

Unit 2: Matter & the Motion of it!

1. I am up to date with the units we use to explain the world!!

SPECIFIC HEAT	DENSITY	MATTER	DISTANCE	FORCE	MOTION	VOLUME
J/g°C	g/mL	Gram (g)	Meter (m)	Newton (N)	Speed (m/s)	Liter (l)
Latent Heat	Kg/m ³	Density (g/ml or g/cm ³)	Astronomical Unit (AU)	1 N = 1 kg•(m/s ²)	Velocity (m/s + direction)	Cubic Meter (m ³)
J/g				lbs/in ²	G = 9.8m/s ²	

2. I can calculate and differentiate between Speed & Velocity.

- I know the difference between distance and displacement.
- I understand the difference between avg. & instantaneous speed/velocity.
- I can discuss speed and velocity as scalar and/or vector quantities.
 - ✓ Scalar =
 - ✓ Vector =
- I can calculate speed/velocity using the following formulas.

distance displacement

$$s = \frac{d}{t} \quad v = \frac{d}{t}$$

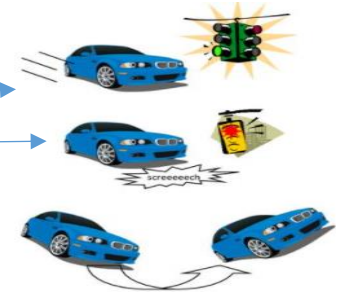
speed velocity

time

3. I can discuss and calculate 1 dimensional acceleration.

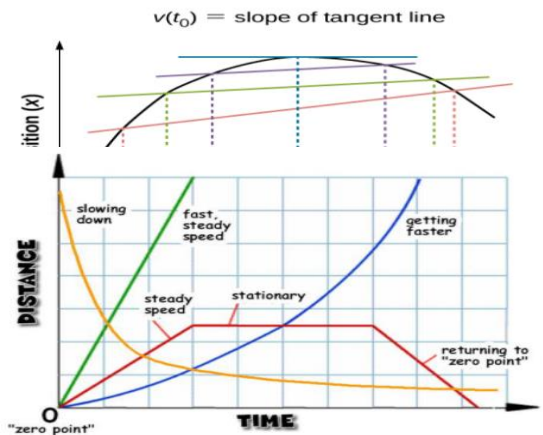
- I can discuss the three forms of acceleration.
 - ✓ Positive Acceleration
 - ✓ Negative Acceleration
 - ✓ Δ in Direction
- I can calculate acceleration using the following formula.

$$\bar{a} = \frac{v - v_0}{t} = \frac{\Delta v}{\Delta t}$$



4. I can interpret and graph 1D motion graphs for velocity and acceleration.

- I can use a motion graph to solve for instantaneous velocity
 - ✓ $v(t_0)$ = slope of tangent line
- I can use a motion graph to solve for average velocity
- I can use a motion graph to determine specific distances and times of motion
- I can use a motion graph to solve for acceleration



5. What goes up must come down....

- I can use the 4 kinematic equations to solve motion problems with constant accelerations
- Gravity constant on earth is 9.8 m/s²
 - ✓ Vertical Motion is independent of horizontal motion
 - ✓ Things going up decelerate as @ same rate things accelerate when falling.
- I can calculate Vertical Motion problems using thing kinematic equations...

$$d = V_i t + \frac{1}{2} a t^2$$

$$V_f = V_i + a t$$

$$V_f^2 = V_i^2 + 2 a d$$

$$d = \frac{V_i + V_f}{2} * t$$

- ✓ **D** = displacement, (*distance when necessary*)
- ✓ **t** = time
- ✓ **a** = acceleration
- ✓ **V_i** = Initial Velocity
- ✓ **V_f** = Final Velocity