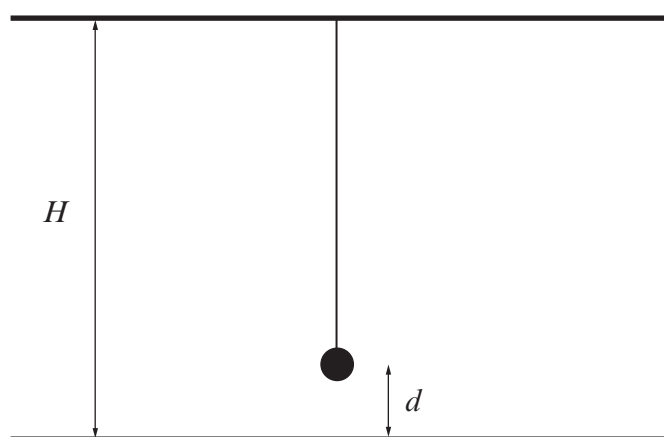


**Data Analysis Task**

A Physics student designs an experiment to measure the height of the laboratory using a simple pendulum. (This is a mass placed on the end of a light string and made to oscillate). The string is attached to the ceiling and its length is varied.

The student does not measure the length of the string. Instead the distance,  $d$ , from the floor to the mass is measured as shown below.



The period of oscillation of the pendulum ( $T$ ) is given by the equation:

$$T = 2\pi \sqrt{\frac{H-d}{g}}$$

where  $H$  is the height of the laboratory and  $g$  is the acceleration due to gravity.

- (a) If values of  $T^2$  are plotted against  $d$  a straight line graph is obtained. Explain why the intercept on the  $T^2$  axis of the graph is equivalent to  $\frac{4\pi^2}{g} H$  and the gradient is equivalent to  $-\frac{4\pi^2}{g}$ . [2]

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