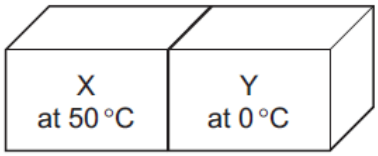
Thermal Processes– 2023 IGCSE Physics 0625

1. Nov/2023/Paper_ 0625/11/No.15

A student has two blocks of metal, X and Y. The temperature of X is 50 °C and the temperature of Y is 0 °C.

The two blocks are placed in contact with each other, as shown.



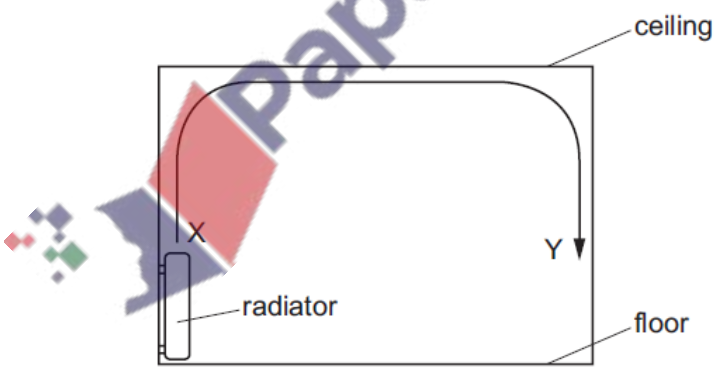
After some time, both blocks have a temperature of 25 °C.

What has happened to the internal energy of each block?

	internal energy of X	internal energy of Y
A	decreased	decreased
B	decreased	increased
C	increased	decreased
D	unchanged	unchanged

2. Nov/2023/Paper_ 0625/11,21/No.16

The diagram shows the view of a room heated by a radiator. The arrowed line from X to Y is the path of the convection current in the air.

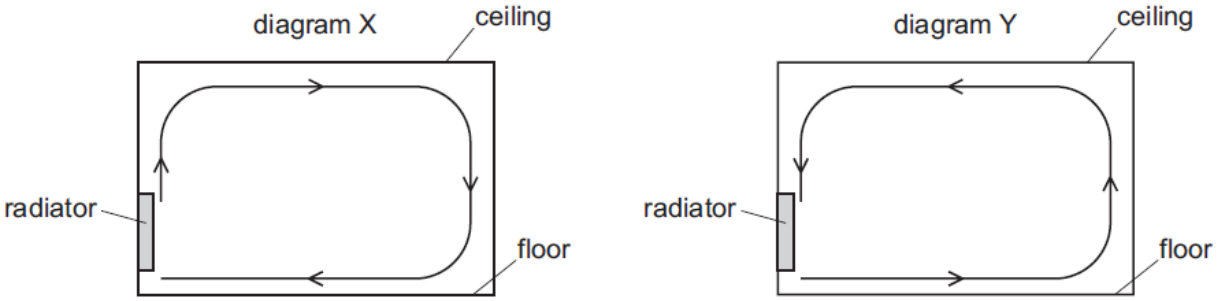


Which row about the air temperature and the air density at X and at Y is correct?

	air temperature	air density
A	higher at X	higher at X
B	higher at X	higher at Y
C	higher at Y	higher at Y
D	higher at Y	higher at X

3. Nov/2023/Paper_ 0625/12,22/No.16

A room is heated by a radiator. The diagrams X and Y show two possible circulations of hot air, which heat the room.

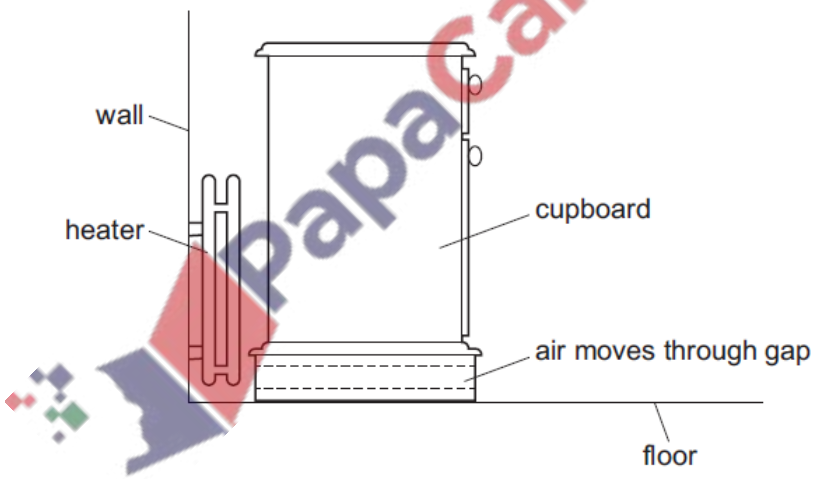


Which diagram and reason explain the heating of the room by convection?

	diagram	reason
A	X	air density decreases when air is heated
B	X	air density increases when air is heated
C	Y	air density decreases when air is heated
D	Y	air density increases when air is heated

4. Nov/2023/Paper_ 0625/13,23/No.16

A cupboard is placed in front of a heater. Air can move through a gap under the cupboard.



Which row describes the temperature and the direction of movement of the air in the gap?

	air temperature	air direction
A	cool	away from the heater
B	cool	towards the heater
C	warm	away from the heater
D	warm	towards the heater

5. Nov/2023/Paper_ 0625/31/No.3(c)

Fig. 3.1 represents the arrangement and separation of particles in a liquid. Each circle represents a particle.

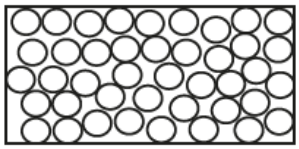


Fig. 3.1

(c) Fig. 3.3 shows a fire heating water in a metal pan.

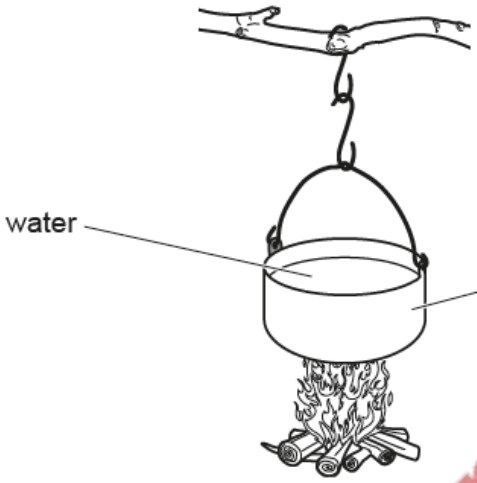


Fig. 3.3

(i) State the name of the process of thermal energy transfer through the metal of the pan.

..... [1]

(ii) Describe how thermal energy is transferred through the water by convection.

.....

.....

..... [3]

(iii) State the temperature at which the water boils at standard atmospheric pressure.

temperature = ...°C [1]

6. Nov/2023/Paper_ 0625/32/No.6

(a) Fig. 6.1 shows a cold drink in a thermal jug. The jug reduces thermal energy transfer from the surroundings to the drink.

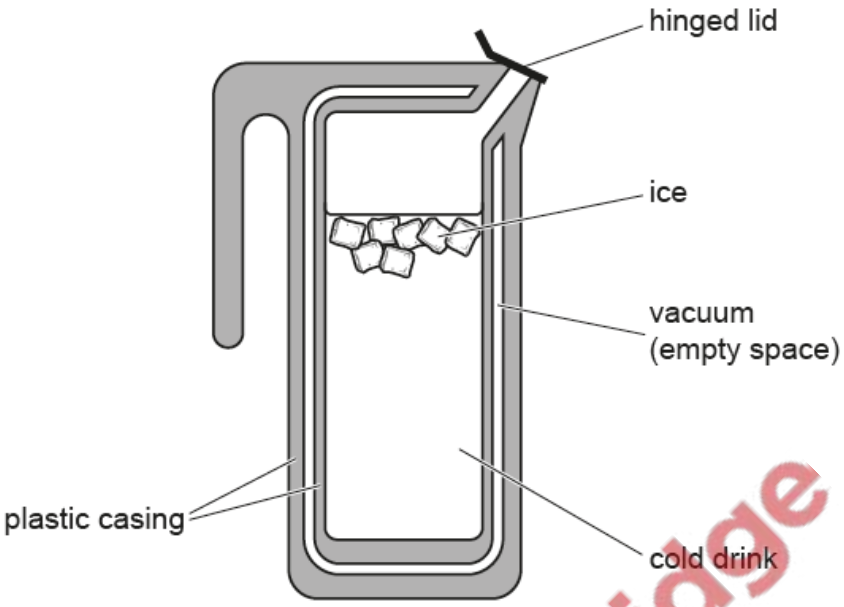


Fig. 6.1

State the names of the **two** processes of thermal energy transfer that are prevented by the vacuum.

Explain how the vacuum prevents these **two** processes of thermal energy transfer.

processes ..... and .....

explanation .....

.....

[2]

(b) Fig. 6.2 represents a demonstration that shows how water moves when heated. The colour from the crystal shows the flow of the water.

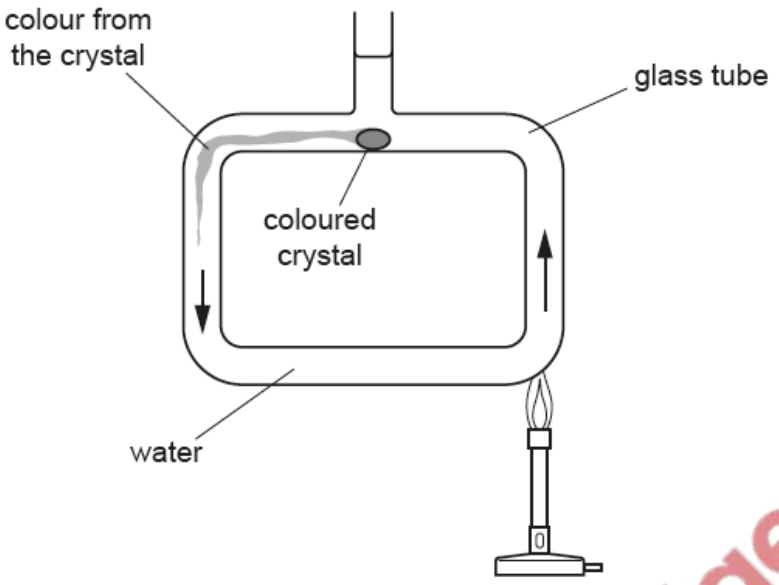


Fig. 6.2

The arrows in Fig. 6.2 show the direction of flow of water in the glass tube when the water is heated.

Explain why the water moves in this way. Use your ideas about density.

.....

.....

.....

..... [4]

[Total: 6]

7. Nov/2023/Paper_ 0625/42/No.2

Fig. 2.1 shows an electric tumble dryer used to dry wet clothes.

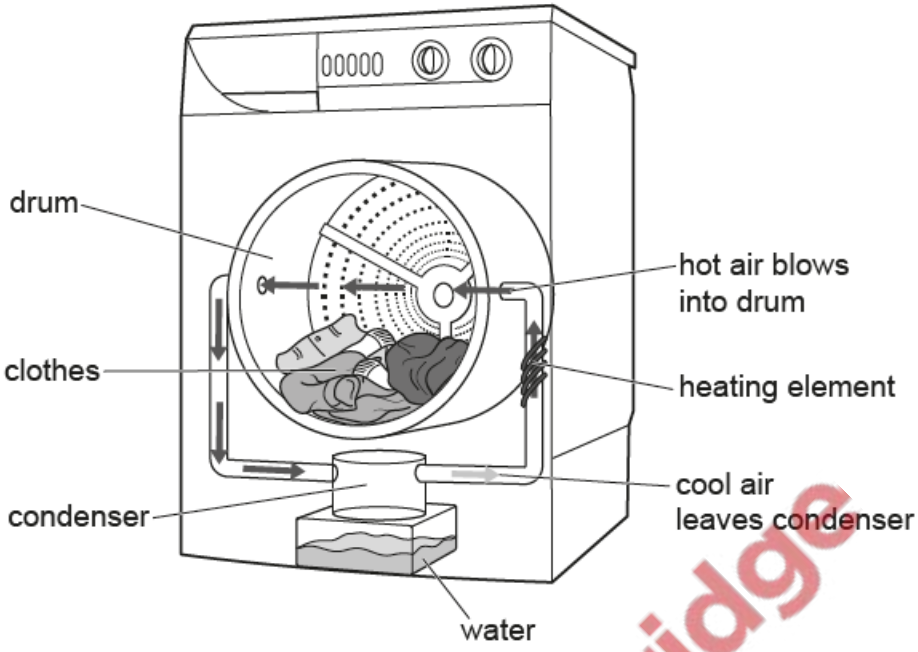


Fig. 2.1

(a) Hot air blows into the drum. The air gains water vapour from the clothes and then leaves the drum. The moist air enters the condenser. Cool air leaves the condenser, passes through the heating element and enters the drum again.

(i) State the process by which the hot air removes water from the wet clothes.

..... [1]

(ii) The air is cooled as it passes through the condenser.

Describe and explain **one** other way in which the air leaving the condenser is different from the air entering the condenser.

description .....

explanation .....

.....

[2]

(b) The drum of the tumble dryer rotates, lifting up the wet clothes which then fall down through the hot air.

(i) Name the force that causes the clothes to fall down.

..... [1]

(ii) When the drum rotates too fast the clothes remain in contact with the wall of the drum.

State the direction of the resultant force on the clothes during the circular motion.

..... [1]

(c) Suggest why using a clothesline to dry clothes in the open air is better for the environment than using an electric tumble dryer.

.....

..... [1]

[Total: 6]

8. June/2023/Paper_0625/11/No.16

Which surface is the worst absorber of infrared radiation?

A dull black

B dull white

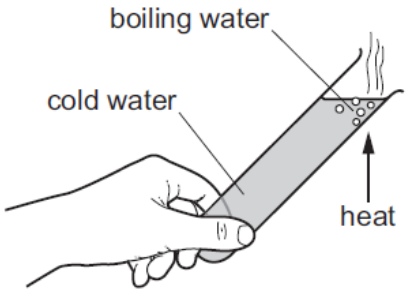
C shiny black

D shiny white

9. June/2023/Paper_0625/12/No.16

A teacher puts some cold water in a test-tube.

She holds the bottom of the test-tube while heating the top.



The water at the top boils but she continues to hold the test-tube as the bottom remains cold.

Which conclusion about water is made from this experiment?

A Water is a bad conductor.

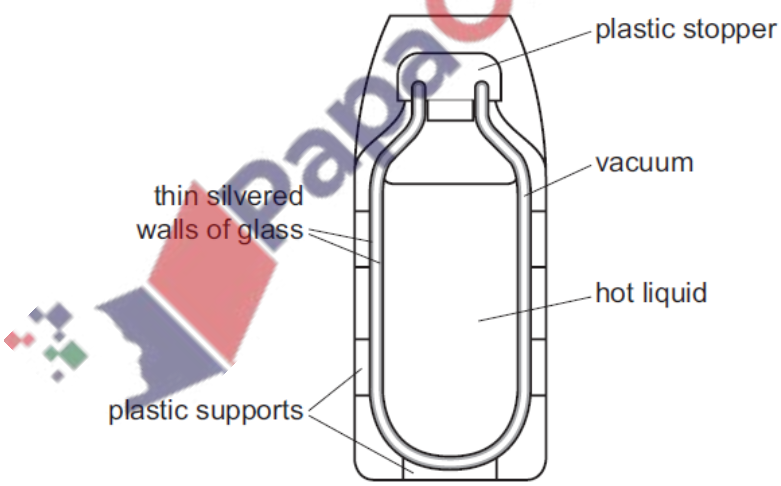
B Water is a bad convector.

C Water is a good conductor.

D Water is a good convector.

10. June/2023/Paper_0625/13/No.16

The diagram shows a flask designed to reduce the loss of thermal energy from a hot liquid.



Which methods of thermal energy transfer are the silvered walls designed to reduce?

A conduction, convection and radiation

B conduction and convection only

C conduction only

D radiation only

11. June/2023/Paper_0625/21/No.16

Some hot water is sealed inside a metal can. The can is in a vacuum in outer space. The hot water slowly cools down.

How does the thermal energy escape into space?

A by conduction then convection

B by conduction then radiation

C by evaporation then convection

D by evaporation then radiation

12. June/2023/Paper_0625/22/No.16

Four cups **A**, **B**, **C** and **D** contain hot coffee.

Which cup keeps the coffee warm the longest?

	the outside surface of the cup	the top of the cup
A	black	covered with a lid
B	black	no lid
C	white	covered with a lid
D	white	no lid

13. June/2023/Paper_0625/23/No.16

Two otherwise identical cars, one black and one white, are at the same initial temperature. The cars are left in bright sunshine and their temperatures increase. During the night, their temperatures decrease.

Which car shows the greater rate of temperature increase and which car shows the greater rate of temperature decrease?

	greater rate of temperature increase	greater rate of temperature decrease
A	black	black
B	black	white
C	white	black
D	white	white

14. June/2023/Paper_0625/32/No.4(c)

A student has a block of solid metal at room temperature.

(c) The metal block emits thermal radiation from its surface.

State **two** features of a surface that is a good emitter of thermal radiation.

1 .....

2 .....

[2]

15. June/2023/Paper_0625/42/No.5(b)

(b) Fig. 5.2 shows a cross-section of a double-glazed window in the room.

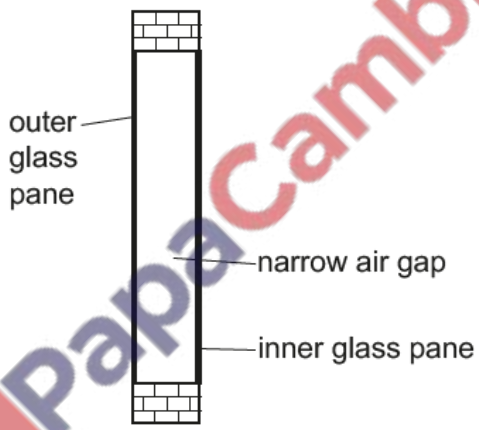


Fig. 5.2

State the main methods of thermal energy transfer from the room to outside which are reduced by this type of window.

..... [1]