Name _____
Date _____ Per. _____

Force and Motion Power Point Notes

Motion: _____

Position: _____

Reference Point: _____
_____

An object is moving if its position changes compared to a reference point.

Distance: _____

Speed: _____

Formula for Speed:

Question: If a cyclist travels 45 kilometers in 3 hours, what is his speed?

Answer: _____
*** It is really important to use units in your answer.***

FYI: Knowing the speed at which something travels does not tell you everything about its motion. To describe an object's motion completely, you need to know the _____ of its motion. For example, suppose you hear that a thunderstorm is traveling at a speed of 25 km/h. Should you prepare for the storm? That depends on the direction of the storm's motion!

Velocity: _____

Symbols for Motion

Symbol	Term
d	
v	
t	
Δ	

FYI: You know the velocity of the storm when you know that it is moving 25 km/h eastward.

What is a Force?

A **force** is _____

Forces can…….

- Cause _____
- Change _____
- Change _____

For Example:

- ***A soccer player's foot touches a ball as he kicks it along the ground.***
- ***A student's hand touches a book as he lifts it out of a backpack.***

Two Types of Forces

- _____
- _____

Balanced Forces are: _____
_____

Examples of Balanced Forces**:**

- ***A ball at rest on a soccer field will not move until it is kicked.***
- ***A chair will stay in place until it is pushed.***

Unbalanced Forces are: _____
_____
_____

Example of Unbalanced Forces:

_____

- ***Two teams pull on a rope in opposite directions. If one team pulls harder on the rope, the forces are unbalanced.***

Forces Acting – Direct Contact

- _____ can slow the motion of an object or keep an object from moving at all.

- Without friction, every surface would be more slippery, walking would be impossible and you would not be able to hold a pencil or write on paper.

Forces Acting From a Distance

_____Forces

_____Forces

Gravity - A force that _____

Question: Would you be surprised if you let go of a pen you were holding and it did not fall?

One person who put a great deal of thought into this question was Sir Isaac Newton. He concluded that a force acts to pull objects straight down toward the center of the Earth.

For Example:

Newton realized that gravity acts everywhere in the universe, not just on Earth. It is the force that makes an apple fall to the ground. It is the force that keeps the moon orbiting around Earth. It is the force that keeps all of the planets in our solar system orbiting around the sun!!

Momentum: _____

_____

FYI: The more momentum (the bigger it is and the faster it is moving) a moving object has, the harder it is to stop. For example, you can catch a baseball moving 20 m/s, but you cannot stop a car moving at the 40 m/s. The car has more momentum because it is bigger and faster than the baseball!

Newton's First Law of Motion or The Law of Inertia

_____

_____

For Example:

Lurching forward in your seat as the bus you are riding in suddenly slowed down

Acceleration: _____

Acceleration refers to:

- Increasing _____
- Decreasing _____
- Changing _____

Newton's Second Law of Motion

Acceleration is produced when a _____. The greater the mass (of the object being accelerated) the greater the amount of force needed (to accelerate the object).

For Example:

An empty grocery cart takes less force to push than a full grocery cart. If your empty cart was rolling down a hill, it would take much less force to stop it than a full grocery cart.

Newton's Third Law of Motion

_____

_____

For Example:

If you push on a wall, it will push back on you as hard as you are pushing on it.