

AP PHYSICS SUMMER HOMEWORK Summer 2018 version 2

All links are on the AP Physics Page at www.astronomyteacher.com

Questions? Email astronomyteacher@mac.com

New AP Physics resource page from the college board:

<https://apstudent.collegeboard.org/apcourse/ap-physics-1>

You will be creating a binder with lab work, equation analyses, and daily “Problems of the Day” inside it separated by tabs. The summer homework is about the equation analyses section. You will add the lab work and problems of the day throughout the school year. You will be using this binder a lot, so get something sturdy and at least 1 inch thick. I have some binders if you cannot get one.

Summer homework steps:

1. Download the equation list.

You can get the equation list directly from:

<https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-physics-1-equations-table.pdf>

Currently at DVHS only AP Physics 1 is offered.

2. Read "GREEAT Science" (go to Astronomyteacher.com and click on Jeff Adkins' Projects > Books and Writing > GREEAT Science or click on the link on the home page). This explains how to read an equation and analyze it.

3. Analyze every equation in the list, one equation per page.

You DO have to do the waves and electricity section. You DON'T have to do the geometry section. There's an example of what it looks like on page 2.

4. Add a QVUA table to the front section.

5. Grading: The project will be graded in general categorically. If you never sketch the graphs, that will drop your grade, for example. If you make one error on one page, it won't matter that much because eventually we will go over every equation, plus some.

Categories:

___ All variables identified

___ All relationships identified (don't skip sinusoidal or inverse square)

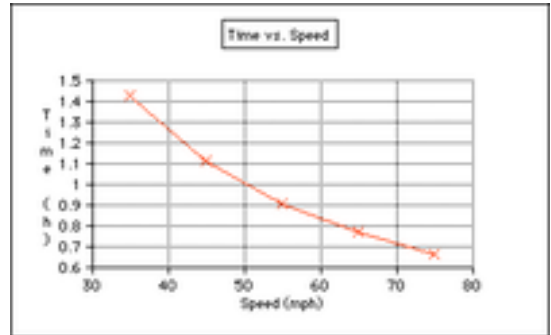
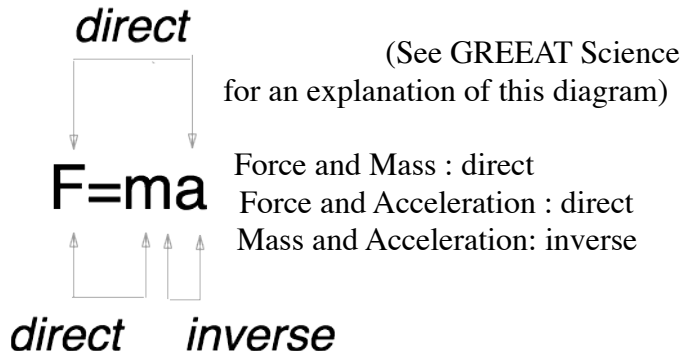
___ Graphs sketched

___ Interpretations written

___ QVUA entries complete

EXAMPLE OF EQUATION ANALYSIS (1 or 2 per page)

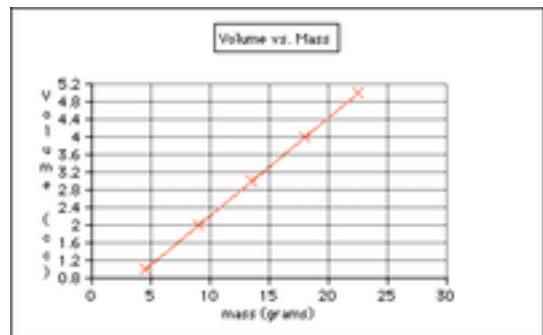
- a. EQUATION: $F = ma$
 b. VARIABLES: F = force, m = mass, a = acceleration
 c. IDENTIFY RELATIONSHIPS:



EXAMPLE OF INVERSE RELATIONSHIP GRAPH SKETCH

SKETCH GRAPHS OF EACH RELATIONSHIP AS ILLUSTRATED IN GREEAT SCIENCE.

- d. INTERPRET RELATIONSHIPS:
- A. As mass gets larger, acceleration gets smaller when force is constant.
 - B. As force increases, acceleration increases if mass is constant.
 - C. As Force increases, a larger mass is required to keep a constant acceleration.



EXAMPLE OF DIRECT RELATIONSHIP GRAPH SKETCH

e. QVUA TABLE: Create a table on each page (or alternatively a master table at the beginning of the book) that has a list of the variables, quantities, units, and unit abbreviations. For example:

Quantity	Variable	unit	unit abbreviation
Force	F	kgm/s ²	Newton (N)
mass	m	kilograms	kg

If you have an older version of these instructions that includes the step of doing a sample problem do not do the sample problems.

=====End of Example =====

Tips:

- List the units of measurement for each variable. You may need to look these up somewhere. Since you will not have books, I recommend the web site [hyperphysics](http://hyperphysics.com). Another good web site for getting an idea of what physics is about is Khan Academy.
- Identify every relationship between variables. Ignore constants such as $1/2$, or physical constants which cannot change such as the speed of light.
- Create a sample problem for each equation where you make up values for all the variables except one, and solve for that. If you're aggressive about it, make a sample problem for each variable.
- Put results in a binder and bring it to class as the beginning of your class notes.
- This is due on the first day of class! You will get a bonus for getting it done on time. If you do not complete it on time you can turn it in one week late but the maximum grade you can get on it will be limited. Write me if you have questions. GREEAT science has many examples.

RELATIONSHIPS:

DIRECT
INVERSE
INVERSE SQUARE
RADICAL
SINUSOIDAL
QUADRATIC

ADVICE FROM THIS YEAR'S CLASS to me and to you:

1. DO buy a study guide such as the Princeton guide and use it to prepare, but don't buy it the week before the test.
2. MORE EMPHASIS on derivations and proportional reasoning, LESS on numerical problem solving.
3. Participating in class discussions and arguments during problems of the day is the best prep for the open response section.
4. Don't just sit and passively listen. Volunteer early, volunteer often.
5. Expect to get MORE QUIZZES.
6. MEMORIZE the equation list even though you will have a copy handy.
7. MEMORIZE the QVUA table because it will make you more efficient.
8. Do all the homework assigned and don't just copy answers.
9. When asked if the summer homework helped and should YOU have to do it, the class voted YES.