

AP Physics 1 Summer Assignment

One of the requirements for AP Physics (either 1 or 2) is scientific argumentation. This means you must be able to clearly state your points on a scientific issue, and defend those ideas to someone with a contrary viewpoint. To this end, you will choose a topic that is current to science in the world today (e.g. energy, water, fracking, etc.), perform research on it, and report your view, pro or con, on the issue. It will require a written report, and an oral presentation to the class, who will then pose questions and challenges to your position. The written paper must be typed, MLA format, with all sources cited. Internet research must be from a verified source (such as an approved scientific journal) and not be more than two years old. A minimum of five sources are needed.

Timeline:

Choose topic by July 1. Must be approved before proceeding.

Progress report July 20. How are you doing? Problems, issues, etc.

Progress report August 8. Should be close to completion.

Written report due August 17.

Class presentation will be determined during the first week of the term. (May be computer presentation (PowerPoint or similar) or display.)

All questions, submissions, etc. to jshidisky@berkscatholic.org and email is available at any time during the summer. Allow me 48 hours to respond I may not have immediate access to my computer.

In addition, you do have some other math skills to work on. These are due on DAY 1!!!

Solve the following system of linear equations for x , y , and z :

$$x = y + z$$

$$10x + 12z = 9$$

$$10x + 40y = 15$$

(This is from an electrical circuit analysis; the values are all actual. You may solve by whatever method you choose.) Show all work that leads to your solution.

The following values were obtained during a scientific experiment:

<i>A</i>	<i>B</i>
0	0.00
1	2.89
2	4.35
3	5.22
4	6.06
5	6.74
6	7.31
7	7.83
8	8.46
9	9.03
10	9.50

Plot a best-fit line graph of these data points, with *A* being the independent variable. (Manually; not on a computer. The AP exam requires manual graphing, so get to know it very well.)

In order to make better sense of the data, devise a method to obtain a straight line graph from these data points. How was it accomplished? (Hint: think what shape the original graph looked like.) Plot this straight-line graph. (The straight line does not have to fit the formula $y = mx + b$; this is physics, not geometry.)

Sometimes you are going to have to rearrange formulas to solve for one variable in terms of another. A common concept on the AP exam is not to have any numerical data and only manipulate formulas to arrive at the conclusion. So, solve the following equation in terms of d :

$$F_x = k \frac{q_1 q_2}{d^2 \sin^2 \theta}$$

This is from an electrostatics problem.

Okay, now solve $d = v_f t - \frac{1}{2} a t^2$ for t .

Get the picture? Learn how to solve the equation in terms of the variable you desire before putting in the numbers. That's what they want you to do on the exam.