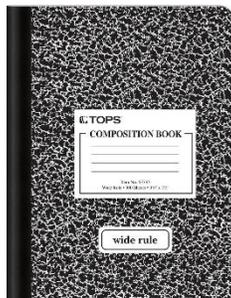


# AP BIOLOGY 2019-2020 SUMMER WORK

1. Prepare your lab notebook using the attached guidelines. Use a composition book like this:



(Doesn't need to be black - fun colors are fine; no particular brand; I suggest wide rule but if you prefer college rule that's ok) Have it ready when we come back in September.

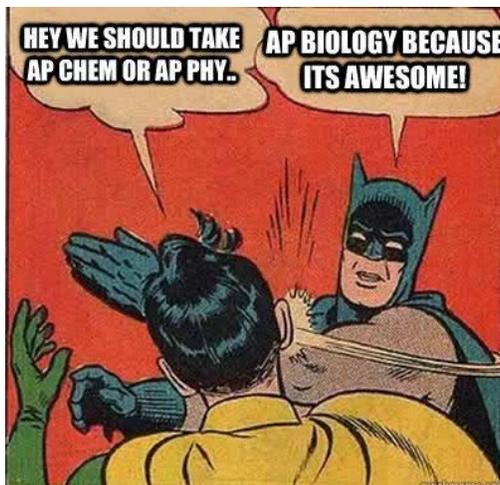
2. Complete the content review according to the attached directions. It is due on the first day of school and there will be a test on the second day.

3. (optional) Go to <https://apstudents.collegeboard.org/courses/ap-biology> to learn more about the exam and what to expect from the course. You can download the entire 224-page exam and course description if you like. They're not keeping secrets.

Note: These documents are also posted on my website.

Have a good summer! Learn a lot!

See you soon,  
Mrs. Jacobsen



### **Summer Assignment: Due on the first day of class.**

- Go to <https://openstax.org/details/books/biology-ap-courses> to download an electronic textbook. This is not the textbook you will use in class when we start, but it's a great resource, it's very portable, and will make a great additional text when we get underway this fall.
- The textbook you will receive in September is *Biology* by Mader & Windelspecht, 11<sup>th</sup> Edition for AP. If you prefer to have your own, you can purchase a used copy on Amazon for around \$20.
- Read each of the stated sections thoroughly for understanding.
- **Take notes** according to the general procedures listed below. It will help with the test. Examine the pictures and read the captions.
- **Answer the questions** below.
- *This assignment is due the first day of class and it needs to be done well.* You will be graded on organization (titles and subheadings), content, and completion. Don't wait until the end of summer to start. Start early, do a little every day.
- Be prepared for a test on the material on the 2<sup>nd</sup> day of school. It will be multiple-choice.

### **Tips for Effective Studying and Note-Taking**

*You may type everything and keep it in a binder instead of a notebook, but be aware that there are documented improvements in learning and retention when you take notes by hand.*

1. Read the Learning Outcomes at the beginning of each chapter. The list of Learning Outcomes introduces the main ideas covered in the section.
2. Leaf through the section *slowly*. Look up and define unknown vocabulary terms in your notebook by using the glossary or an online science dictionary.
3. Look carefully at illustrations and read their captions. These pictures are worth thousands of words.
4. Read the chapter. Take notes as you read.
5. Optional: Test your understanding of the chapter by trying the Review and Critical Thinking Questions at the end of the chapter. You may see these questions again on tests or quizzes.

### **Why are we doing this?**

There is a lot of content to cover in this course. The objective of this assignment is to review material you learned in introductory biology and to introduce you to some concepts we're covering in the first few units. These concepts can take a lot of time to cover in a lecture-style lesson and if you've seen it before, we can get to the good stuff (activities and labs) sooner. It's also important for you to get into the habit of reading the textbook and taking notes every day. I don't give daily graded homework – reading and studying the material we covered every day is your homework.

<b>Read and take notes on these sections</b>	<b>Topic</b>	<b>Answer These Specific Questions in Complete Sentences (in addition to taking notes on the listed sections)</b>
2.1	Molecules and Compounds	1. Define electronegativity. 2. Which elements have the highest and second highest electronegativity?
2.2	Properties of water	3. How does electronegativity affect interactions between water molecules? 4. What are the four emergent properties of water that contribute to Earth's suitability for life? 5. Describe how different types of solutes dissolve in water.
Ch. 3	Structure and function of biomolecules	6. What is the fundamental basis for the differences among carbohydrates, proteins, and nucleic acid? 7. Compare the composition, structure, and function of starch and cellulose. What role do starch and cellulose play in the human body? 8. Why are lipids not considered to be polymers? 9. Proteins are the most structurally and functionally diverse class of biological molecules. Explain the basis for this diversity. 10. What role does complementary base pairing play in the functions of nucleic acids?
Ch. 4	Cell Structure and Function	11. Draw two eukaryotic cells, labeling and describing the function of each structure.
6.2 6.4	Biochemical reactions	12. Compare and contrast endergonic and exergonic reactions. 13. Explain the meaning of each component in the equation for the change in free energy of a spontaneous chemical reaction. Why are spontaneous reactions important in the metabolism of a cell? 14. How does ATP transfer energy from exergonic to endergonic reactions in the cell? 15. Compare and contrast an exergonic reaction with and without an enzyme.
7.1	Organelles and the Flow of Energy	16. Explain how photosynthesis and respiration are redox reactions.
11.1	Mitosis vs. meiosis	17. Compare and contrast mitosis and meiosis.
14.2 14.3	DNA Structure and Function	18. Draw and label a model of DNA. 19. What is the function of DNA and how does it fulfill this function? 20. Diagram and describe DNA replication. 21. When does DNA replication take place?
15.1 15.3 15.5	From gene to Protein	22. What is the purpose of transcription? 23. What molecules are involved in the process of translation?
18.1	Process of natural Selection	24. List the main ideas of natural selection and give an example of how natural selection might occur in an animal population of your choice.

Name: \_\_\_\_\_

## AP Biology Lab Notebook

This notebook is your documentation that you completed the lab components of the AP Biology course.

### Setting up the notebook:

- Record all data in black permanent ink. Test your ink in the back of the notebook for water solubility. When you're shopping look for pens that are made for fraud prevention or check writing.
- Your notebook must be permanently bound (not spiral bound, not loose-leaf).
- Reserve the first few pages of the notebook for an index or table of contents (date, title, and page #).
- On the front inside cover write
  - your name
  - phone number
  - e-mail address
  - semester date
  - laboratory course
  - instructor's name
- **Number all pages** consecutively with odd page numbers on the right hand side. *Never tear out any pages!*
- **The top of each (right-hand) page** should include the **date**, the **title** of the lab exercise, and your **name**.
- Each lab should begin on a new page.
- Generally, the left-hand page is reserved for calculations, detailed observations, and additional materials that you have taped in.
- Attach pertinent material from the lab into your notebook (e.g. chromatographs, photos, graphs, tables, etc.) with tape.
- All tables and graphs should be clearly labeled.
- Corrections should be crossed out with a single line (~~like this~~) and never scribbled out nor whited-out.
- Always write as neatly as possible.
- Never add observations/data outside of the lab.
- Do not skip lines or leave sections of the notebook blank.

### Include the following in the notebook:

**Title** of the activity/investigation (pre-lab)

**Purpose** of the lab activity/investigation (pre-lab)

**Hypothesis** (if applicable) with reasoning (pre-lab)

**Pertinent Background** (pre-lab)

- Information about the materials you are using (e.g. species)
- Chemical equations

**Procedure** (pre-lab)

- If you are performing one of the procedures from the lab manual, then you need only include a brief outline of the procedure with a citation of the lab manual. *Any deviations from the procedure in the lab manual must be clearly outlined, as well.*
- If you are performing an experiment that you designed, then you must include a complete procedure (in numbered format). Sketches of lab set-ups are very helpful.
- Identify the control group, experimental group, constants, independent variable and dependent variable.

**Observations/Data** (data table should be set up pre-lab)

- Include detailed observations and drawings, where applicable.
- Data must be recorded in clearly labeled data tables. Set these up before running the experiment.
- It is important that you record the data directly into your notebook as you collect it.
- All of the data recorded in the notebook must be clearly labeled.

**Results**

- Include calculations for any numeric results with units clearly indicated.
- Try to follow the basic rules of significant figures.
- Include statistical measures and true values where appropriate.
- Make a rough graph of the data (where appropriate) – final graphs will go in your lab manual.

**Conclusions**

- Discuss your final results.
- Did the results support your hypothesis?
- Note possible sources of error and the effect that they might have affected your answer.
- Include modifications that might improve the experiment (decrease error and/or increase efficiency)