HONORS IPC **Fall Final Exam Topics**

The very best way to study for your exam is to look at old quizzes, tests, and powerpoint presentations

From Unit 1:

* Know the difference between accuracy & precision
* Be able to calculate the accuracy and precision of a data set
* Know how to measure to the least count of a measuring tool
* Know the correct units for measurement on a triple beam balance, meter stick, and graduated cylinder
* Know how to use water displacement to measure the volume of an irregularly shaped solid object
* Be able to calculate: average, range, %error, %difference
* Convert numbers into scientific notation and back again
* Understand why we use the SI units of measurement and be able to state the SI units of measurement for: length, mass, time, elec. current, temperature, amount of substance, light intensity, force
* Know the names, symbols, exponent value, and decimal values of the metric system from milli to kilo and be able to convert between them
* Use dimensional analysis to convert between different units
* Name the steps of the scientific method in order
* Be able to take the parts of an experiment and label them as independent variable, dependent variable, or constants
* Write a hypothesis based on information given about an experiment
* State the 3 types of graphs and what kinds of data they are typically used to represent
* Be able to interpret graphs and calculate slope

Unit 1 Vocab:

coordinate plane, inverse correlation, linear equation, random relationship (graphing), ordered pair, rise, run, slope, slope-intercept form, strong/weak positive correlation (graphing), zero slope, x-intercept, y-intercept, x-axis, y-axis, x-coordinate, y-coordinate, base unit, SI units (listed above), metric prefixes (listed above), accuracy, precision (2 meanings), least count, types of error (systematic, random, human), dependent/independent variables, constants, control, volume, matter, mass, and density

From Unit 2:

* Understand the difference between distance & displacement; be able to calculate both given a set of circumstances
* Know the formulas for speed, average speed, velocity, and acceleration; be able to algebraically rearrange them, and use them to solve for any of their variables; know their units
* Interpret position vs. time graphs and velocity vs. time graphs (remember that a horizontal line on these graphs does not mean the same thing!)

Unit 2 Vocab:

motion, distance, displacement, scalar, vector, speed, average speed, instantaneous speed, velocity, acceleration

From Unit 3:

* Be able to draw and interpret free body diagrams; tell which way an object will move based on the forces acting upon it
* Know the 4 fundamental forces of the universe and explain how they are important
* Newton’s 1st Law - definition, inertia, examples
* Newton’s 2nd Law - definition, equation (be able to rearrange it), examples
* Newton’s 3rd Law - definition, examples
* Know the magnitude of gravitational acceleration on Earth and other planets
* What is the difference between weight and mass? What is apparent weight?
* Be able to use the momentum equation to solve for p, m, or v
* Impulse and momentum: how does time affect the force needed to bring about an amount of change in momentum?
* Understand basic conservation of momentum and solve for the velocity or mass of a second object given any two of the three momentum variables (p,m,v) of a first object

Unit 3 Vocab:

force, net force, normal force, friction, static friction, rolling friction, sliding friction, air resistance, gravity, field, weight, mass, inertia, strong force, weak force, electromagnetism, terminal velocity, free fall, acceleration due to gravity, equilibrium, momentum, conservation of momentum, impulse, change in momentum