

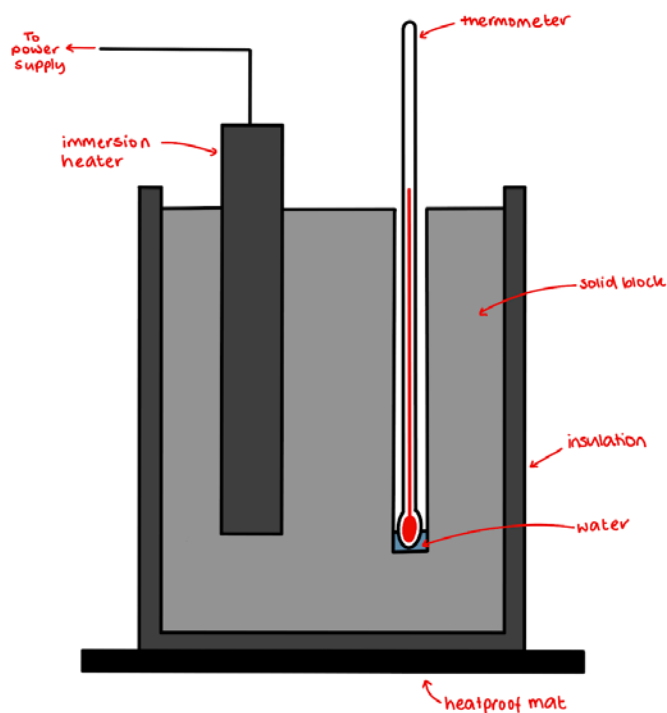
OCR A Physics GCSE

Topic P9: Practical Skills

PAG 5



PAG 05: Determining the specific heat capacity of a metal



1. Measure the **mass**, m , of the metal block using a mass balance
2. Record the **initial temperature** of the block using the **thermometer**
 - a. a small amount of water in the thermometer hole improves **thermal contact**
3. Position a heater within the metal block (see diagram), switch on the **voltage supply** and start the **stopwatch**
4. Measure the **voltage** and **current** of the heater using the **voltmeter** and **ammeter**
5. After five minutes, record the **final (peak) temperature** and calculate the **change in temperature, Δt**

Considering

$$Energy = mc\Delta T$$

We need the following equation to determine the specific heat capacity of the metal:

$$\begin{aligned}
 &\textit{specific heat capacity of metal} \\
 &= \frac{\textit{energy}}{\textit{mass of block} \times \textit{temperature change}}
 \end{aligned}$$



To find 'energy' we need to know the voltage (v), the current (I) and the time taken to heat the metal block (t) as:

$$IVt = \text{Energy}$$

We know this because:

$$\text{Energy} = \text{Power} \times \text{time}$$

and

$$\text{Power} = \text{Current} \times \text{Voltage}$$



