

AP Physics 1 Summer Assignment

Expect to be challenged! This is a college level course where you will be using your knowledge and understanding of everything you have learned in all of your classes to solve problems, analyze situations, arrange materials, compare data, and design labs. That is physics!

Success: Effectiveness: Performance:

You cannot expect to acquire the understanding you need to do well on an AP Exam by merely attending class and listening to the teacher. You have to become INVOLVED. YOU have to participate. If you get stuck, see ME, or other students! Ask for HELP. Your classmates will be your new best friends. You must study regularly. Students who study regularly have a good foundation to build on for new topics.

This will pay off! If you are unorganized or inconsistent, things may start to fall apart - and nobody wants that to happen. Show some self-discipline and do what I ask you to do regularly! Especially the homework!!

Homework => Practice => Success

Summer To Do Checklist: (NO LATE WORK WILL BE ACCEPTED)

1) Math Practice (Due First Day Of School)

Attached are practice problems in math which are due the day you get back. It is expected that you understand and know how to work these problems. If you have forgotten how to do some things, you need to get yourself caught up and you have all of summer to do just that. If you don't know how to do all of the problems, **you are already behind**. In order to get credit you must **show your work**. Email me if you have questions.

2) Video on your smart device: (Due Third Day of School)

Video 10 seconds to 1 minute of an object moving in a straight line. (DO NOT WALK TOWARDS OR AWAY FROM THE CAMERA) A straight line is a straight line. Objects should not move up and then to the right—this would not be a straight line!! (Objects include, but are not limited to: car, airplane, butterfly, ant, bird, baby brother crawling, racecar, sports players, sports equipment, person jogging or walking)

When you video your object, you need to keep the recording device stationary. The only object moving will be the object you are recording.

You need to place yourself far enough away from the object moving so that you can keep the recording device stationary. If you feel yourself moving- you are doing it wrong. Try Again!

You need to get an exact measurement of the distance between two reference points in your video (example: if your video is of a person jogging-you could measure the distance between two trees in your video or measure the height of the person, etc.)

As a member of AP Physics, you are automatically enrolled as a member of the elite group of Physics Ninjas.

Whew... that's a lot of stuff to do and to take in. AP Physics will be a lot of work, but you are now an AP Physics student and that's why you signed up... because you are the few, the proud, the best of the best and can handle this type of work.

Enjoy your summer!

Jennifer Camba

camba.jennifer@newton.k12.ga.us

Sample Physics Problems

The following are ordinary physics problems. Place the answer in scientific notation when appropriate and simplify the units (Scientific notation is used when it takes less time to write than the ordinary number does. As an example 200 is easier to write than 2.00×10^2 , but 2.00×10^8 is easier to write than 200,000,000). Do your best to cancel units, and attempt to show the simplified units in the final answer.

a. $T_s = 2\pi \sqrt{\frac{4.5 \times 10^{-2} \text{ kg}}{2.0 \times 10^3 \text{ kg/s}^2}} =$ _____

b. $F = \left(9.0 \times 10^9 \frac{\text{N} \cdot \text{m}^2}{\text{C}^2}\right) \frac{(3.2 \times 10^{-9} \text{ C})(9.6 \times 10^{-9} \text{ C})}{(0.32 \text{ m})^2} =$ _____

c. $\frac{1}{R_p} = \frac{1}{4.5 \times 10^2 \Omega} + \frac{1}{9.4 \times 10^2 \Omega}$ $R_p =$ _____

d. $K_{max} = (6.63 \times 10^{-34} \text{ J} \cdot \text{s})(7.09 \times 10^{14} \text{ s}) - 2.17 \times 10^{-19} \text{ J} =$ _____

e. $\gamma = \frac{1}{\sqrt{1 - \frac{2.25 \times 10^8 \text{ m/s}}{3.00 \times 10^8 \text{ m/s}}}}$ _____

Often problems on the AP exam are done with variables only. Solve for the variable indicated.

Don't let the different letters confuse you. Manipulate them algebraically as though they were numbers.

f. $K = \frac{1}{2} kx^2$, $x =$ _____

l. $x_m = \frac{m\lambda L}{d}$, $d =$ _____

g. $T_p = 2\pi \sqrt{\frac{l}{g}}$, $g =$ _____

m. $pV = nRT$, $T =$ _____

h. $F_g = G \frac{m_1 m_2}{r^2}$, $r =$ _____

n. $\sin \theta_c = \frac{n_1}{n_2}$, $\theta_c =$ _____

i. $mgh = \frac{1}{2} mv^2$, $v =$ _____

o. $qV = \frac{1}{2} mv^2$, $v =$ _____

j. $x = x_o + v_o t + \frac{1}{2} at^2$, $t =$ _____

p. $\frac{1}{f} = \frac{1}{s_o} + \frac{1}{s_i}$, $s_i =$ _____

k. $B = \frac{\mu_o I}{2\pi r}$, $r =$ _____