Physical Science Chapter 12 Notes

* Gravity is a force exerted by masses
  + Masses attract each other
  + *Gravity*: the force that objects exert on each other because of their masses
    - Greater mass results in greater force
      * If the mass is large, it will produce a greater force on the smaller mass
    - Greater distance results in smaller force
      * If the distance between the two masses is large, the force between those two masses will be small
* Gravity on Earth
  + The force of gravity acts on all masses equally
  + Gravity has the same acceleration on all masses
  + Downward pull
  + *g =* 9.8 m/sq. second
    - *Gravitational constant*
    - Formula for calculating the force due to gravity on a mass close to Earth’s surface is F=m*g*
* Weight- the force of gravity on an object
  + Depends on the force of gravity acting on the object
* Gravity keeps objects in orbit
  + *Orbit*: the elliptical path one body follows around another body due to the influence of gravity
    - Objects are held in motion by centripetal force
* Friction is a force that opposes motion
  + Friction occurs when surfaces slide against each other
    - *Friction*: a force that resists the motion between two surfaces in contact
* Friction between two surfaces depends on the materials that make up the surfaces
* A larger force is needed to start something moving than to keep something moving
* Frictional force has a limit to how large it can be.
* The harder two surfaces are pushed together, the more difficult it is for the surfaces to slide over each other
* Friction depends on the total force pressing the surfaces together
* Friction between surfaces produces heat
  + Rub your hands together… what happens?
  + Increased speed of the molecules on the surface produces the warmth
* Motion through fluids produces friction
  + *Fluid*: substance that can flow easily (gases and liquids)
  + *Air resistance:* friction due to air
* Air resistance depends on surface area and the speed of an object
  + An object with larger surface area contacts more molecules = greater air resistance
  + Faster an object moves it contacts more molecules is a smaller amount of time = greater air resistance
* Pressure depends on force and area
  + Pressure describes how a force is spread over an area
    - *Pressure*: a measure of how much force is acting on a certain area
      * Increased pressure may feel like the force has increased, but the force has stayed the same.
      * P = force / area P= F/A
      * Unit for pressure is the pascal (Pa) one pascal is the pressure exerted by one newton of force (1N)
* Pressure in fluids depends on depth
  + Pressure that a fluid exerts depends on the density and the depth of the fluid
* Pressure in Air
  + Changing elevation: air has weight, the more air there is above you, the greater the weight of that air
  + Changing Density: air at the top of a column presses down on the air below it, farther down the column, the more weight
    - Air at lower elevations is more compressed so it is more dense
  + Effects on pressure: pressure is exerted by individual molecules colliding with an object
  + Denser air = more molecules = more collisions
    - Increase in collisions increases force and pressure exerted by air
* Pressure in Water
  + Water molecules are very close together
  + Water exerts more pressure than air because of different densities
  + Some organisms have developed adaptations to combat the pressures at great depths