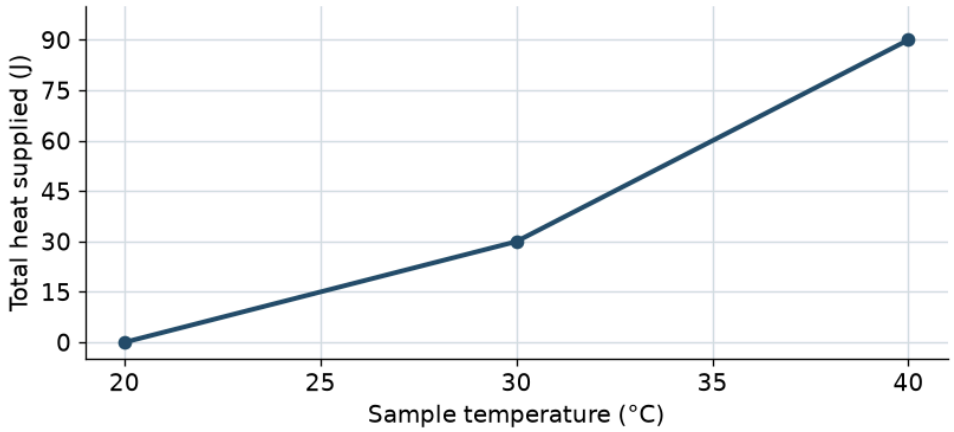
Reading Heat Capacity From Two Slopes

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

A sealed display warms one solid sample without changing its phase. It transfers no energy to the surroundings in this model. The graph shows the total heat supplied after the sample starts at 20 °C. For any interval, the sample’s heat capacity in that interval equals the heat supplied divided by the temperature rise.



Total heat supplied to the sample as its temperature rises.

1 Which 10 °C rise requires more energy in the graph?

(1) 20 to 30 °C

(2) 30 to 40 °C

(3) They require the same energy.

(4) The graph gives no energy comparison.

2 Calculate the sample’s heat capacity over each 10 °C interval. [1]

Answer and work

3 A student divides the 90 J reading at 40 °C by 10 °C and reports 9 J/°C for the last interval. Explain what that calculation includes by mistake. [1]

Answer and work

In a new run the same sample starts at 30 °C. It receives 30 J and remains in the upper temperature range shown.

4 Predict the sample’s final temperature. Use the appropriate interval on the graph. [1]

Answer and work