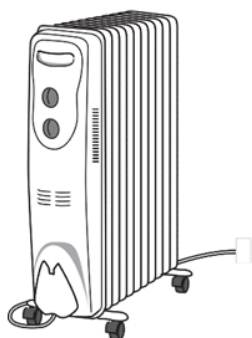


GCSE Physics B (Twenty First Century Science)
J259/01 Breadth in Physics (Foundation Tier)

Question Set 14

1

The diagram shows a common type of electric heater. It contains oil which is heated by an electrical element.



The table shows some information about the heater.

Electrical power	1500 W
Voltage rating	230 V
Specific heat capacity of oil	1600 J/kg °C
Mass of oil	4.5 kg

- (a) Show that more than 700 000 J of energy is needed to heat the oil from 20 °C to 120 °C.

Use the equation:

change in internal energy = mass × specific heat capacity × change in temperature

- (b) (i) Use your answer to (a) to calculate the minimum time for the oil to reach a temperature of 120 °C, starting at 20 °C. [2]

Minimum time = s [3]

- (ii) In practice, it will take longer than this for the heater to reach 120 °C.

State the reason for this.

[1]

Total Marks for Question Set 14: 6

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