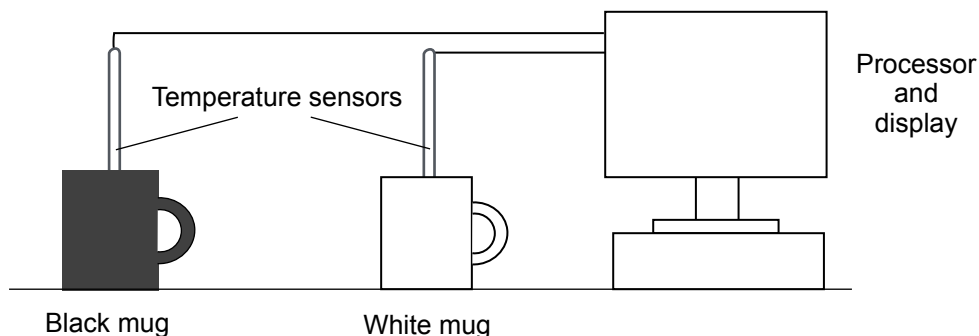
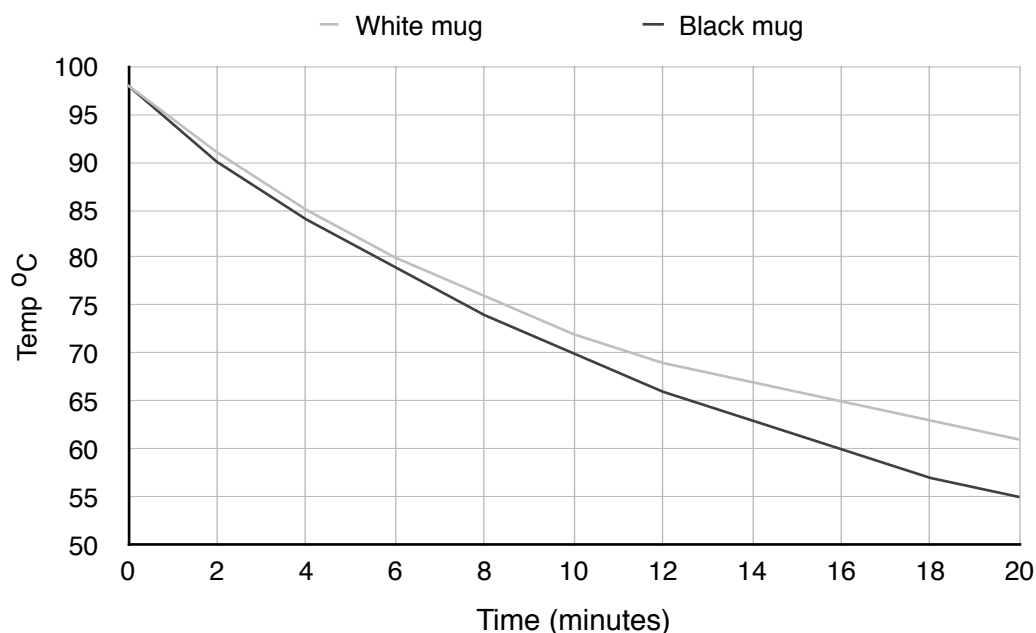


1 A student made the following hypothesis:
“It is better to use a white mug than a black mug for keeping drinks hotter for longer.”
 The student decided to test this hypothesis by doing the following experiment.



The two mugs were filled with 250 cm³ of hot water. The temperature sensors recorded and displayed the temperature every 2 minutes for 20 minutes.

The graph shows the results recorded over 20 minutes.



1 (a) (i) What method of heat transfer is the student investigating? [1 mark]

Radiation or infrared radiation [1]

To be safe, it's probably better to write infrared radiation.

1 (a) (ii) Was the student's hypothesis correct? [3 marks]

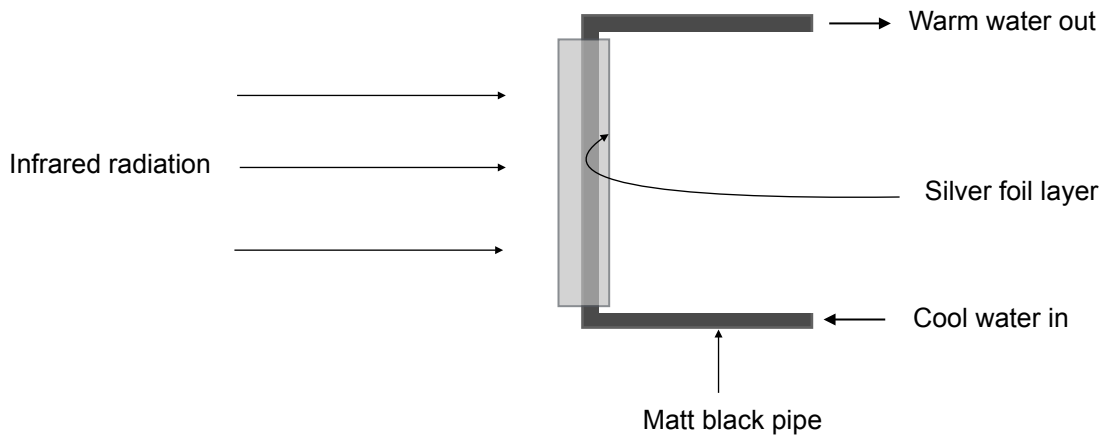
Use the graph to help you answer.

Yes [1]

The white mug had a higher temperature at all points or times during the experiment or the water in the white mug was hotter at the end. [1]

Any correct use of numbers, e.g. water in white mug was more than 5 °C hotter at the end. [1]

1 (b) The diagram shows a simple solar water heater.



1 (b) (i) Why is there a layer of silver foil on the back of the panel? [2 marks]

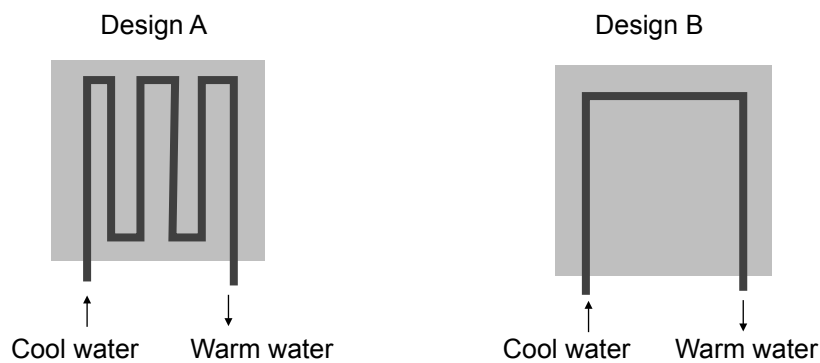
Reflect the heat or infrared back to the pipe [1]
to make the water warmer. [1]

1 (b) (ii) Why is pipe a matt black colour? [1 mark]

To absorb as much heat or infrared radiation as possible. [1]

Can't just say to absorb heat or infrared, because a white pipe would also absorb.

1 (b) (iii) The diagram shows two designs of solar water heaters as shown when facing the sun.



Suggest why Design A is better than Design B. [2 marks]

Water stays in the solar heater for longer [1]
so the water gets warmer. [1]

You could also say there is more surface to absorb the heat from.

(Total 9 marks)

End