

45 minutes

Science Paper 1

Stage 7

Name .....

Additional materials: Ruler

READ THESE INSTRUCTIONS FIRST

Answer **all** questions in the spaces provided on the question paper.

You should show all your working on the question paper.

The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is 50.

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Page	Mark
1	
2	
3	
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1 The structure of the Earth is made up of layers.

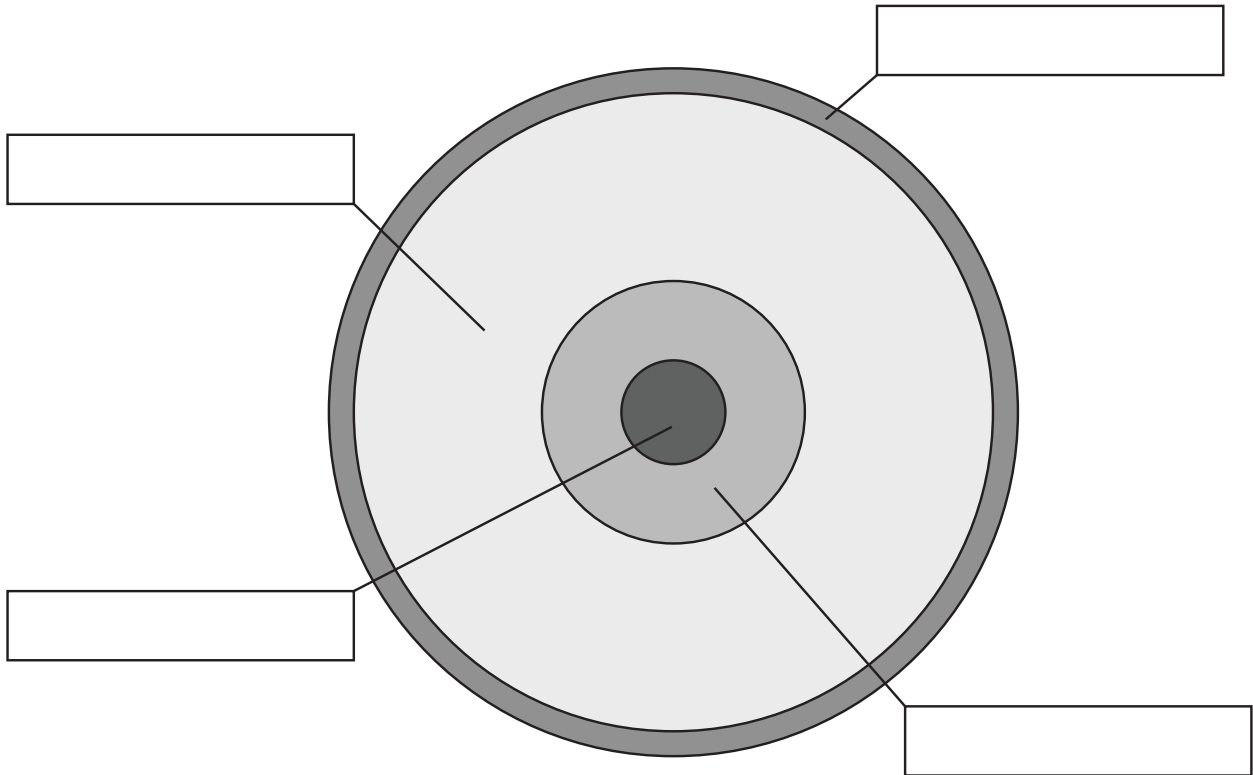
(a) Label the diagram of the layers of the Earth using these words.

crust

inner core

mantle

outer core



[2]

(b) Tick (✓) the boxes next to the **two** correct statements.

The inner core is the hottest part of the Earth.

☐

Iron and nickel are only found in the crust.

☐

Solid rocks are found in all the layers.

☐

The mantle is made up of semi-molten rock called magma.

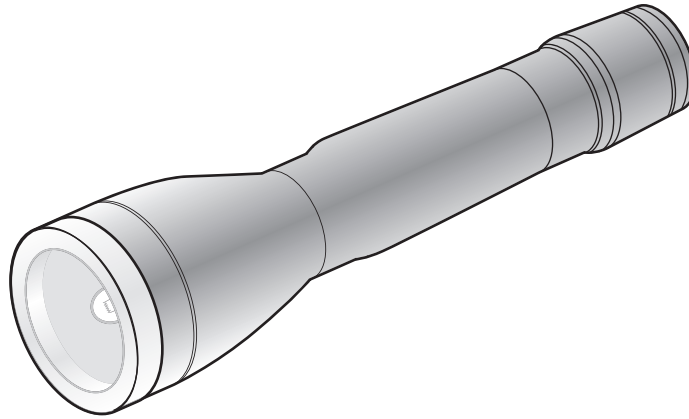
☐

[2]

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2 Many everyday items use energy transfers.

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A torch transfers energy of one type into other types.

Use the words in the list to complete the sentences.

**chemical**

**electrical**

**kinetic**

**light**

**gravitational**

**sound**

**thermal (heat)**

The torch battery is an energy source. It stores ..... energy.

The torch is switched on. Energy is transferred from the battery to the bulb.

This is ..... energy. Energy is transferred by the bulb to the surroundings as ..... energy and ..... energy.

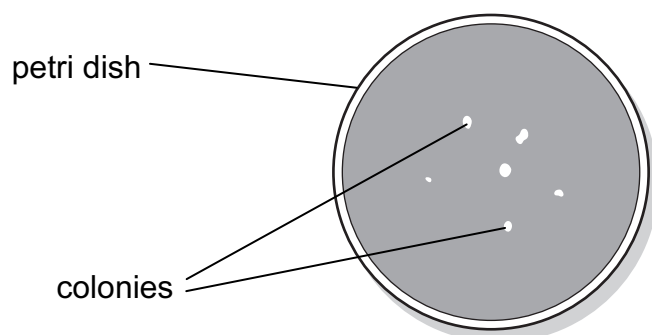
[3]

### 3 Bacteria are micro-organisms and can be used in food production.

It is important to find out the best conditions for bacteria to reproduce.

When bacteria reproduce they form colonies.

This Petri dish has six bacterial colonies.



Here are the results for identical Petri dishes kept in different conditions.

#### without oxygen

temperature in °C	number of colonies
0	0
10	0
20	0
30	0
40	0
50	0

#### with oxygen

temperature in °C	number of colonies
0	5
10	10
20	20
30	32
40	56
50	21

(a) How do you know these bacteria need oxygen to reproduce?

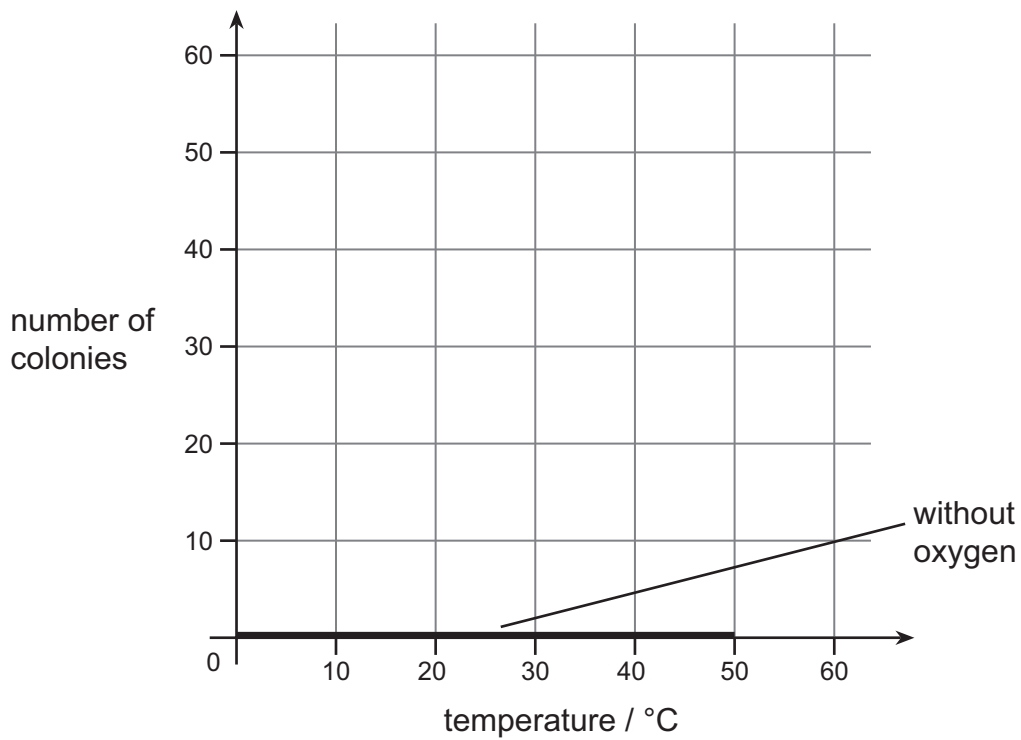
..... [1]

(b) The colonies formed are different sizes.

Suggest a method for measuring the size of the colony.

..... [1]

(c) Here is a graph of the results without oxygen.



(i) Draw the results with oxygen on the same graph.

[2]

(ii) Use the graph to predict the number of colonies at 60°C.

Number of colonies at 60°C without oxygen = .....

Number of colonies at 60°C with oxygen = ..... [1]

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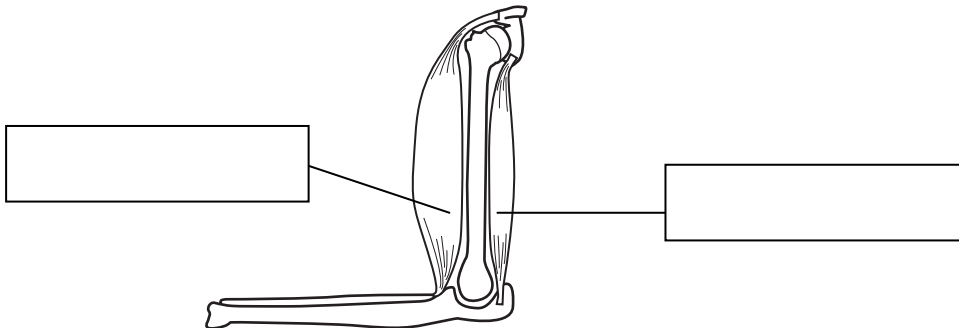
4 The human body is made up of organ systems.

(a) Draw a line to connect each **organ system** to its **main function**.

organ system	main function
digestive	transport nutrients
circulatory	break down nutrients
nervous	remove waste
excretory	gas exchange
respiratory	co-ordination

[3]

(b) Here is a diagram showing the muscles and bones in the arm.



(i) Label the **two** muscles.

[1]

(ii) How do the **two** muscles work together to make the arm bend?

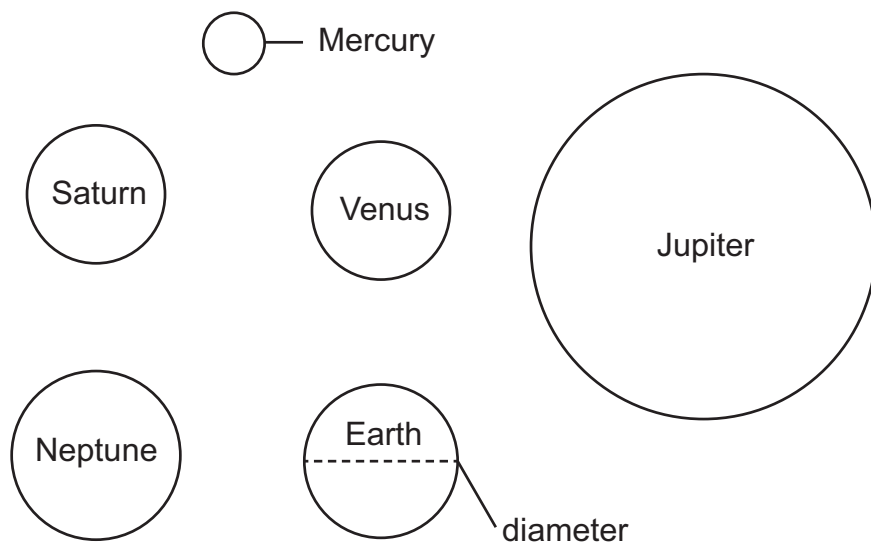
.....  
 .....

[2]

- 5 The diagram shows six planets.

Different planets have different gravitational forces.

The diameter of the circles represents the size of the gravitational forces.



- (a) In the diagram, the diameter of Earth is 2 cm.

The gravitational force on Earth is 10 units.

Use this information to complete these sentences.

In the diagram, the diameter of Jupiter is ..... cm.

The gravitational force on Jupiter is ..... units. [2]

- (b) Write the names of the **three** planets where you would weigh less than you do on Earth.

1 .....

2 .....

3 ..... [1]

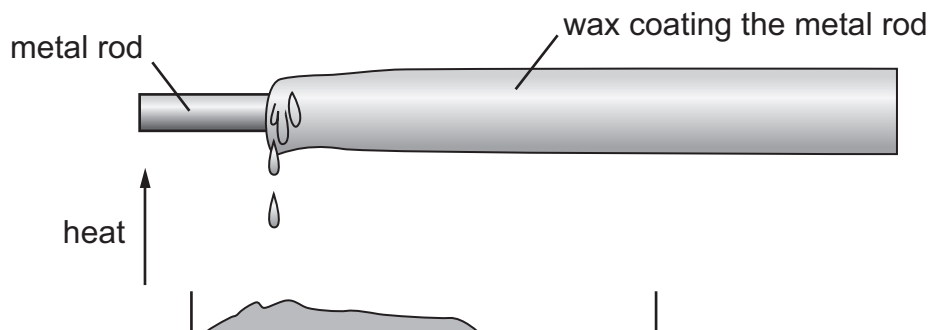
6 Luka investigates the properties of four different metals.

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(a) His first investigation is about heat conduction.

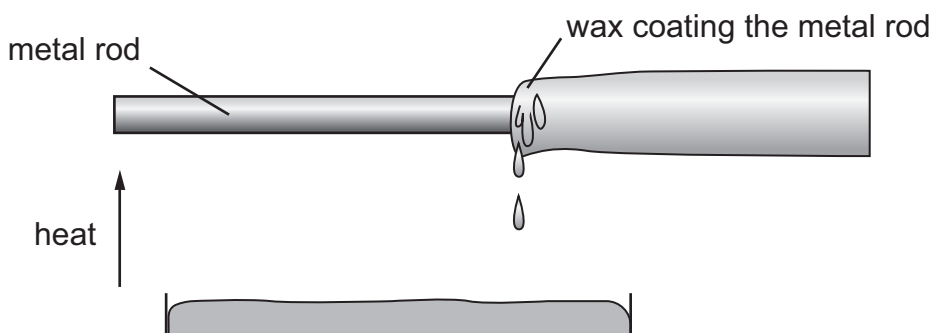
Luka heats the end of each metal rod.

Some of the wax will heat up, melt and drip off the rod.



After five minutes, he stops heating the metal rod.

Here is the result.



(i) Luka heats each metal rod for the same amount of time.  
Suggest **two** other things he should keep the same to make it a fair test.

1 .....

2 ..... [2]

(ii) He wants to compare how well the four metals conduct heat.  
Suggest a measurement he could take and the apparatus he could use.

Measurement .....

Apparatus ..... [1]



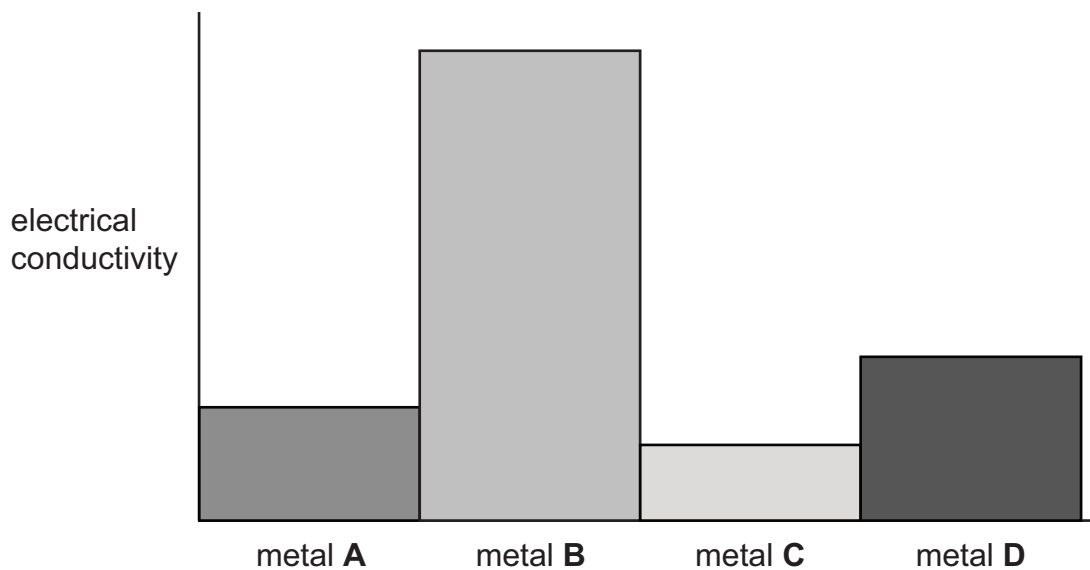
(iii) Luka records his results. Draw a results table for him to use.

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[2]

(b) Luka's second investigation is about the conduction of electricity.

Here are his results.



(i) Which metal would be the best to use for electrical wires?

[1]

(ii) Suggest **one** other property of metals that is important when making electrical wires.

[1]

7 Herons are birds that eat fish.



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(a) The picture shows how the heron is adapted to hunt and catch its own food.

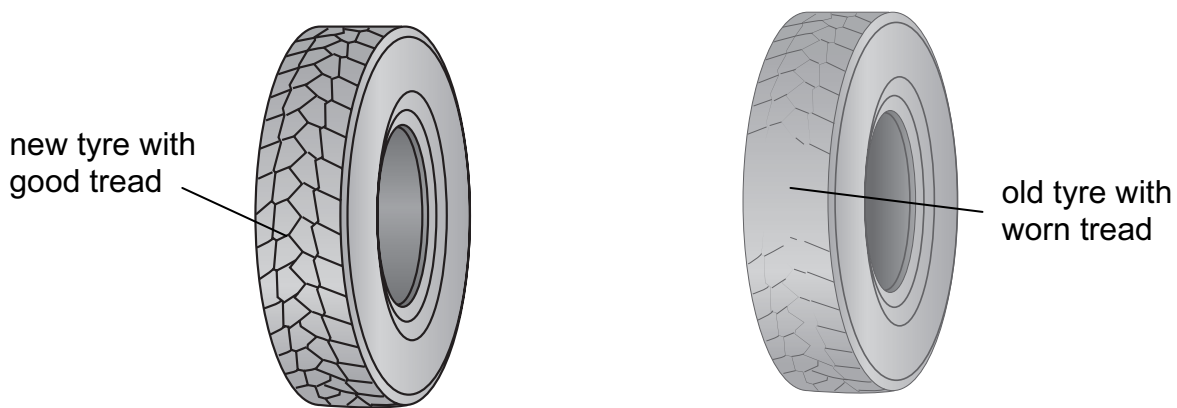
Write **two** ways in which the heron is adapted.

- 1 .....
- 2 ..... [2]

(b) Write the name for the type of animal which hunts and catches its own food.

..... [1]

8 Car tyres lose tread as they get older.



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(a) Complete the sentences about two cars travelling at the same speed.

The drivers brake suddenly.

The force of friction between the ..... and  
the ..... makes the cars stop.

The car with old worn tyres takes 20 metres to stop.

The other car has new tyres.

This car only takes 18 metres to stop.

This is because the force of friction has ..... [2]

(b) The condition of the road surface changes the force of friction.

Tick (✓) the **two** correct statements.

Water on the road surface increases friction.

☐

Oil on the road surface decreases friction.

☐

Ice on the road surface does not change friction.

☐

Rougher road surface increases friction.

☐

Smoother road surface does not change friction.

☐

[2]

- 9 Which of the statements about particles in a solid are correct?  
Tick (✓) the **three** correct statements.

The particles in a solid are:

further apart than the particles in a liquid.

☐

further apart than the particles in a gas.

☐

able to vibrate about a fixed point.

☐

arranged in a more fixed pattern than  
particles in a liquid.

☐

not able to vibrate when they reach 0°C.

☐

able to vibrate more as they gain energy.

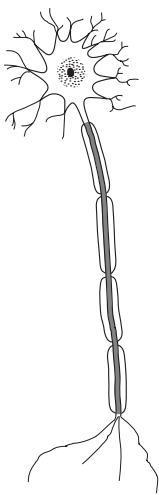

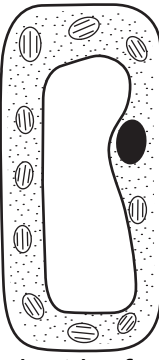
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[2]

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10 Complete the table about cells.

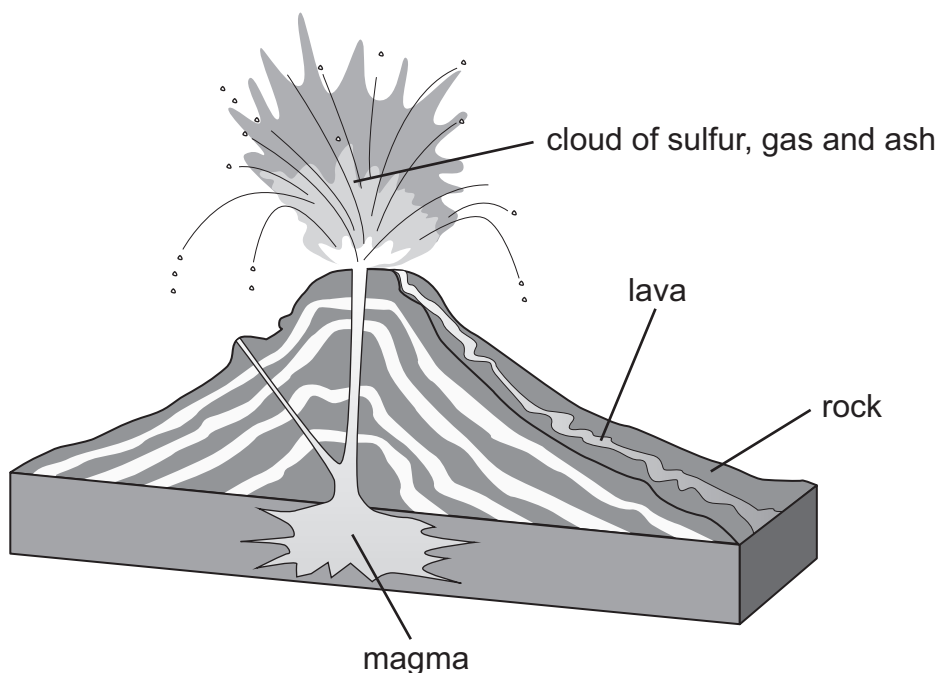
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cells	appearance	function
 a nerve cell		to carry electrical impulses
 a sperm cell	tiny cell with a nucleus and a long tail	
 a plant leaf cell	cell contains lots of chloroplasts	

[3]

11 This diagram shows an erupting volcano.

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After an eruption, the magma and lava cool. Rock is formed.

(a) What is the name of this rock?

Underline the answer from the list.

**igneous rock**

**metamorphic rock**

**sedimentary rock**

[1]

(b) Clouds of sulfur gas are released into the air when a volcano erupts.

Sulfur is a bright yellow crystalline solid at room temperature.  
Sulfur does not dissolve in water.  
Sulfur does not conduct electricity.

Is sulfur a metal or a non-metal?

.....

Which piece of information in the box helped you to decide?

.....

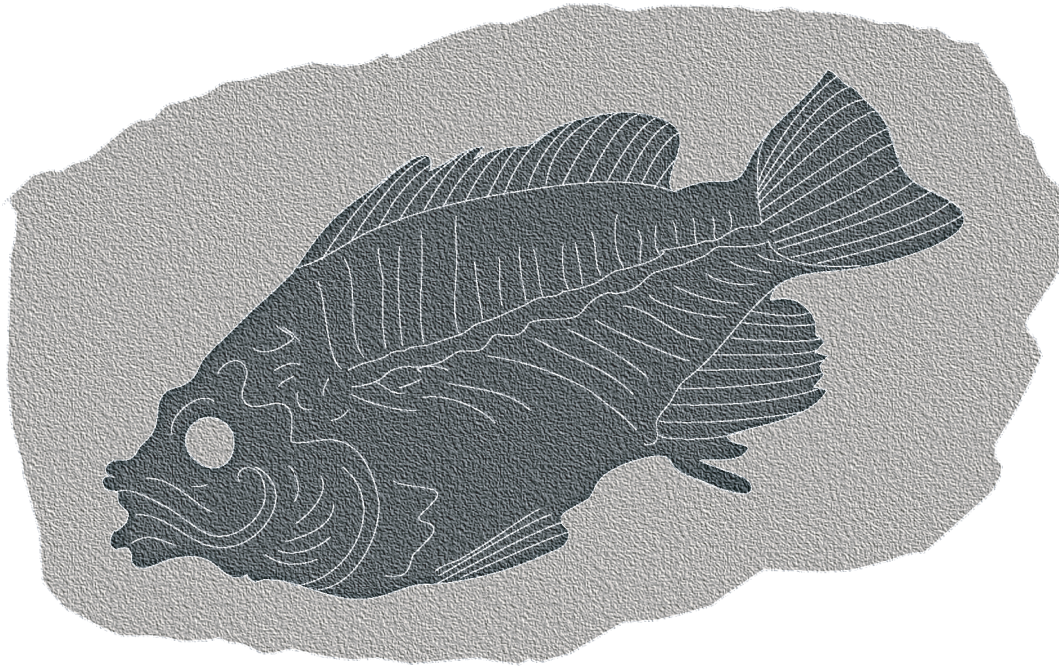
[1]

(c) Volcanic eruptions also happened many millions of years ago.

Layers of volcanic ash covered the bodies of fish.

Over many years this ash formed rock.

This picture shows part of the rock that has been formed.



(i) This picture shows a fish which is now a ..... [1]

(ii) What is the name of the type of rock in the picture?

Underline the answer from the list.

**igneous rock**

**metamorphic rock**

**sedimentary rock**

[1]

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**12** Energy sources can be renewable and non-renewable.

**(a)** Write the energy sources in the correct box.

energy sources:

gas

hydroelectric

oil

solar

tidal

wave

wind

**renewable,  
e.g. wood**

.....  
.....  
.....  
.....  
.....  
.....  
.....

**non-renewable,  
e.g. coal**

.....  
.....  
.....  
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.....

[2]

**(b)** What is meant by a non-renewable energy source?

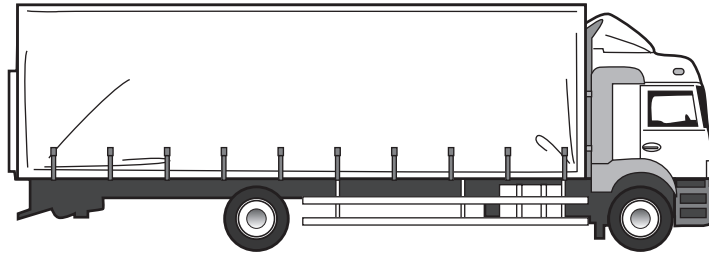
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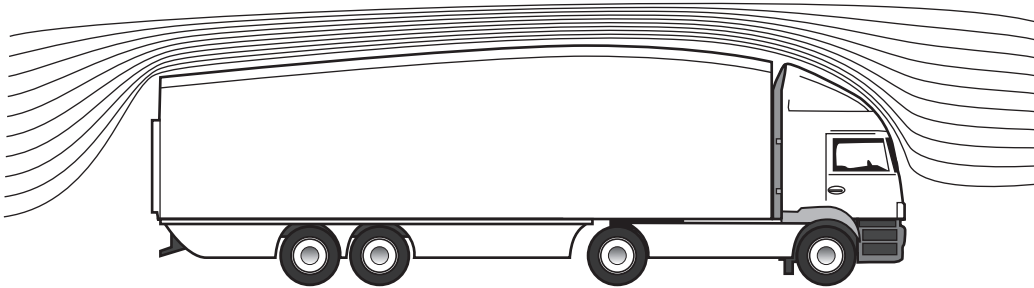
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13 This picture shows the shape of an old truck.



This picture shows the shape of a new truck.



The lines on the new truck show the air movement as the truck travels along a road.

(a) The new truck reduces forces acting on it.

Write the name of **one** force that has been reduced.

..... [1]

(b) Describe what effect this will have on the motion of the truck.

.....  
 ..... [1]

(c) How does this new shape affect the fuel consumption of the truck?

..... [1]

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