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# CAMBRIDGE PRIMARY Science

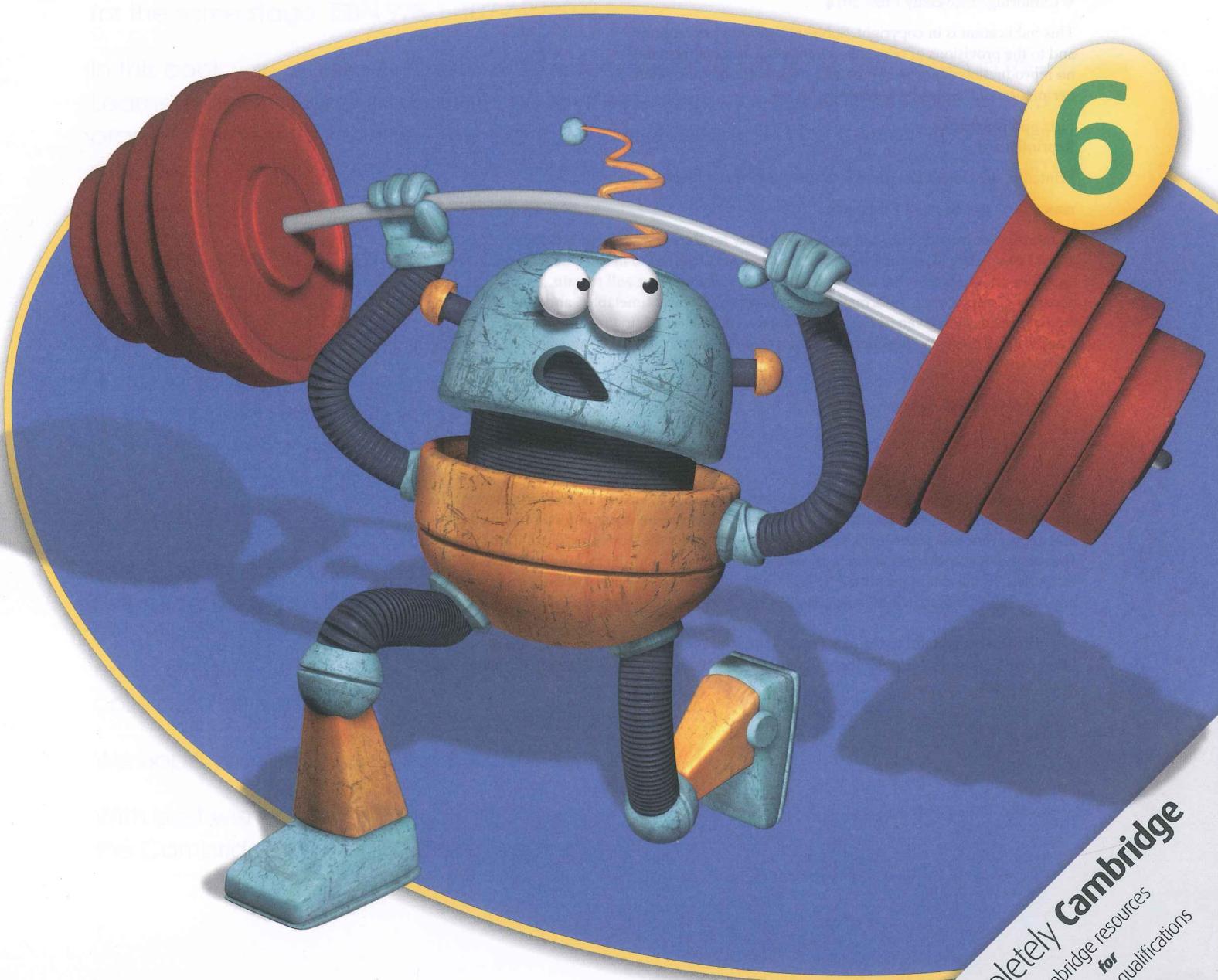
LEVEL 1 | STAGE 2

This Activity Book provides a variety of activities for the Cambridge Primary Science Stage 2 curriculum.

In the book:

## Activity Book

6



Fiona Baxter and Liz Dilley

Completely Cambridge  
Cambridge resources  
for  
Cambridge qualifications

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# Introduction

The Cambridge Primary Science series has been developed to match the Cambridge International Examinations Primary Science curriculum framework. It is a fun, flexible and easy-to-use course that gives both learners and teachers the support they need. In keeping with the aims of the curriculum itself, it encourages learners to be actively engaged with the content, and develop enquiry skills as well as subject knowledge.

This Activity Book for Stage 6 is designed to be used alongside the Learner's Book for the same stage, ISBN 978-1-107-69980-9.

In this book you will find an exercise to accompany each topic presented in the Learner's Book, as well as a language review exercise at the end of each unit to practise the key vocabulary. The exercises are designed to be completed as pen-and-paper exercises, and learners can work on them individually or in pairs or small groups. The exercises may be set as in-class work or homework.

There are different styles of exercise throughout to maintain interest and to suit different purposes. The main aims of the exercises in this book are:

- to consolidate the subject knowledge presented in the Learner's Book
- to encourage learners to apply this knowledge in new situations, thus developing understanding
- to practise scientific language
- to develop scientific enquiry skills such as presenting and interpreting results from investigations.

The answers to the exercises in this Activity Book are available in the Teacher's Resource Book for Stage 6, ISBN 978-1-107-66202-5. This resource also contains extensive guidance on all the topics, ideas for classroom activities and guidance notes on all the activities presented in the Learner's Book. You will also find a large collection of worksheets.

We hope you enjoy using this series.

With best wishes,  
the Cambridge Primary Science team.



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# Useful words

active busy doing things

Maria is **active** in helping to plan the class party.

affect to do something that causes a change

The amount of rain will **affect** how well the crops grow.

check to make sure that something is correct

Raoul will **check** his mathematics calculations before he gives them to his teacher to mark.

collect to find and bring things together

Kioni will **collect** all the eggs from the hens' nests.

compare to look at two or more different things and decide how similar or different they are to each other

Mrs Kahn will **compare** the prices of different brands of tea to see which is the cheapest.

decide to take action according to available information

Liam must **decide** whether to take a sun hat after he has seen the weather forecast.

effect the way in which an event, action or person makes something change

The **effect** of the rain was a good crop of maize.

**explore** to investigate something in depth

The prince will **explore** all the pathways through the forest until he finds the one that leads to the castle.

**evaluate** to compare results or explanations to find the most useful or worthwhile

Thakane compared her drawing with Vusi's and Thandi's to **evaluate** how good the drawing was.

**evidence** signs that show you that something exists or is true

The footprints were **evidence** that someone had walked in the mud.

**factor** something that has an effect on other things

Rain is a **factor** that could stop the soccer match.

**identify** to recognise something in a picture or description and be able to give it a name

Kaleb was able to **identify** seven parts of the body shown in a diagram.

**list** to write down examples as single words with no sentences

Petra must write a **list** of things she needs to buy at the supermarket.

**plan** to think and talk about how you will do something before you carry it out

The De Sousa family made a **plan** of all the places they would like to visit on their holiday.

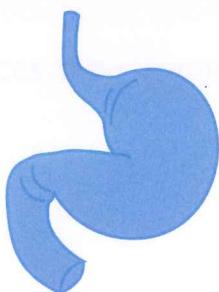
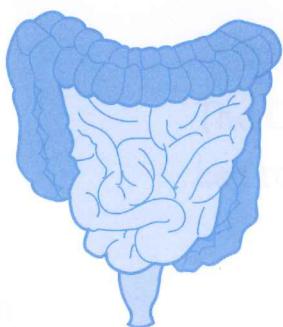
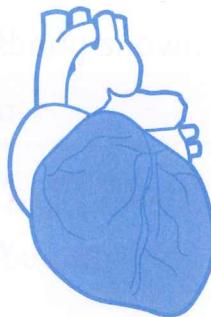
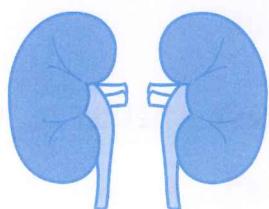
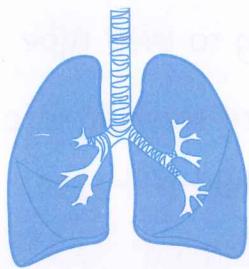
re-arrange	to change the order of things
	Andrew decided to <b>re-arrange</b> the flowers in the vase to make them look more attractive.
repeat	to do or say something again
	The choir was told to <b>repeat</b> the last part of the song until they sang it correctly.
separate	to divide or split something into different parts
	Abuya needs to <b>separate</b> eggs into egg yolks and egg whites when she bakes a cake.
sort	to put things into groups according to their type
	Mr Motswiri needs to <b>sort</b> the dirty washing into white clothes and coloured clothes before washing them.
suggest	to introduce the idea of doing something
	It looks as though it's going to rain so I <b>suggest</b> you take your raincoat.
test	to try something out to see if it works
	Naomi plugged in her new electric kettle to <b>test</b> whether it worked.

# Humans and animals

## Exercise 1.1 Body organs

In this exercise, you will name body organs and identify their position in the body.

- 1 Some body organs are shown. Write the name of the body organ below each drawing.
- 2 Draw a line from each organ to its correct position in the body.



## Exercise 1.2 The heart

In this exercise, you will test your knowledge about the heart.

- 1** a Name the body system that the heart is part of.

\_\_\_\_\_

- b Name the two other parts of this system.

\_\_\_\_\_

- 2** Use the words in the box to complete the sentences. You will need to use some words more than once.

blood    blood vessels    food    lungs    oxygen    waste products

- a The heart pumps \_\_\_\_\_ through the body.

- b The left side of the heart pumps \_\_\_\_\_ that contains

\_\_\_\_\_.

- c The right side of the heart pumps \_\_\_\_\_ without \_\_\_\_\_ to the \_\_\_\_\_.

- d Blood is carried in \_\_\_\_\_.

- e Blood carries \_\_\_\_\_ and \_\_\_\_\_ to all parts of the body and takes away \_\_\_\_\_.

## Exercise 1.3 Heartbeat and pulse

In this exercise, you will analyse pulse rate measurements.

Name	Pulse rate
Marcus	88
Cui	110
Clara	90
Marta	87
Thabo	90

Marcus and his friends measured their pulse rates. These are their results.

1 What units do we use to measure pulse rate?

2 What is the average pulse rate of the group? How did you work this out?

3 a What pattern can you see in the results?

b Which result does not fit the pattern? Suggest a reason for this.

c How can you find out if your suggestion is correct?

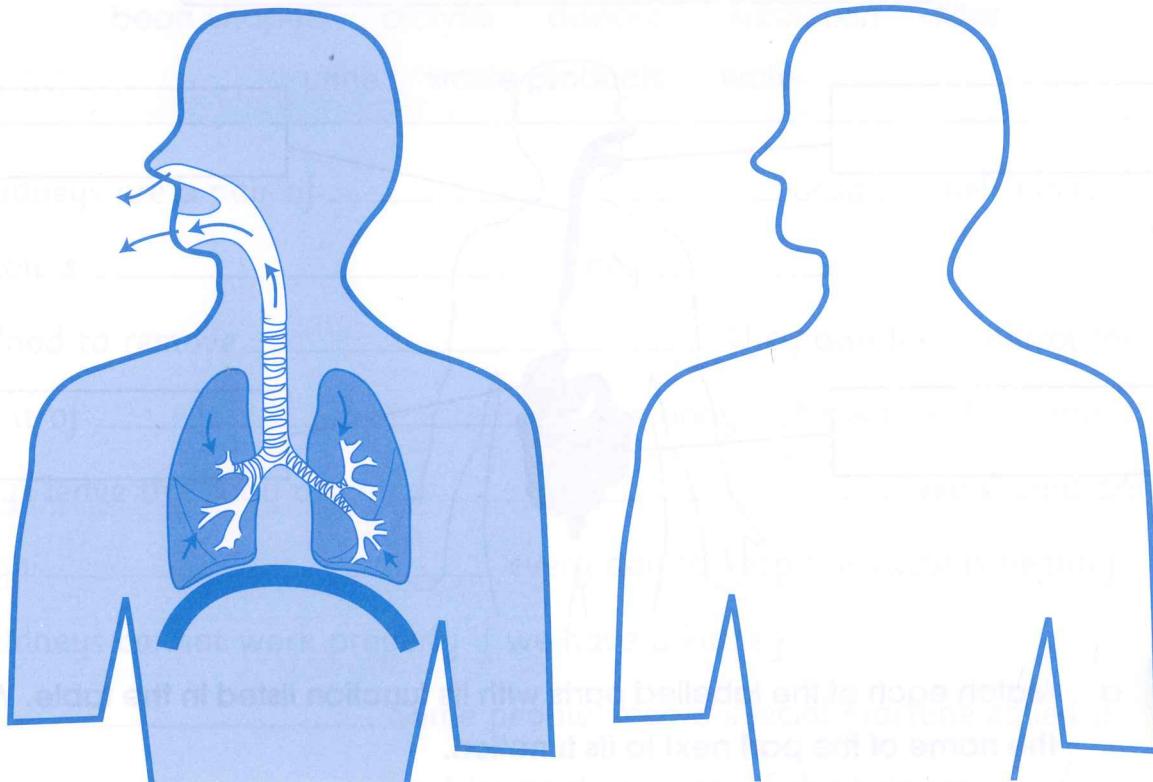
## Exercise 1.4 The lungs and breathing

In this exercise, you will make a drawing of the lungs.

- 1 The drawing shows the lungs when you breathe out.

Make a drawing to show what happens to the lungs when you breathe in.

Label your drawing.



- 2 Complete the flow diagram using these words to show the oxygen pathway when we breathe in.

blood    lungs    nose    windpipe

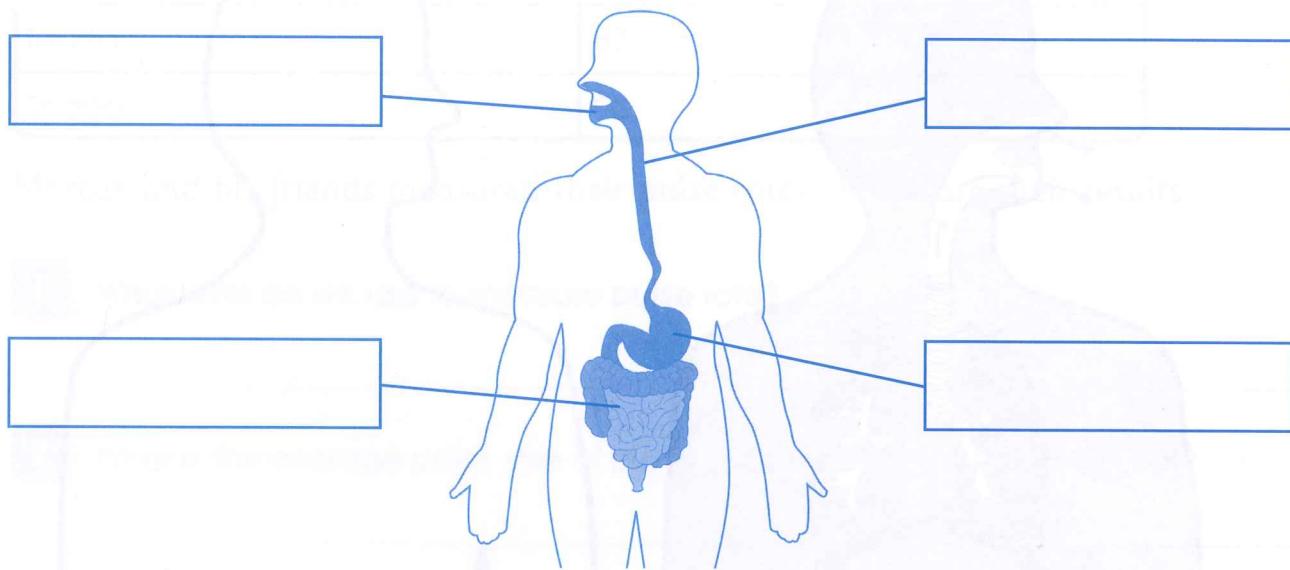
\_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_

## Exercise 1.5 The digestive system

In this exercise, you will identify the parts of the digestive system and their functions.

- 1 Label the diagram of the digestive system. Use these words to help you.

gullet intestine mouth stomach



- 2 a Match each of the labelled parts with its function listed in the table. Write the name of the part next to its function.

Part	Function
	pushes food into the stomach
	mixes food with digestive juices
	chews food and starts digestion
	breaks food down into very tiny particles

- b The functions in the table are not in the same order as they happen in the body. Write the functions in the correct order.

\_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_

## Exercise 1.6 What do the kidneys do?

In this exercise, you will complete sentences about the kidneys and their functions.

Use the words in the box to help you. You will need to use some words more than once.

bean-shaped    dialysis    disease    excretion    filter  
urine    waste products    water

The kidneys are a pair of \_\_\_\_\_ organs. Their main function is \_\_\_\_\_. They \_\_\_\_\_ the blood to remove \_\_\_\_\_. They also help control the amount of \_\_\_\_\_ in the body. The wastes from the kidneys leave the body as liquid \_\_\_\_\_. We should drink enough \_\_\_\_\_ every day to keep the kidneys healthy.

The kidneys cannot work properly if we have a kidney \_\_\_\_\_.

Some people need a special machine called a \_\_\_\_\_ machine to do the job of the kidneys.

Body Junctions

The brain is part of the \_\_\_\_\_ system.

Body Junctions

## Exercise 1.7 What does the brain do?

This exercise tests your knowledge about the brain.

- 1 a Which body system is the brain part of?

\_\_\_\_\_

- b Name another part of this body system.

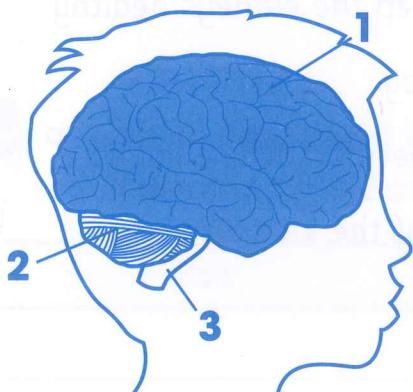
\_\_\_\_\_

- 2 Name two important body functions that are controlled by the brain without you having to think about them.

\_\_\_\_\_

\_\_\_\_\_

- 3 Choose the part of the brain in the drawing that controls each of the following:



a Saying your name \_\_\_\_\_

b Standing on one leg \_\_\_\_\_

c Kicking a ball \_\_\_\_\_

d Listening to music \_\_\_\_\_

e Breathing faster while running \_\_\_\_\_

- 4 Explain why someone who has had a serious head injury may not be able to talk anymore.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Language review

This exercise checks that you understand the scientific words used in this unit.

Choose the correct words from the word box to complete the sentences.

breathing   circulation   circulatory system   controls  
digestion   disease   excretion   lungs   nervous system  
organs   pulse   urine   windpipe

\_\_\_\_\_ inside our bodies do different jobs to keep us alive and healthy.

The pumping of blood around the body is called \_\_\_\_\_.

The heart, blood vessels and blood form the \_\_\_\_\_.

Your \_\_\_\_\_ tells you how fast your heart is beating.

The mouth, stomach and intestines carry out the process of \_\_\_\_\_.

We take air into our bodies and let air out of our bodies by \_\_\_\_\_.

Air moves from the nose, down the \_\_\_\_\_ and into the \_\_\_\_\_.

The main function of the kidneys is \_\_\_\_\_. They produce a liquid called \_\_\_\_\_.

A sickness that stops our bodies working properly is called a \_\_\_\_\_.

The brain is part of the \_\_\_\_\_. It \_\_\_\_\_ all our body functions.

# 2

# Living things in the environment

## Exercise 2.1

## Food chains in a local habitat

In this exercise, you will apply and practise what you know about habitats and food chains.



This garden is full of plants and animals that live together. The peach tree provides a home and food for the birds and the caterpillars. The roses provide food for the bees and aphids. The grass provides food for ants.

- 1 Identify the habitat in the picture.

- 
- 2 Draw five food chains to represent the feeding relationships between plants and animals that you can see in the picture.

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- 3 Describe two other ways in which plants and animals depend on each other in this garden.

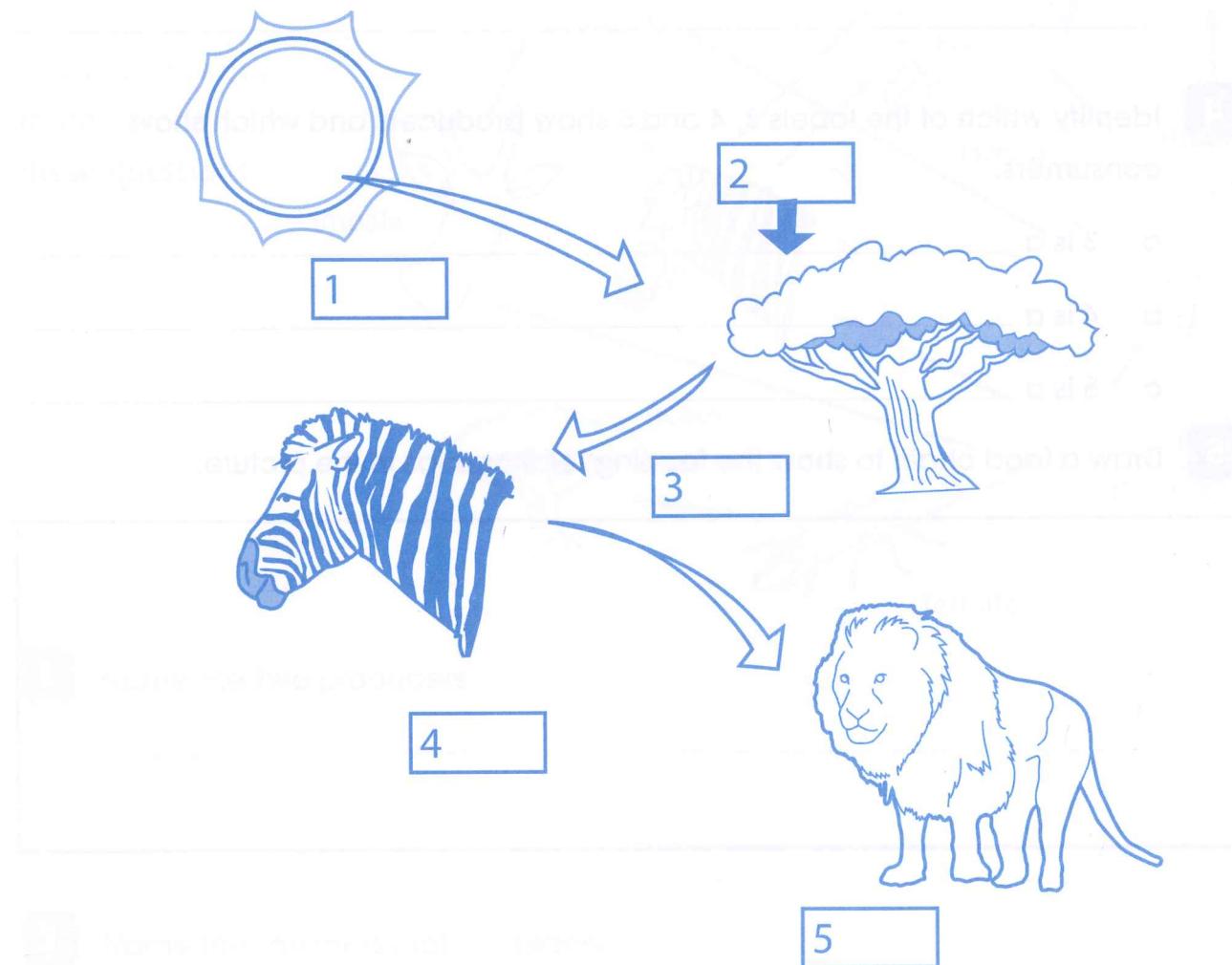
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## Exercise 2.2 Food chains begin with plants

In this exercise, you will identify producers and consumers and draw a food chain.

Look at this picture.



Arrows 1 and 2 represent factors that the tree needs to make food.

1 What does arrow 1 represent?

---

2 What does arrow 2 represent?

---

3 What is the third factor that the tree needs to make food?

---

4 Identify which of the labels 3, 4 and 5 show producers and which show consumers.

a 3 is a \_\_\_\_\_

b 4 is a \_\_\_\_\_

c 5 is a \_\_\_\_\_

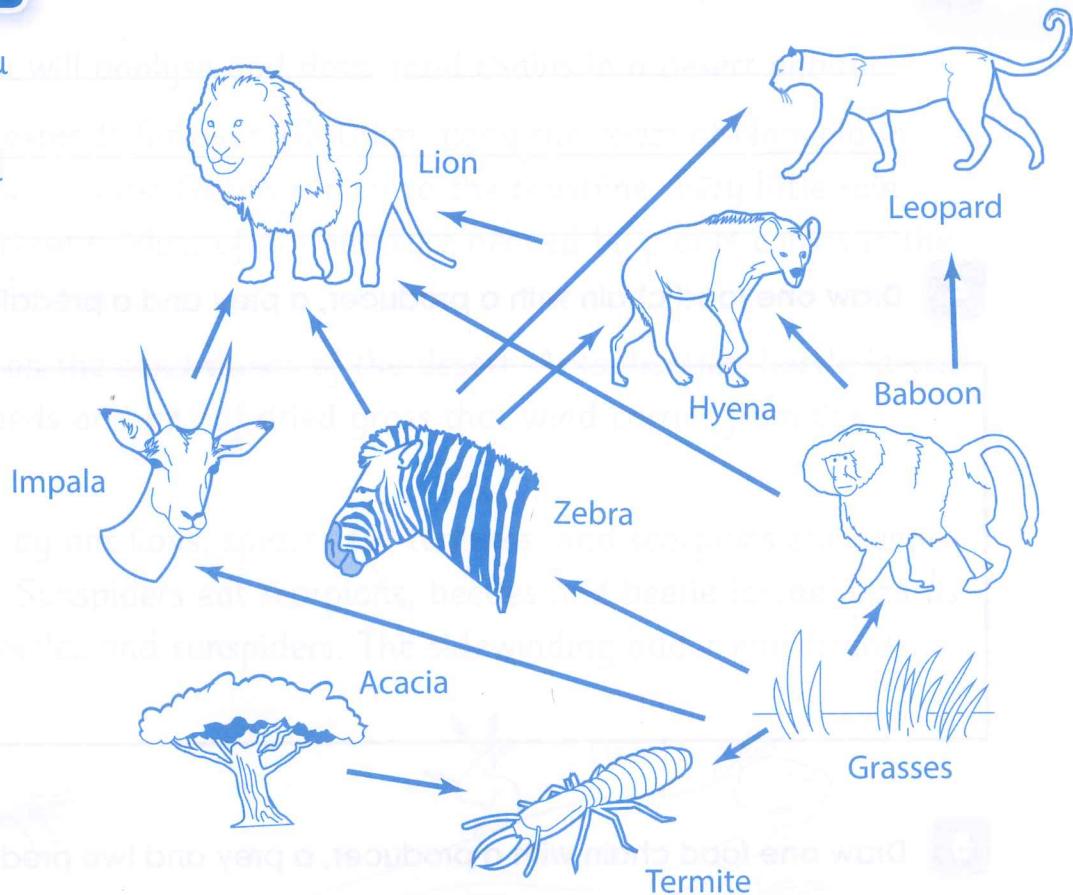
5 Draw a food chain to show the feeding relationships in the picture.



## Exercise 2.3 Predators and prey

In this exercise, you identify predators and their prey, and draw food chains.

Use the drawing to answer these questions.



1 Name the two producers.

---

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2 Name four animals that eat plants.

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**3** Name three predators.

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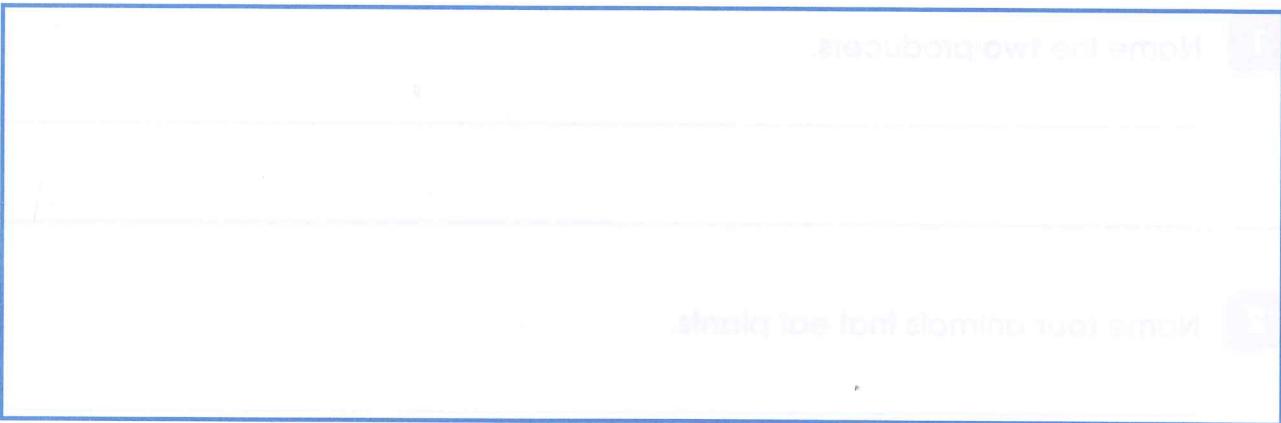
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**4** Draw one food chain with a producer, a prey and a predator.



**5** Draw one food chain with a producer, a prey and two predators.



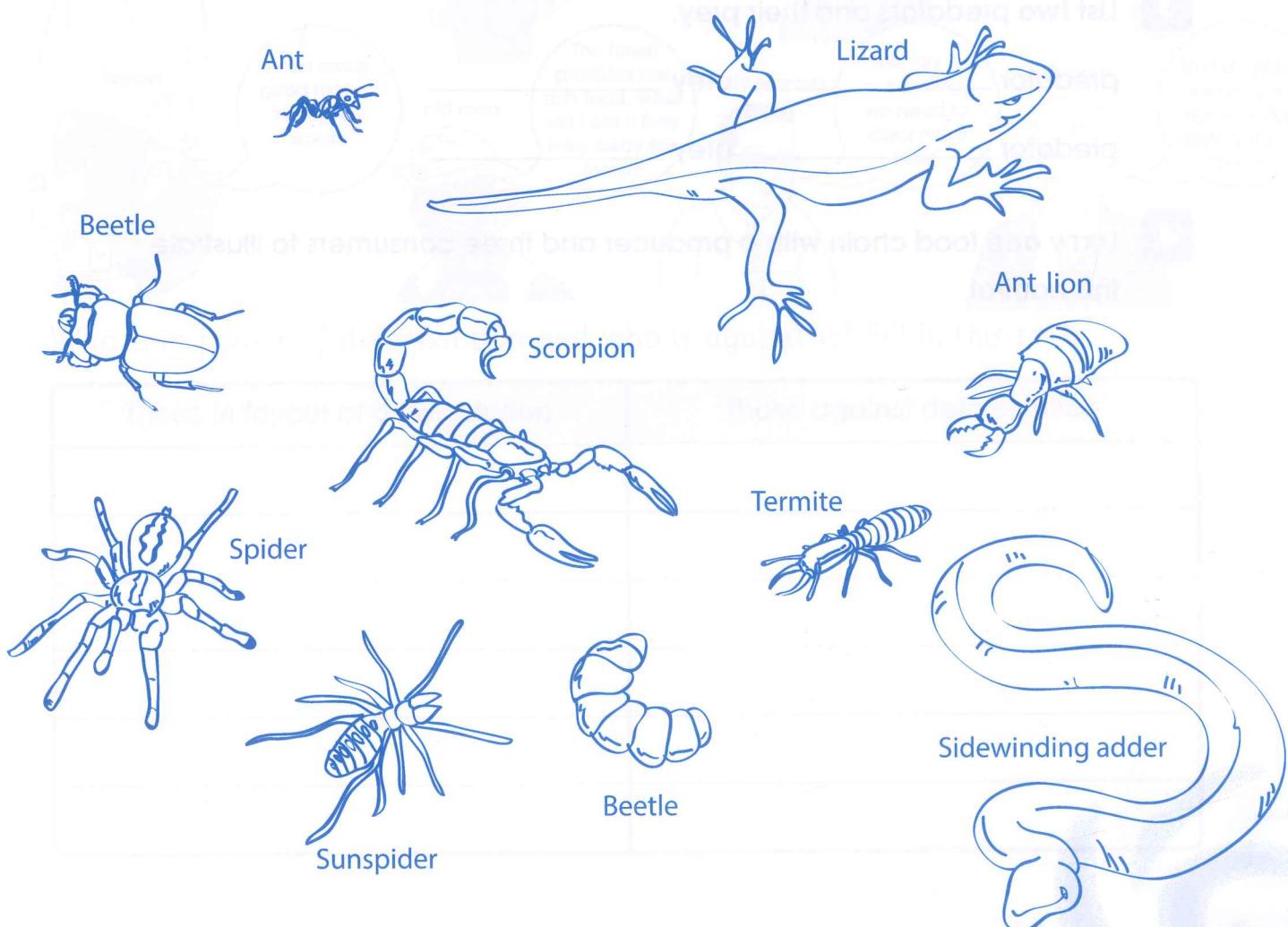
## Exercise 2.4 Food chains in the Namib Desert

In this exercise, you will analyse and draw food chains in a desert habitat.

The Namib Desert extends for over 1000 km along the coast of Namibia in southern Africa. The Atlantic Ocean is next to the coastline. Very little rain falls in the Namib Desert. Most of the moisture needed by plants comes in the form of mist from the sea.

Many animals live on the sand dunes of the desert. Ants, beetles, beetle larvae and termites eat seeds and bits of dried grass that wind carries from the coast.

The ants are eaten by ant lions, spiders eat termites, and scorpions eat beetle larvae and spiders. Sunspiders eat scorpions, beetles and beetle larvae. Lizards then eat spiders, beetles and sunspiders. The sidewinding adder eats lizards.



**1**

a Identify two producers in the desert habitat.

\_\_\_\_\_

\_\_\_\_\_

b How do these producers get water?

\_\_\_\_\_

\_\_\_\_\_

**2**

Name three animals that only eat plants.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**3**

List two predators and their prey.

predator \_\_\_\_\_ prey \_\_\_\_\_

predator \_\_\_\_\_ prey \_\_\_\_\_

**4**

Draw one food chain with a producer and three consumers to illustrate this habitat.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Exercise 2.5 Deforestation

In this exercise, you will compare different opinions on deforestation.

Read what these people have to say about deforestation:



Who is in favour of deforestation and who is against it? Fill in this table.

Those in favour of deforestation	Those against deforestation

## **Exercise 2.6** Air pollution

In this exercise, apply your knowledge about air pollution.

- ## 1 Name three gases that are polluting cities.

10.000  
10.000  
10.000  
10.000  
10.000

- ## 2 What produces each of these pollutants?

- 3** The most polluted cities are all very large cities with many people living and working in them. Power stations and industries burn coal. How do these factors affect pollution in these cities?

## Exercise 2.7 Acid rain

In this exercise, you will apply what you know about acid rain and food chains to a freshwater habitat.

A freshwater lake is a habitat for plants and animals. They depend on one another. Acid rain has a bad effect on this habitat. The plants begin to die. The eggs of fish and amphibians, like frogs and toads, become damaged and may not hatch. Animals such as freshwater shrimps have a tough shell formed of calcium. The acid wears away the calcium and the animal dies.

When one living thing is killed by the acidity in the water, others are affected. For example, fish eat shrimps and herons eat fish. So, if the shrimps die, there will be no food for the fish and they will also die. Then there will be no food for the herons, so they will die.

### 1 What is acid rain?

### 2 How are frogs affected by acid rain?

### 3 Draw one food chain for this habitat before it was polluted by acid rain.

### 4 Explain how acid rain pollution will affect the food chain.

## Exercise 2.8 Recycling

In this exercise, you fill in a table using what you know about recycling.  
Fill in the table. The first one has been done for you.



Item of rubbish	How I could recycle it
glass bottle	use it again take it to the bottle bank/recycle

## Exercise 2.9 Take care of your environment

In this exercise, you will think about how you have used the environment in the past week.

- 1** Think about what you have done in the last week. Fill in this questionnaire.

Action	Yes	No
Did you travel in a car, bus or taxi?		
Did you throw anything away?		
Did you use electricity or burn coal or wood?		
Did you use batteries?		
Did you eat any take-away food in a polystyrene container?		
Did you use anything in a plastic container?		

If you said 'Yes' to any of these questions, you have added to pollution.

- 2** For the questions where you answered 'Yes', describe how your action pollutes the environment.

---

---

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- 3** What could you have done to pollute the environment less in the last week?

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## Language review

- 1 Write these words in the correct order to show how energy flows in a food chain:

consumer   producer   Sun

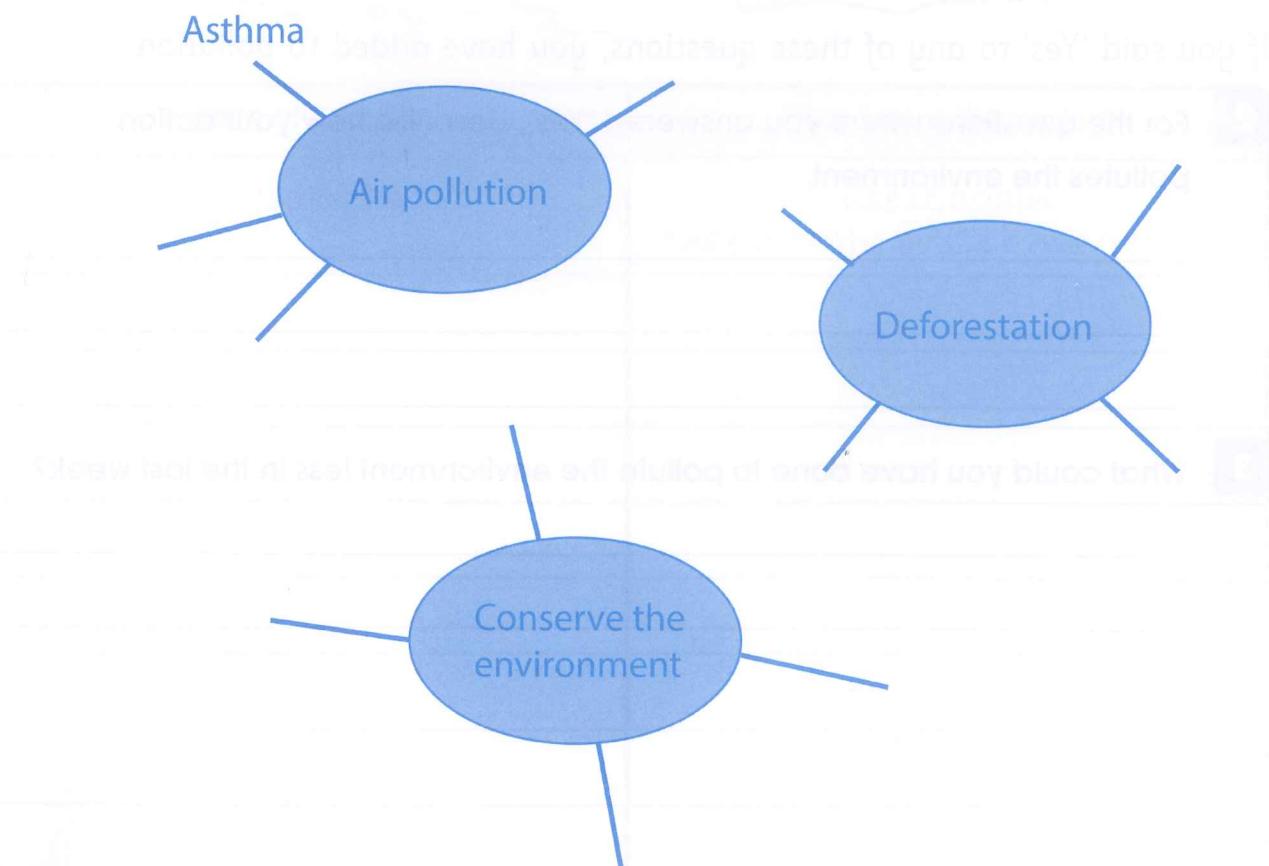
- 2 What is the difference between a predator and a prey?

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- 3 Complete the spider diagrams. Use these words.

acid rain   animals lose their habitat   bad visibility   bronchitis  
drying out of soil   fewer types of trees   global warming  
make compost   recycle   re-use   use less



# 3

# Material changes

## Exercise 3.1 Reversible and irreversible changes

In this exercise, you will identify reversible and irreversible changes.

1 Say whether each of these changes is reversible or irreversible:

- melting butter in a hot pan \_\_\_\_\_
- baking a cake \_\_\_\_\_
- dissolving salt in water \_\_\_\_\_
- burning wood on a fire \_\_\_\_\_
- rusting on a tin can \_\_\_\_\_

2 How can you reverse each of these changes?

- making a paper plane from a folded sheet of paper  
\_\_\_\_\_

- a chocolate bar melting in your pocket  
\_\_\_\_\_

- water freezing to become ice  
\_\_\_\_\_

## Exercise 3.2 Mixing and separating solids

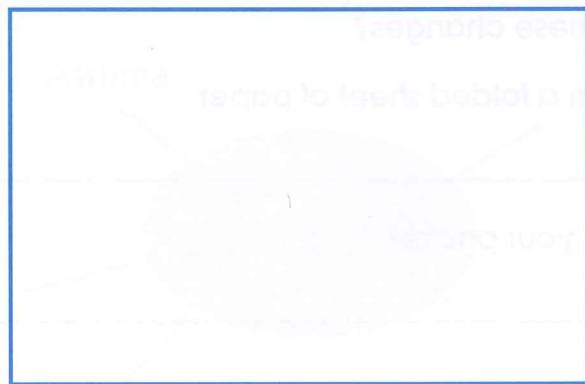
In this exercise, you will test your knowledge about mixtures.

- 1** Mark each of these statements about mixtures as true (✓) or false (✗)

- a A mixture is made up of one substance.
- b A mixture is made up of more than one substance.
- c An example of a mixture is marbles and sand.
- d An example of a mixture is salt.
- e Mixtures can be separated.
- f No new substances are made when different substances are mixed together.

- 2** a Draw a diagram to show a mixture of sand and marbles.

Label your diagram.



- b How would you separate this mixture?

---

---

- c How would you separate a mixture of salt and rice?

---

---

## Exercise 3.3 Soluble and insoluble substances

In this exercise, you will think about soluble and insoluble substances.

### 1 Fill in the missing words:

When a solid mixes with a liquid and becomes part of the liquid it \_\_\_\_\_.

A solid that dissolves in a liquid is \_\_\_\_\_.

A solid that does not dissolve in a liquid is \_\_\_\_\_.

### 2 These are the results of an investigation where a solid is mixed with a liquid.

Observations	Mixture A	Mixture B	Mixture C
The liquid is cloudy.	✓	✗	✓
The liquid looks like before.	✗	✓	✗
The solids settled at the bottom.	✓	✗	✓
The liquid is clear.	✗	✓	✗

- a Which mixture or mixtures contained soluble substances? Name two ways that you know this.

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- b Which mixture or mixtures contained insoluble substances? Name two ways that you know this.

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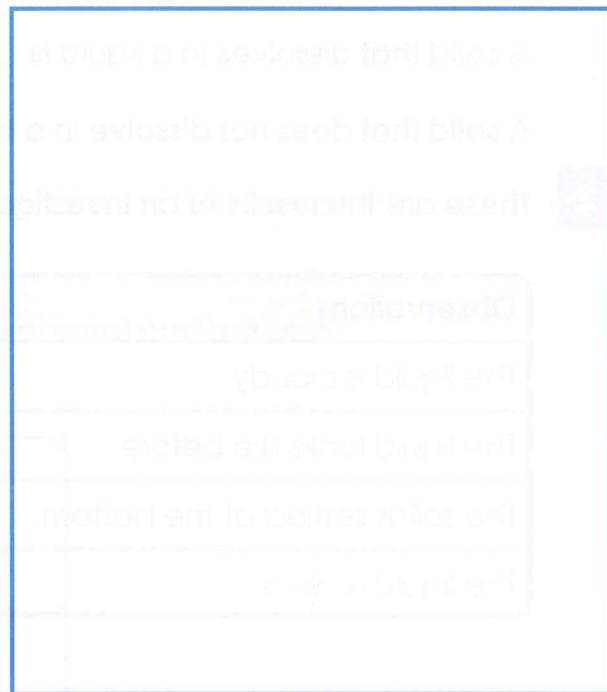
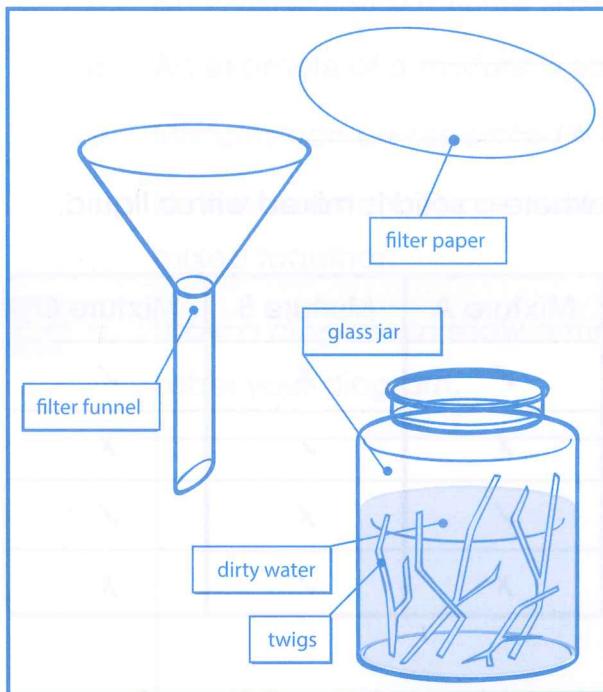
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## Exercise 3.4 Separating insoluble substances

In this exercise, you will think about how water can be cleaned.

**Remember:** even though the filtered water is now cleaner, it is still not safe to drink. It needs to be boiled or purified in a special filter to be drinkable.

- 1 Make a labelled drawing to show how you could use the equipment and materials in the pictures to clean water.



- 2 a What is this method for cleaning water called?

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- b How does this method help clean water?

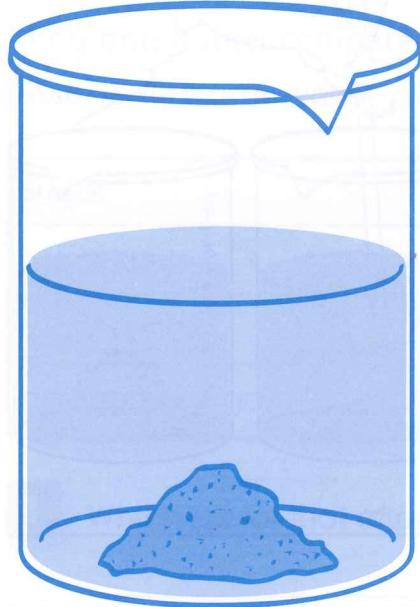
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## Exercise 3.5 Solutions

In this exercise, you will test your knowledge about solutions.



Pablo added a coloured substance to water. After ten minutes, the colour was evenly spread in the water and the substance at the bottom of the beaker had disappeared.

- 1** a Is this an example of a solution? \_\_\_\_\_
- b Give two reasons for your answer.

---

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- 2** Name the two parts of a solution.

---

- 3** Name one way that you can tell if a liquid is a mixture or a pure substance.

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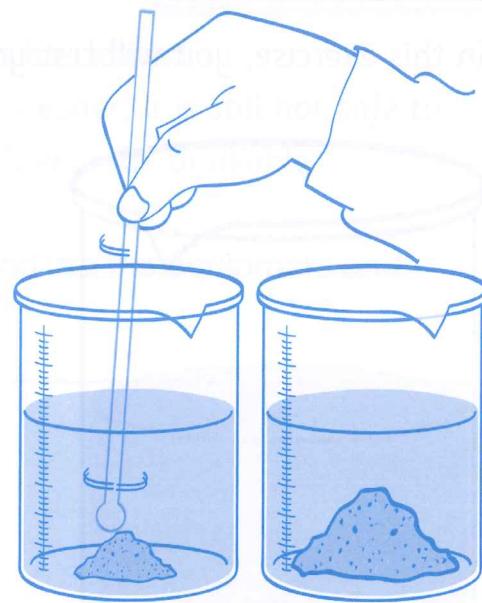
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## Exercise 3.6

### How can we make solids dissolve faster?

In this exercise, you will think about the factors that affect dissolving.

The picture shows a test to find out about factors that affect dissolving.



1 Which factor that affects dissolving is being tested? \_\_\_\_\_

2 Which factors are the same in both beakers? \_\_\_\_\_

3 Which factors are different in the beakers? \_\_\_\_\_

4 Which beaker is the control? \_\_\_\_\_

5 Will this be a fair test? Explain your answer. \_\_\_\_\_

## Exercise 3.7

# How does grain size affect dissolving?

In this exercise, you will consider how long it takes a substance to dissolve.

Ming and Kumei compared how long it took for different kinds of sugar to dissolve in warm water. They conducted a fair test. These are their results.

Sugar	Time to dissolve in seconds
sugar lump	90
sugar grains	45
powdered sugar	30

1 Which factor that affects dissolving did they investigate?

2 What pattern can you see in their results?

3 What could they conclude from their investigation?

4 Name three things they must do to make their test fair.

5 a How would their results be different if they dissolved the sugar in cold water?

b Explain why.

## Language review

This exercise checks that you understand the scientific words used in this unit.

Choose the correct words from the box to complete the sentences. You can use words more than once.

dissolves    filter    insoluble    irreversible    mixture  
pure    reversible    sieve    soluble    solute    solution  
solvent    suspension    uniform

- 1 Water boiling is a/an \_\_\_\_\_ change.
- 2 A tin can rusting is a/an \_\_\_\_\_ change.
- 3 Sugar dissolved in tea is an example of a \_\_\_\_\_ and a \_\_\_\_\_.
- 4 Sugar \_\_\_\_\_ when it mixes with tea and becomes part of the tea.
- 5 We can use a \_\_\_\_\_ to separate a \_\_\_\_\_ of gravel and sand.
- 6 We can separate sand and water with a \_\_\_\_\_ which lets through the water but not the sand.
- 7 Chalk does not dissolve in water because it is \_\_\_\_\_.
- 8 A mixture of flour and water is cloudy because it is a \_\_\_\_\_.
- 9 Sugar dissolves in tea because it is \_\_\_\_\_.
- 10 In a cup of tea, the tea is the \_\_\_\_\_ and the dissolved sugar is the \_\_\_\_\_.
- 11 We cannot see sugar dissolved in tea as the tea has a \_\_\_\_\_ appearance.
- 12 Water is a \_\_\_\_\_ substance but tea is a \_\_\_\_\_.

# 4

# Forces and motion

## Exercise 4.1 Mass and weight

In this exercise, you will ...

1

- a Name the instrument used to measure mass.

---

- b Name the unit of mass.

---

2

- a Name the instrument used to measure weight.

---

- b Name the unit of mass.

---

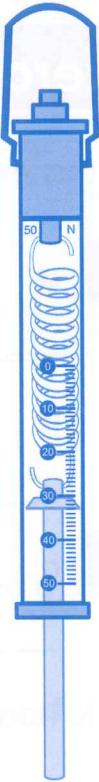
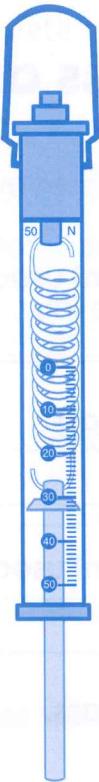
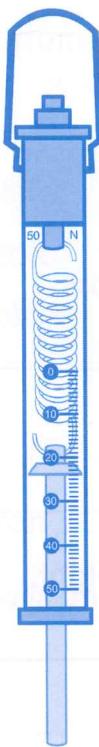
3

- Class 6 measured mass and weight. Complete their table of results.

Remember to include the correct units for each measurement.

Object	Mass	Weight
brick	1	
pile of books		25
Miss Small	52	
bag of cement		400

- 4** a Class 6 measured the weight of different objects with forcemeters. Read and record the measurements on the forcemeters below.



- b List the objects in order of their weight. Start with the object that has the lowest weight.

- 5** If you pull on an object hanging from a forcemeter, would this give you an accurate reading of its weight? Say why or why not.

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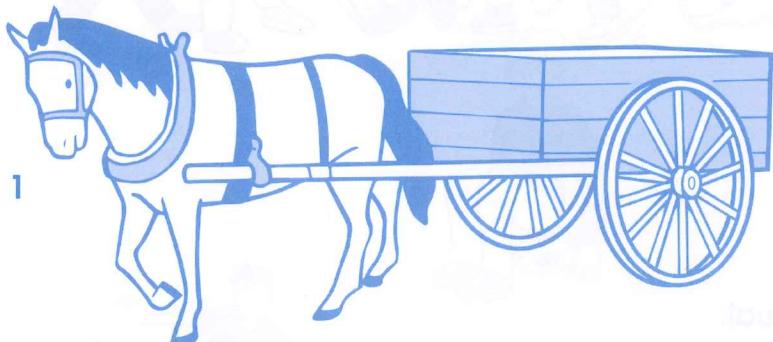
## Exercise 4.2 How forces act

In this exercise, you will use what you know about force diagrams.

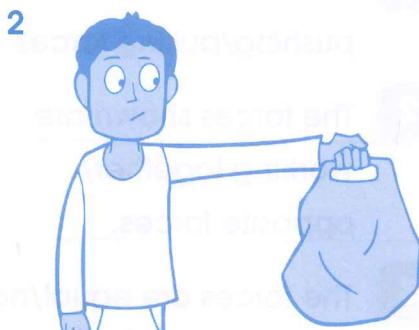
- 1** Draw arrows to identify the direction of the forces acting in each of the pictures.

Use same length arrows if the forces are equal.

Use longer arrows to show the stronger force.



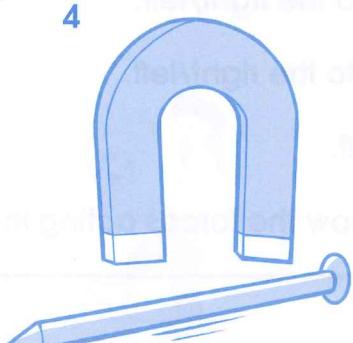
1



2



3



4



5

- 2** a In which drawings are the forces the same size?

- b In which drawings are the forces different sizes?

## Exercise 4.3 Balanced and unbalanced forces

In this exercise, you will consider balanced and unbalanced forces.

Look at the picture and underline the correct words to make each of the sentences true.



- 1** The forces shown are pushing/pulling forces.
- 2** The forces shown are working together/opposite forces.
- 3** The forces are equal/not equal.
- 4** The forces do/do not balance each other.
- 5** The bigger force is pulling to the right/left.
- 6** The smaller force is pulling to the right/left.
- 7** Movement is to the right/left.
- 8** Draw a force diagram to show the forces acting in the picture.

A large, empty rectangular box with a blue border, intended for the student to draw a force diagram illustrating the forces shown in the tug-of-war illustration above.

## Exercise 4.4 The effects of forces

In this exercise, you will revise what you know about the effects of forces.

- 1 Write down how forces affect the objects shown in each picture.

a



---

---

b



---

---

c



---

an object moves when a force acts on it.

---

d



---

an object moves when a force acts on it.

---

- 2 In which drawings are the forces:

a balanced

---

---

b unbalanced

---

---

## Exercise 4.5 Forces and energy

In this exercise, you will revise what you know about forces and energy.

- 1 Ming rides her bicycle to school.

a What force does she exert on the bicycle?

---



b What effect does the force have on the bicycle?

---

---

c Is any work done? Say why or why not.

---

---

- 2 Mr Speed's car breaks down. He pushes the car but it does not move.

a What force does he exert on the car?



b Has any work been done on the car? Say why or why not.

---

---

c Why does Mr Speed feel tired?

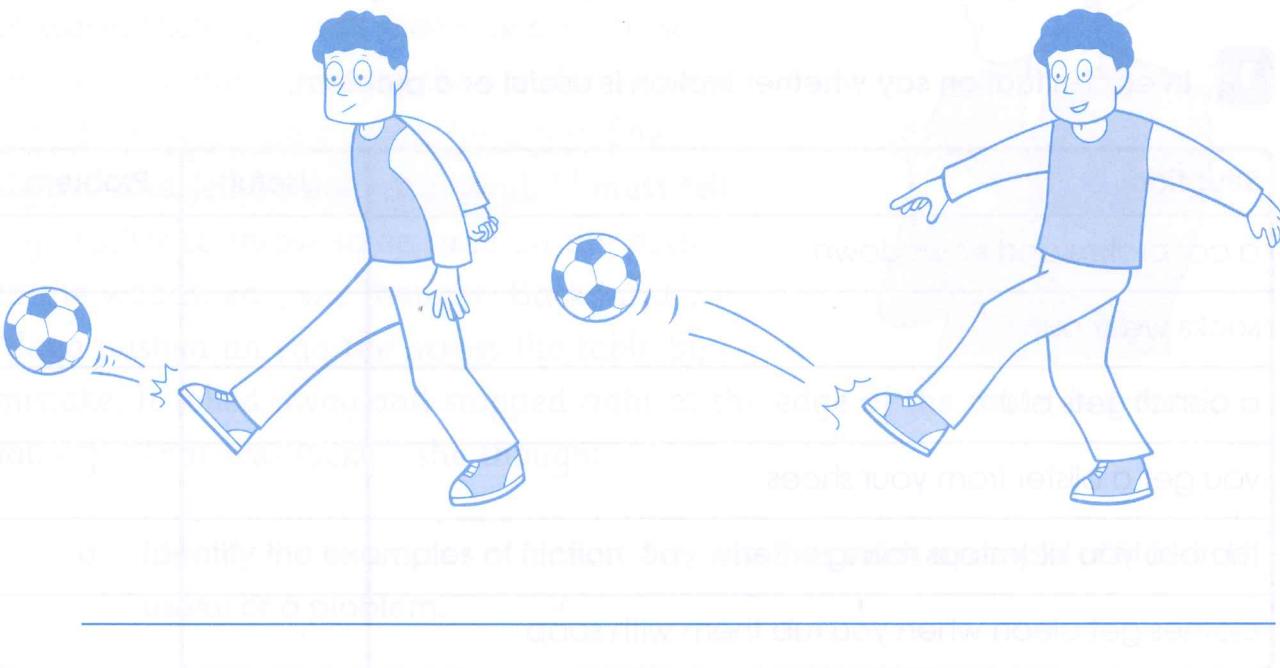
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3

Which picture (A or B) shows that more work has been done?

Say why.



4

Yusef is flying a kite.

a Where does the kite get the energy to fly?

\_\_\_\_\_

b What will happen if the wind suddenly stops blowing?

\_\_\_\_\_

c Why do you think kites are made of very light materials?

\_\_\_\_\_



## Exercise 4.6 Friction

In this exercise, you will think about when friction is useful, and when it is not.

- 1 In each situation say whether friction is useful or a problem.

Situation	Useful	Problem
a car brakes and slows down		
socks wear out		
a pencil gets blunt		
you get a blister from your shoes		
the ball you kick stops rolling		
clothes get clean when you rub them with soap		

- 2 Write true or false for each sentence.

- a Friction allows objects to move easily when they touch. \_\_\_\_\_
- b Friction cannot make objects start moving. \_\_\_\_\_
- c Friction stops objects from sliding away when they move. \_\_\_\_\_
- d We produce more friction if we rub things together softly than if we rub them strongly. \_\_\_\_\_

**3****Read the story and answer the questions.**

Maya felt cold. She rubbed her hands together to warm them up. That didn't help much so she stuck a match to light the fire. Maya went outside to fetch more wood for a fire. She slipped and fell on the icy ground. "I must tell my brother to throw some sand on the path to the woodshed", she thought. Back inside, Maya pushed an egg across the table by mistake. It rolled away and stopped right at the edge of the table, but didn't fall off. "That was lucky", she thought.



- a Identify the examples of friction. Say whether each example of friction is useful or a problem.

---

---

---

---

- b Why did Maya want her brother to put sand on the icy path?

---

---

- c Why did the egg not fall off the table?

---

---

## Exercise 4.7 Investigating friction

In this exercise, you will look at some results of an investigation.

Amina and Mira measured how far a block of wood slid down a plank covered with different materials. These are their results.

Surface of plank	Distance block moved in cm
cardboard	75
plastic wrap	120
sandpaper	25
paper towel	50

- 1** a Which surface produced the most friction?

- b How do you know this?

- c Why did this surface produce the most friction?

- 2** a Which surface produced the least friction?

- b How do you know this?

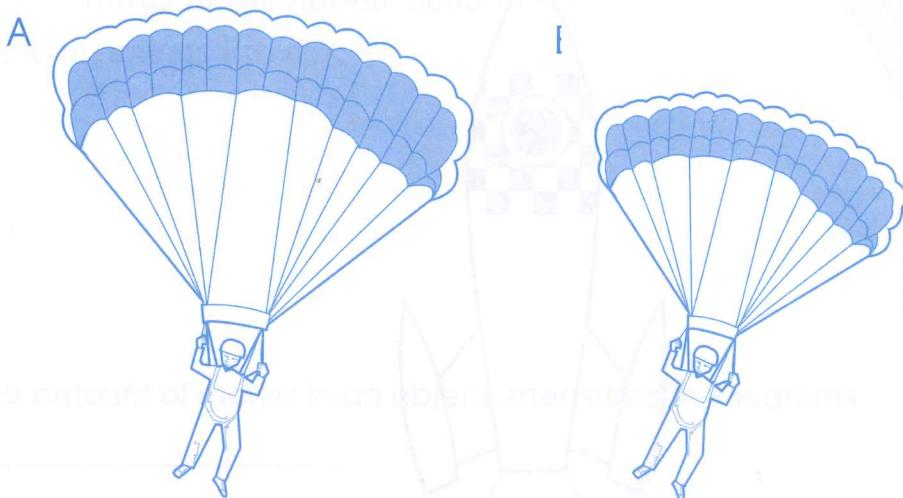
- c Why did this surface produce the least friction?

- 3** Suggest a way to reduce the friction of the block of wood on all the surfaces.

## Exercise 4.8 Air resistance and drag

In this exercise, you will think about air resistance and parachutes.

The drawing shows two people jumping with parachutes.



- 1**
  - a Which parachute will fall faster?  

---

---
  - b Explain why.  

---

---
- 2** Label the forces acting on the parachutes and show the direction in which each force acts.
- 3** Do you think parachutes fall faster or slower if the person or weight is heavier? How can you test your idea?  

---

---

- 4** When rockets are launched into space they need to escape the Earth's gravity. They use a force called thrust to do this.



- a Label the forces acting on the rocket in the drawing.
- b Which force pushes the rocket upwards?
- c Which force pulls the rocket back towards the Earth?
- d When the rocket moves upwards, are the forces balanced or not? Explain your answer.

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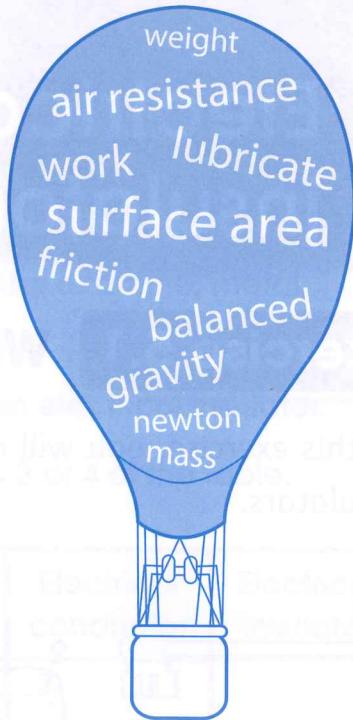
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## Language review

This exercise checks that you understand the scientific words used in this unit.

Choose the words in the hot-air balloon that match the meanings listed.



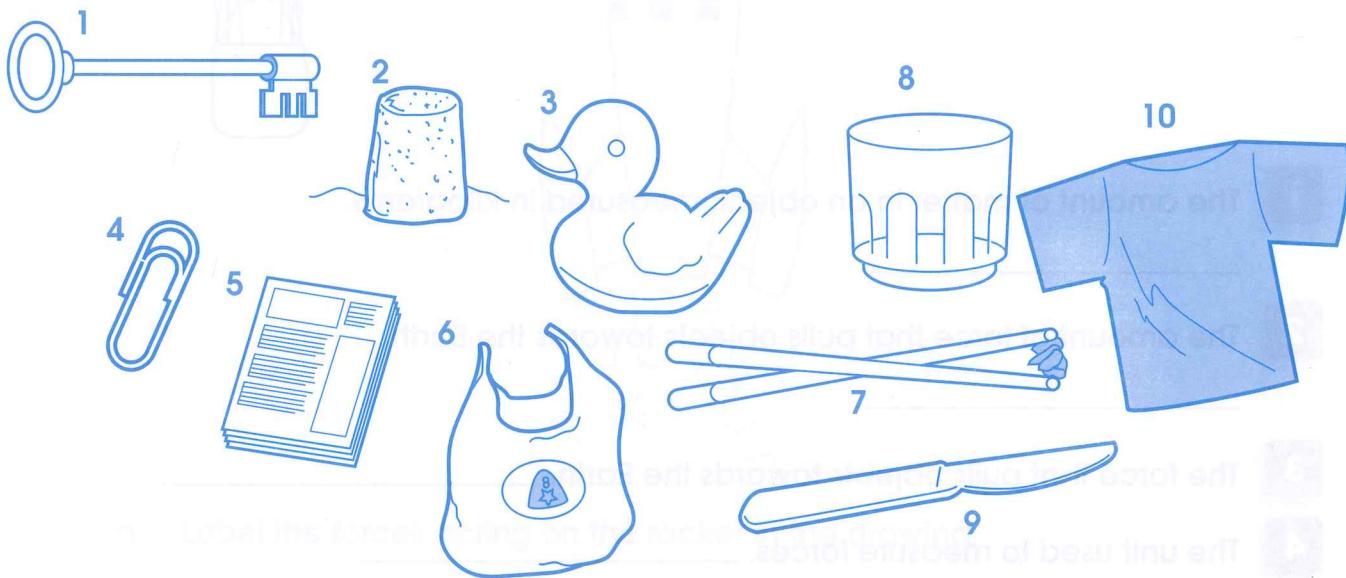
- 1 The amount of matter in an object, measured in kilograms.  
\_\_\_\_\_
- 2 The amount of force that pulls objects towards the Earth.  
\_\_\_\_\_
- 3 The force that pulls objects towards the Earth. \_\_\_\_\_
- 4 The unit used to measure forces. \_\_\_\_\_
- 5 Two forces of the same size that act in opposite directions on an object.  
\_\_\_\_\_
- 6 The energy transferred when a force makes an object move.  
\_\_\_\_\_
- 7 A force that slows things down. \_\_\_\_\_
- 8 When you use oil to stop moving parts of machine from getting too hot.  
\_\_\_\_\_
- 9 The size of the outside part of an object. \_\_\_\_\_
- 10 The force caused by air pushing against moving objects  
\_\_\_\_\_

## 5

# Electrical conductors and insulators

## Exercise 5.1 Which materials conduct electricity?

In this exercise, you will revise what you know about electrical conductors and insulators.



- 1** What is the difference between an electrical conductor and an electrical insulator?

---



---



---

2

Identify objects 1–10 in the picture. Fill in your answers in column 1 of the table.

Identify the material that each object is made from (for example, metal, wood). Fill in your answers in column 2 of the table.

Decide whether each is an electrical conductor or an electrical insulator.

Record your answers by putting a ✓ in either column 3 or 4 of the table.

Object	Material object made from	Electrical conductor	Electrical insulator
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

## Exercise 5.2 Does water conduct electricity?

In this exercise, you will revise and apply what you know about water and conduction of electricity.

### 1 What is pure water?

---

---

### 2 How is tap water different to pure water?

---

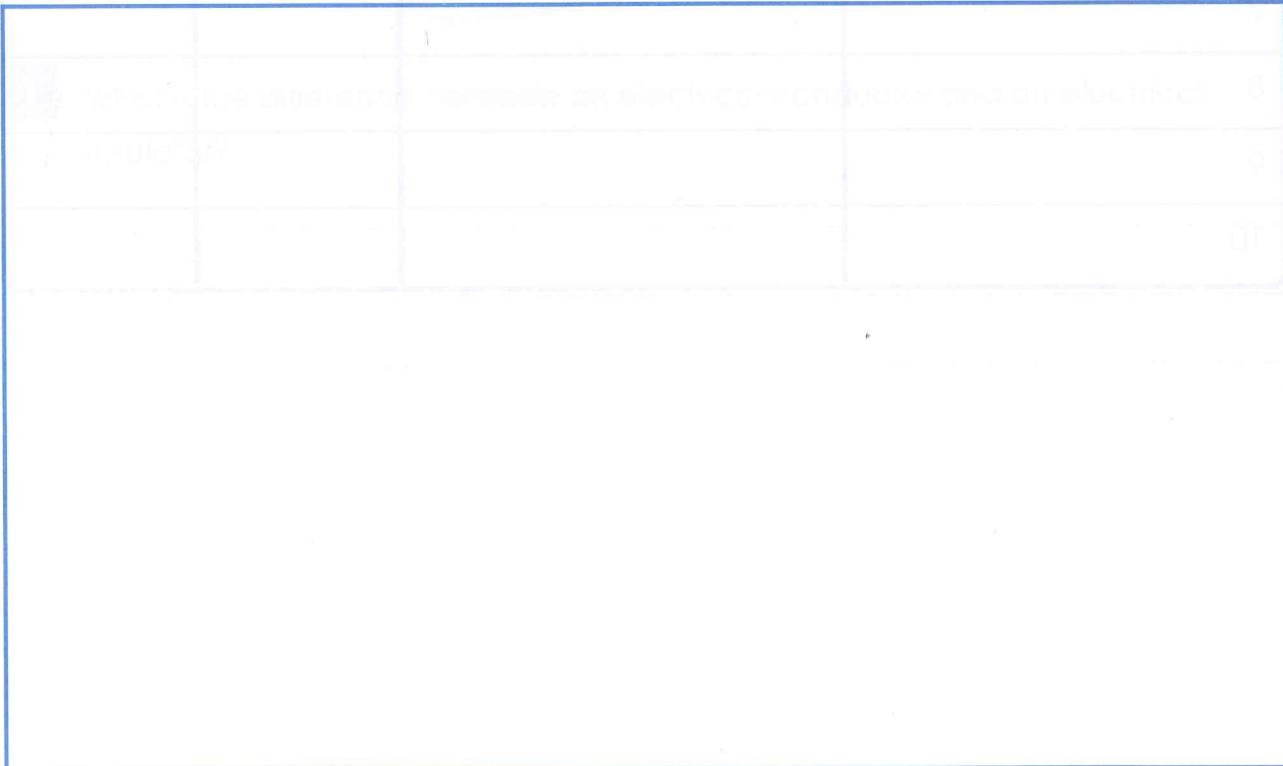
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### 3 Why can plants, animals and humans conduct electricity?

---

---

### 4 Draw a sign to put up in a restaurant kitchen to warn workers never to use wet hands near electric stoves and appliances.

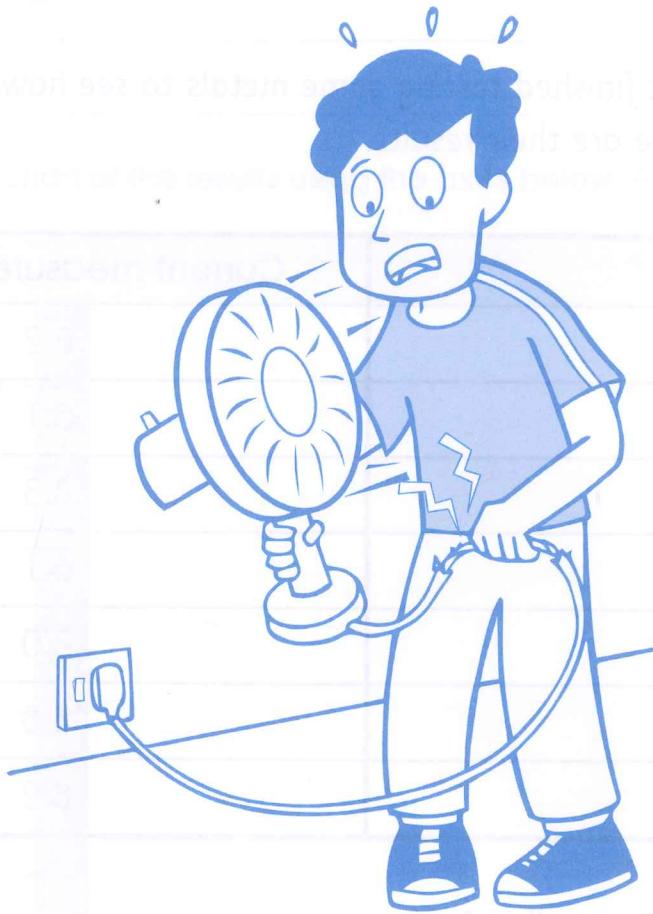


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Jawad has just completed a 20 km run. He is very hot and sweaty.

The first thing that he does when he gets home is turn on the electric fan.

Jawad moves the fan and touches some bare wire where the plastic insulation has worn away.



a What has happened to Jawad?

b List the three factors that caused this to happen.

### Exercise 5.3

## Do different metals conduct electricity equally well?

In this exercise, you will apply what you know about how well different metals conduct electricity.

Tom and Aba have just finished testing some metals to see how well they conduct electricity. Here are their results.

Metal	Current measured in amps
aluminium	8.2
stainless steel	5.1
brass	8.3
steel	6.1
silver	8.0
gold	8.5
copper	8.2

- 1 Which three metals are alloys?

---

---

---

- 2 a Which five metals would be suitable for electrical wiring?

---

---

---

- b How do you know this?

3

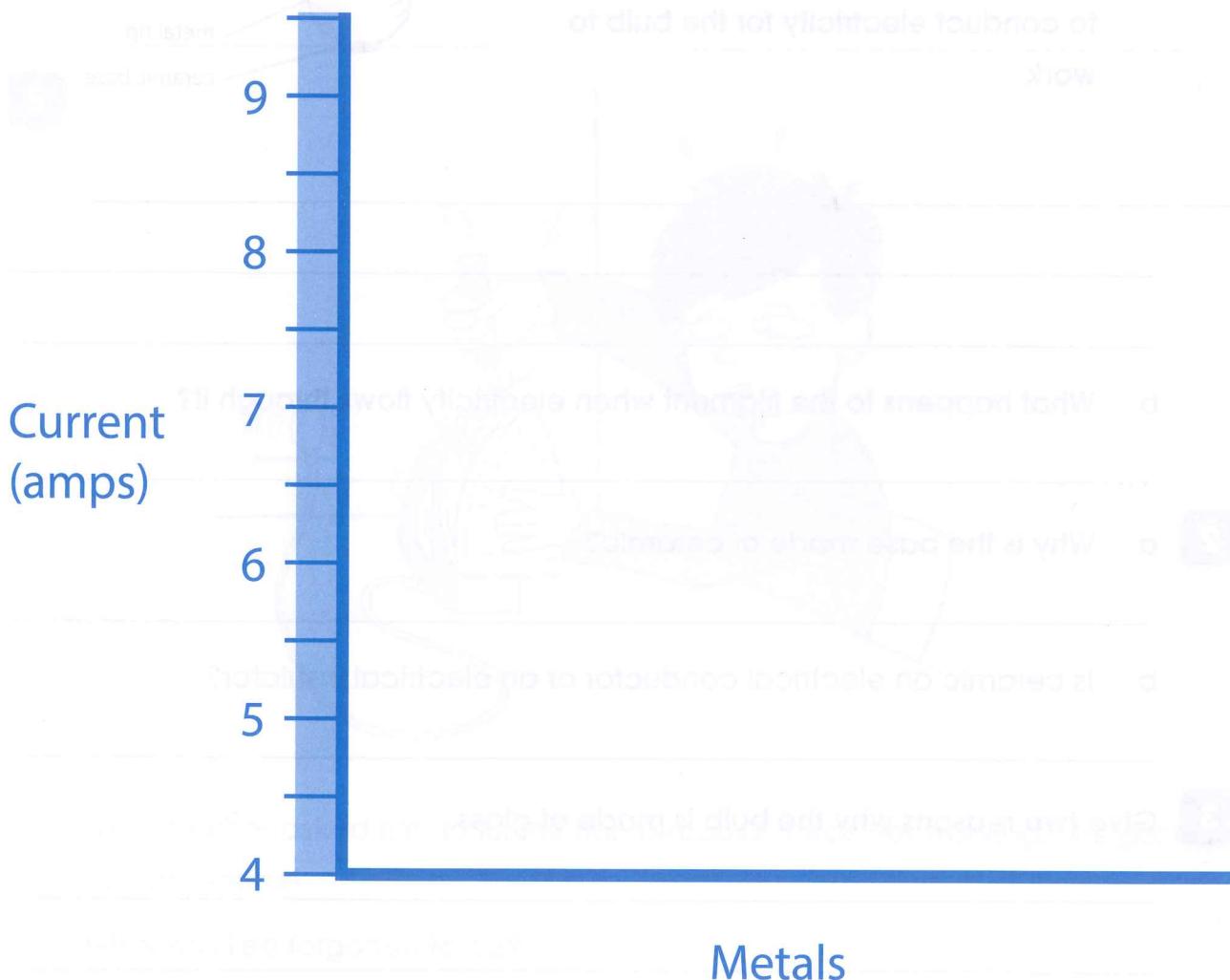
Which metal is usually used for electrical wiring?

4

Why aren't the other metals you listed in question 2 used for this purpose?

5

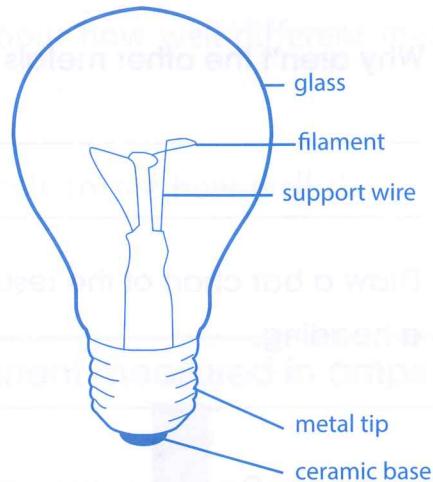
Draw a bar chart of the results using the axes below. Give your graph a heading.



## Exercise 5.4 Choosing the right materials for electrical appliances

In this exercise, you will use what you know about choosing the right materials for electrical systems.

- 1** a List three parts of the light bulb which are made of materials that conduct electricity. For each part, say why it has to conduct electricity for the bulb to work.



- b What happens to the filament when electricity flows through it?

- 2** a Why is the base made of ceramic?

- b Is ceramic an electrical conductor or an electrical insulator?

- 3** Give two reasons why the bulb is made of glass.

**4** Here are four steps, labelled A to D, that you should take to replace a light bulb safely with a new one.

The steps are in the wrong order. Re-arrange them so that they are in the correct order.

- A Unscrew the old light bulb.
- B Wait for the bulb to cool down.
- C Switch the electricity off.
- D Screw in the new light bulb.

**5**

- A a circuit with a bulb and a switch
- B a circuit with a bulb and a plug
- C a circuit with two bulbs and a switch

Why is a multi-plug dangerous?

- A Because the plug is faulty

- B Because the bulb is faulty

- C It uses more energy than one plug

- D It takes up less space than one plug

- E It costs less than one plug

- F It can cause a fire

- G It requires more than one section of wire

- H It is more difficult to fix

Lee's mother asked him to fix the iron because it was not working. Lee got an electric shock!

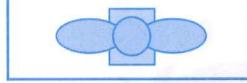
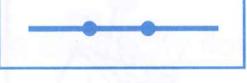
What has Lee forgotten to do?

Lee has forgotten to turn the iron off at the plug.

## Exercise 5.5 Circuit symbols

In this exercise, you will revise symbols for electrical components.

Match up the components on the left with their circuit symbols on the right.  
Draw lines linking the matching pairs.

Component	Symbol
	
	
	
	
	
	
	
	
	
	

## Exercise 5.6 Changing the number of components

In this exercise, you will use your knowledge about changing the number of components in a circuit to choose the correct answers to questions.

For each question (1–5), circle the correct answer from the alternatives A, B and C.

**1** In which circuit will the bulb or bulbs glow brightest?

- A a circuit with one bulb and one cell
- B a circuit with one bulb and two cells
- C a circuit with two bulbs and one cell

**2** Why is a bulb brighter when it is powered by two cells rather than one?

- A because the flow of electricity in the circuit is less
- B because the flow of electricity in the circuit is the same
- C because the flow of electricity in the circuit is greater

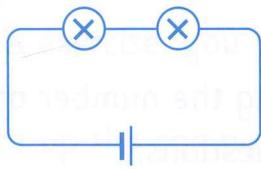
**3** Jamil has connected two bulbs and two cells in a circuit. How can he make the bulbs dimmer (but not switched off)?

- A replace one of the cells with a section of wire
- B replace one of the cells with a cork
- C replace one of the bulbs with a section of wire

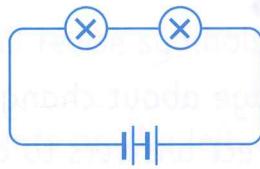
**4** Tracey makes a complete circuit with one bulb and three cells. The bulb lights for an instant and then goes out. Why?

- A not enough electricity flows around the circuit
- B too much electricity flows through the bulb
- C the cells are flat

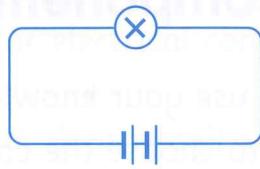
**5** In which circuits will the bulbs be brightest?



A



B



C

In questions 6 and 7, you need to draw circuits using circuit symbols.

**6** Draw a circuit diagram for Jamil's circuit described in 3.

Jamil's circuit has a battery and three light bulbs. A bulb is connected in parallel with the other two. The other two are connected in series.

**7** Draw a circuit diagram for Tracey's circuit described in 4.

Tracey's circuit has a battery and four light bulbs. Two light bulbs are connected in parallel with each other. This pair is then connected in series with the other two light bulbs.

## Exercise 5.7 Adding different components

In this exercise, you will use your knowledge about adding different components to a circuit.

- 1 Thandi and Susan want to make a circuit with a 3V buzzer.

Write down the components they will need.

---

---

- 2 Draw the circuit diagram.

- 3 How could they make the buzzer sound louder?

---

---

- 4 They want to replace the buzzer with a 6V bell. What changes do they need to make to their circuit?

---

---

- 5 Draw the new circuit diagram.

2

---

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5

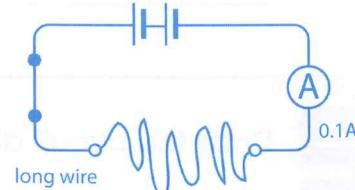
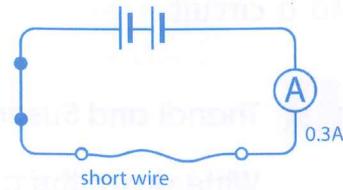
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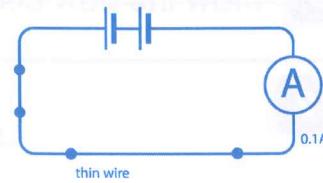
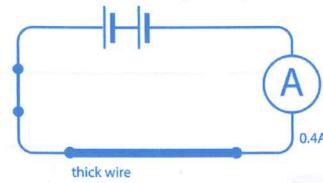
## Exercise 5.8 Length and thickness of wire in a circuit

In this exercise, you will use your knowledge about the length and thickness of wire in a circuit.

- 1** Look at the circuit diagrams. They show two circuits, one with a short wire and one with a long wire. The ammeter readings show the strength of current in amps passing through the wire.
  - a Which wire allows a stronger current to pass through?



- 2** Look at the circuit diagrams. They show two circuits, one with a thick wire and one with a thin wire. The ammeter readings show the strength of current in amps passing through the wire.
    - a Which wire allows a stronger current to pass through?
- b Explain why.



## Exercise 5.9 Improving Volta's battery

This exercise introduces you to John Daniell, another scientist who worked with batteries.

Read the paragraph about the British scientist called John Daniell.

Volta's pile was not good for delivering currents for a long period of time. In 1820 British scientist John Daniell developed a battery that lasted longer. His battery consisted of a large jar with a copper plate at the bottom. At the top of the jar there was a piece of zinc hanging over the copper plate. He used two different conducting solutions, one floating on the other. This meant his battery could only be used for things fixed in one place, otherwise the solutions mixed. Daniell's battery was used to power telephones and door bells for 100 years.

- 1** List the creative ideas that Daniell used to improve on Volta's pile.

Two different conducting solutions were used.  
The zinc plate was suspended above the copper plate.

- 2** How was Daniell's battery an improvement on Volta's battery?

The Daniell cell provided a more reliable and longer-lasting current than Volta's pile.

- 3** What disadvantage did Daniell's battery have?

The Daniell cell had to be fixed in one place because the two solutions mixed if they were moved.

## Language review

This exercise checks that you understand the scientific words used in this unit.

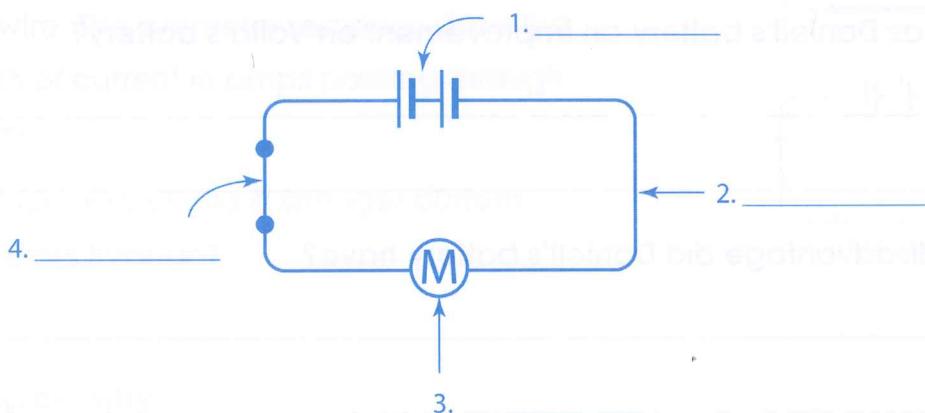
- 1 Fill in the correct words in these sentences. Use the words above.

ceramic conductor current electric shock insulator  
battery metal plastic switch wire switch motor

The cover of a plug acts as an \_\_\_\_\_. The cover is made from materials such as \_\_\_\_\_ or \_\_\_\_\_. The inside of a plug is made of \_\_\_\_\_ which is a \_\_\_\_\_ of electricity.

You can get an \_\_\_\_\_ if you touch a bare wire when an electric \_\_\_\_\_ is flowing through it.

- 2 a Label the four components 1–4 in the circuit diagram.



- b What could you add to the circuit to measure the current passing through it?

---

- c In what unit is the current measured?

---



# CAMBRIDGE PRIMARY Science

## Activity Book

6

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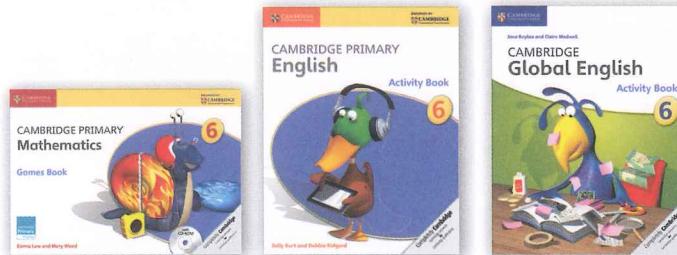
- one exercise to accompany each Topic in the Learner's Book
- exercises that can be completed in class or as homework
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