

13 A circular, flat-bottomed dish contains 100 cm^3 of water.

Students are asked how to increase the rate at which the water evaporates.

Their suggestions are listed.

student 1 Pour the water into a flat-bottomed dish of larger diameter.

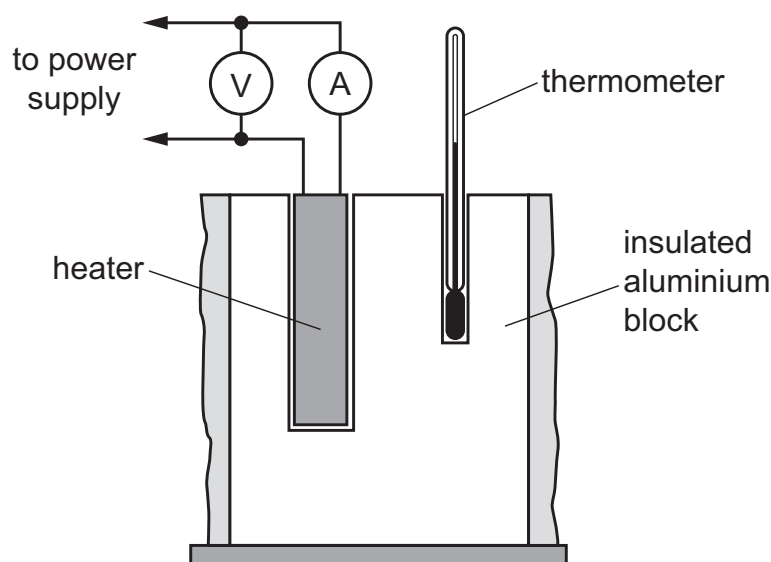
student 2 Cool the dish and water.

student 3 Create a current of air over the dish with a fan.

Which suggestions will increase the rate of evaporation?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

15 The diagram shows the equipment used in an experiment on the heating of aluminium.



The table gives the results for the experiment.

mass of block	0.80 kg
voltmeter reading	12 V
ammeter reading	5.0 A
time	300 s

The specific heat capacity of aluminium is $900\text{ J}/(\text{kg } ^\circ\text{C})$.

What is the maximum possible temperature rise in the block?

A 9°C **B** 20°C **C** 25°C **D** 225°C

4 (a) Define specific heat capacity.

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..... [2]

(b) A volume of 0.0024 m³ of oil is heated in a pan for 7.0 min. The temperature of the oil increases from 20 °C to 180 °C.

The density of the oil is 910 kg/m³. The specific heat capacity of the oil is 2000 J/(kg °C).

(i) Calculate the mass of oil in the pan.

mass = [2]

(ii) Calculate the energy required to increase the temperature of the oil.

energy = [2]

(iii) Calculate the power required to supply the energy calculated in (b)(ii).

power = [2]

[Total: 8]

4 Fig. 4.1 shows a metal pan on an electric hotplate. The pan contains 200 cm³ of water.

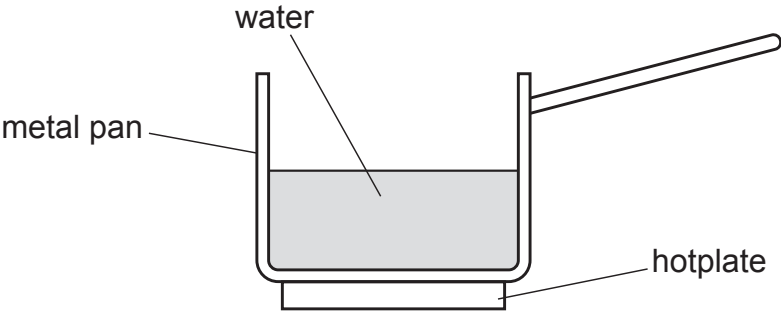


Fig. 4.1

The pan is heated. The temperature of the water in the pan increases.

(a) Thermal energy is transferred through the metal pan by conduction.

State and explain the **two** ways that thermal energy is conducted in a metal.

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..... [3]

(b) (i) The water boils and leaves the liquid as a gas.

Explain, in terms of forces and distances between particles, why the gas occupies a much greater volume than it does as a liquid.

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..... [2]

(ii) State **two** ways in which boiling differs from evaporation.

1

2

[2]

(c) The water is replaced with 200 cm³ of milk.

The initial temperature of the milk is 20.0 °C. The boiling point of milk is 95.0 °C.

The milk starts to boil when 60 700 J of thermal energy has been transferred to it. The density of milk is 1.03 g/cm³.

Calculate the value of the specific heat capacity of milk. Give your answer to 3 significant figures.

specific heat capacity = [4]

[Total: 11]

3 Fig. 3.1 and Fig. 3.2 show how a puddle of water changes on a warm windy day.

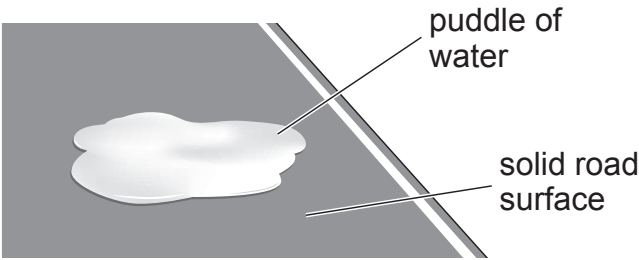


Fig. 3.1

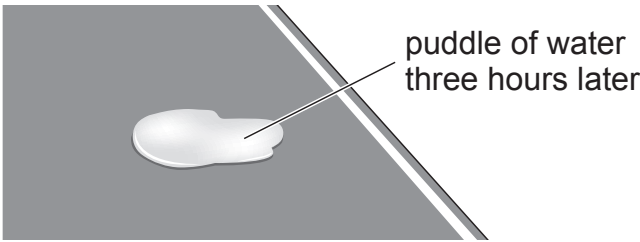


Fig. 3.2

- (a) Describe the process by which the volume of water in the puddle decreases.
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- [2]
- (b) State and explain **one** change in the weather that would cause the volume of water in the puddle to decrease more slowly.
- statement
- explanation
- [2]
- (c) Explain, in terms of molecules, how sweating helps to cool your body on a hot day.
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- [3]

[Total: 7]