

AP Biology Summer Assignment
Due Tuesday August 21, 2018 8:00 am

Welcome to AP Biology!

AP Biology is the equivalent of a one-year college or university course in biology where we will explore the question, "How do we know what we know about the living world?" by investigating four Big Ideas:

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

Topic areas will include the chemistry of life, cells, cell energy, genetics, molecular genetics, evolution, plant and animal form and function, and ecology. These topics will be explored using science practices, such as representations and models, mathematics, scientific questioning, data collection and analysis, and explanation of scientific theories to study biological systems at the molecular, cellular, organism, population, and ecosystem levels.

The textbook for the class is Campbell Biology in Focus, AP Edition, 1st Edition/2014. You may purchase either the hard copy edition or the e-text. If you license the digital version of the textbook, please ensure that you have access through June 2018. Please note that the digital version requires Internet access at all times – the material cannot be downloaded.

To get the most out of class and laboratory time when school begins in the fall, all students must complete the summer assignment described below. This assignment should take between 8-10 hours; longer if you have not yet taken chemistry.

Please read and follow all directions in this assignment in order to receive full credit. I will be available to answer questions by email at ceisen@sdja.com, however I will be out of the country from July 20 - August 10, with no access to email.

1. Chapter 1 - Introduction: Evolution and the Foundations of Biology

NOTE: Responses to parts B and C below must be submitted to turnitin.com under assignment titled Chapter 1 Outline and Questions. The class ID is 18189883 and the password is EisenAPBio.

A. Read Chapter 1 of Campbell's Biology in Focus (pages 1-16) which provides an overview of the themes to be covered during the year. Please pay particular attention to Figures 1.3, 1.11 and 1.19.

B. Create an outline of the material contained in Chapter 1.1 and 1.2 using the four Big Ideas set forth above as your headings. Include as many facts from the reading as you can under each big idea. A fact may be included in more than one big idea.

C. Design an experiment: It has been observed that the population of purple striped frogs has been declining recently. One hypothesis is that Pesticide XX adversely affects frogs. Pesticide XX is used by farmers to kill weeds that grow in crop fields, and has been found in runoff water, including streams and ditches where purple striped frogs breed and tadpoles swim. Design an experiment to test the hypothesis. Your experiment must include a hypothesis, a proposed method for testing your hypothesis, dependent and independent variables, appropriate controls, predicted results and proposed conclusions. This is a made up scenario, so there is no "correct" answer. Use figure 1.19 as your guide.

D. Read the Scientific Skills Exercise on page 15. Answer questions 1-7 on page 15 in the Scientific Skills Exercise box. Please bring a hard copy of this portion of the assignment to the first class period.

Chapter 2 - The Chemical Context of Life

NOTE: Parts B-E below must be submitted to turnitin.com under assignment titled Chapter 2 Reading Guide and Questions. The class ID is 18189883 and the password is EisenAPBio (same as above).

A. Read Chapter 2.1 through 2.4 which covers basic chemistry including the structure of atoms, chemical bonding and chemical reactions. This material is considered background material for AP Biology and will not be covered in class. Please pay particular attention to Figures 2.7, 2.8, and 2.9. If there is sufficient interest, I will offer a crash course on this material during Pod in the first week or two of the semester.

B. Answer questions 1-48 on the Active Reading Guide: <https://goo.gl/5N5CQC>. If you have taken chemistry, this will be review and will be a short assignment. If you haven't taken chemistry, plan to spend at least a couple of hours on this part of the assignment.

NOTE: Copy the Active Reading Guide document(s) into a google doc or a word doc and type your answers on the document. Save your file as a pdf for uploading to turnitin.com

C. Read Chapter 2.5 which covers the properties of water that help make Earth suitable for life. Watch the video: <http://www.bozemanscience.com/water-a-polar-molecule>

D. Answer questions 49-77 on the Active Reading Guide: <https://goo.gl/6sYXoF>

E. Which Big Idea does the subject of the properties of water best fit into. Explain your reasoning.

F. Read the Scientific Skills on page 37. Answer questions 1-4. Please bring a hard copy of this portion of the assignment to the first class period.