

# AP Environmental Science Summer Prep Guide

There are some things that you can brush up on that will make this year start easier and be more productive. You will want to be conversant (be able to hold an interactive conversation with me) on these topics. If you need some work to get to that level check the links. For some helpful video clips on the MANY topics in AP Environmental Science check out the Bozeman Science AP Biology website.

<http://www.bozemanscience.com/ap-environmental-science/>

This document will probably grow this summer as I work on plans for the year. Check my website or email me ([john.hook@fotbendisd.com](mailto:john.hook@fotbendisd.com)) for updates.

## Environmental science

For our purposes it is a university course. From a discipline perspective it is the study of the interactions between humans and everything non-human. You need to be familiar with both. We'll handle getting you to understand the discipline as we go through the year. The course description is easier. Here's a link to everything that you need to know. Scroll down to page four and dive in.

<http://media.collegeboard.com/digitalServices/pdf/ap/ap-environmental-science-course-description.pdf>

## Metric units

Know commonly used units for mass, volume and length. Everything from giga to nano. Have at least one conversion factor for all three that yields metric equivalents from customary units. For example, a centimeter = 0.39 inches. Recognize the magnitude of commonly used metric prefixes such as mega = 1 million or deci = 1 tenth.

<https://www.unc.edu/~rowlett/units/prefixes.html>

<https://www.nist.gov/pml/weights-and-measures/approximate-conversions-metric-us-customary-measures>

## Graphics

You will frequently need to communicate complex data in an efficient manner. Graphics tend to communicate relationships quickly and accurately, if they are used properly. Recognize the type of graph that best suits your data.

[2F8%2F12489644%2Fsample\\_data\\_setsgraphing\\_notes.docx&usg=AFQjCNEIGHTVU9UxcPDvAnlvDaA4ZFkc3w&sig2=v\\_5ZURqSi5BbNubUeNPXA](#)

## Properties of water

Things to consider:

What causes water to be polar? Take this to the level of atomic behavior in the molecule.

What does solid water float in liquid water and why would we care?

Why does water have a high specific heat, and what is specific heat anyway?

What causes water to demonstrate capillary action and why is that important?

Water really isn't a universal solvent but so many solutes dissolve in it that it seems that way. What causes this?

What causes water to have a moderating effect on Earth's climate?

<https://watereducation.utah.gov/waterscience/Properties/default.asp>

## The importance of carbon

Things to consider:

Carbon chemistry

What is an organic molecule?

Why is carbon such a versatile component in organic molecules?

Describe the covalent bonding options available with carbon.

Which elements are most likely to be bonded to carbon in organic molecules?

The name similarity would make you think that hydrocarbons and carbohydrates would be nearly the same but there are major behavioral differences due to the difference in abundance of oxygen. Why does that matter?

Carbon isomers have the same molecular formulas but behave very differently. Why?

Amino, methyl, sulfhydryl, phosphate, hydroxyl, carbonyl and carboxyl are all very common and important parts of organic molecules. What types of biomolecules contain them?

Why is silicon often used as the base element for extraterrestrial life in science fiction movies?

<http://www.ck12.org/biology/Significance-of-Carbon/lesson/The-Significance-of-Carbon-Advanced-BIO-ADV/>

## Photosynthesis

What is accomplished by photosynthesis?

Why is photosynthesis critical for an ecosystem?

Describe the role of ATP in photosynthesis.

<https://www.khanacademy.org/science/biology/photosynthesis-in-plants/introduction-to-stages-of-photosynthesis/v/photosynthesis>

## Science processes

The University of California – Berkeley put together an excellent description of the science process. Read through the approximately 60 webpages on this site. When you are finished write a 150-word summary of what science is and does.

[http://undsci.berkeley.edu/article/0\\_0\\_0/us101contents\\_01](http://undsci.berkeley.edu/article/0_0_0/us101contents_01)

## Matter and Energy

The kinetic theory will be used to fully or partially explain many environmental phenomena. Know it.

<http://www.mentorials.com/high-school-chemistry-matter-kinetic-theory-of-matter.htm>

1<sup>st</sup> and 2<sup>nd</sup> laws of thermodynamics are also critical. How they apply to organisms and ecosystems is a big deal. Know them.

<https://www.khanacademy.org/science/biology/energy-and-enzymes/the-laws-of-thermodynamics/a/the-laws-of-thermodynamics>

Law of conservation of matter

University of California – Davis has a nice explanation from a chemistry perspective. You need to be able to apply it to environmental problems.

[https://chem.libretexts.org/LibreTexts/Eastern\\_Mennonite\\_University/EMU%3A\\_Chemistry\\_for\\_the\\_Life\\_Sciences\\_\(Cessna\)/05%3A\\_Introduction\\_to\\_Chemical\\_Reactions/5.1%3A\\_The\\_Law\\_of\\_Conservation\\_of\\_Matter](https://chem.libretexts.org/LibreTexts/Eastern_Mennonite_University/EMU%3A_Chemistry_for_the_Life_Sciences_(Cessna)/05%3A_Introduction_to_Chemical_Reactions/5.1%3A_The_Law_of_Conservation_of_Matter)