Physical Science Chapter 11 Notes

Forces change motion

* A **force** is a push or pull
* Types of forces
	+ **Contact Force**
		- One object pushes or pulls another object by touching it
		- First object is applying a contact force to the second
	+ **Gravity**
		- Force of attraction between two masses
		- Strength of gravitational force between the objects depends on their masses
	+ **Friction**
		- Force that resists motion between two surfaces that are pressed together
	+ Balanced vs. Unbalanced Forces
		- **Net Force** – overall force acting on an object when all the forces are combined
			* If Net force = zero then all forces acting on the object are balanced
		- *Balanced forces* – have same effect as no force at all. (motion of the object doesn’t change)
			* Cannot change object’s speed or direction
		- *Unbalanced forces* – can change the motion of an object (doesn’t matter if the ball started at rest or was already moving)
* **Newton’s First Law**
	+ Objects at rest stay at rest
	+ Objects in motion stay in motion
		- \*\*\*unless acted on by outside force
	+ **Inertia** – resistance of an object to change in the speed or the direction of its motion
* Force and mass determine acceleration
* **Newton’s Second Law -**
	+ Force and mass determine acceleration
	+ **F = ma**
	+ Acceleration of an object increases with increased force and decreased with increased mass
		- *Centripetal force* – any force that keeps an object moving in a circle. The force points toward the center of the circle
	+ Forces can change the direction of motion
* **Newton’s Third Law –**
	+ Forces act in *pairs*
	+ For every **action** there is an equal and opposite **reaction**
* Newton’s three laws describe and predict motion
* Forces transfer momentum
	+ **Momentum**: measure of mass in motion
		- Product of its mass and its velocity
		- P = mv
		- Momentum = mass x velocity
		- Momentum can be *transferred* from one object to another
			* *Collision* – two objects in close contact exchange energy and momentum
	+ Momentum is *conserved*
		- *Principle of conservation of momentum* – total momentum of a system of objects does not change, as long as no outside forces are acting on that system