AP PHYSICS C

SUMMER ASSIGNMENT 2017

Welcome to AP Physics C! I'm looking forward to working with you this year uncovering the science around us! Attached are the Learning Objective for AP Physics C: Mechanics provided by the College Board. Each of these Understandings will be a key component to our course.

AP Physics is a course that digs a little deeper into the course content of Physics, while introducing the use of Calculus, not Algebra, as a method to solve problems. AP Physics C will focus on the following topics in preparation for the AP C Mechanics Exam:

- Kinematics
- Newton's laws of motion
- Work, energy and power
- Systems of particles and linear momentum
- Circular motion and rotation
- Oscillations and gravitation

We will also work in some extra material related to Electricity and Magnetism as the year progresses.

Standards Addressed in the AP Physics C Summer Assignment

1. Standard - 3.2.P.A6
    a. Compare and contrast scientific theories.
    b. Know that both direct and indirect observations are used by scientists to study the natural world and universe.
    c. Identify questions and concepts that guide scientific investigations.
2. Standard - 3.2.P.B1
    a. Differentiate among translational motion, simple harmonic motion, and rotational motion in terms of position, velocity, and acceleration.
    b. Use force and mass to explain translational motion or simple harmonic motion of objects.
    c. Relate torque and rotational inertia to explain rotational motion.

Assignment Schedule

Assignment Number	Assignment	Due Date
1	Google Form: Introduction & Academic History	Saturday, July 1st by **MIDNIGHT**
2	Review: Math Concepts	Google Form due: August 10th **MIDNIGHT** Packet of work: August 28th **IN CLASS**
3	Review: Physics (1 Dimensional Kinematics, Static Equilibrium)	August 28th **IN CLASS**
4	Units/Formula Review	**Quiz** August 28th **IN CLASS**
5	Real World Physics	September 5th **IN CLASS**

Recommended Supplies

- A quadrille (graphing) notebook with perforated pages
- A regular notebook
- Multiple colored pens/pencils/highlighters (for diagraming purposes)
- A graphing calculator
- Index cards

Google Classroom and Technology

Google Classroom will be used to add notes, assignments and resources for the academic year. Components of your summer assignment can be found on Classroom. If you are unfamiliar, I will be having a Classroom Introduction Day after school, June 1st in Room 284. Feel free to stop by for a quick tutorial on how to use Classroom. If you are unable to attend that date, let me know and we can schedule a time that works for us both.

To join:

1. Go to: www.classroom.google.com
2. Sign-in using your school google email address, which has the following format
    a. First 5 letters of your last name
    b. First 3 letters of your first name
    c. 3 zeroes
    d. @rams.spring-ford.net
        i. Ex: Amanda Birnbrauer would be: BIRNBAMA000@rams.spring-ford.net
3. Hit the plus sign to join a class, and enter the code: **ht5myn1**

There will be computers in my classroom, so we will use them when they are advantageous to our learning process. Don't be daunted by this—if you are not tech savvy we can work together to increase your skills… and we will still use the old-school paper and pencils for most problem solving endeavors!

Summer Office Hours

I will make myself available via email for immediate questions/answers **every Monday** from **3-4** PM. You can always reach me by email at any time, but I cannot guarantee when I will be able to get back to you. Please feel free to reach out at any time if you have any questions, comments or concerns.

Email: abirn@spring-ford.net "Office" Hours: **MONDAYS from 3-4**

Assignment 1 Information Sheet INTRODUCTION & ACADEMIC HISTORY

PURPOSE: This Google Form is so that I can get to know you as a person and student. I want to be able to meet your needs as student during the school year as well as cater specific assignments towards interests and activities you participate in. This form can be found in your Google Classroom. I will send an email to your personal account (a question asked in the form) to confirm that I received your answers. This will be graded on a Pass/Fail basis (Complete/Incomplete)… pretty easy, right? ☺

DUE: Saturday, July 1st by MIDNIGHT

GRADING: Out of 10 points, completion

Assignment 2 Information Sheet REVIEW: MATH CONCEPTS

DIRECTIONS: There are 57 total questions that should be answered in full either on the attached paper or on loose leaf. This packet **AND** your work must be turned in on the first day of school. A Google Form with just your answers will be turned in prior, on August 10th. I am having you do both so that I know where we, as a class, need to begin our instruction. The answers you provide will give me some insight in to that before the start of the school year. Please do this to the best of your ability, and on your own. I don't want to see what you and a friend know together—I want to see what you know on your own! If you have any questions, feel free to shoot me an email: abirn@spring-ford.net .

PURPOSE: Up until this year you have taken a number of math classes and may have forgotten some math concepts that are key to problem solving. I am using this assignment to see where you are and what you remember from Algebra, Geometry and Trig/Pre-Calculus. Do each to the best of your ability.

DUE: There are two due dates:

- Google Form: August 10th by midnight
- Paper with work and answers: First day of school, August 28th, in class

GRADING: You will be assessed on the following for a total of 45 points:

- Completion of the form (15 points)
- Correctness of the form (5 points)
- Turned in work on the first day of school (20 points)
- Punctuality (5 points)

It is broken up in this way so that if you do not get all of the answers correct, but do your best and turn everything in, you still get a majority of the points. If you just have answers and no work, something you are unable to do on the AP exam, you will lose almost half of the points. Lateness on this particular assignment should not occur, which is why punctuality accounts for such a small percentage.

Enjoy!

Assignment 3 Information Sheet REVIEW: PHYSICS- 1D KINEMATICS AND STATIC EQULIBRIUM

DIRECTIONS: You are to work on two chapters in your text: 1 Dimensional Kinematics and Static Equilibrium. These two topics you have already learned in your previous physics class—so this should be more of a review than an acquisition of new material. You are to complete a number of tasks in regards to these two chapters. These will be collected and checked on the first day of class, August 28th. If you have any questions, feel free to shoot me an email: abirn@spring-ford.net .

For each chapter:

1. Outline and take notes
    a. There is no specific formatting to this outline, as each students acquires information differently. That being said, there are some things that all students should include:
        i. Definitions
        ii. Formulas
        iii. Conceptual relationships (as x increases, y does… ?)
        iv. Key points/misconceptions
    b. You should write these out—not just highlight in the text. Handwriting will increase your retention of the material!
2. Answer a select number of questions at the end of each chapter. These numbers can be found on the attached page. They will be turned in, so please do them on loose-leaf and remember to show all of your work!
3. If you have any questions along the way, please note them! I will respond when I see them. You can choose one of the following formats to ask:
    a. On loose-leaf
    b. Via email: abirn@spring-ford.net
    c. Google Forms for each chapter
4. We will be testing on these two chapters within the first week of school (depending on school schedule), so be prepared!

PURPOSE: The less time we need to spend reviewing, the better. Completing these two chapters will allow us to move forward very quickly in the year and cover more ground. We can spend more time on topics that require an in-depth analysis of material, and get even further than mechanics!

DUE: All work will be due on the first day of class, August 28th.

GRADING: You will be graded on all components of the assignment in the following way:

- Completeness for the outline
    - A total of 45 points
- Correctness for the questions
    - A total of 55 points

I will have some helpful video guides posted in the Google Classroom throughout the summer to help you with some of the questions—use them to your advantage!

Assignment 4 Information Sheet REVIEW: FORMULAE AND UNITS

DIRECTIONS: Attached is the formula sheet used on the AP Physics C **FREE RESPONSE** portion of the exam. On the multiple choice, you are not allowed a formula sheet or a calculator. There is also a blank sheet attached for you to fill in as practice. You should do your best to memorize this sheet—but try not to memorize it in the order you see. Flash cards would be helpful, as well as filling out a number of blank sheets.

PURPOSE: These formulae and units have to be memorized by the time we reach the test. Every 2 weeks, we will have a "pop" formula/unit quiz. These quizzes are going to be graded and given back so that you can see where you went wrong. At the end of the MP, I will put in the highest grade you received. We will do this up until the test, so that we can recall units and formulae with ease.

DUE: There is no due date for your summer memorization, but we will have a quiz on DAY ONE, August 28th, to get our baseline score for all of the formulae and units.

GRADING: The score on your highest quiz every MP will be entered—so no grading for the summer assignment will be required.

Assignment 5 Information Sheet REAL-WORLD PHYSICS

DIRECTIONS: There are a number of physics concepts and topics listed on the attached page. They are generic, and that is on purpose. You are to take each topic and come up with an application or example of it in the real world. This is up to you to decide how to best represent the topic in question: video, picture, tangible object, etc. This should be a fun activity that you don't need to stress over, because anywhere your summer takes you physics can be found! The not-so-fun part is telling me why what you chose is a representation of that topic—but it only needs to be around 3 sentences. Clear, concise and to the point!

PURPOSE: Physics is everywhere around us, and the more ties we can make between class content and our everyday activities, the better. We can further our knowledge of the content if we are able to access our prior knowledge and relate new material to the information we already possess. This exercise will help you to see that the world around us can be related to physics in overt and subtle ways.

DUE: When we return from Labor Day weekend, on September 5th.

GRADING: Each topic will be out of 5 points.

- Accurate depiction of the physics
- Accurate description of the physics