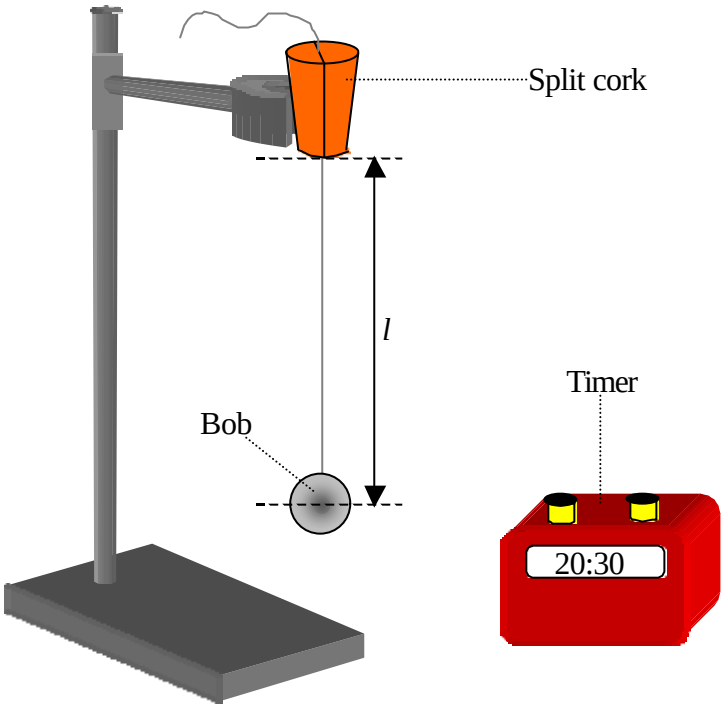
INVESTIGATION OF THE RELATIONSHIP BETWEEN PERIOD AND LENGTH FOR A SIMPLE PENDULUM AND HENCE CALCULATION OF *g**

Apparatus

Pendulum bob, split cork, string and timer.

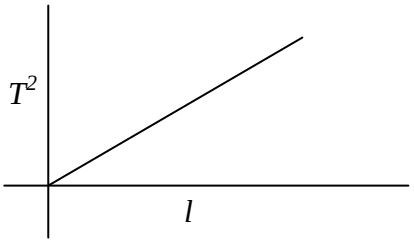


Procedure

1. Place the thread of the pendulum between two halves of a cork or between two coins and clamp to a stand.
2. Set the length of the thread at one metre from the bottom of the cork or coins to the centre of the bob.
3. Set the pendulum swinging through a small angle (<5°). Measure the time *t* for thirty complete oscillations.
4. Divide this time *t* by thirty to get the periodic time *T*.
5. Repeat for different lengths of the pendulum.
6. Draw a graph of T^2 against length *l* and use the slope to calculate a value for *g*.

Results

l/m	t/s	T/s	T^2/s^2



$$T^2 = 4\pi^2 \frac{l}{g}$$

$$\Rightarrow \frac{T^2}{l} = \frac{4\pi^2}{g} = \text{slope}$$

$$\Rightarrow \quad g \quad = \frac{4\pi^2}{(\text{slope})}$$