

### Experiment 3:

### The stopping distance of a small cube

Engineers who design and build roads sometimes change the type of road surface near a pedestrian crossing, as shown in Fig. 3.1. The purpose of this is to increase the grip between the car tyres and the road surface if the car has to make an emergency stop.

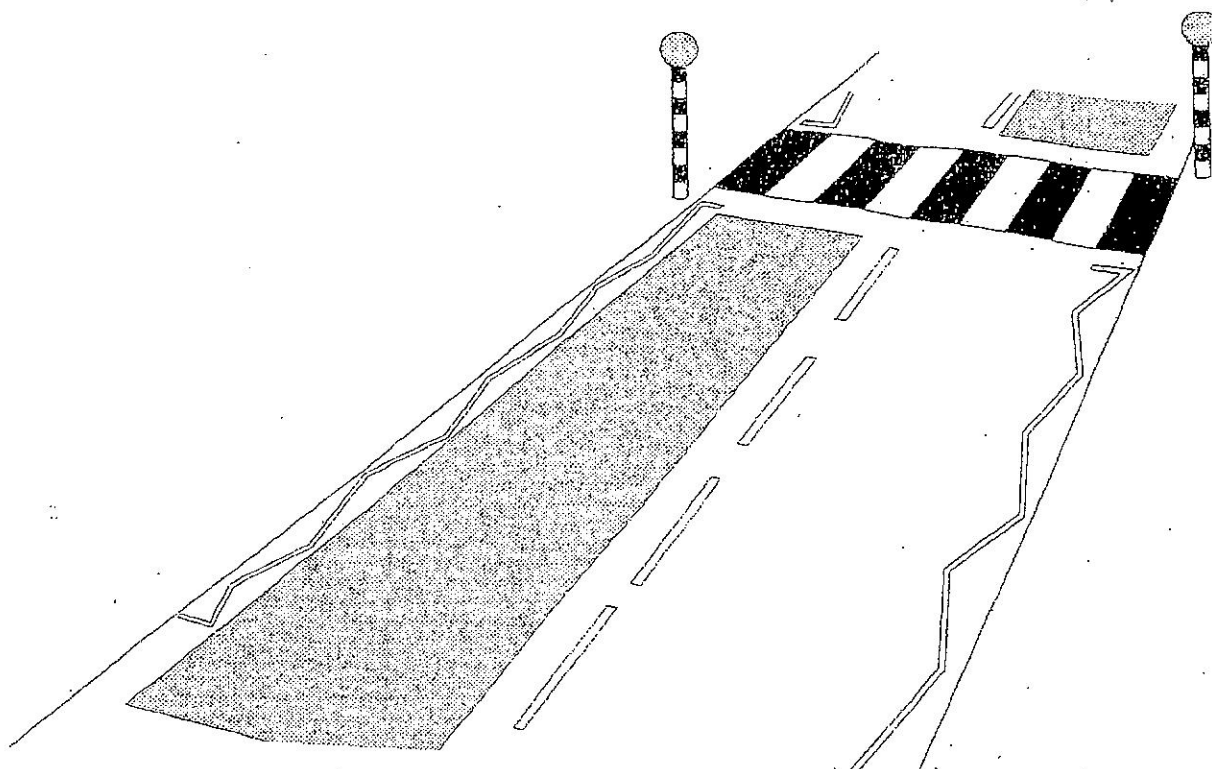


Fig. 3.1

Design an experiment to investigate how the stopping distance of a small cube sliding on a rough surface depends upon the initial speed of the cube and the type of surface used.

You may assume that all of the following equipment is available, together with any other standard laboratory apparatus that would be found in a school or college science laboratory.

Air table	Selection of flat surfaces of different roughness
Flat block of ice	Metre rule
Air blower	Dynamics trolley
Ticker-tape timer	Paper tape
Stopwatch	Electronic timer
Light gates	Small cube

Your answer should include a diagram and make particular reference to

- why the initial speed of the cube should be measured before it moves over the rough surface,
- how the speed of the cube may be measured,
- the control of variables.