Draft Physics Syllabus: AP Physics 1
Mr. Kuncik
Old Rochester Regional High School
2019 – 2020 school year

Vision:
The goal of honors physics is to give students the primary skills necessary to succeed in college math and science courses. About 40 % of American high school students indicate interest in studying math and science in college, but only about half of them graduate with a math or science diploma. I believe we can greatly improve students' chances by giving them the skills most likely to help them pass college math and science courses. These include:
- analytical reasoning, being able to defend results contrary to human intuition
- strong basic math skills
- following directions to operate laboratory devices
- setting up and conducting open-ended explorations in the laboratory
- writing effectively and precisely about science

The goal of honors physics is to practice and develop these skills over the course of the year.

If you are not planning to study math and science in college, you are certainly still encouraged to take honors physics if you want to by challenged. Know that you will still be held to the same standard of expectation as a student who is planning to major in medicine or engineering.

Of course, part of the goal of this class is also to pass the AP Physics 1 exam. The course will cover all of the content, which is primarily on Mechanics, with smaller sections on waves and electric circuits. If you develop all of the skills listed above, you will do well on the exam.

Grading:
Grading will be on a total point scale. Each assignment is worth a certain number of points, and your grade is determined by the total number of points you earned divided by the total number available. Roughly, points are worth as follows:
- typical classwork assignment: 5 – 15 points
- typical homework assignment: 5 – 15 points
- quiz sequence (after three attempts): 80 – 100 points
- lab report: 30 – 50 points
- writing assignment: 30 – 50 points

I conduct my tests differently from normal. It is difficult to explain the method, but after a few weeks it will make sense! Instead of taking a test once, students typically take a test on a particular topic 3 – 4 times. Your grade is based on the difficulty of the hardest problem you are able to solve. Roughly:

Hardest Problem You can solve	**Your Grade**
The hardest problem you can solve is one that has only one step. (Level 1)	F
The hardest problem you can solve has 2 -3 steps. (Level 2)	D
The hardest problem you can solve has more than 3 steps and/or requires you to consider different sources of information. (Level 3)	C
The hardest problem you can solve is one that involves many steps, incorporating content from different areas, non-direct or counterintuitive methods. (Level 4)	B
Problems that guide you through developing a complete model that describes a particular piece of content. (Level 5)	A

Again, I'm not going to try to explain my entire system here, but it will make sense after a few weeks in class.

Will I pass the AP test?

If you routinely gain an A on the quizzes, you can expect to do well on the AP Physics 1 test.

Homework:
Homework will include both practicing problems begun in class, and learning how to solve new problems. If the homework involves learning new content, it will typically be accompanied by Youtube videos on that topic.

Textbook:
There is an official textbook for this class. The textbook will be given out on Step-Up Day and

The two most useful online resources for this class are websites called The Physics Classroom and Flipping Physics:
https://www.physicsclassroom.com
https://www.flippingphysics.com/

If you want to get a head start for the year beyond the summer work, I would recommend reviewing content in these websites, particular on the areas of electric current, kinematics, and dynamics.

Website:
I use my own website for the course, rather than Google Classroom.
My website can be accessed through
mrkuncik.com
or
danielkuncik.com

The site is currently still set up for this year, I will be updating the site before the start of the year.

Room:
My room next year is not the same as my room this year!
It will be the room that was previously Ms. Faria's and Ms. Bonnie's room.
So on the first or second day of school, go there!

Summer Work:
There are three components to the summer work for this class.

Part 1: Math Practice

Complete a series of five packets that review several concepts from mathematics. Nearly all of the math content you need to know to pass the AP Physics 1 exam is in these packets, and most of it you should already know. Some problems you will find very simple, other problems you might not know how to complete. Please work hard and study this content. There will be quizzes on this content in the first weeks of the school year!

Please note that when solving conversion problems, you will be required on all quizzes to use the *conversion factor* method described in the problems.
There is one exception: conversions between grams and kilograms, seconds and milliseconds, meters and centimeters, you should be able to complete in your head extremely fast.

Also note that I expect you to memorize all formulas and the metric prefixes.
And, you should memorize pi to 15 places (not 100% necessary, but it's nice to know).

The math assignments are due the first day of the school year.

Part 2: The Clockwork Universe

You are assigned to read a book called *The Clockwork Universe* buy Edward Dolnick, which goes through how and why physics was first discovered, and to answer a set of written questions on the reading. The purpose of this book is to give a human context to the problems we are learning to solve.

I did not receive all the books in time for step-up day, so about ten of you will need to drop by my classroom later this week to pick one up. Don't forget!

This assignment is due the third class of the school year. (Note that other homework will also be due that day.) More readings from this book, in addition to the textbook, will be assigned during the year.

Part 3: Brief Laboratory Explorations

A big part of AP physics is conducting laboratory explorations! As part of the summer assignment, you will complete 8 such explorations, and to write about what you observe in a lab notebook.

This assignment is due the second class of the school year. (Note that other homework will also be due that day.)