

Innovation Academy

AP and Super Biology 2023-2024: Summer Practice

Welcome to AP Biology/Super Bio!

AP Biology as a college level course that involves a great deal of collaborative learning. It is important to me, that I get to know you as a student and a person. I expect that you will work hard and have bumpy roads along the way throughout the year because AP Biology is not like any other AP science course. However, my goals are to support you in your learning journey, and this is going to be an exciting year! I hope that you will keep an open line of communication with me and treat this course like a college level course because it is equivalent to a two-semester college introductory biology course for biology majors.

This document is a collection of AP Biology teachers' thoughts and creative work around the US

The AP Biology Curriculum centers around the 4 Big ideas and you will need to not only know these but also understand how they are interconnected.

1. The process of evolution drives the diversity and unity of Life.
2. Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.
3. Living systems store, retrieve, transmit, and respond to information essential to life processes.
4. Biological systems interact, and these systems and their interactions possess complex properties.

These four big ideas are the framework for the 8 main units of the course:

[AP Biology Overview Video](#): A great resource to use to review but also give you a good idea of what to expect from this course:

1. Chemistry of Life
2. Cell Structure and Function
3. Cellular Energetics
4. Cell Communication and Cell Cycle
5. Heredity
6. Gene Expression and Regulation
7. Natural Selection/Evolution
8. Ecology

Suggested Materials:

1. OpenStax: AP Biology Textbook: <https://openstax.org/details/books/biology-ap-courses>
This is a free online textbook that I always recommend to students as another study tool and resource.
2. Khan Academy – going over basics on the High School Biology site.
 - a. Khan Academy: <https://www.khanacademy.org/science/high-school-biology>

- b. Khan Academy again is another good free online resource that includes helpful videos, articles, and practice questions that follow the AP Biology curriculum
3. YouTube Videos:
 - a. There are several YouTube channels dedicated to short science review videos such as the [Amoeba Sisters](#) , [Crash Course](#) and [Bozeman science](#)
4. Composition notebook: you ought to consider having composition notebook for your class lecture notes just for AP Biology and we will definitely be using a Lab Notebook (dedicated) to your lab experience.

Here are some skills for you to review and practice before starting this fall if you choose to practice and/or review.

Foundational Skills for AP Biology:

I. Science practices

Task: Create your own ONE pager on the 6 science practices

1. AP Biology Science Practice 1: [Models and Representations](#)
2. AP Biology Science Practice 2: [Using Mathematics Appropriately](#)
3. AP Biology Science Practice 3: [Formula Question](#)
4. AP Biology Science Practice 4: [Data Collection Strategies](#)
5. AP Biology Science Practice 5: [Analyze Data and Evaluate Evidence](#)
6. AP Biology Science Practice 6: [Scientific Explanations and Theories](#)

II. [Nature of Science:](#)

1. What is the scientific method? Is there just one universal scientific method? Why or why not?
2. Reflect on what was discussed in the video. How would you complete these general sentence stems regarding the nature of science?
 - a. Science has a major goal of:
 - b. Science can lead to the development of:
 - c. It's important to know that science is:
3. Why is it important to verify the credibility of a source when researching a topic?
4. Observations and inferences are important in science. How would you explain the difference between the two terms?
5. Constant/Controlled variables and a control are easily confused. How would you explain the difference between the constant and control to someone who has no idea what science it about?
6. Why is a control group generally very necessary in an experiment?

III. [CER \(Claim, Evidence, Reasoning\):](#)

1. What can lead to being curious and lead to fascinating scientific investigations?
 - a. Questions
 - b. Answers
 - c. Qualitative measurements
 - d. Quantitative measurements

2. During research, what is important to examine?
 - a. That the information comes from credible sources
 - b. That the information is factual
 - c. That the information is peer reviewed
 - d. All of the above
3. What type of organisms use brumation?
 - a. Ectotherms
 - b. Endotherms
 - c. All hibernating organisms
 - d. All tortoises
4. What does reasoning provide?
 - a. Stats and data
 - b. How or why evidence supports a claim.
 - c. A hypothesis of the phenomenon
 - d. A conclusion
5. What helps the turtles remain in the water during the winter?
 - a. Crepuscular changes
 - b. Seasonal changes
 - c. Physiological changes
 - d. What should you do next time you read a claim online? What questions should you ask before you consider the claim?

IV. Graphing:

- a. What type of graph uses a “best fit” line?
- b. Explain the difference between a bar graph and a histogram.
- c. What type of graph shows a change over time?
- d. What type of graph displays a relationship of variables?
- e. Which type of graph is best for comparing 2 or more different groups? Explain why.
- f. Which type of graph is better for showing distribution of data? Give your reasoning.
- g. Explain when a pie chart/pie graph should be used and give (draw/label) your own student created example.
- h. State at least 5 elements that any graph should always exhibit.