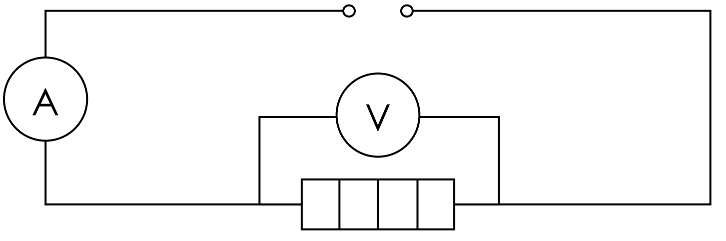
11th July

1. An experiment is carried out to determine the specific heat capacity of aluminium.

The circuit below is set up, with the heater placed inside an insulated cylindrical 1.00 kg aluminium block.



The reading on the ammeter stayed constant at about 3.4 A, while the voltmeter read 9.6 V throughout.

The following results were recorded for the temperature over ten minutes:

Time / s	Temperature / ˚C
0	20
60	21
120	22
180	24
240	25
300	27
360	29
420	31
480	32
540	34
600	35

a. **Plot** this data on the graph opposite

The energy transferred by the heater ($E = ItV$) is equal to the increase in thermal energy of the aluminium ($Q = mc\Delta\theta$), assuming there are no heat losses from the system.

b. Equate $E = ItV$ and $mc\Delta\theta$, then **rearrange** to make $\Delta\theta/t$ the subject of the equation

c. Calculate the **gradient** of the straight line on the graph

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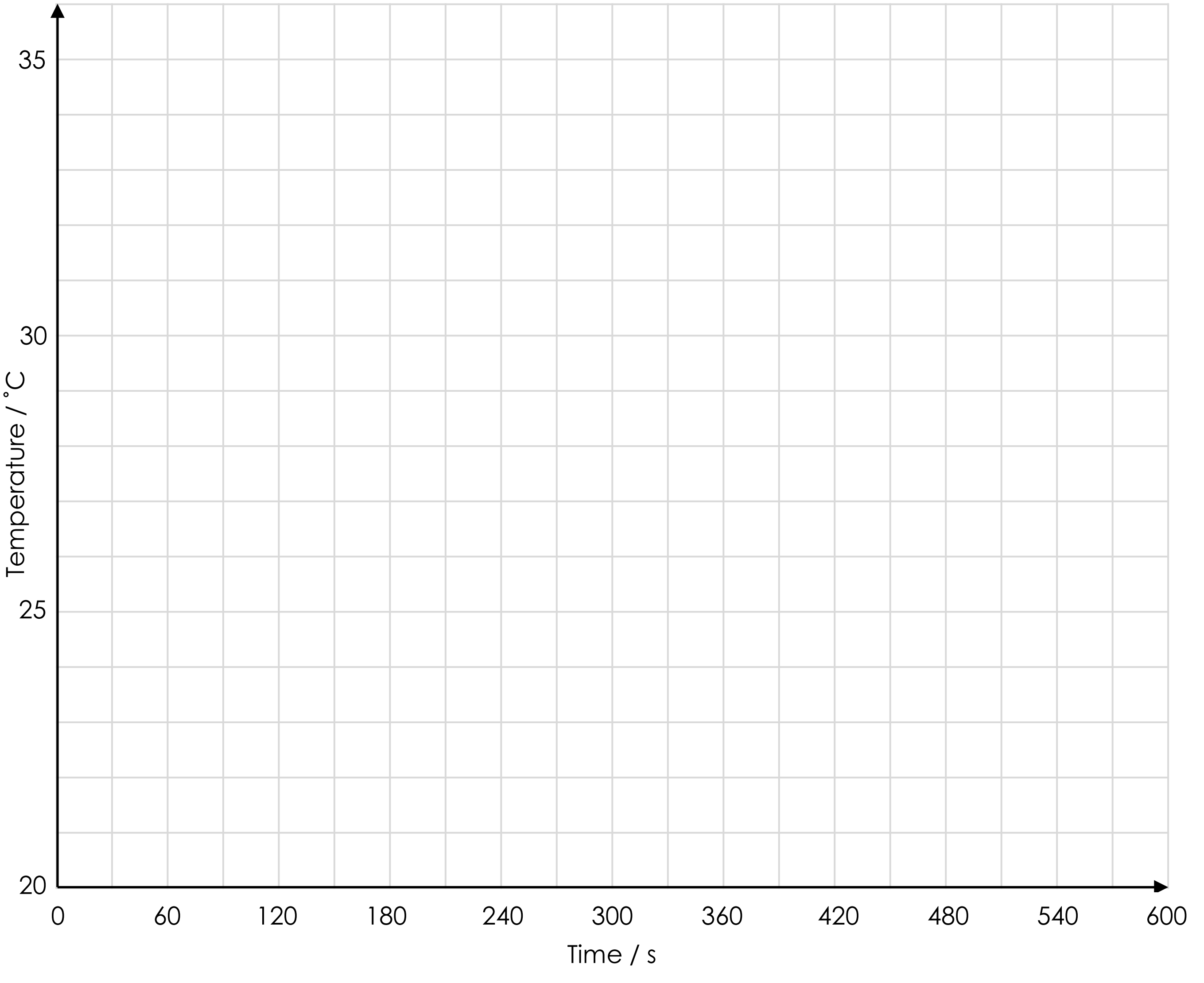

d. Use your gradient, and your answer to part b., to calculate a value for the **specific heat capacity** of aluminium