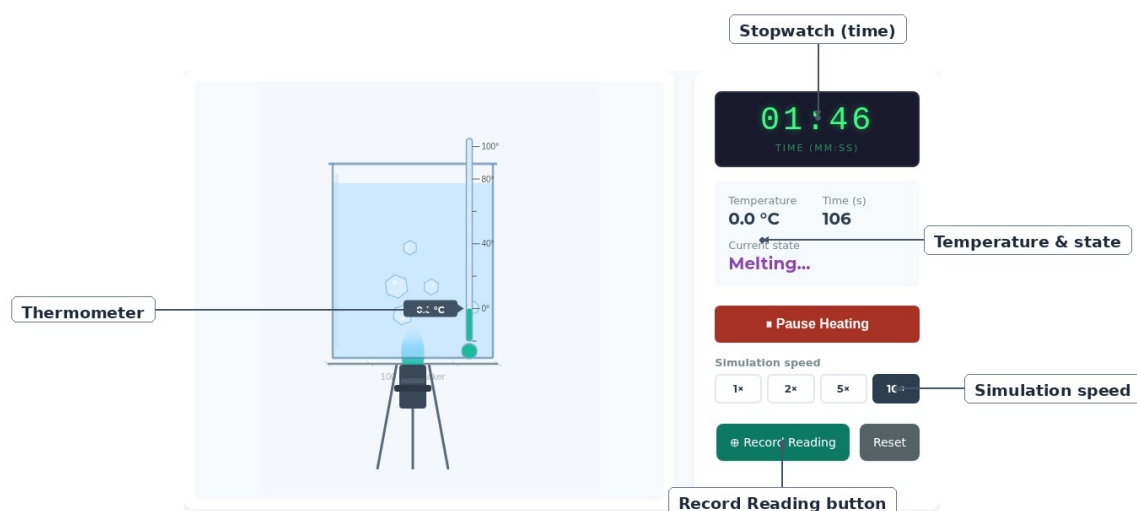


Change of State Investigation

Temperature Against Time as Ice is Heated

Aim:

You are investigating how the temperature of a substance changes over time as it is heated from solid ice, through melting, and on through boiling.



Method:

1. Check that the thermometer reads $-20\text{ }^{\circ}\text{C}$ for the 100 g ice sample before you start.
2. Set the Simulation speed to $5\times$ or $10\times$ to make the experiment run at a reasonable pace.
3. Press Start Heating, then press Record Reading every 30 seconds of simulation time.
4. Collect at least 10 data points, making sure you record readings during every phase of heating — including any flat sections.

Prediction:

Before you start: will the temperature rise at a steady, constant rate all the way from $-20\text{ }^{\circ}\text{C}$ to $100\text{ }^{\circ}\text{C}$, or could the rate of increase change at some points? Explain your thinking.

.....

.....

Test your prediction as you take readings.

Results:

#	Time (mm:ss)	Time (s)	Temperature (°C)	State

Analysis:

Plot a graph of temperature (y-axis) against time in seconds (x-axis). Draw a smooth best-fit curve through your points.

How many flat sections can you see on your graph? Label each one directly on your graph.

.....

.....

Read off the temperature at each flat section. What do these two values represent?

.....

.....

.....

Explaining why:

At each flat section, is energy still being transferred into the substance? If so, what is that energy doing, if it is not raising the temperature?

Why does the temperature stay constant during a change of state, even though the Bunsen burner keeps supplying energy the whole time?
