Forces and Motion

Why do a soccer ball and a bowling ball hit the ground at the same time?

All objects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ toward Earth at a rate of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation:

Δv =

g =

t =

Air resistance – the force that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the motion of objects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Depends on:

Terminal velocity – when the object stops \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Free fall – if only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and no other forces are acting on it; no place with \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Free fall can occur:

Orbiting – when an object \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ another object \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Caused by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Projectile motion – the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that an object follows when thrown near the surface of the Earth

Horizontal motion - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the ground

Vertical motion - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the ground

Gravity only affects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Newton’s Laws of Motion

1st Law – An object \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ stays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and an object \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ stays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unless acted upon by an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force

* Objects at rest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Example:
* Objects in motion will continue to move \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unless acted upon by an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force
* Example:

A common unbalanced force acting on moving objects = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Inertia – the tendency of an object to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The more \_\_\_\_\_\_\_\_\_\_\_\_\_ an object has, the more\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ it has

2nd Law – The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of an object depends on the \_\_\_\_\_\_\_\_\_\_\_\_\_ of an object and the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ applied

* Acceleration \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as mass \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Acceleration \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as force \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation:

* An object with a \_\_\_\_\_\_\_\_\_\_\_\_ mass and a \_\_\_\_\_\_\_\_\_\_\_ acceleration, can still have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_force

Example:

* An object with a \_\_\_\_\_\_\_\_\_\_\_\_ mass and a \_\_\_\_\_\_\_\_\_\_\_\_ acceleration, can still have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ force

Example:

3rd Law – For every action, there is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction

* All forces act in \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Examples:

Momentum – the product of an object’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

All \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have momentum

The \_\_\_\_\_\_\_\_\_\_\_\_\_ momentum an object has, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ it is to stop

Equation:

Measured in:

Law of Conservation of Momentum – when objects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, momentum can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but the amount of momentum \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Objects can stick together and move in the direction of the object with \_\_\_\_\_\_\_\_\_\_\_\_\_\_ momentum

Example:

* Objects can bounce off each other and move in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ directions with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ speeds

Example: