AP PHYSICS C

SUMMER ASSIGNMENT 2018

Welcome to AP Physics C! I’m looking forward to working with you this year uncovering the science around us! The Learning Objectives for AP Physics C: Mechanics and Electricity and Magnetism provided by the College Board can be found on the class’s Google Classroom. Each of these Objectives 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 and Electricity and Magnetism Exams:

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| **Mechanics** | **Electricity and Magnetism** |
| • Kinematics  • Newton’s laws of motion  • Work, energy and power  • Systems of particles and linear momentum  • Circular motion and rotation  • Oscillations and gravitation | • Charge, Electrical Forces, and Electrical Fields  • Gauss’s Law  • Electric Potential and Capacitance  • Electric Current, Resistors, and DC Circuit  • Magnetic Fields  • Electromagnetism, Faraday’s Induction, and LR and LC Circuits |

**Standards Addressed in the AP Physics C Summer Assignment**

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

**Assignment Schedule**

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| **Assignment Number** | **Assignment** | **Due Date** |
| 1 | Google Form: Introduction & Academic History | Sunday, July 1st by **MIDNIGHT** |
| 2 | Concept Checks  (1 per topic covered in Mechanics, 1 for all Electricity and Magnetism Topics) | **All will be due August 20th, by MIDNIGHT** |
| 3 | Real World Physics | September 4th  **IN CLASS** |
| **OPTIONAL** | Read a Physics Book (or two! ☺) | N/A |

**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 8st 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](http://www.classroom.google.com)
2. Sign-in using your school google email address, which has the following format
   1. First 5 letters of your last name
   2. First 3 letters of your first name
   3. 3 zeroes
   4. @rams.spring-ford.net
      1. Ex: Amanda Christofas would be: [CHRISAMA000@rams.spring-ford.net](mailto:CHRISAMA000@rams.spring-ford.net)
3. Hit the plus sign to join a class, and enter the code: **3uaqhk**

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 **4-5** 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](mailto:abirn@spring-ford.net) [achri@spring-ford.net](mailto:achri@spring-ford.net) “Office” Hours: **MONDAYS from 4-5**

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:** Sunday, July 1st by MIDNIGHT

**GRADING:** Out of 10 points, completion

Assignment 2 Information Sheet CONCEPT CHECKS

DIRECTIONS: There are a series of Google Forms posted to the Classroom. These ask you to indicate your familiarity with the topic, any concerns that you had coming from your 2017-2018 class and a few practice problems of varying difficulty. These forms should be completed to the best of your ability.

PURPOSE: Because Physics C is a second year course, there are a number of topics that you are already **very** familiar with. This will allow me to plan ahead and eliminate lectures on topics that we don’t need and add those that are necessary. It will also help me to track your learning to have a baseline level. These will be used to create groups in the beginning of units.

DUE: August 20th, by MIDNIGHT

GRADING: Each concept check for mechanics will be worth 10 points, completion. The electricity and magnetism check will be worth 20 points, completion.

Assignment 3 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

**OPTIONAL** Assignment Information Sheet READING

The following list of books are really great and have some interesting physics in them. If you’re interested, give them a read!

If you decide to read one, use Remind to let me know which one and when you start it—I can be sure to read it as well to answer and questions you may have or just to geek out about it together!

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| ***TITLE*** | ***AUTHOR*** |
| Astrophysics For People in a Hurry | Neil deGrasse Tyson |
| Black Hole Blues | Janna Levin |
| The Hunt for Vulcan | Thomas Levinson |
| Insultingly Stupid Movie Physics | Tom Rogers |
| The Physics of Everyday Things | James Kakalios |
| Physics of the Future | Michio Kaku |
| Physics of the Impossible | Michio Kaku |
| The Physics of Superheroes | James Kakalios |
| Reality is Not What It Seems | Carlo Rovelli |
| Time Travel | James Gleick |
| Vacation Guide to the Solar System | Olivia Koski and Jana Grcevich |
| What If? | Randall Munroe |
| What if Einstein Was Wrong? | Brian Clegg |
| 13 Things That Don’t Make Sense | Michael Brooks |