Welcome AP Physics 1 Students!

This Advanced Placement Physics 1 course is accredited by both the College Board (AP Physics 1) and Everett Community College (PHYS& 114). The main goals of this physics class is to help you hone your critical thinking skills, put your math skills to use, prepare you for a career in science, computer, engineering, and medicine. Although this class will involve a fair amount of math, it is important to realize physics is much more than finding the right equation to solve a "problem". Solving a physics "problem" required *real* thought, not just number-crunching. If you try to understand a concept before looking for an equation, you will get much more out of this class (and do better on the tests). I think the single most important aspect of any science course is to QUESTION … question what you are observing … question your own thought process … question your classmate's analysis … question your teacher's "answer".

This summer, I would like you to observe and question physics in the real world around you. To get started, read the "**AP Physics: 1 ~ Year at a Glance**" document (on back) and consider what we will be learning this year.

1. Choose a concept we will be studying that is of particular interest to you and look in the world around you for a real-life example of this concept.
2. Take a picture of the motion, interaction, energy, etc. that demonstrates your concept.
3. Write an essay explaining…why you chose the concept, where you took the photo, what is happening in the photo, what physics you understood behind the concept, what more you would like to learn, etc.
4. You must be either the photographer or the subject in the photo. You must include a title describing the specific concept (from the list on back) on the photo.

I will use the following rubric to grade this assignment. Have fun with this assignment and I'll see you in September!!

~Mr. Zupke

Summer Physics Photo Rubric

Email (bzupke@everettsd.org) or share via Google Docs (10489@apps.everettsd.org) on or before Friday, Sept. 15th

Thorough & Thoughtful (A)	Sufficient (B/C)	Limited (C/D)	No credit given*
Superb Photo • Clearly demonstrates physics concept • **TITLE DESCRIBING SPECIFIC PHYSICS CONCEPT** included on photo • Excellent image quality	**Acceptable Photo** • Clearly demonstrates physics concept • Title DESCRIBING PHYISCS CONCEPT included • Acceptable image quality	**Poor Quality Photo** • Clearly demonstrates physics concept • Title DESCRIBING PHYISCS CONCEPT included • Poor image quality	**UNSAFE PHOTO*** • OR Photo does not clearly demonstrate physics concept • OR Title DESCRIBING PHYISCS CONCEPT not included on photo
Thorough and Thoughtful Essay 1) 250-500 words 2) Why you chose the concept 3) Where you took the photo 4) What is happening in the photo 5) What physics you understood behind the concept 6) What more you would like to learn 7) Includes only accurate scientific explanations 8) Well written and easy to follow	**Sufficient Essay** Missing 1-2 of 8 required components	**Limited Essay** Missing 2-3 of 8 required components	• Essay is missing 4 or more of the required components • REPORT IS PLAGARIZED **(this includes references not being cited if used)**

***PHOTO HAS BEEN DISQUALIFIED (given 0 credit) FOR THE FOLLOWING REASON(S):**

- Unsafe photo (teacher's discretion) include explosions of any sort, a contrived photo that puts someone in a dangerous situation, etc.
- Photo not taken BY/OF student

Everett High School ~ AP Physics: 1 ~ Year at a Glance 2017-18

Unit Name, Reading Chapters, and Guiding Questions	Time
Unit 1: Scientific Thinking in Experimental Settings What tools/equipment is appropriate for collecting data? ● How can data be analyzed to provide a mathematical model of physics phenomena?	1 wk
Unit 2: Kinematics in One and Two Dimensions How can the motion of an object moving at constant velocity be described and represented? ● How can the motion of an object that is accelerating be described and represented? ● What information can be gathered from motion graphs? ● What are the characteristics of the motion of a projectile launched at an angle?	4 wks
Unit 3: Dynamics How can the forces acting on an object be represented? ● How can a free body diagram be used to create a mathematical representation of the forces acting on an object? ● How do Newton's laws apply to interactions between objects at rest and in motion? ● How do Newton's laws apply to systems of two or more objects?	5 wks
Unit 4: Circular Motion & Gravitation What does it mean for a force to be fundamental? ● What force or combination of forces keeps an object in circular motion? ● How is the motion of the moon around the Earth like the motion of a falling apple? ● How does the effect of Earth's gravitational field on an object change as the object's distance from Earth changes?	2 wks
Unit 5: Energy and Conservation of Energy How are the different modes of energy storage transformed within a system and transferred between a system and the environment? ● How can energy be represented with graphs and equations? ● What does it mean for energy to be conserved?	5 wks
Unit 6: Impulse, Momentum, and Conservation of Momentum How does a force exerted on an object change the object's momentum? ● How are Newton's second and third law related to momentum? ● What does it mean for momentum to be conserved? ● How can the outcome of a collision be used to characterize a collision as elastic or inelastic?	4 wks
1st SEMESTER EXAM --- 1 week	
Unit 7: Simple Harmonic Motion How is simple harmonic motion connected to uniform circular motion? ● How can oscillatory motion be represented graphically and mathematically? ● How is conservation of energy applied in simple harmonic oscillators?	2 wks
Unit 8: Rotational Motion and Conservation of Angular Momentum How can the particle model be extended to a rigid-body model of an object? ● How are the rotational quantities (angular position, velocity, and acceleration) related to linear quantities? ● What does it mean for angular momentum to be conserved?	4 wks
Unit 9: Mechanical Waves and Sound How are wave's energy transport phenomena? ● How do the relative velocities of the source of a wave and the observer affect the frequency of the observed wave? ● How do waves from more than one source interfere to make waves of smaller o larger amplitude, depending on the location where the waves meet? ● How can wave boundary behavior be used to derive and apply relationships for calculating the characteristic frequencies for standing waves in strings, open pipes, and closed pipes?	2 wks
Unit 10: Electrostatics How can the charge model be used to explain electric phenomena? ● How can the forces between two charges be characterized using Newton's third law? ● How can preexisting knowledge of forces and energy be applied to process involving electrically charged objects?	1 wk
Unit 11: DC Circuits How do charges move through a conductor? ● How was the conventional direction of electrical current determined? ● How can phenomena occurring in electric circuits be described by physical quantities such as potential difference (voltage), electric current, electric resistance, and electric power? ● How do conservation laws apply to electric circuits?	3 wks
REVIEW --- 1 week	
2nd SEMESTER EXAM and/or **AP EXAM**	