



Physics

PHY6T/P12/task

Unit 6 Investigative and Practical Skills in A2 Physics ISA (P) Cooling Experiments

Stage 1: Task Sheet

This task is worth 7 marks

You are advised to read through the instructions before beginning your work.

You are going to investigate heat exchange between cold metal and hot water and to plot a cooling curve for hot water.

- Record the precision of your thermometer and that of the measuring cylinder.
- Measure and record room temperature, θ_s .
- Pour 60 cm^3 of cold water into each cup and mark the water level on the inside of both.
- Empty both cups.
- Use the ruler to measure the diameter, d , of a 2p coin.
- Use the ruler to measure the height, h , of a pile of ten 2p coins.
- Place the ten coins into one of the cups. This is cup B: the other cup is cup A.
- Collect a beaker of freshly boiled water and pour the water into both cups just up to the water levels you marked earlier.
- Place a thermometer into each cup, stir both gently and record θ_A and θ_B . θ_A is the maximum temperature reading for the water in cup A and θ_B is the temperature of the water in cup B measured **at the same time** as θ_A .
- Empty both cups.
- *You are now going to plot a cooling curve for the water in cup A.*
- Collect another beaker of freshly boiled water and pour it into cup A up to the water level you marked earlier.

- Stir gently with the thermometer and as soon as the maximum temperature reading is reached, start the stopclock or stopwatch and record this temperature.
- Keep stirring the water gently while it cools and record the water temperature, θ , at suitable time intervals for a total of 600 seconds.
- Present all your readings in a suitable format.
- Plot a graph of θ against time, t , in seconds (θ on the y -axis) and draw a best fit line.

After the investigation

At the end of the investigation, hand in all your written work, including the graph and recorded results, to the supervisor.

This documentation will be required for Stage 2 of the ISA. Ensure that you have entered your centre details, candidate number and name on all the sheets you have completed.