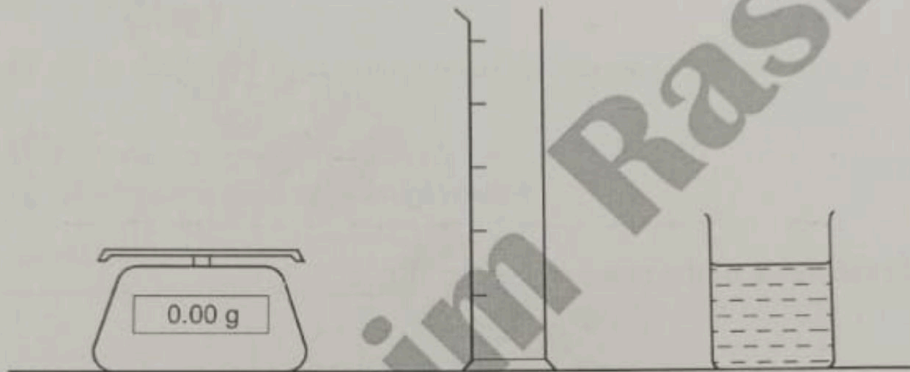


Question {1}

- 8 (a) The mass of a liquid is 40g. Name a piece of apparatus that could be used to measure this mass. .... [1]
- (b) The volume of the liquid is 50cm<sup>3</sup>. Name a piece of apparatus that could be used to measure this volume. .... [1]
- (c) Calculate the density of the liquid.  
Show your working and give units in your answer. .... [2]

Question {2}

10 Amulu uses this apparatus to measure the density of water.



The sentences describe his experiment for measuring the density of the water, but they are not in the correct order.

- A Pour 50 cm<sup>3</sup> water into the measuring cylinder.
- B Divide the mass of the water by 50.
- C Remove the empty measuring cylinder from the scales.
- D Place the empty measuring cylinder on the scales.
- E Subtract the mass of the measuring cylinder from the mass of the measuring cylinder and water.
- F Note the mass of the empty measuring cylinder.
- G Note the mass of the measuring cylinder and water.
- H Place the measuring cylinder and water on the scales.

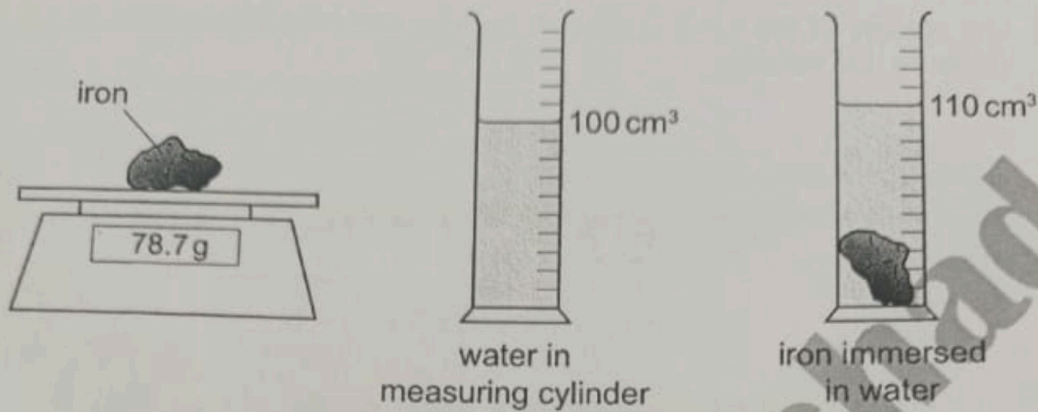
Write the correct order in the boxes. The first one has been done for you.

D                           

[5]

Question {3}

11 This apparatus is used to find the density of an irregular shaped piece of iron. The results are shown in the diagrams.



- (a) What is the name of the apparatus used to measure the mass of the piece of iron? ..... [1]
- (b) What is the mass of the piece of iron? ..... [1]
- (c) What is the volume of the piece of iron? ..... cm<sup>3</sup> [1]
- (d) Calculate the density of the piece of iron.  
Show your working, and give the correct unit with your answer.  
..... [3]

Question {4}

7 The density of any solid, liquid or gas can be calculated.

(a) A solid has a mass of 12 g.

It has a volume of 3.2 cm<sup>3</sup>.

Calculate the density.

.....  
 .....

density of solid ..... [3]

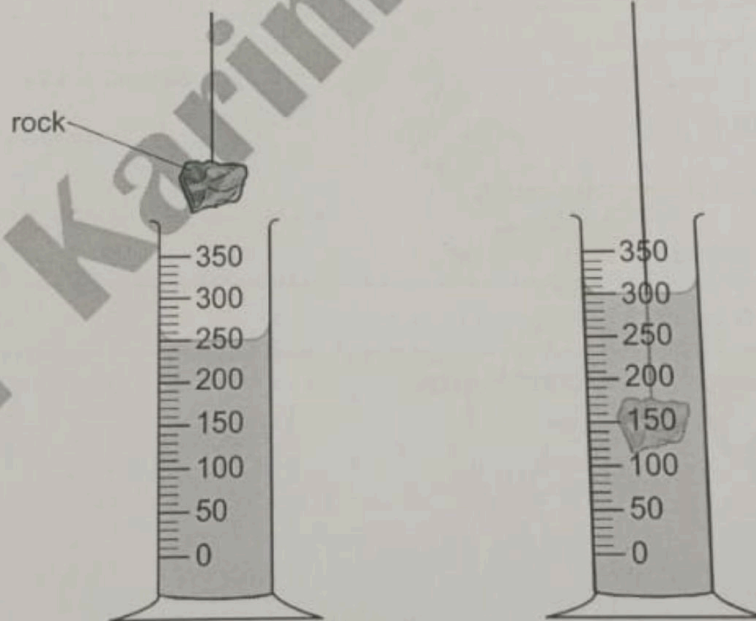
(b) What is the unit of the density you have calculated in part (a)?

unit ..... [1]

Question {5}

13 Measuring cylinders are used to measure volume.

Look at the diagram.



What is the volume of the piece of rock?

..... cm<sup>3</sup>

[1]

## Question {6}

- 5 Lily compares the densities of three substances A, B and C.

Look at her table of information.

substance	mass in grams	volume in $\text{cm}^3$	density in $\text{g}/\text{cm}^3$
A	90.0	20	
B	3.2	1000	0.0032
C	9.7	10	0.97

- (a) Calculate the density of substance A.

density of substance A = .....  $\text{g}/\text{cm}^3$  [2]

- (b) Suggest which substance A, B or C is a gas.

.....

Explain your answer.

.....  
.....

[2]

## Question {7}

- 6 Iron is a solid at room temperature.

A block of iron has a volume of  $40 \text{ cm}^3$ .

The mass of the block is 316 g.

- (a) Calculate the density of iron in  $\text{g}/\text{cm}^3$ .

density of iron = .....  $\text{g}/\text{cm}^3$  [2]

- (b) Hydrogen is a gas at room temperature.

Describe how the density of hydrogen compares to the density of iron.

..... [1]

Question {8}

5 Chen measures the mass and volume of some substances.

3146\_02

He calculates the density of each substance. The table shows his results.

substance	mass in g	volume in cm <sup>3</sup>	density in g/cm <sup>3</sup>
A	395	50	7.9
B	0.22	100	0.0022
C	452	40	11
D	328	45	7.3
E	340	38	

(a) Calculate the density of substance E.

Give your answer to two significant figures.

density of substance E = ..... g/cm<sup>3</sup> [3]

(b) Which substance in the table is a gas?

Explain your answer.

substance .....

explanation .....

.....

[2]

Question {9}

9 Nitrogen is a gas.

Use this information to explain why:

a nitrogen is less dense than copper

[2]

---

---

b bubbles of nitrogen in water move upwards through water.

[2]

Dr Karim Rashad



Question {3}

7 Complete the sentences and answer the question about thermal (heat) energy.  
Choose from the following words.

conduction

conductor

convection

evaporation

insulation

insulator

radiation

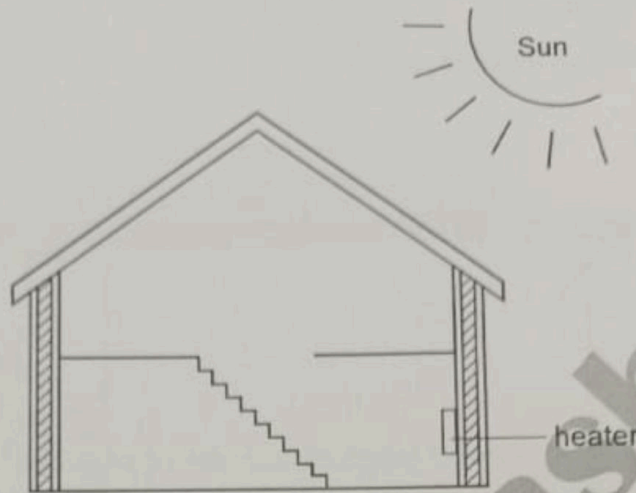
- (a) The main form of thermal (heat) energy transfer in liquids and gases is called ..... [1]
- (b) Thermal (heat) energy is transferred through a solid by ..... [1]
- (c) Iron is a metal so it is a good ..... [1]
- (d) What is the term for a poor conductor? ..... [1]

Dr. Karim Rashad



Question {4}

4 The diagram shows a cross-section of a house.



(a) What is the name of the process by which heat energy is transferred through the walls of the house?

..... [1]

(b) What is the name for materials that do not allow heat energy to pass through them easily?

..... [1]

(c) Warm air often goes to the upper parts of the house.  
What is the name of the process by which air moves and carries heat energy with it?

..... [1]

(d) What is the name of the process by which energy reaches the walls of the house directly from the Sun?

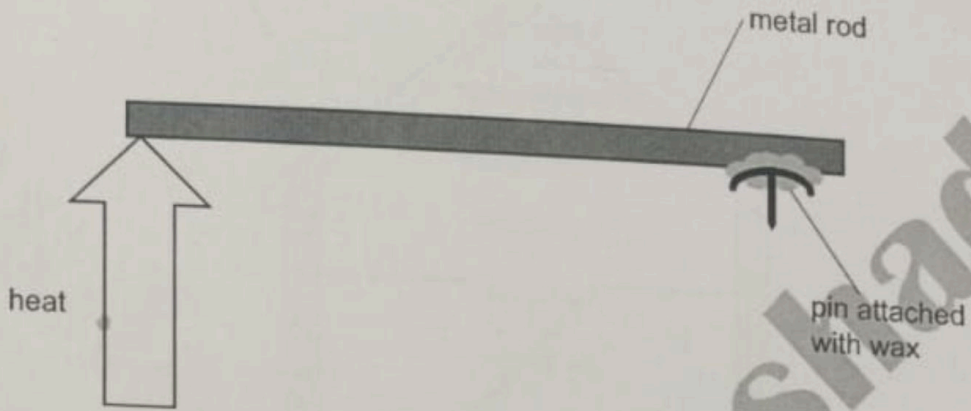
..... [1]

Question {5}

6 Angelique investigates heat transfer.

She heats a metal rod.

The metal rod has a pin attached with wax.



When the end of the metal rod is hot, the wax melts and the pin falls.

(a) What type of heat transfer is Angelique investigating?

..... [1]

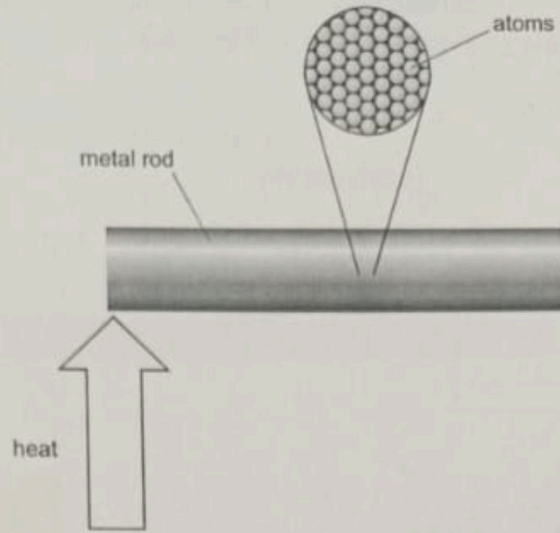
(b) Angelique repeats the investigation with rods made of different metals.

The pins fall after different amounts of time.

Why do the pins fall after different amounts of time?

..... [1]

(c) Angelique draws a picture of the atoms inside one of the metal rods.



Describe how the heat is transferred to the end of the metal rod.

Use Angelique's drawing to help you.

.....

.....

.....

[2]

Question {6}

12 The lizard loses thermal (heat) energy and gains thermal (heat) energy.

Complete the labels to show the energy transfers taking place.

Choose from the following words.

conduction

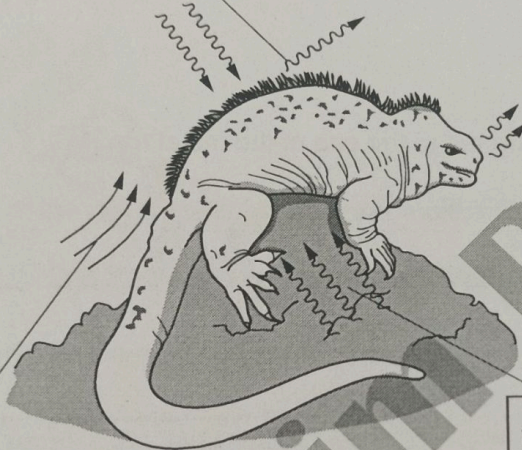
convection

radiation

[2]

thermal energy lost from surface of skin by

.....



thermal energy lost by air movements by

.....

thermal energy gained from rock by

.....

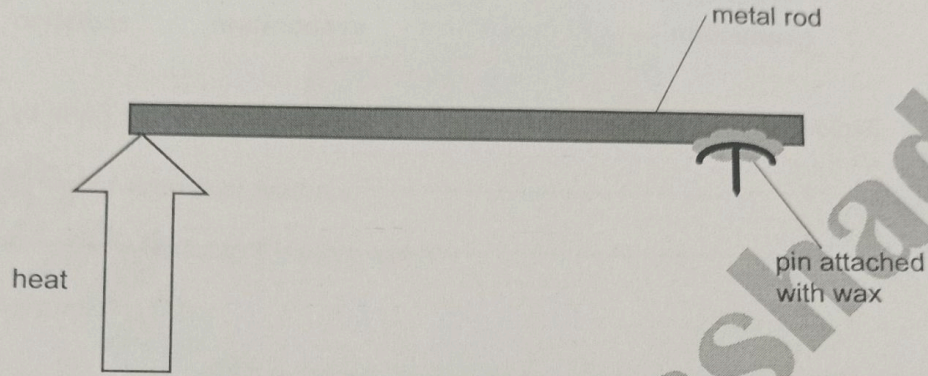
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Question {7}

9 Blessy investigates conduction of thermal (heat) energy.

She heats a metal rod.

The metal rod has a pin attached with wax.



When the end of the metal rod is hot, the wax melts and the pin falls.

Blessy must think about the safety hazards of this investigation.

Describe two of these **safety hazards**.

1 .....

.....

2 .....

.....

[2]

Question {8}

16 Energy from the Sun reaches the Earth.

(a) Which process transfers thermal (heat) energy from the Sun to the Earth?

Circle the correct answer.

conduction      convection      evaporation      radiation

[1]

(b) Explain why energy from the Sun can only be transferred to the Earth by this process.

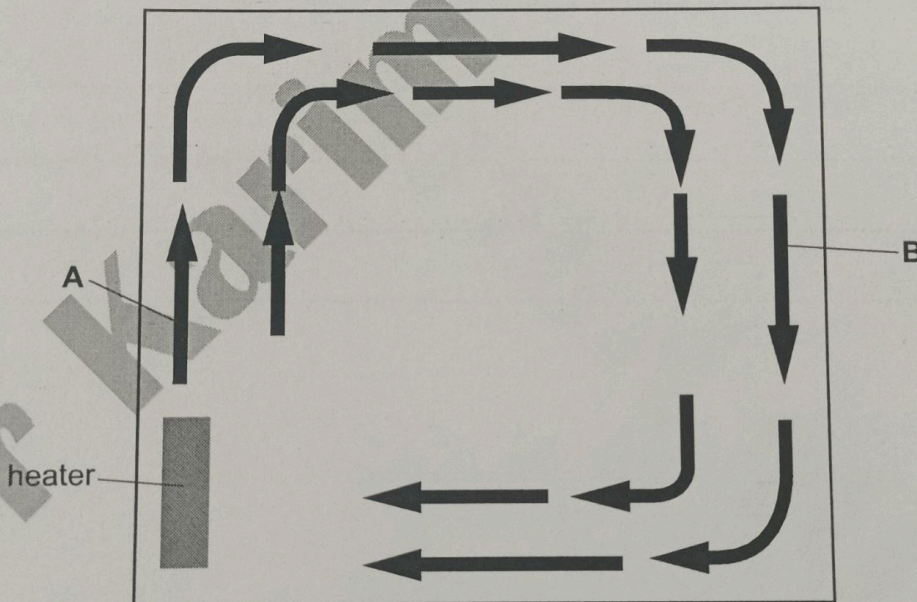
.....

..... [1]

Question {9}

11 The diagram shows how a room can be heated.

The arrows show the direction of air movement.



Use the diagram to complete the sentences.

At A warm air rises because it is .....

At B cool air sinks because it is .....

This process is called .....

[3]

## Question {10}

13 Birds can live in cold places.



They trap air between their feathers.

Why does this help to keep the birds warm?

Circle the correct answer.

trapped air is a good conductor

trapped air is a good convector

trapped air is a good insulator

trapped air is a good radiator

Question {11}

3 Complete the sentences about thermal (heat) energy transfer.

Choose words from the list.

conduction

convection

radiation

Thermal (heat) energy can be transferred from one place to another place.

When particles are involved, the processes are ..... and .....

When electromagnetic waves are involved, the process is .....

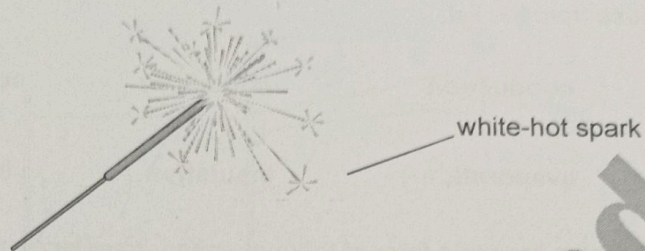
[2]

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Question {12}

7 The diagram shows a white-hot spark.



Complete the sentences about a white-hot spark.

Choose from the list.

density

heat energy

insulation

particles

pressure

sound energy

structures

temperature

vibrations

A white-hot spark is at a very high .....

It does not contain much ..... because it does not contain many

.....

[3]

Question {13}

6 Answer the questions about thermal (heat) energy transfer.

Choose from the list.

conduction

conductor

convection

radiator

evaporation

insulation

insulator

radiation

(a) What is the main form of thermal energy transfer in solids?

..... [1]

(b) What is the main form of thermal energy transfer in liquids and gases?

..... [1]

(c) Complete the sentences using words from the list.

(i) Saucepan handles are made from wood.

This is because wood is a good ..... [1]

(ii) Copper is a metal, so it is a good ..... [1]

Question {14}

7 Carlos heats water in a cooking pan.

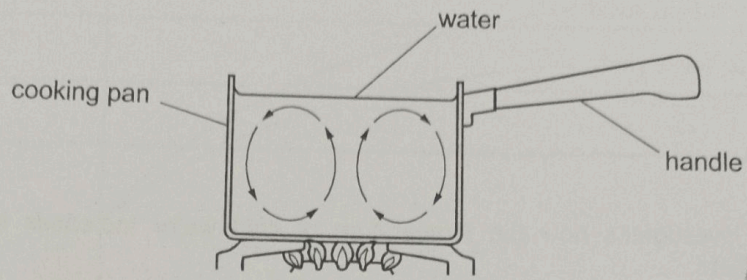


diagram.

..... [1]

(b) Carlos puts a lid on his cooking pan.

The water in the cooking pan heats up faster.

Explain why.

..... [1]

(c) Some pans have steel handles.

Other pans have wooden handles.

Which material, steel or wood, is best for making the handles of pans?

.....  
Explain your answer.  
..... [1]

Question {15}

3 This question is about heat and temperature.

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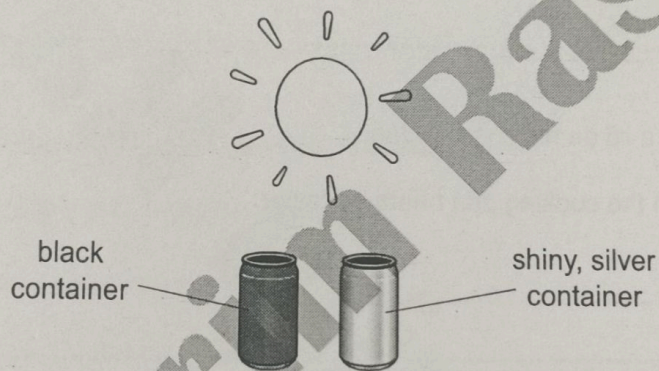
(a) Describe the difference between heat and temperature.

.....  
.....  
..... [2]

(b) Rajiv investigates how the temperature of cold water increases in two different metal containers.

He puts the same volume of cold water in each container.

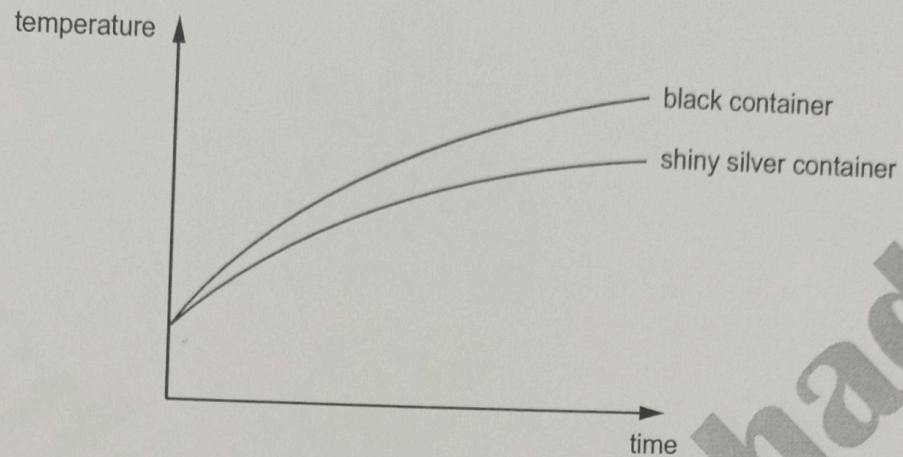
He puts the two containers in the sun.



(i) Name the equipment Rajiv uses to measure the temperature of the water.

..... [1]

- (ii) Look at the graph showing how the temperature of the water in each container increases with time.



The black container gains the most thermal energy.

Explain how you know from the graph.

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

- (iii) Explain why the black container gains more thermal energy by radiation.

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

- (c) Explain how the thermal energy travels **through** the metal containers.

Complete these sentences.

Thermal energy travels through the metal containers by the process of .....

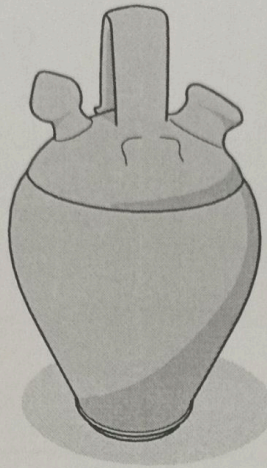
The particles in the metal gain thermal energy and ..... more.

As energy passes through the metal the particles ..... with each other.

[2]

Question {1}

7 The picture shows a container called a water cooler.



The container is made of clay.

(a) The water in the container soaks into the clay, making the outside wet.

Water evaporates from the outside, cooling the container.

Explain how evaporation cools a liquid.

.....  
.....  
..... [2]

(b) When the outside cools down, heat energy is transferred through the clay.

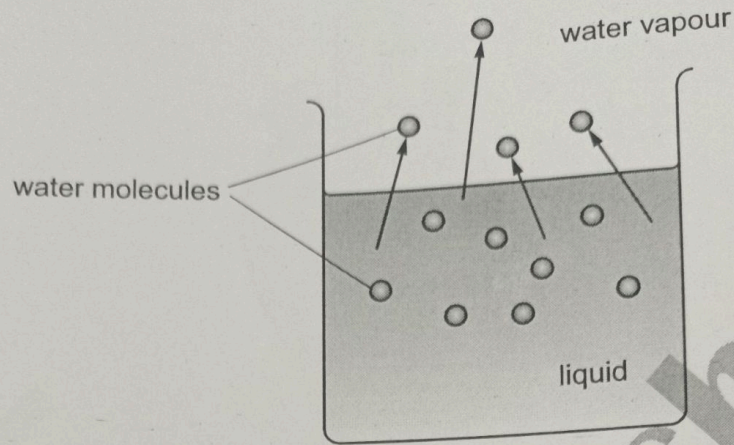
Heat travels from the inside of the container through the clay by conduction.

Explain how heat energy is conducted through solids.

.....  
.....  
..... [2]

Question {2}

13 Chen draws a diagram to show water changing from a liquid to water vapour.



Complete the sentences.

All the water molecules in the liquid are moving.

Some of the molecules have more .....

These molecules move ..... enough to escape the surface of the liquid.

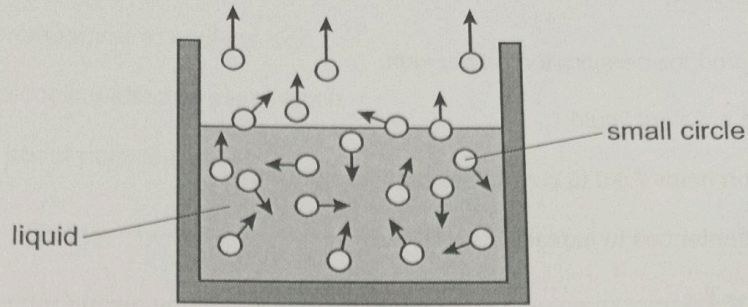
This is called .....

This makes the liquid become .....

[4]

Question {3}

9 Carlos draws a diagram to show evaporation.



(a) What do the small circles represent?

.....[1]

(b) What do the arrows represent?

.....[1]

(c) Explain how evaporation causes the liquid to cool down.

.....  
.....  
.....[2]



Question {4}

7 Aiko is in a hot room.

She starts to produce perspiration on her skin.

Perspiration is a watery liquid.

The perspiration helps Aiko to control her body temperature.

Complete the sentences to explain how.

Choose from the list.

boil

chemical

condense

cool

decreases

electrical

evaporate

increases

melts

potential

stays the same

thermal

The water in the perspiration begins to .....

During this process the water absorbs ..... energy from the skin.

The temperature of the skin .....

[3]

Question {5}

3146\_02

6 Perspiration is a watery liquid produced by the skin.

The water evaporates to cool the skin.

Explain the cooling effect of evaporation.

Use ideas about particles.

.....

.....

.....

.....

[3]

Dr Karim Rashad