?

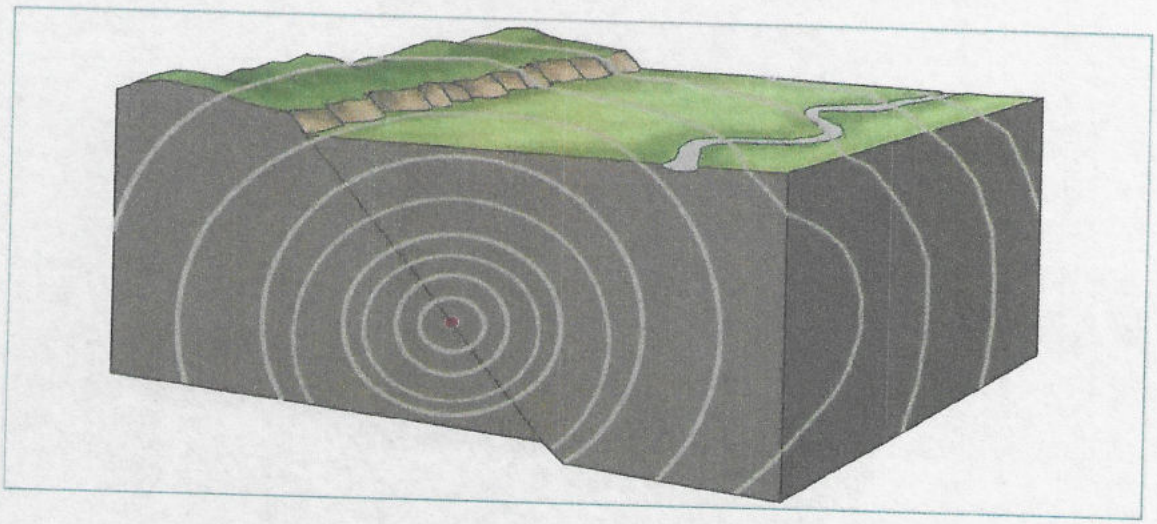
KEY TERMS

- earthquake
- volcano
- landslide
- flood

Some events, such as earthquakes, volcanoes, landslides, and floods, take place on Earth from time to time.

What is an earthquake?

Earth's outside layer, the crust, is made up of huge rocks. These rocks, deep below the ground, slide past each other. Their sudden movement causes an earthquake.



Consequences of an earthquake:



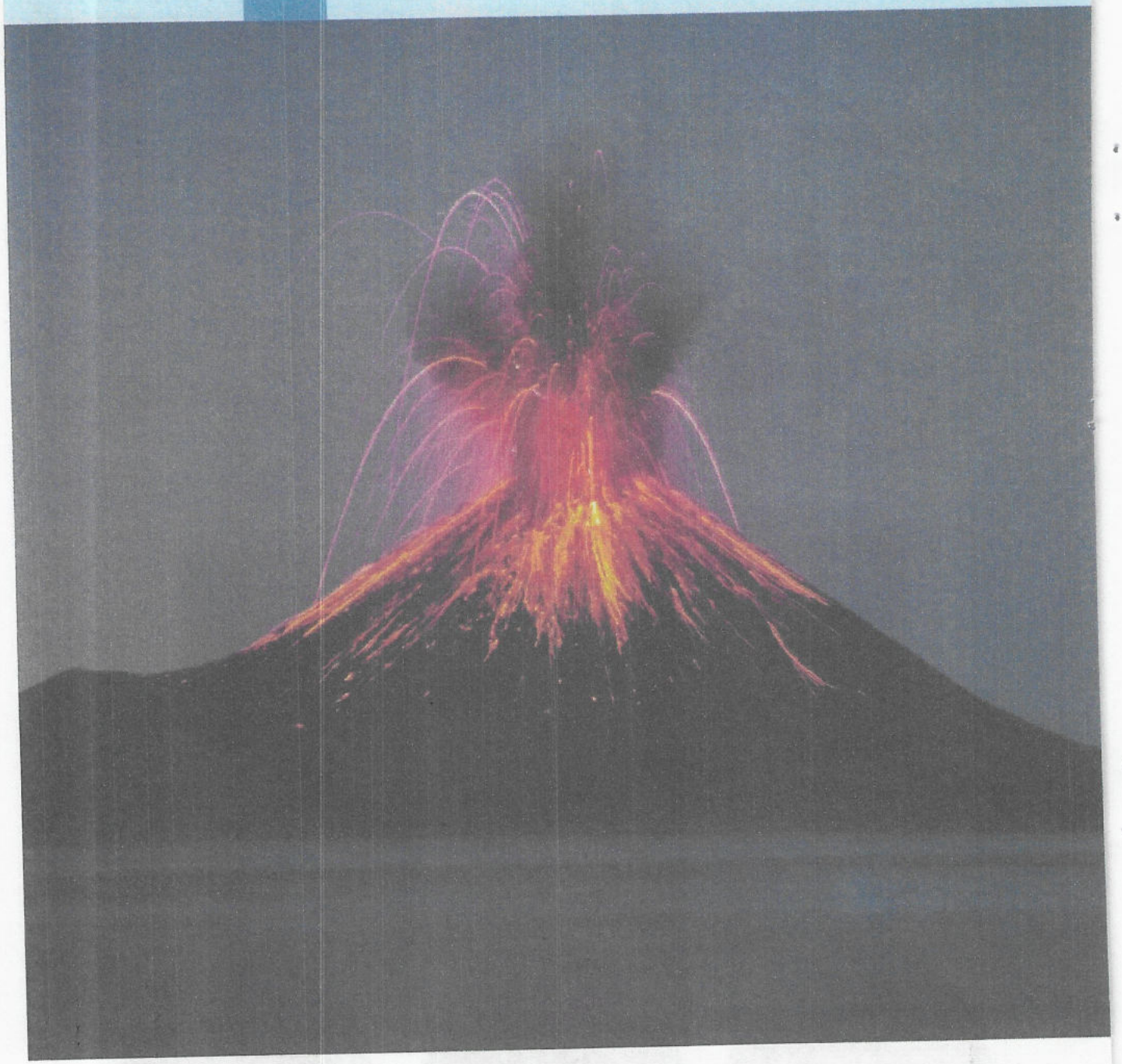
landslide



damage



death



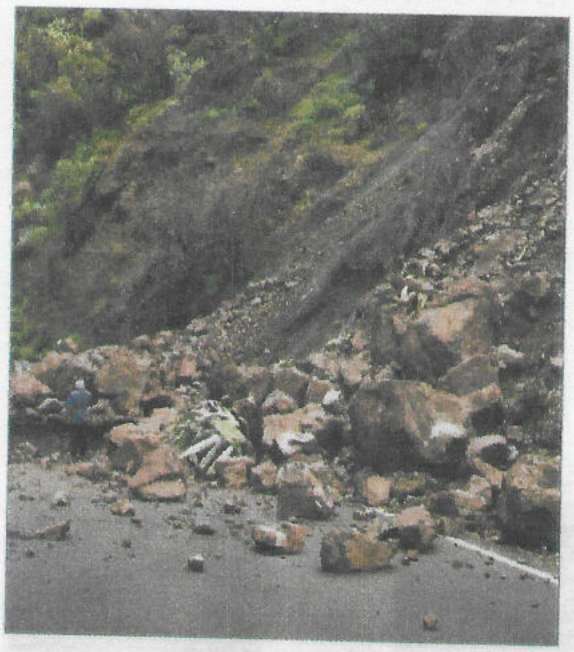
What is a volcano?

A volcano is usually a mountain that builds up around an opening in Earth's crust. When a volcano erupts, lava is ejected.



What is a flood and a landslide?

Heavy rains and melting snow fill rivers. When water flows over a river's sides, a flood occurs. Flood is water that flows overland.



A landslide is a rapid movement of rocks or soil. It is caused mainly by rain, earthquakes, and volcanoes.

Flows are the most destructive forms of landslides.

A Write true or false. Then correct the false statements.

An earthquake is a sudden movement of rocks.

A volcano is mainly a mountain that erupts, ejecting lava.

Volcanoes can cause landslides.

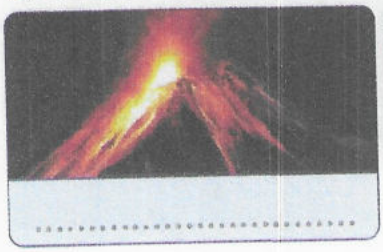
A landslide is a slow movement of soil.

A flood is water that flows overland.

B Match.

flood	•	• a rapid movement of soil and rocks
landslide	•	• a huge flow of water
earthquake	•	• a sudden movement of rocks

C Name the following pictures.



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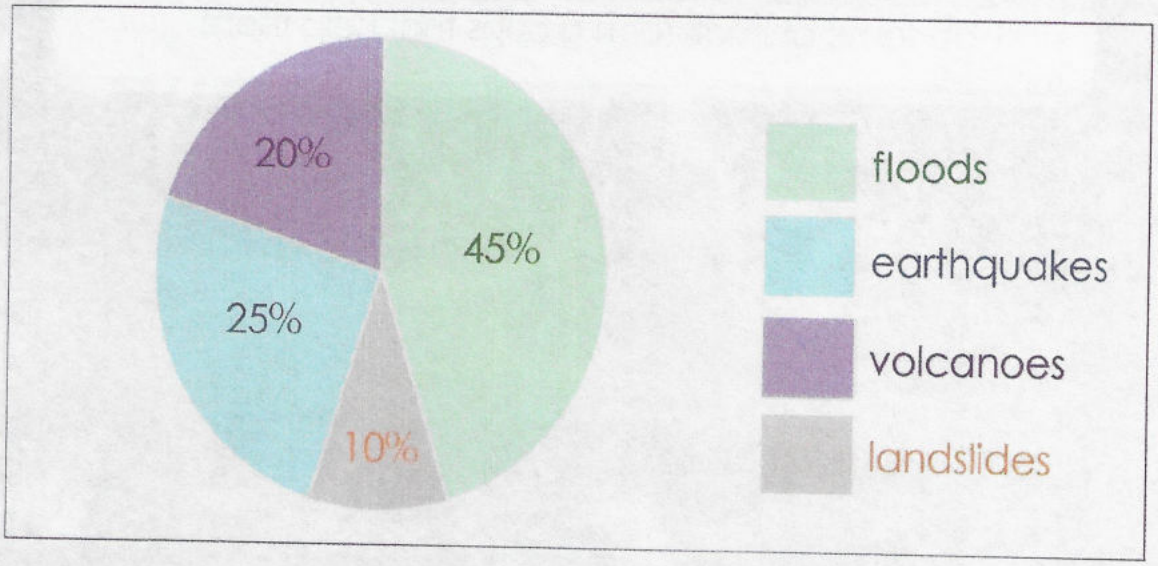
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D Analyze a Circle Graph

In 1888, planet Earth recorded many events represented in the following circle graph.



- Which event has the highest percentage?

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- Which event has the lowest percentage?

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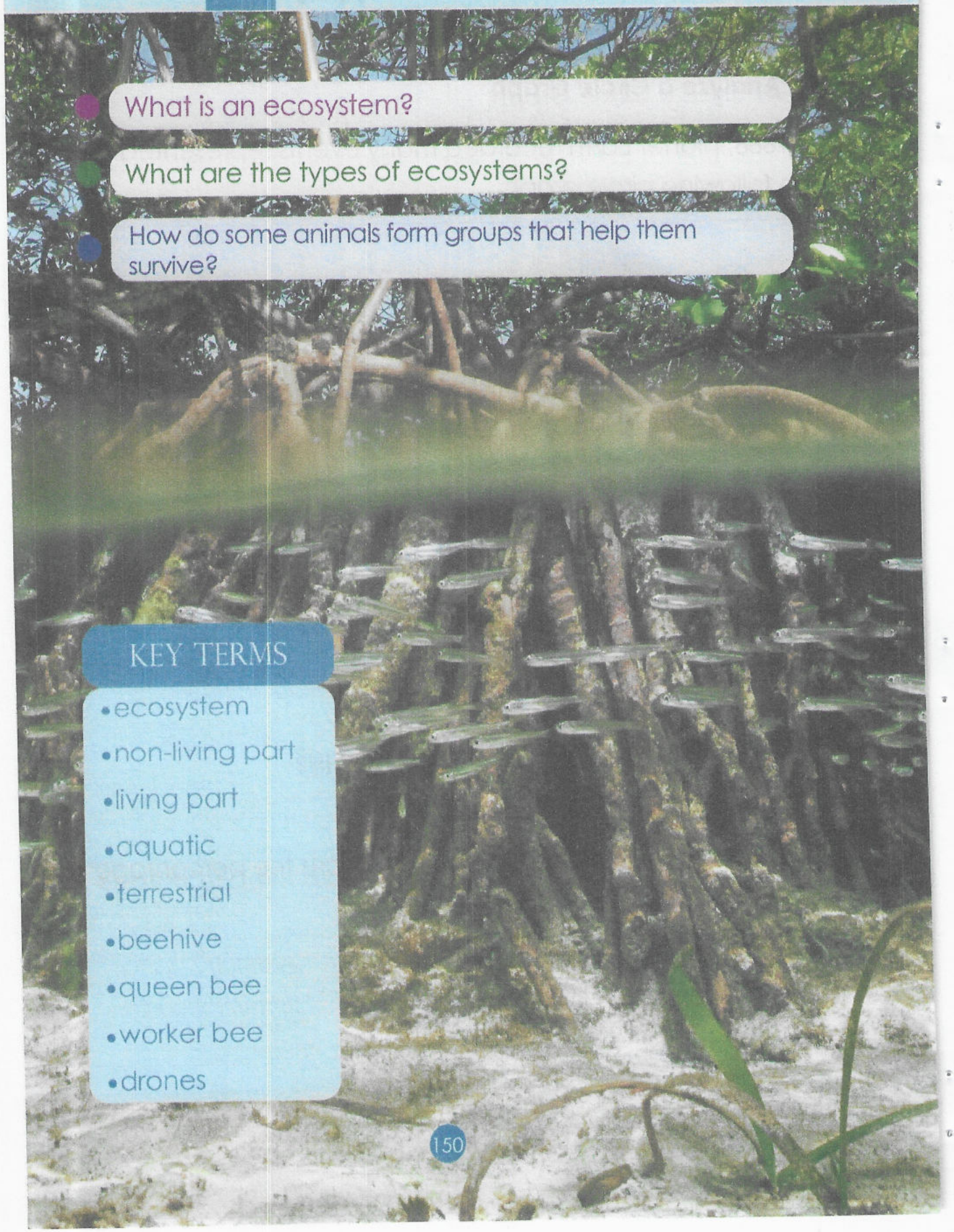
- By referring to the circle graph, compare the percentage of earthquakes to that of volcanoes.

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- What is an ecosystem?
- What are the types of ecosystems?
- How do some animals form groups that help them survive?

KEY TERMS

- ecosystem
- non-living part
- living part
- aquatic
- terrestrial
- beehive
- queen bee
- worker bee
- drones

What is an ecosystem?

An ecosystem is a place where living things live and interact. It is made up of two basic parts: a non-living part and a living part.

The non-living part is a place where organisms live. It includes land, water, air, sand, and sunlight.











The living part includes all the organisms that live in an ecosystem. It includes animals, plants, fungi, and others.







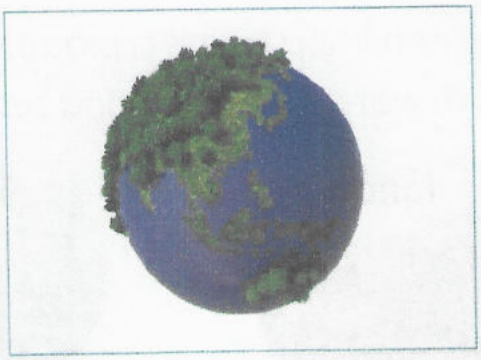




What are the types of ecosystems?

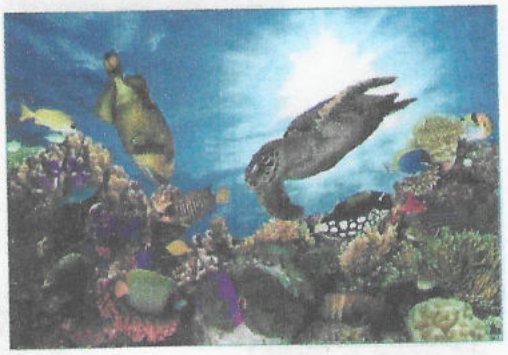
An ecosystem can vary in size from small, such as a pond, to huge, such as the whole Earth.



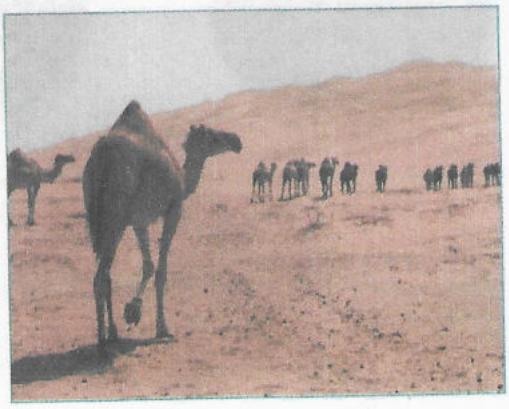


The two types of ecosystems are aquatic and terrestrial ecosystems.

In an aquatic ecosystem, organisms live in water, which is abundant everywhere. Examples of aquatic ecosystems are ponds, rivers, coral reefs, seas, and oceans.



In a terrestrial ecosystem, organisms live on land. Examples of terrestrial ecosystems are forests, gardens, deserts, and grasslands.



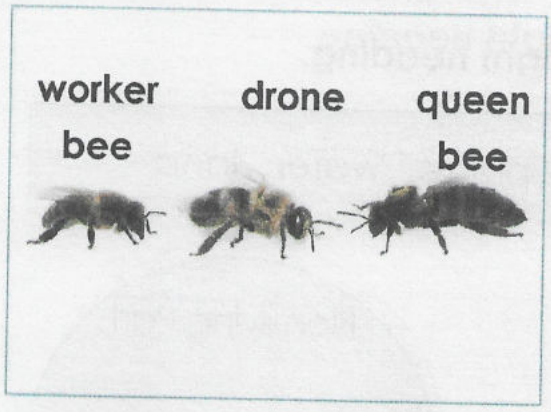
How do some animals form groups that help them survive?

Some animals, such as bees and ants, form groups in an ecosystem that help them survive.





Bees live in a beehive. They arrange themselves in groups of worker bees and drones, with the queen bee at the top.





A beehive is made up of thousands of hexagonal, waxy, tiny rooms where bees store honey and take care of the young.

A Write true or false. Then correct the false statements.

An ecosystem is made up of living things only.

Water and air belong to the living part of an ecosystem.

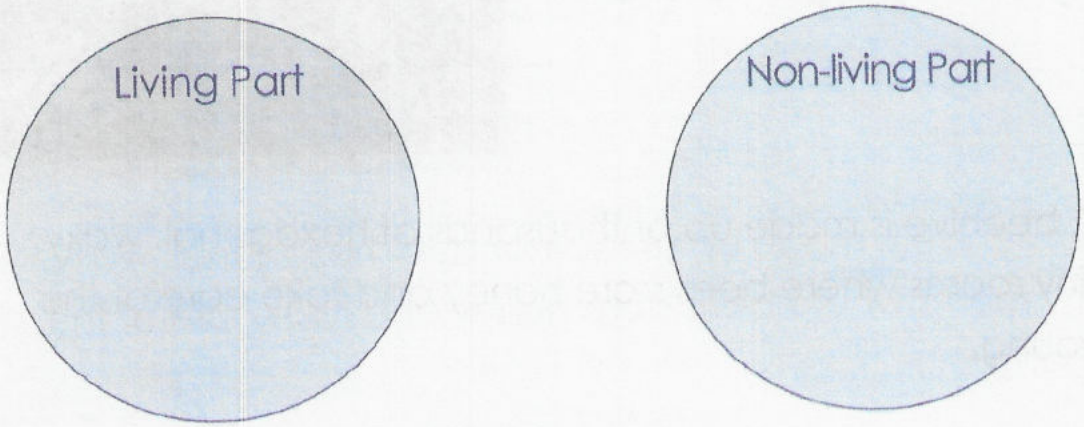
An ecosystem has three basic parts.

Ants live in a beehive.

The biggest type of bee is the queen bee.

B Classify the terms under the right heading.

soil - animals - sunlight - plants - water - land



C Label the circle graph according to the following data.

A pond contains animals of 65% fish, 25% frogs, and 10% crabs.

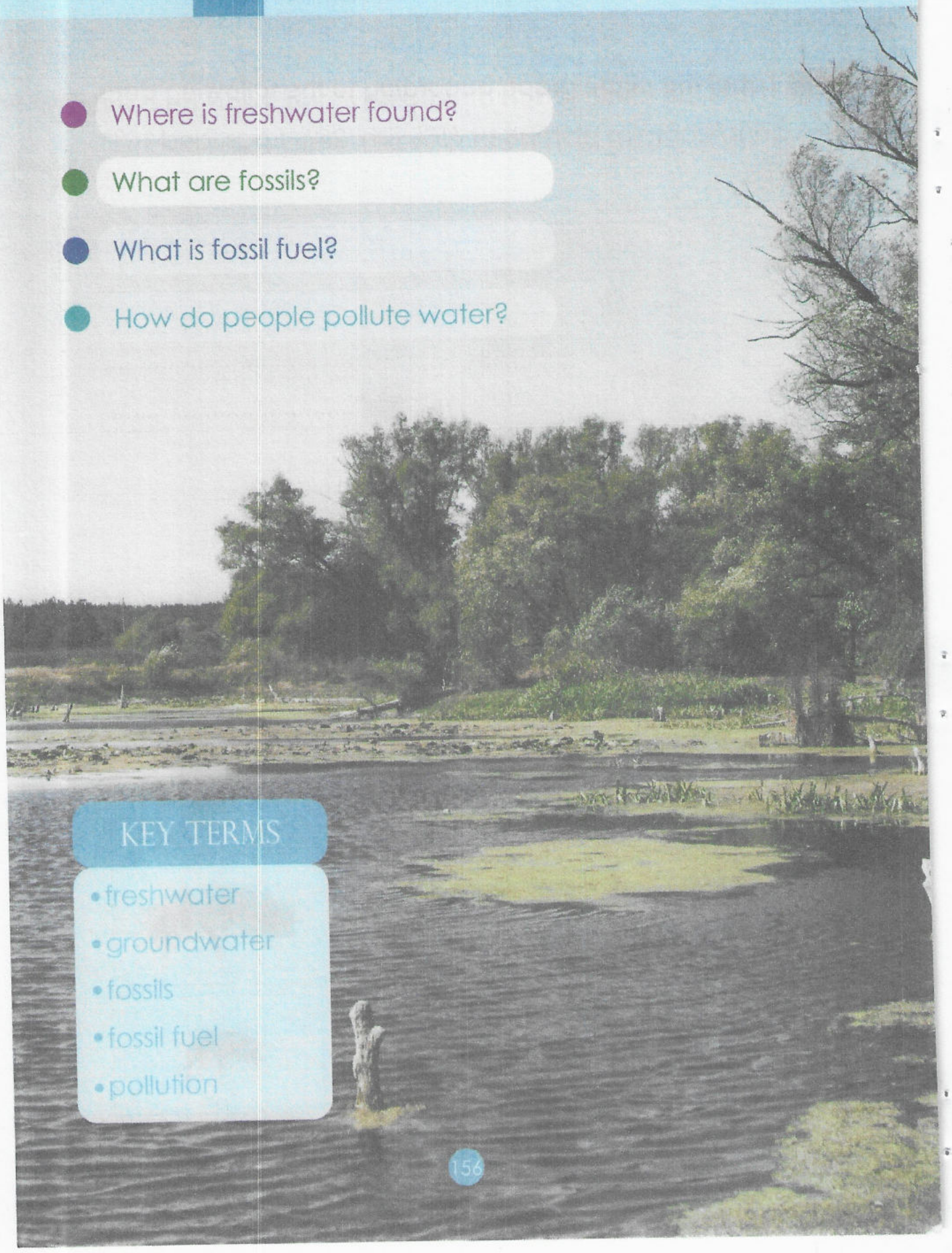


D Match.

beehive	•	• 
drone	•	• 
worker bee	•	• 
queen bee	•	• 

LESSON 24 MAIN RESOURCES

- Where is freshwater found?
- What are fossils?
- What is fossil fuel?
- How do people pollute water?



KEY TERMS

- freshwater
- groundwater
- fossils
- fossil fuel
- pollution

Where is freshwater found?

Most of Earth's water is in the salty oceans. People cannot use it for drinking. People drink freshwater or water that is not salty. Freshwater is found in rivers, ponds, streams, and lakes. It is also found underground. Water that is held in rocks below the ground is called groundwater.
Sea ice is another example of freshwater.

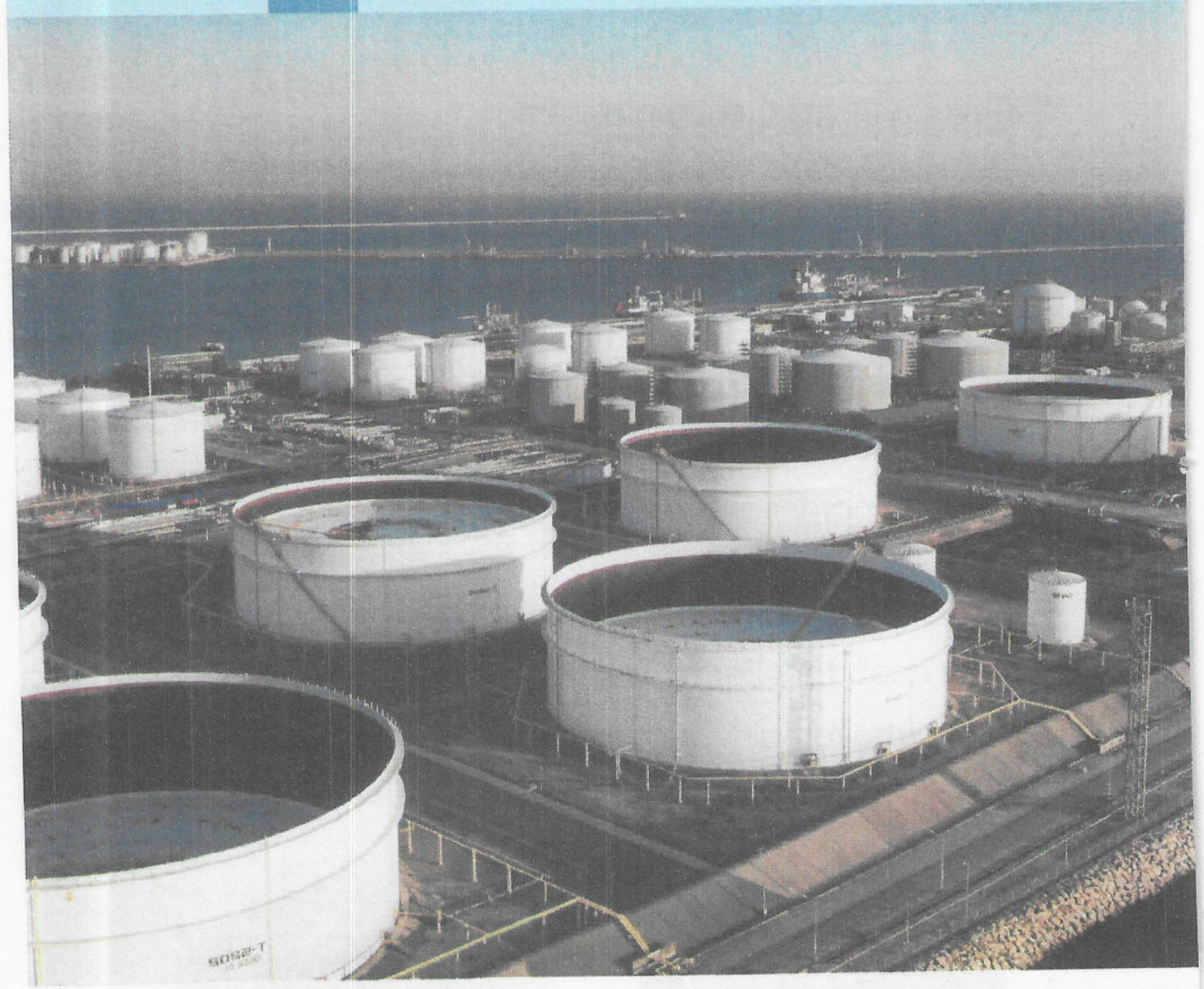
What are fossils?

Another important Earth resource is fossils.
Fossils are the remains or traces of plants and animals that lived long ago.





Many fossils stay preserved by the hard rocks around them.



What is fossil fuel?

Fossil fuel is formed from the remains of ancient plants and animals, such as dinosaurs, that were buried hundreds and even thousands of years deep into our Earth.

Oil and natural gas are fossil fuels.

Coal, another type of fossil fuel, is formed from dead trees, ferns, and other plants that lived 300 to 400 million years ago, even before dinosaurs.



What can happen to water resources?

Water can be polluted. Thus, it cannot be used.

Pollution happens when harmful things, such as sewage water, get into seas, rivers, and underground water sheets. Pollution can make living things sick.

Due to water pollution, fish in the sea will become polluted and die. Moreover, corals will be destroyed, and plants will wither.



A Write true or false. Then correct the false statements.

Coal is a fossil fuel derived from dinosaurs.

A fossil is a trace of something that lived long ago.

Freshwater is found in oceans.

Oil is a type of fossil fuel.

Pollution happens when harmful things get into the water.

B Classify each water resource under the correct heading.

groundwater - river - sea - lake - ocean - streams

Salty Water	Freshwater

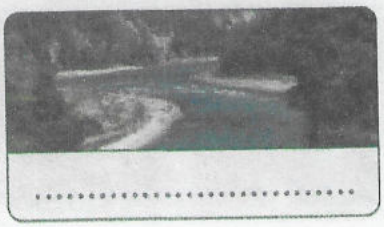
C Write a suitable name for each of the following figures.



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D Make a Bar Graph

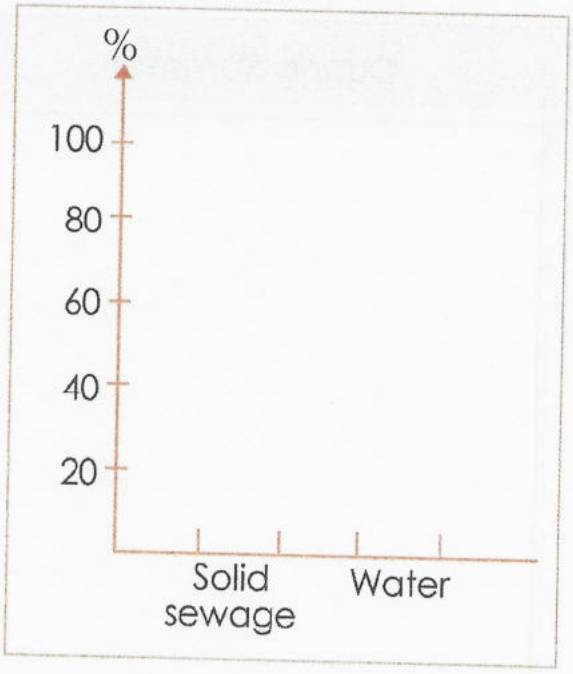
The water of a lake is analyzed and found to contain 20% solid sewage and 80% water.

- Compare the percentage of solid sewage to that of water in the lake.

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- Fill in the given percentages in the following bar graph.



- Give one way to protect planet Earth from pollution.

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Project 1

Effects of decrease in the level of water in a pond

In spring, a pond was completely filled with water containing 10 fish, 5 frogs, and many plants.

In summer, due to certain environmental conditions, the water level decreased by half, the number of fish became 5, the frogs migrated away from the pond, and the plants disappeared.

- On big cardboard, draw the pond, showing the changes that occurred before and during summer.

Before Summer	During Summer

Project 2

Several weather conditions existing on Earth at the same time in different regions

The weather can be sunny, cloudy, rainy, snowy, and stormy.

- On big cardboard, cut and paste or draw pictures of the different weather conditions in a table like the one below.

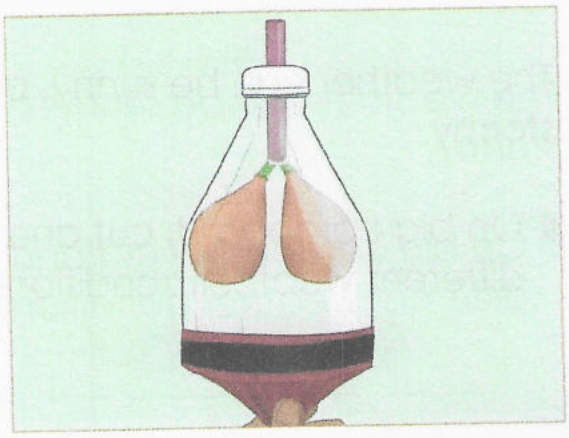
Sunny	
Cloudy	
Rainy	
Snowy	
Stormy	

Project 3

A lung model

Materials

- Plastic bottle
- Tape
- Rubber bands
- Y-shaped tube
- Scissors



Procedure

1. Cut the bottom of the plastic bottle using scissors. This will create a circular open end where the lungs will be attached later.

2. Attach 2 balloons, each on one of the Y-shaped tube's holes.

3. Insert the Y-shaped tube into the bottle, and extend it to the outside through the bottleneck, as shown in the figure.

4. Take another balloon, and cut off its top.

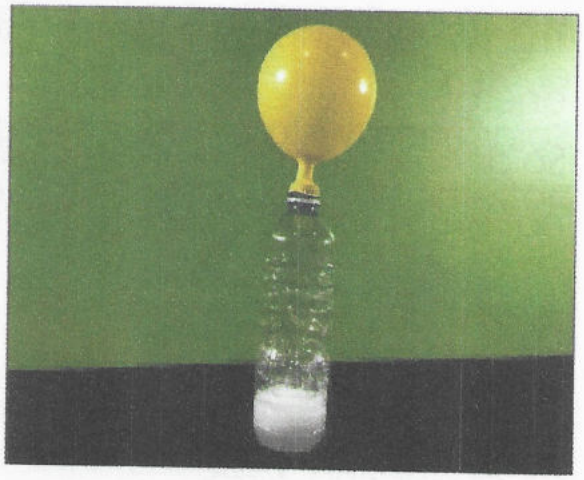
5. Put this balloon on the bottom of the bottle so that it covers the circular opening.

Project 4

Blowing up a balloon by a chemical reaction

Materials

- Balloon
- 40 ml of water
- A soft drink bottle
- Plastic straw
- Lemon juice
- 1 tsp of baking soda



Procedure

1. Pour 40 ml of water into the soft drink bottle.

2. Add a teaspoon of baking soda, and stir it with the straw until it dissolves.

3. Pour lemon juice into the bottle, and quickly attach the stretched balloon over the mouth of the bottle.

4. Watch your balloon inflating.

Project 5



A solar house

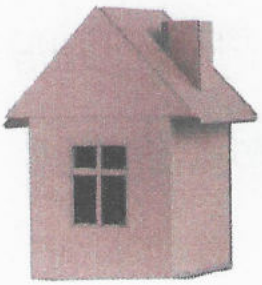
We can obtain electricity from the Sun.

This type of energy is useful, green energy called solar energy.

Solar energy is a clean, costless form of energy that does not emit harmful gases to the environment.

Materials

- A solar panel
- Lamps
- Connecting wires
- A cartoon box
- Glue



Procedure

1. Make a cartoon house model.

2. Attach the solar panel to the roof of the house.

3. Attach the connecting wires to the solar panel and the lamps.

4. Fix the lamps to the walls of the house, and attach them to the panels.

Project 6

Earth model



Materials

- Clay (orange, yellow, red, blue, green)

Procedure

1. Start with the core by rolling a small ball of red clay, the same size as a ping pong ball.

2. Place a layer of yellow clay around the core in a circular way. This is the mantle.

3. Wrap a thin layer of orange clay around the mantle. This is the crust.

4. Wrap a layer of blue clay as oceans, and add green clay as landmasses.

5. Using an unsharpened edge, make a cross section of your model to show the layers of Earth.