Unit 2 Study Guide- 1D motion

1. Scalar vs Vector
   1. Scalar quantity- magnitude only
   2. Vector quantity- magnitude and direction
2. Distance vs Displacement
   1. Distance- how far an object travels (direction does not matter)
   2. Displacement- how far an object is from where it started (direction does matter)
3. Speed vs Velocity
   1. Speed- how fast an object is traveling (direction does not matter)
   2. Velocity- how fast an object is traveling in a certain direction (direction does matter)
4. Acceleration
   1. 3 ways an object can accelerate
      1. Speeding up
      2. Slowing down
      3. Changing directions
   2. In the x direction, we can calculate for acceleration using our formulas.
   3. In the y direction (on Earth) the acceleration is gravity = -9.8m/s2
   4. On a PT graph, the line would be curved if there is acceleration.
   5. On a VT graph, the slope of the line tells us acceleration
      1. Slope= y2-y1  
          x2-x1
5. Slope of a PT graph
   1. Finding the slope tells us velocity
6. Slope of a VT graph
   1. Finding the slope tells us acceleration
7. Constant velocity
   1. Means no acceleration
8. Constant acceleration
   1. gravity
9. **Graphs!**
   1. PT graphs- be able to analyze what is happening at each section of a graph and find slope
   2. VT graphs- be able to analyze what is happening at each section of a graph and find slope
10. **Formulas!**



v= velocity = m/s

x or d = displacement = m

t = time = s

a= acceleration=m/s2

vi or vo= initial velocity = m/s

vf = final velocity= m/s

1. **Concepts!**
   1. In the “x direction” (horizontal) – gravity does not affect the x direction.  
      + velocity and + acceleration means the object is speeding up in the positive direction  
      - velocity and – acceleration means the object is speeding up in the negative direction  
      + velocity and – acceleration means object is slowing down in the positive direction  
      - velocity and + acceleration means object is slowing down in the negative direction
   2. In the “y direction” (vertical) GRAVITY!!  
      If I throw an object up, the velocity will be positive. The acceleration (gravity = -9.8m/s2) will be negative. The object will slow down as it reaches the top of its path. At the top of its path, we can say that the final velocity is 0 m/s. Then the object changes directions and begins to fall down. Now, the velocity is negative and the acceleration is negative (gravity = -9.8m/s2). This means that the object will be speeding up as it falls.

If I drop an object down, the initial velocity is 0m/s and gravity is -9.8 m/s2. Then you can use the information given to solve for whatever you are missing.

Disregarding air resistance, objects fall at the same rate regardless of their mass, shape, or size. All objects are affected by gravity (-9.8m/s2).