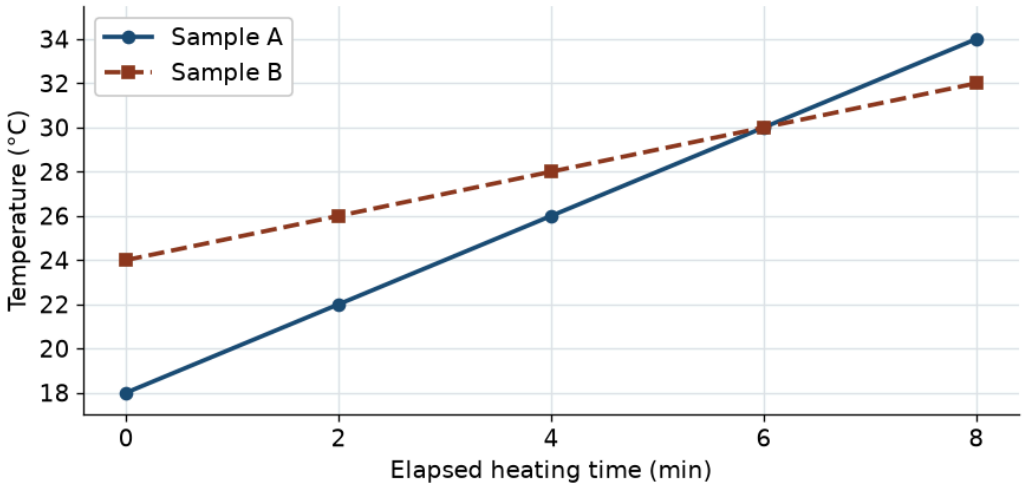
Reading Two Heating Curves That Cross

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom model heats two solid samples. Neither changes phase. Each receives energy from its heater at 10 J per minute, and each loses negligible energy to the surroundings. The graph records the temperature of each sample. The heat capacity of a sample is the energy required to raise that entire sample by 1 °C.



Temperature records for samples A and B.

1 At which recorded time do the two samples have the same temperature?

(1) 2 min

(2) 4 min

(3) 6 min

(4) 8 min

2 Use the first six minutes of the graph to compare the average temperature increase per minute for the two samples. [1]

Answer and work

3 At six minutes the samples have the same temperature. Explain why their temperature changes and the energy supplied show that B has the greater heat capacity. [1]

Answer and work

The class repeats the test with B. It changes the rate of energy transfer from B’s heater while keeping the sample and the other conditions the same.

4 What heater energy transfer rate would make B warm at the same rate that A warmed in the first test? Show your reasoning. [1]

Answer and work