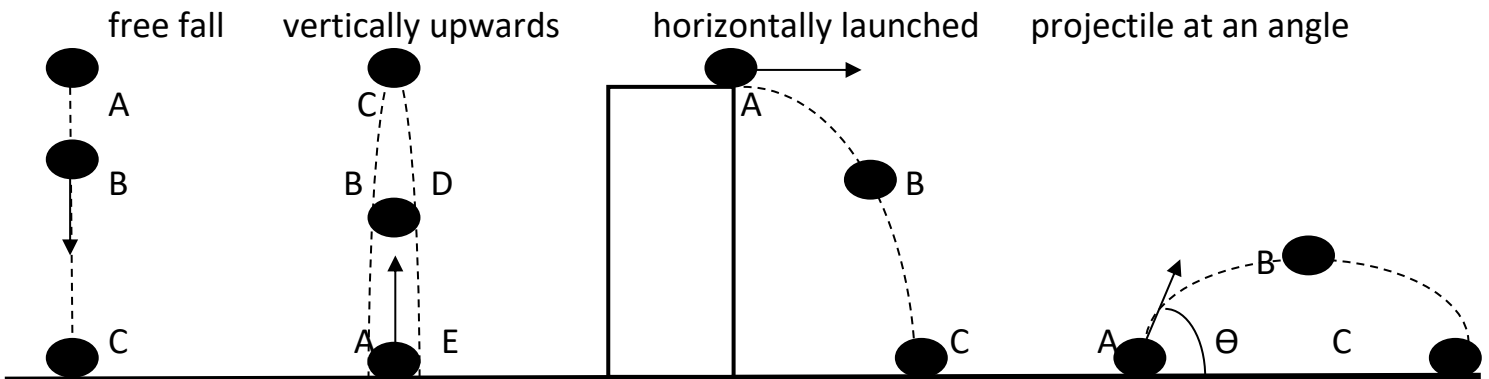| Strand	MECHANICS
Sub Strand	Kinematics
Content Learning Outcome	At the end of the lesson students should be able to • Apply the 3 kinematic equations to solve projectile motion problems

PROJECTILE MOTION

Projectile motion is any motion in air where the acceleration is due to gravity.

The acceleration due to gravity at any point of a projectile is same.

We will use the three equations of motion to find either the time or the maximum height. Questions can also ask for the amount of kinetic and potential energy at any point.

Equations of motion
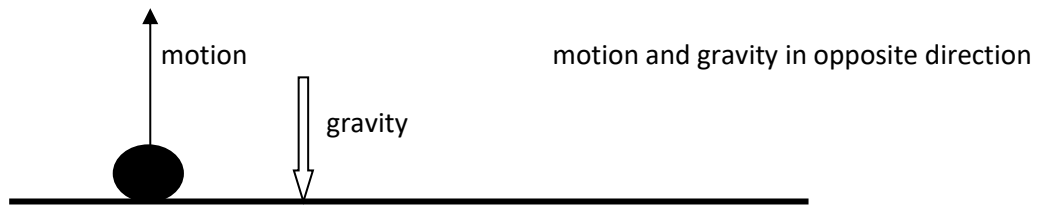
1. $V_F = V_I + at$

2. $V_F^2 = V_I^2 + 2\,a\,d$

3. $d = V_I t + \frac{1}{2}a\,t^2$
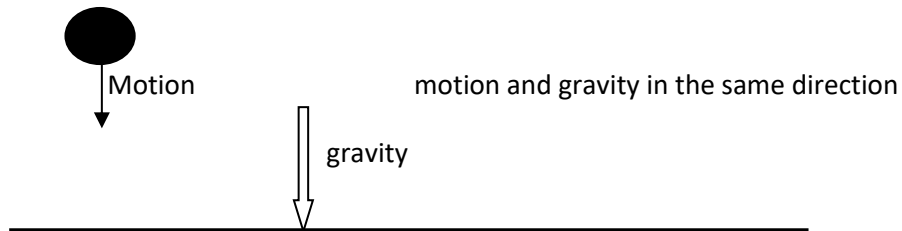
Kinetic energy - $E_K = \frac{1}{2}m\,v^2$

Potential energy - $E_P = m\,g\,h$

For the purpose of using equations of motion

a. For projectile going upward use a = - 10m/s^2

motion   motion and gravity in opposite direction

gravity

b. For projectile going downwards use a = 10m/s^2

Motion   motion and gravity in the same direction

gravity

FREE FALL

Here the initial velocity of the object is 0m/s^2.

1. An object is dropped freely from a 500m cliff. Find

a. The time taken to reach the ground   b. velocity of the object at the bottom

2. An object is dropped freely from a cliff and it takes 7s for the object to reach the bottom. Find

a. The height from which it was dropped.   b. velocity at the bottom