

Thermal Physics revision:

Calorimetry:

1. What quantity of heat is required to raise the temperature of 0.5 kg of water from 15°C to 85°C . The specific heat of water is $4180 \text{ J kg}^{-1} \text{ K}^{-1}$.
2. If a body of mass 250 g increases in temperature by 30°C by absorbing 3 kJ of heat, what is its specific heat?

Thermal Physics revision examples solutions:

Calorimetry:

$$Q = m c \Delta T$$

①

ΔT = change in temperature as a result of body acquiring heat energy

$$\Delta T = 70^\circ \text{C}$$

$$c = 4180 \text{ J kg}^{-1} \text{K}$$

$$m = 0.5 \text{ kg}$$

$$Q = 0.5 \times 4180 \times 70$$

$$\underline{Q = 146,300}$$

②

$$m = 0.25 \text{ kg}$$

$$\Delta T = 30^\circ \text{C}$$

$$Q = 3000 \text{ J}$$

$$c = \frac{Q}{m \Delta T} = \frac{3000}{0.25 \times 30}$$

$$\underline{c = 400 \text{ J kg}^{-1} \text{K}^{-1}}$$

