

Welcome to AP Biology!!

Over the summer you will be learning the background chemistry/ basic molecular information that is required before we jump deeper into the biology. All summer assignments are to be turned in on Schoology before the due date listed on the assignment. The homework requires that you read the chapter in the book and/or watch the appropriate videos on Khan Academy. You may email me if you have any questions over the summer, but know that I might email back a few days later, so plan accordingly.

### **Chapter 2 Assessment Questions: due June 21 at 10pm**

*Read Ch. 2 in your book and answer these on a separate document and turn in on Schoology*

1. Distinguish between essential elements and trace elements. Identify the four elements that make up 96% of living matter.
2. Explain what an isotope is and the difference between radioactive and heavy isotopes.
3. A molecule's shape influences its function. Explain this crucial relationship and provide an example that demonstrates this.
4. Is a trace element an essential element? Explain.
5. Answer the following questions about the element fluorine.
  - a. How many electrons does fluorine have?
  - b. How many electron shells?
  - c. Name the orbitals that are occupied.
  - d. How many electrons are needed to fill the valence shell?
6. Why does the structure  $\text{H}-\text{C}=\text{C}-\text{H}$  fail to make sense chemically?
  
7. What are you most looking forward to over the summer?

### **Chapter 3 Assessment Questions: due July, 12 at 10pm**

*Read Ch. 3 in your book and answer these on a separate document and turn in on Schoology*

1. Briefly describe the four emergent properties of water that contribute to Earth's suitability for life.
2. Water's ability to moderate temperature stems from three properties: specific heat, heat of vaporization, and evaporative cooling. Describe the effects each has on both aquatic and terrestrial ecosystems.
3. Distinguish between hydrophilic and hydrophobic substances.
4. Acetic acid ( $\text{CH}_3\text{COOH}$ ) can be a buffer, similar to carbonic acid. Write the dissociation reaction, identifying the acid, base,  $\text{H}^+$  acceptor, and  $\text{H}^+$  donor in the space below.
5. Explain what a buffer is and how it can be used in biological solutions.
  
6. Why are you taking AP biology?

### **Water Footprint Assignment due July 19th at 10pm**

Now that you have learned about the properties and necessity of water, it is time to calculate your own water footprint. A water footprint is the amount of fresh water utilized in production or supply of goods and services used by an individual.

Follow the link below to calculate your water footprint. You will do this by answering various questions about your day to day life. Please answer as accurately as possible.

After you have calculated your footprint answer the reflection questions and post to Schoology

Link to calculator: <https://www.watercalculator.org/>

Reflection:

After you have calculated your water footprint, answer the following questions. Answer in complete sentences.

1. What was your water footprint in gallons/day. Did the amount of fresh water you use per day surprise you? Explain why or why not.
2. What factor had the greatest impact on you water footprint? Did this surprise you? Why or why not?
3. What are some small adjustments that you can make to decrease your water footprint?
4. We all learned about the water cycle in preschool. We know that the amount of water on Earth will always remain the same. Explain why water conservation is necessary even though it is a renewable resource. You may use outside sources to back up your argument, but please cite any links that you use below.

#### **Chapter 4 Assessment Questions: due Aug. 2nd at 10pm**

*Read Ch. 4 in your book and answer these on a separate document and turn in on Schoology. For any drawings, draw on a notebook sheet of paper, take a picture of your drawing, and upload it to Schoology please.*

1. Draw an example of each possible carbon skeleton.

Single Chain

Branching Chain

Double Bond Chain

Ring

2. Define *isomer*. Distinguish between the three types of isomers.
3. What chemical change occurs to ATP when it reacts with water and releases energy?
4. Make notecards/flashcards of the 7 functional groups. On one side write the chemical group name (hydroxyl, carbonyl, etc.) and on the other draw the formula/structure (—OH for hydroxyl). You will need to be able to recognize these functional groups.

5. What is your summer “jam”?