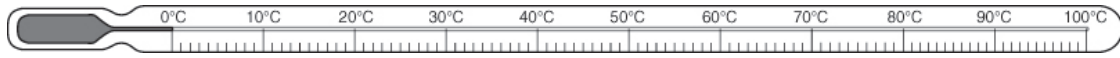


Name _____ Class _____ Date _____

1 The drawing below shows a measuring instrument.



(a) Name this instrument. _____ (1)

(b) What does this instrument measure? Tick **one** box.

- A length
- B degrees
- C heat
- D temperature

(1)

(Total for Question 1 = 2 marks)

2 A boy takes a can of lemonade from the fridge and puts the can on the table.

(a) Explain the direction of energy transfer between the can and the air in the room.

(2)

(b) The boy leaves the can of lemonade on the kitchen table for 6 hours.

Suggest what temperature the lemonade will be after 6 hours.

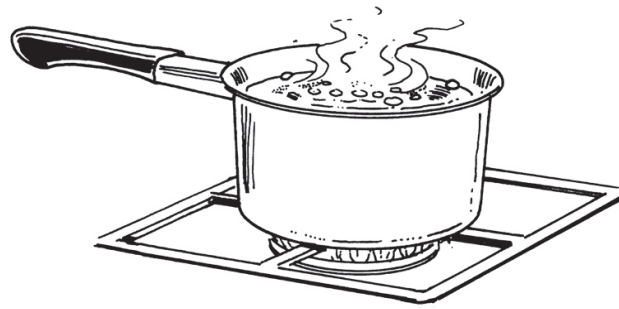
(1)

(Total for Question 2 = 3 marks)

3 The water in this pan is boiling.

(a) State the temperature of boiling water.

_____ (1)



(b) The main part of the pan is made of metal and the handle is made of wood.

(i) Why is the pan made of metal? Tick **one** box.

A Metal is a good conductor of heat.

B Metal is a good insulator of heat.

C Metal is a good conductor of electricity.

D Electricity is a good insulator of electricity.

(1)

(ii) Why is the handle made of wood? Tick **one** box.

A Wood is a good conductor of heat.

B Wood is a good insulator of heat.

C Wood is a good conductor of electricity.

D Wood is a good insulator of electricity.

(1)

(c) Name **one** other material that could be used to make a handle that is safe to use.

_____ (1)

(Total for Question 3 = 4 marks)

4 The table shows some results from an insulation experiment. Different materials were put around beakers of hot water. The temperature of the water was measured at the start of the experiment. The temperature was measured again after 5 minutes.

Material	Start temperature (°C)	Final temperature (°C)
A	90	73
B	90	82
C	90	75
D	90	80
E	90	70

(a) State which material was best at keeping the water warm.

(1)

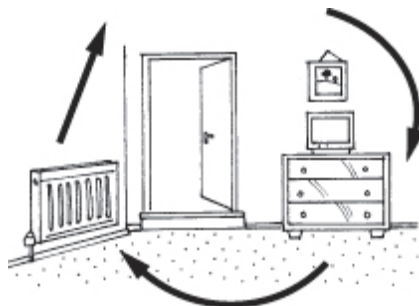
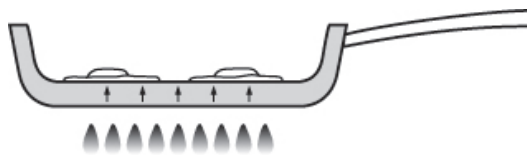
(b) Many insulating materials contain trapped air. Explain why trapped air is a good insulating material.

(2)

(Total for Question 4 = 3 marks)

5 These drawings show energy transfers happening.

(a) State the **main** energy transfer happening in each drawing.



(i) _____ (1) (ii) _____ (1)

(b) Explain how energy is being transferred through the pan in part (a)(i). Use ideas about particles in your answer.

(4)

(Total for Question 5 = 4 marks)

6 A man is cooking using two pans of boiling water. Both pans are made of steel, but one pan has a much thicker base than the other pan.

(a) He turns off the gas on the cooker. Explain why the water in the pan with the thicker base continues to bubble for longer than the water in the thinner pan.

(2)

(b) The man usually puts a lid on his pans when he is heating water.

Explain **two** ways a lid helps the water to reach boiling point more quickly.

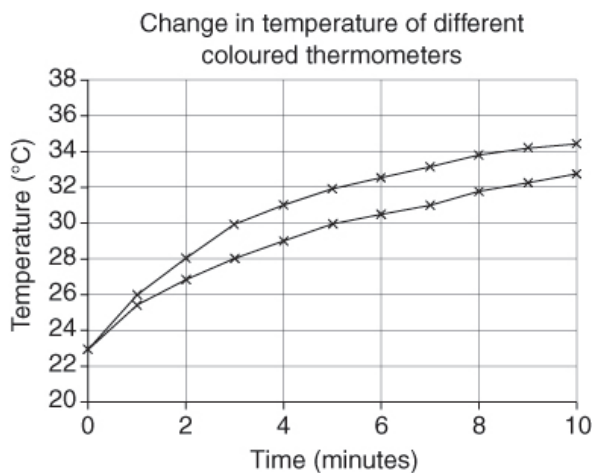
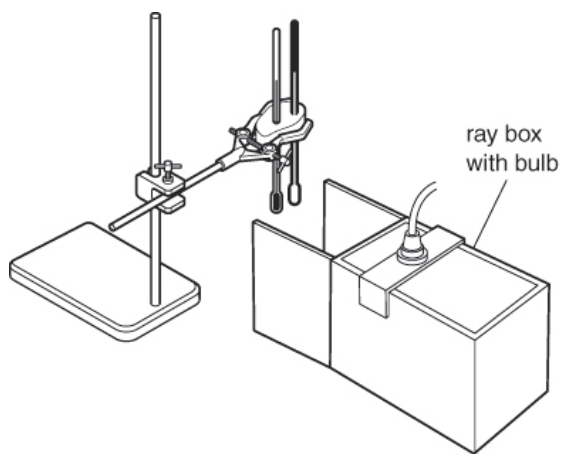
(2)

(Total for Question 6 = 4 marks)

7 A student is investigating energy transfers using two thermometers.

The bulb of one thermometer is painted black. The bulb of the other thermometer is painted silver.

The graph shows the results of the experiment.



(a) Explain which type of energy transfer the student is investigating.

(2)

(b) State which line represents the black thermometer. Give **one** reason for your answer.

(1)

(c) The student could have measured the temperature every 5 minutes. Suggest why it was better to measure the temperature every minute.

(1)

(Total for Question 7 = 4 marks)

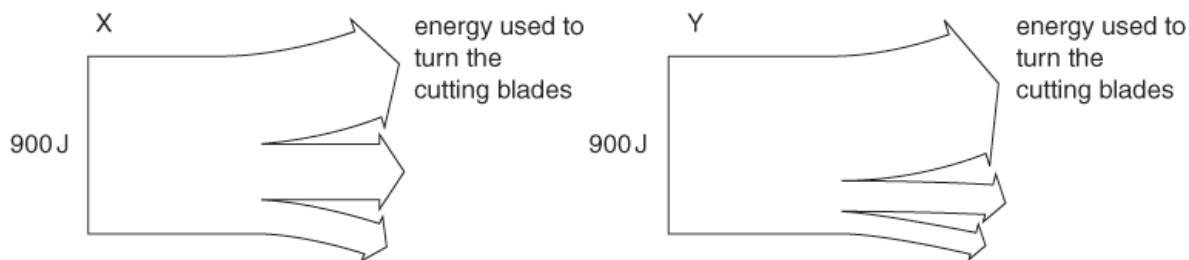
8 Kettle A takes 2 minutes to boil 1 dm³ of water
Kettle B takes 2.5 minutes to boil the same volume of water.

Which kettle is the most powerful? Tick **one** box.

- A** A is more powerful, because it transfers the same amount of energy in a shorter time.
- B** A is more powerful, because it transfers the same amount of energy in a longer time.
- C** B is more powerful, because it transfers more energy in a shorter time.
- D** B is more powerful, because it transfers the same amount of energy in the same amount of time.

(Total for Question 8 = 1 mark)

9 These Sankey diagrams show the energy transfers in two lawn mowers, **X** and **Y**.



(a) State **two** ways in which the lawn mowers transfer wasted energy. Tick **one** box.

- A** by sound and by light
- B** by heating and gravitational potential
- C** by heating and by sound
- D** by heating and by electricity

(1)

(b) Which lawn mower is more efficient? Tick **one** box.

- A** X, because more energy is wasted
- B** X, because more energy is transferred as useful energy
- C** Y, because more energy is wasted
- D** Y, because more energy is transferred as useful energy

(1)

(Total for Question 9 = 2 marks)

10 The energy use of an electric heater is calculated using this equation:

$$\text{energy use} = \text{power rating} \times \text{time}$$

- (a) Calculate the energy use of a 1.5 kW heater that heats for 6 hours. Give your answer in kWh.

(2)

- (b) Describe **one** way in which the person who uses the heater could reduce the amount of energy they use for heating.

(1)

(Total for Question 10 = 3 marks)