

GS@IP Junior Biology Summer Assignment

Resources:

You may purchase a Barron's AP Biology book

You may consult Khan Academy

You may consult Bozeman Science

You may consult other online sites, but make sure it is .org, .edu, or .gov site

Answer each of these questions. You may use external sources, but you must reference and cite them in APA format. 1-inch margins, Times New Roman, 12 point, single-spaced. There is no minimum or maximum word requirement for each response, but answer concisely.

- 1.) Define these terms, explicitly stating how they relate to the general themes in biology:
 - a. Order
 - b. Evolutionary adaptation
 - c. Response to environment
 - d. Reproduction
 - e. Regulation
 - f. Energy Processing
 - g. Growth and Development
- 2.) Describe the levels of the hierarchy of life (biosphere through atom), and explain the notable emergent properties.
- 3.) Describe positive feedback, and give an example. Describe negative feedback, and give an example.
- 4.) Describe the current organismal classification system, including domain. How does this relate to descent with modifications?
- 5.) What is the difference between qualitative data and quantitative data?
- 6.) What is the difference between inductive reasoning versus deductive reasoning?
- 7.) What is the difference between a theory and a hypothesis?
- 8.) What is a controlled experiment? Give an example of your own controlled experiment.
- 9.) Choose an element from the periodic table (excluding hydrogen and helium). Draw a Bohr model. Include atomic number, atomic mass, orbital(s), nucleus, protons, neutrons, and electrons.
- 10.) Show an ionized form of this element. Include atomic number, atomic mass, orbital(s), nucleus, protons, neutrons, and electrons. *If your element cannot ionize, choose another element that can.*
- 11.) Show an isotope of this element. Include atomic number, atomic mass, orbital(s), nucleus, protons, neutrons, and electrons. *If your element cannot form isotopes, choose another element that can.*
- 12.) Describe the difference between ionic, polar covalent, nonpolar covalent, hydrogen, and Van der Waals interactions/bonds.
- 13.) Describe how chemical equilibrium is reached between reactants and products. What may affect the rate of these interactions?
- 14.) Draw 5 water molecules as they would appear if hydrogen bonding. Show both hydrogen and oxygen elements, and label the partial charges of these molecules. Which emergent properties of water are exhibited due to these interactions?
- 15.) How can water molecules perform environmental buffering capabilities? Why is this important?