

AP Biology Summer “Assignment”

AP Biology extends learning about biology from simply memorizing facts to an application of knowledge, understanding of scientific processes, and the analysis of scientific data. In order to spend sufficient time learning how to analyze, evaluate, and interpret data and experiments, it is important that you already have some basic knowledge of the topics we cover. Fortunately, since you have already completed first year biology and chemistry, you already have that basic knowledge! The purpose of this “assignment” is to review the topics that you have already learned, that will help you in this course. This isn’t a real assignment, as there’s nothing to complete and turn in.

1) This is a list of chemistry topics that you should already know. **You will have an assignment on the first day of school that covers these chemistry topics.** Be sure to review them:

- Know how to determine the subatomic particles (protons, neutrons, electrons) using a periodic table.
- Know how to determine an atom’s valence electrons.
- What is the difference between ions and isotopes? How does the number of subatomic particles change for each of those?
- What’s the difference between ionic and covalent bonds?
- What’s the difference between polar and nonpolar covalent bonds?
- How does electronegativity influence bonding?
- What is a hydrogen bond? Between what types of molecules do they form? Where do you find them in living things?
- Be able to draw simple molecular structures if given a molecular formula. Know how many covalent bonds each of the following will form: C, H, O, N
- Know the following about water:
 - Why hydrogen bonds form between them
 - Cohesion vs adhesion
 - Why ice floats
 - Why water is a great solvent
 - Hydrophilic and hydrophobic substances
- These following topics will be reviewed in detail, but it would help if you already have a basic understanding:
 - What is an acid and what is a base? (in terms of ability to release or pick up hydrogen ions)
 - What does pH measure? (Know it in terms of concentration of hydrogen ions)
 - What are some common examples of acids or bases? Know how to identify one by its structural formula.
 - Know what a “redox” reaction is. What does it mean to be oxidized? To be reduced?

2) This is a list of intro to biology topics that you were introduced to in middle school, learned in more detail in 9th grade, and will need to fully understand in AP Biology. Each section will start with a BRIEF review of the basics. We will learn each of these topics in far more detail in AP Biology. Your goal over the summer is to remind yourself about the basics so you already have a general idea when we start learning the details.

- Scientific method is huge in this course. Be able to identify independent & dependent variables from experiment descriptions and from graphs. You also need to know the difference between a control group and controlled variables.
- Know the similarities and differences between prokaryotic and eukaryotic cells, including which organelles are in the different cell types and the functions of those organelles.
- Know the overall inputs and outputs of photosynthesis and cellular respiration.
- Know the purposes of Mitosis and Meiosis and the basic differences between the two cell division processes.
- Be able to explain the relationship between DNA, chromosomes, and genes.
- Know the difference between homozygous (AA, aa) and heterozygous (Aa) genotypes for traits and how to set up and analyze a 4 box Punnett Square.
- Know the definitions of transcription and translation regarding the processes that make protein from the instructions of DNA.
- Be able to describe Natural Selection and explain why variation in a population is important.
- Be able to read a food web and explain the relationship between producers, consumers, and decomposers.