What is Physics? Notes: U1P1a

- The main goal of Physics is straight forward. It to describe _____ that has happened in the universe's _____ and _____ that _____ _____ in the universe's _____. To achieve this lofty goal Physics focuses on two simple ideas:
  - _____ – which describes current position, velocity/speed, acceleration.
  - _____ – which explains how _____ evolves over time.
- The Physics believes if you can successfully understand and plot the course of every particle of matter throughout its existence, then you have achieved perfect knowledge for all time.

Math in Physics

- Let's be very clear. MATH IS _____ PHYSICS. Math is _____ even a science.
- Math is a condensed and precise _____ for ideas. Learning the rules for Math is really learning _____ (and about as much fun). For anyone who has fallen in love with a particular story, poem or song, however, you have experienced something similar to what a Mathematician or Physicist experiences with their proof that opens their eyes to a truth they never before realized.

Scientific Diagrams

A _____ _____ is a single _____ used to clearly define the physical _____ in terms of well demarcated _____. It is _____ for _____ homework problem. It is _____ for _____ lab report.

- Objects should be drawn well enough to be _____.
  - Variables that occur at a _____ instant in time are drawn exactly where they happen. Typical adjectives include: _____ and _____.
  - Variables that occur over an extended _____ are drawn near the _____ of the action and use a _____ to show where the variable starts and _____. Typical adjectives include: _____ and _____.

Motion Graphs

- A _____ _____ is a series of pictures drawn at regular _____ intervals. Its purpose is to show how _____ changes. Objects can be drawn clearly or as single dots.

Position (Distance vs. Displacement)

- Displacement is the _____ from a _____ point going to an ending point. Looking at a map of two mountain peaks, _____ can be measured with a _____.
- _____ is the total _____ traveled including any _____. On the same mountain map, measuring distance requires that you measure along a _____ that can actually be followed.
- _____ can be very challenging to calculate if a _____ is curvy. If you know the start and end points, however, _____ can always easily be calculated (ironically) with the _____ formula, which is _____.
- _____ always has a direction, because it is a _____ separation. In Math class, a value with direction is called a _____. _____ on the other hand may not have a single _____. So, in Math class, we call it a _____.
- REMEMBER!!! Distance is _____. Displacement is _____.

Movement (Speed vs. Velocity) Notes: U1P1b

- You have probably learned in a non-Physics class that velocity is speed but with _____. This is _____.
- Speed (a _____) is a change in _____ compared to time.
- Velocity (a _____) is a change in _____ compared to time.
- Speed and velocity only have the same value if you move _____ or the period of time is very _____.

Average vs Instantaneous

- _____ variables take place over an infinitesimal amount of time.
- _____ variables take place over a _____/measurable amount of time.
- _____ speed = | _____ velocity |

Acceleration

- Velocity is the _____ over the _____ – a.k.a. the _____ that _____ changes. As an equation v_{avg} = _____.
- Acceleration is the _____ over the _____ – a.k.a. the _____ that _____ changes. As an equation a_{avg} = _____.
- Note: Acceleration does NOT mean, "To get _____." _____ change in 'v' counts.
- Since velocity is a _____ (not a scalar), there are two ways to get acceleration,
    - Change the _____ of velocity by _____/_____. In a car this means to _____.
    - Change the _____ of the velocity, by _____. In a car this means to _____.
- In both cases, you can tell that _____ is changing even if your eyes are _____.

(Note: Constant velocity _____ be felt; otherwise traveling in an _____ would hurt.)

Deceleration vs. Acceleration

- Deceleration means _____, not _____ acceleration.

Acceleration Velocity Motion

Free Fall Notes: U1P1c

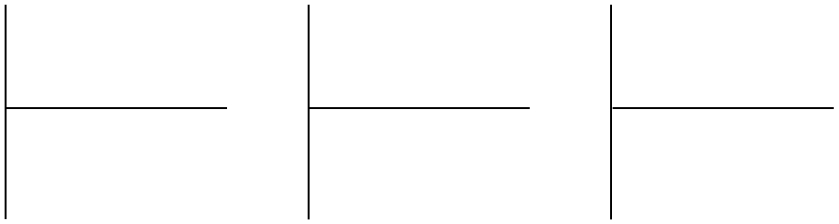
- Free fall is how an object moves through the _____, so long as air _____/_____ can be ignored (which is most of the time for our level of Physics).
- In this situation, on Earth, when an object is falling downward, its acceleration will be 9.8 $^{m}/_{s^2}$ pointing _____, because Earth's _____ _____ = ___ = _____ _____.
- When an object is rising upward, a= _____, because _____ causes the acceleration.
- When an object is at the top of its motion, a=_____, because _____.

Suppose and arrow is fired upward with an initial velocity of 30m/s. How will it move?

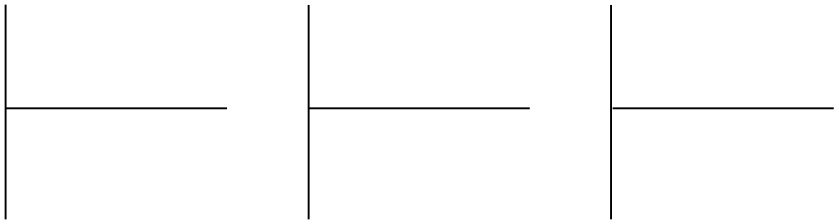
t	a	v	v_{avg}	d	Δd

d-t, v-t, a-t Graphs and Three Main Types of Motion

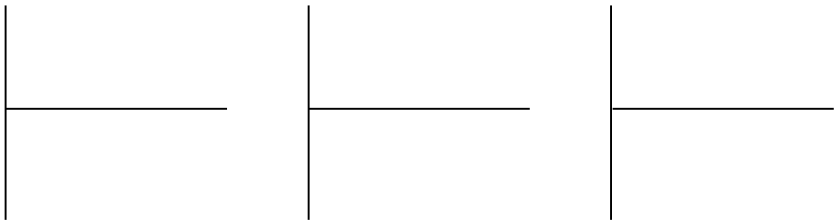
Constant _____



Constant _____



Constant _____



____ is slope on a ___ vs ___ graph since ____ is _____ and ____ is _____

____ is area on a ___ vs ___ graph since ____ is _____ and ____ is _____

____ is _____ on a ___ vs ___ graph since ____ is _____ and ____ is _____

____ is _____ on a ___ vs ___ graph since ____ is _____ and ____ is _____