

## Using a Simple Pendulum to Measure the Acceleration due to Gravity

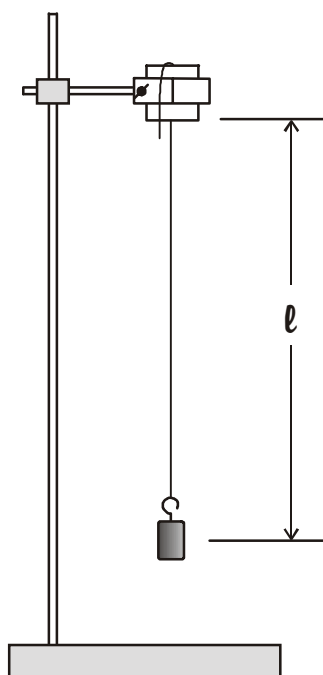
Theory suggests that the time period of a simple pendulum can be calculated using the following equation

$$T = 2\pi \sqrt{\frac{\ell}{g}}$$

where,  $\ell$  is the length of the pendulum and  $g$  is the acceleration due to gravity.

Assuming that this equation is correct, use a simple pendulum to find the acceleration due to gravity.

You will probably measure the time periods corresponding to various lengths but be sure to have one result for a pendulum of length 0.3m.



### Data Analysis

1. Use your results to find a value for  $g$ .
2. The accepted value for  $g$  (in Paris) is  $9.81 \text{ N kg}^{-1}$ . Calculate the percentage difference between your final figure for  $g$  and the accepted value.
3. Calculate a value for  $g$  using the result corresponding to a pendulum of length 0.3m. Assuming that your reaction time is 0.15s, find the uncertainty in this result. State the figure in the usual way ( $g = x \pm \Delta x \text{ N kg}^{-1}$ ). Comment on the level of precision of this result compared with your final result.