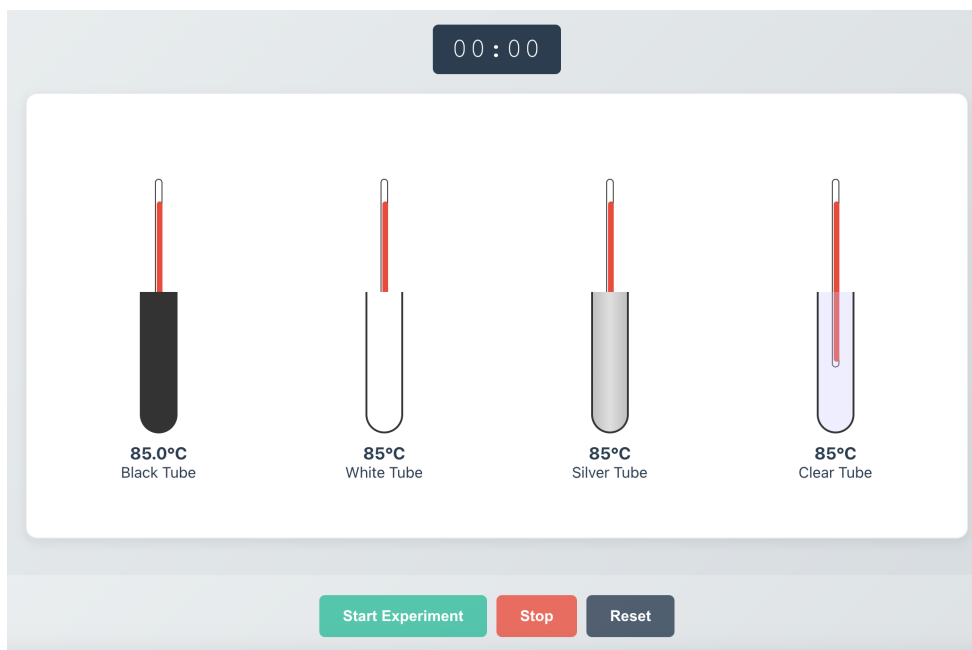


Investigating Radiation

Aim: The aim of the experiment is to investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface



Variables:

- **Independent variable** = Colour of test tube
- **Dependent variable** = Temperature
- **Control variables:**
 - Volume of water
 - Starting temperature of water

Method:

1. Set up the four identical boiling tubes painted in different colours: black, white and silver. One is not painted as a control.
2. Fill the boiling tubes with hot water, ensuring the measurements start from the same initial temperature
3. Note the starting temperature, then measure the temperatures at regular intervals, e.g. every 30s for 10 minutes. (Note: the simulation has been speeded up to double time)

Results:

Time (min)	Temperature (°C)			
	black	white	silver	clear

Analysis of Results

- Plot a graph of temperature against time. You should have 4 cooling curves.
- Most of the energy lost from the beakers will be by heating due to conduction and convection
- Any difference in energy loss will be due to infra-red radiation from the surfaces
- Which colour was the best at radiating heat? Which was the worst?

Extension

- How could you find out which colour **absorbs** heat radiation best?
- How could you make your results more accurate?