NEW YORK CITY DEPARTMENT OF EDUCATION

Thomas A. Edison Career & Technical Education High School

165-65 84th Ave. * Jamaica, New York 11432 * (718) 297-6580 * Fax (718) 658-0365
www.thomasedisonhs.org
Moses Ojeda, Principal
Gabriella Triola, Assistant Principal
Science Department

AP Biology Summer Assignment Instructions

Congratulations! You are on your way to taking AP Biology next school term. This is where the hard work begins. This assignment builds a foundation of knowledge that we will require in order to make sense of all the concepts and knowledge that make up the material for the AP Biology Exam. You may find some of this material familiar from The Living Environment. You may also find a lot of things to be unfamiliar. Do not fear, take your time with the assignment and utilize any resources listed on the AP Biology 2017-2018 Google Classroom Page (see instructions below for how to "join" the class).

You will be tested on this material during Marking Period 1, Term 1 of the 2017-2018 school year.

I look forward to meeting you all again in September!

So, to summarize:

- Go to classroom.google.com, log-in, click the (+) and "Join a Class." Enter this class code: o9bkyyn
- Take a deep breath
- Complete Assignment
- Take Exam in September.

Good Luck!

Mr. Hansen

AP Biology Supplemental – Biology
Video Review Sheet
https://paul-andersen.squarespace.com/biology

1. Biology is the:
2. Big Idea 1: Evolution -
    a. What did Darwin propose: all life…
    b. What is macroevolution?
    c. Darwin came up with a mechanism for evolution called:
    d. 5 things that can cause evolution are:
    e. Natural selection allows organisms to become better
3. Big Idea 2: Free Energy –
    a. Starts with the _____ then plants do _____ then organisms do respiration that generates _____ and eventually all leaves as _____
    b. Define Free Energy:
    c. Homeostasis: maintaining a stable internal _____ using _____ mechanisms.
4. Big Idea 3: Information – flow from organism to organism, generation to generation
    a. Diagram the Central Dogma of Life: DNA
    b. Genetics: what scientist helped with our early understanding of genetics?
    c. Responding to our environment through cell _____ - an example of information transfer.
5. Big Idea 4: Systems –
    a. Emergent Properties: properties that weren't there the
    b. E.O. Wilson is known as the _____ of _____.

Name: 2017-2018
AP Biology Summer Assignment Mr. Hansen

VIDEO GUIDE FOR BOZEMAN BIOLOGY – WATER AS A POLAR MOLECULE

Electronegativity means _____

Oxygen is unique because_____

Why does water behave like a magnet?

The bond between oxygen and hydrogen **within** a water molecule is a _____ bond

The bond between oxygen and hydrogen on **different** water molecules is a _____ bond

Draw the hydrogen bonds between the five water molecules show at 3:48 (pause the video here!

_____ is a polar molecule, _____ is a nonpolar molecule.

Describe the five properties of water that are due to its polarity

Property	Description	"real life" application of this property
High specific heat		
Solvent		
Cohesion		
Capillary action		
Ice floats		

Why is Seattle warmer in the winter than Yellowstone, even though both locations are at similar latitudes?

How does water get to the top of a tree?

Why is it "good" for aquatic organisms that live in cold climates that ice floats?

AP Biology 042 – Biological Molecules
Video Review Sheet
www.bozemanscience.com/042-biologoical-molecules

1. What are the four categories of macromolecules?
2. What is a monomer?
3. Lipids are unique because they don't have a single type of monomer. Name two reasons why lipids are important.
4. Lipids are generally polar molecules. T/F circle one
5. Nucleic acid monomers are _____ and are made up of _____
6. What are the functions of nucleic acids?
7. Protein monomers are:
8. What differentiates one amino acid from another?
9. Carbohydrate monomers are
10. The significance of "directionality" of the monomers in a polymer is that when you put the monomers together in a certain sequence/order they have
    a. The process of "putting monomers together" is called
    b. What is lost during the process of #11?
    c. What kind of bond is formed generally? Specifically between amino acids of a protein?
    d. What must be added to break the bonds?
    e. What is the name of that process?
11. Concerning **Nucleic Acids**:
    a. What are the two examples of nucleic acids he gave? (btw ATP is also an example)
    b. What is a nucleotide and what are its three parts?
    c. What are differences between DNA and RNA?
    d. What are the four nucleotides in DNA? RNA?
    e. When you see 3' and 5', this is referring to the nucleic acid's directionality and specifically to the carbons found in the

AP Biology Supplemental – Gibbs Free Energy
Video Review Sheet

https://paul-andersen.squarespace.com/gibbs-free-energy

1. Write the equation for Gibbs Free Energy:

2. Not so much "free" but a_____ energy.
3. Spontaneous reactions: once you give them a little _____ they will _____ on their own.

   They tend to _____ energy and give it their surroundings.

   a. Total Energy (___), which is enthalpy. In biology our energy is in b_____. In a spontaneous reaction it gets smaller or d_____
   b. Entropy (____) is a measure of the d_____/randomness of a system. In spontaneous reaction, entropy i_____.
   c. Temperature (T), if we i_____ the temperature the spontaneous reaction is more likely to happen.

4. Applied to Gibb's Free Energy equation: *(pay attention to X = Y - AB)*
   a. What items make delta G decrease, less than 0 (spontaneous)? E_____
      i. A decrease in:
      ii. An increase in:
   b. If the delta G is greater than 0, called and E_____ reaction
   c. If delta G = 0, then in E_____
5. Examples:
   a. Cellular Respiration – what type of reaction? ….and how much energy?
   b. Why doesn't sugar just explode on our countertops?
   c. Photosynthesis – what type of reaction? ….how much energy?
   d. Where does the activation energy come from for photosynthesis?
   e. Day to day, we use _____, it is our energy coinage, we can s_____ it and then cash it in.
   f. What is the delta G value for breaking ATP down into ADP?