Experiment 9: The motion of a small sphere on an inclined plane

In this experiment, you are required to investigate the motion of a ball rolling down a sloping track.

Fig. 2.1 shows a track with one end at a height h above the other.

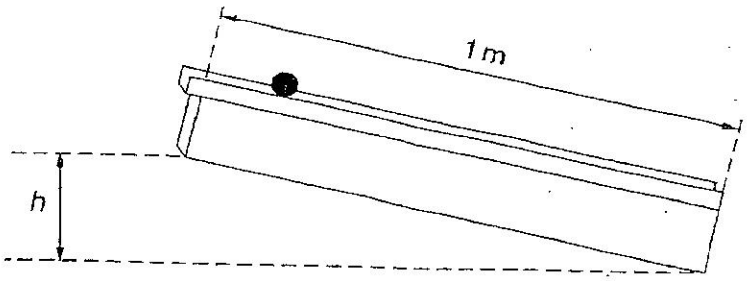

Fig. 2.1

The ball is released from rest near the top of the track and takes time t to reach the other end.

Theory predicts that h and t are related by the expression

$$h = \frac{14s^2}{5gt^2} + k,$$

where s is the length of the track, k is a constant and g is the acceleration of free fall.

(a) By making appropriate use of the apparatus which has been provided, design and carry out an experiment to test the validity of the expression given above when $s = 1.00$ m.

(b) On page 6 write a brief account of your experiment.

Page 8 is to be used to record all your results.

Page 9 is to be used to plot a suitable graph from your results.

On page 10, write down any conclusions you have reached concerning the validity of the expression.

(c) Also on page 10, suggest, with a reason, one possible improvement which you could make to the design or execution of your experiment if you had to repeat it using either existing apparatus or other standard laboratory equipment.