

Name: _____ Date: _____

Physical Science Notes 12
Newton's 3rd Law

- Newton's 3rd Law of Motion states that to every action there is an

equal and opposite reaction.

- Imagine yourself pushing on the wall. What happens?
- Imagine yourself pushing on the wall while wearing roller skates. What happens?
 - This is an example of Newton's 3rd Law of Motion. By pushing forward on the wall, you see that an opposite reaction takes place when you move back. The stronger the force of the push, the farther back you will move.
- Other examples of Newton's 3rd Law include:
 - rifle
 - rocket
 - balloon

Momentum

- Very soon, we will be doing a lab where we roll marbles down a ramp toward a paper car.
 - As we increase the mass of the marbles by adding more marbles, the card should move farther. This is because of a property called momentum, which relates to how much force is needed to change the motion of an object.

- The more mass an object has, the harder it is to slow an object down and the more force it will have when impacting another object.
- The following is the formula for figuring out momentum, where
p = momentum, m = mass, and v = velocity.

$$p = mv$$

The Law of Conservation of Momentum

- Finally, it is important to note that the momentum of an object stays the same unless its mass, velocity, or both change.
- Also, momentum can be transferred from one object to another upon a collision between the two objects.
- Think of a game of pool. When you hit the cue ball into another ball, the momentum of the cue ball changes as its velocity decreases, but momentum is transferred to another ball as its velocity increases. In a world with no friction and a perfect shot, all of the momentum of the cue ball would be transferred to the ball it hits.
- During the break, the momentum of the cue ball is transferred to an entire group of balls and they go flying in different directions. This is why professional pool players are always seeking to add more power to the cue ball by increasing the amount of force they hit it with.