**Physics AP2 FCHS 2018-19**

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***Grade Breakdown***

25% Lab

Quizzes, and participation

10% Homework and reading quizzes

65% Test

Project

***Thermodynamics***: temperature, pressure, heat/energy transfer, ideal gases, kinetic theory, laws of thermo, entropy, PV diagrams, probability and thermal equilibrium,

***Electricity*** …: charges and particle model, charge and charge flow, electric force (Coulomb’s law), electric field, electric potential, Potential difference, Potential energy, equi-potentials, dipoles, DC and steady state RC circuits

***And Magnetism***: magnetic fields, magnetic forces, charged particles moving in B-field, electromagnetic induction, AC circuits

***Fluids:*** Properties of fluids, hydrostatic principle, pascal’s principle, Archimedes principle (buoyancy), fluid flow continuity, conservation of energy and Bernoulli’s principle

***Optics:*** light and EM, reflection, mirrors, critical angle, refraction and lenses, internal reflection, thin film interference, polarization, interference and diffraction

***Modern Physics:*** History, fundamental forces, photoelectric effect, nuclear including radioactivity, nuclear reactions, & half-life, mass-energy equivalence, quantized states, energy emission and absorption, wave-particle duality, De Broglie wavelength, electron diffraction, photon momentum and particle/photon collisions

Modeling Theory:

Discover first, then anchor/explain

Do the experiment, find the relationship, then solidify;

***Labs***

1. Linear expansion
2. Calorimetry: specific heat
3. Latent heat fusion and vaporization
4. Heat flow: thermal conductivity constant
5. Gas laws

Equations:

Linear: y=mx+b

Quadratic : y=kx2

y =kx1/2

**Problem Solving**:

Read the problem,

determine the given,

determine what relationship applies

solve for the correct answer

check for reasonableness

Read, Pay attention, Ask questions, Attend, do work (labs and homework)

***Lab Write Ups:***

**Purpose**: [Q],[P] state what you are trying to proven the form of a [Q] question and make a [P] prediction.

**Procedure**: State the steps and the methods actually used clearly enough so data could be reproduced by someone else.

**Data**: [D], [O] The raw data that you and your group generated and [O] Observations

**Calculations**: [C], [E] One sample of each calculation or manipulation you did with your data. [E] error analysis

**Graphs and Figures**: any pertinent graphs and figures

**Conclusion**: [E AND A] Explain: “What did you discover or verify” in the lab…relate it back to the purpose. [E] Error analysis, quality analysis, reliability analysis. [A] Applications to real world and physics we know (words and sentences)

***Homework:*** Homework will be due on Fridays. If it is Friday tomorrow,(aka Thursday) you have homework and possibly labs due in Physics tomorrow.

10% off per day (that we are here at school), so 10 days later, the homework is worth 0%) This year we will have answer keys rolled out with subsets of problems to check answers, so there should be less to little late homework. Also, there will be subsequent reading quizzes that go into the 10% portion of the grade, but you may use whatever notes you have taken from the reading on these quizzes.

***Quizzes, Quests, and labs***: all go in the 25% portion of the grade. There will be written, short answer, problem solving, and multiple choice questions.

***Pre-/Post- testing*** will not count against you, but gains will be factored in.

Do your own work

**Cheating**: (1st offense: take a 0 have an opportunity to make up homework or take test on your own time for 81% max, 2nd offense 0 do not re-take the offending grade, 3rd offense – F for the nine weeks.

Cheating counts if it occurs on Homework, labs, quizzes, quests or tests, projects, or Final exams. Don’t copy.

If you are copying work for this class or another during this class, both the new and the original versions will be confiscated and destroyed. You have been warned.

***Semester Grades:***

1st nine weeks 42.5 %

2nd nine weeks 42.5 %

Final 15 %

Semester Grade

1st 9 wks x 0.425 + 2nd 9 wks x 0.425 + Final x 0.15

All un-taken grades are pro-rated out until they become due.

Homework, reading quizzes 10%

Labs, Quizzes, Participation 25%

Tests 65%

***Ways to envision “phenomena”:***

“***Conceptually***”-What is going on? What forces are acting? what is the velocity doing? What is the energy doing? Words, words, words… NGSS, AP test sentences

Conservation laws like Conservation of Energy, Charge, Mass, Momentum, etc…

“***Quantitatively***”- numbers, equations, How much? To what degree? Most problems in the book.

“***Symbolically***” - Equations (many times without the numbers) like E=mc2 if Voltage = current x resistance (V=IR), F=ma, … AP provides a cheat sheet of equations

“**Conceptually with symbols and words**” using the equations in terms of concepts and not so much numbers.

What happens to the current when you turn up the voltage? (since V=IR, if the Resistance is kept constant, when the Voltage is increased, the current is increased. If ↑V = constant I ↑.

In AP Terms, when they ask for an “***Explanation***” They believe that

**Explain = Claim + Evidence + Reasoning**

(or rational)

“**Claim**”- what you think will happen

“**Evidence**” – Example or problem solving to support Reasoning

“**Reasoning**” –physics concept rationale symbols and words as to why a thing does what it does.

***Three levels of understanding***:

1. Broad, general, verbal descriptive… in the first place…what you walk in the door with “It got increases.”
2. Relationship When the mass doubles, the volume doubles as well…they are directly proportional, (“inversely”, “go as the square”, the square root…

Density = mass / Volume

1. Higher order and finesse…trigonometric vector addition (sin, cos, tan)

Definitely: “rates of change” Y/X, x/t, v/t…dy/dx, dx/dt, dv,dt

Definitely: graphing and interpreting graphs and equations.

Know all three, be able to use complete sentences and describe what you think is going on, both on labs, in homework, and on quizzes and tests.

***Explain = Claim + Evidence + Reasoning***