**PHYSICS HOW TO....**

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| **GET FULL CREDIT ON A HOMEWORK/TEST PROBLEM:**1. List what you are given in the problem (variables, quantities)
2. List what you are looking for in the problem.
3. Write the base equation (the given form of the equation) you will use.
4. Rewrite the base equation to solve for whichever variable in it you are solving for, if necessary.
5. Show the equation set-up – put the numbers in.
6. Write and BOX the answer.

Do this NEATLY so that I can follow the steps and see exactly what you did in what order. You may want to get in the habit of ***Marking the Text*** of each problem (see your notebook reference sheet on *Marking the Text in Science*).  | https://s-media-cache-ak0.pinimg.com/236x/c9/b7/5f/c9b75f7b0bfd540318289f0df07e8beb.jpg**TAKE NOTES IN CLASS**1. BE NEAT.
2. Use ***Cornell Notes Structure*** (see the Cornell Notes reference sheets in your notebook).
3. Take notes in order. Write as much as you can.
4. Highlight and BOX any equation you are given, along with all the variable definitions that go with it. Write these NEATLY so you can understand them later.
5. Add in the Cues and Questions in the Cue Column of your notes later.
6. MEMORIZE any equations you are given.
7. MEMORIZE any definitions you are given.

**STUDY your notes later.** **MARK THE TEXT** to help you study.**\*Helpful Hint\*:** Keep a set of index cards (a card ‘book’, if possible) with one card for each equation you are given. I will show you how to do this. If you get an equation in your notes, make a card for it. |
| **TAKE NOTES & WORK THROUGH****A LAB IN YOUR NOTEBOOK:**There are sections to each lab so as you work, you should take your notes in sections:1. **PRE-LAB –** you will get an introduction to and basic information about what we will be investigating and helpful hints on how to do the lab. Take notes on this in a section you title “Pre-Lab”. Be sure to:
	1. List and define all the variables you will use.
	2. If there is equipment setup shown to you, DRAW a picture of it neatly. Label important parts. Make sure you understand how to set things up.
	3. Write down any safety considerations.
2. **PURPOSE –** write this word for word from the board. If there is more than one purpose, write them ALL word for word.
3. **DATA COLLECTION** – Create neat data tables for all data you will collect BEFORE you start collecting it.
4. **DATA ANALYSIS** – Create data tables for any variables you calculate (not measure). If you are using Logger Pro, you can just print and glue in all your graphs and data tables from there. Include error analysis/calculations and y-intercept 5% rule calculations if needed.
5. **POST-LAB** – Take notes on our formal post-lab discussion. This is not the whiteboarding session, but where I am at the board summarizing what we have found. Show ALL steps of any equation derivations. Highlight and BOX any base equations and important manipulated equations. Include any needed statements on error and your decision about your y-intercept.
6. **CONCLUSION**: Write a simple statement of the relationship(s) you discovered in the lab. Say how your variables are related to one another (proportional, inversely proportional, etc.). You are giving your conclusions about the purpose(s) laid out in the beginning.
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**Physics Laboratory Write-up Checklist**

This is a sample of the type of checklist used when grading major investigations.

**The checklist you get when the lab is returned will be tailored for that specific lab.**

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| *General* *Formatting* | 1. Group names;
2. Report written on one side only,
3. Sections in correct order
4. Each section clearly labeled, neat and organized
5. Spelling correct – RUN SPELL CHECK
6. Punctuation, complete sentences, correct grammar
7. In ink or word processed, no fringe. Typed preferred.
 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Title** | 1. Pertains to the lab. Extra credit if it’s clever/humorous.
 | \_\_\_\_\_ |
| **Purpose** | 1. Relationship/s to be studied is/are clearly stated as given
 | \_\_\_\_\_ |
| **Apparatus****& Procedure** | 1. Diagram drawn with all components labeled. Can use a clear photograph, labeled.
2. Clear and brief sequence of steps. I should be able to recreate EXACTLY what you did, in order.
3. Variables defined
4. Control of variables explained
 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Data** | 1. Measurements organized into a neat, correctly structured data table
2. Values kept constant are listed on data page
3. Values are clearly labeled
4. Units on all values
5. Multiple trials with repetitions (no averages – you’ll calculate and put those in Evaluation of Data)
6. Range of data appropriate
7. Data of good quality
8. No calculated values in raw data
 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Evaluation of Data** | 1. Sample calculations
2. Graphs (all graphs need to be present, in order)
	1. Graph title
	2. Variables on appropriate axes, units included
	3. Scale appropriate
	4. Line appropriate
3. Interpretation of graphs (in order from first to last)
	1. statement on shape of graph/s, what shape tells you about the relationship between the variables
	2. mathematical model (derivation of equation, units on slope and intercept)
4. Calculations of error, if appropriate
5. 5% Rule calculations for y-intercept, if appropriate
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| **Conclusion** | 1. Written explanation (English sentences) of relationship/s
2. Justification for statements you have made
3. General equation provided
4. Physical Meaning of slope (PMS)
5. Significance of Y-intercept
6. Description of new terms
7. Reasonable explanation for error
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