

# Physics

# PHY6T/Q13/task

## Unit 6 Investigative and Practical Skills in A2 Physics ISA (Q) Damped SHM

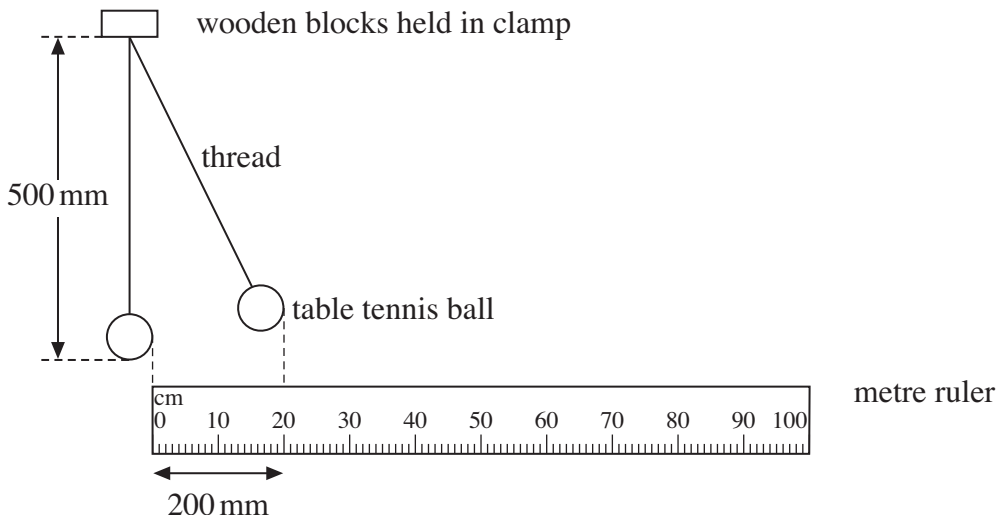
### Stage 1: Task sheet

This task is worth 7 marks

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

**You are going to carry out an experiment to investigate the relationship between amplitude and elapsed time (ie time from release) for a ball oscillating on a thread.**

**Figure 1**



- Set up the apparatus as shown in **Figure 1**.
- Displace the ball 200 mm to one side and release it so that it oscillates. Take measurements to determine as accurately as possible the time period,  $T$ , of the oscillations.
- Displace the ball 200 mm to one side and release it. Determine the amplitude after 1 oscillation and calculate the elapsed time,  $t$ . The elapsed time is calculated by multiplying the number of oscillations by  $T$ .
- Displace the ball 200 mm to one side and release it. Determine the amplitude after 2 oscillations and calculate the elapsed time,  $t$ .
- Repeat the procedure for 3 oscillations, 4 oscillations, 5 oscillations and 6 oscillations.
- Take sufficient readings to reduce the uncertainty in your results.
- Record all your results in a table which should include amplitude  $A$ , elapsed time  $t$  and  $\ln(A/\text{mm})$ .
- Plot a graph of  $\ln(A/\text{mm})$  on the  $y$ -axis against  $t$ .

**After the Investigation**

At the end of your investigation, hand in all your written work, including the graph, 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.