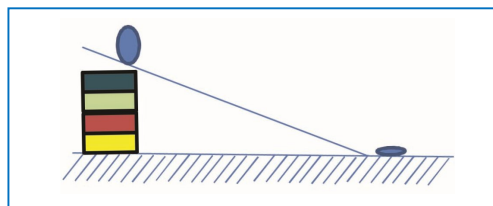


EXPERIMENT - 1**MOTION OF OBJECT ON INCLINED PLANE - 1**

Aim : To find the acceleration and velocity of an object moving on an inclined plane.
To draw the graph between distance travelled by the object and time.

Required : Glass marble, identical books-6, stop clock/digital timer, long plastic tube of 2 m, steel plate, Marker pen



Formula : The initial velocity of the object released on an inclined plane (u) = 0

$$S = ut + \frac{1}{2} at^2$$

$$S = \frac{1}{2} at^2$$

$$2s = at^2$$

$$\text{acceleration } a = \frac{2s}{t^2} \text{ and } V = u + at$$

$$V = at \text{ (} e : u = 0 \text{)}$$

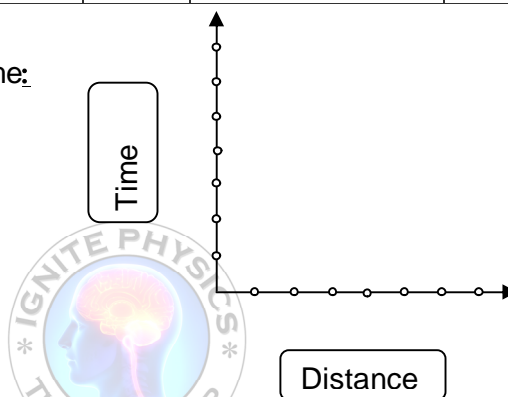
Procedure: (1) Take a long plastic tube of 2m length and cut it in half along the length of the tube to make like a track.

- (2) Mark the readings on the track from '0' to 200 cm with a marker pen.
- (3) Place the books under the tube at one edge such that it looks like an inclined plane.
- (4) Keep a steel plate at the other edge.
- (5) Hold a marble at certain point say 40 cm on the track and release the marble. Start the stop clock simultaneously. (Distance (s) = 40 cm)
- (6) The marble hits the plate and produced sound on reaching the ground. Then stop the stop clock.
- (7) Note down the time taken by the marble to travel 40 cm on inclined plane as t_1 .
- (8) Repeat the same procedure two times and find t_2 and t_3 .
- (9) Note down the readings in table and find the average time $\frac{(t_1+t_2+t_3)}{3}$. E
- (10) Find acceleration $a = \frac{2s}{t^2}$, and velocity $v = at$ and note them in the table.
- (11) Draw a graph by taking distance on 'X' axis and time on 'Y' axis.
- (12) Do the same for different distances like 60, 80, 100, 120, 140 and 160 cm.

Observation :

Sl No.	Distance (in cm's)	Time			Average time (t)	$a = \frac{2s}{t^2}$	$v = at$
		t_1	t_2	t_3	$\frac{(t_1 + t_2 + t_3)}{3}$		
1.	40						
2.	60						
3.	80						
4.	100						
5.	120						
6.	140						
7.	160						

Graph between distance and Time:



The following are the observations from the table :

- The speed of the object increases with distance travelled on inclined plane.
- The graph between distance and time for an object travelled on inclined plane is a curve.

Precautions :

- (1) Take care while switch on / off the stop clock. (Must take accurate measurement)
- (2) Arrange the track such that the readings are marked from bottom to top.
- (3) Releasing marble and switch on the stop clock must be done simultaneously. So more care is needed.

Result :

- The acceleration and velocity of an object moving on an inclined plane are calculated.
- The graph between distance travelled by the object and time on inclined plane is drawn.