Kinematics Test Review – Physics

- Motion is relative- whether a object is moving or not depends on your perspective/how you perceive it
- When asked to explain why something is not moving, (do not say not moving because the same speed, but through scope see same perspective) b/c not moving scope or object not changing size(bigger/smaller)
- Dot Diagrams
    - Must have a start and direction (+,-)
    - Space between the dots represents time(1 second) and distance(traveled in that time)
    - When two dot diagrams, they are next to each other start
    - If two dots line up, but it is at different seconds, they are in the same place, but not at the same time
- Slope in position vs. time (x vs. t) graphs is called velocity
- **Speed** – a measure of how far in how long without regard to direction
- **Velocity** – cares about direction (can be '+' or '-'
- $x=V_0t + x_0$ - **used to figure out a point, when 2 equations set equal, objects are at same position at same time (if** from opposite directions, one of the velocities is negative)
    - x – position of object at time t
    - V_0 – initial velocity
    - t – time
    - x_0 – initial position

Displacement, Distance, Path length

- **Displacement** – how far object moves from its starting point to its final point (cares about direction)
    - Change in $x = x_f – x_0$
- **Distance** – does not care about direction = |x|
- **Path Length** – think of car odometer, add distances together

- **Average speed** = path length/change in time(how long it took to travel)

- In a v vs. t, the area between axis is the change in x(displacement)
- In a v vs. t graph, lines above x axis – object moving in the 't' direction and if below in '-' direction
- 2 indexes – velocity, speeding up index(how much velocity changed in 1 sec)
- **Acceleration –** change in velocity/change in time
  - Acceleration of object in free fall = +/- 9.8 m/s^2
  - Motion in the x direction is always constant, so acceleration is 0
- Change in velocity always downward with freefalling objects
- Can find initial speed of object by
  - $X_f = at + v_0$
  - Or(without time)

***** If acceleration and velocity have the same signs, it is speeding up, but with different signs it is slowing down**