AP/ECE Biology



Summer work

Please read chapters 1-5 in the text and complete the coinciding homework assignments.

We will have a test on the material from the summer packet, within the first two weeks of school.

Name:

Date:

**Chapter One Homework**

1. **Define the term reductionism.**
2. **Describe the levels of biological organization**
3. **Why is evolution considered an overarching theme of biology?**
4. **What is the cell theory?**
5. **How many nucleotides make up the human genome?**
6. **What is the difference between negative and positive feedback?**
7. **What are the three domains of life?**
8. **What domain do we belong to?**
9. **What has the Galapagos finch example of adaptive radiation taught us about the evolution of species?**
10. **What are the two forms of inquiry mentioned in the text, how do they differ?**
11. **Why is the scientific method really a myth?**
12. **How is a question outside of the realm of science identified?**
13. **How does science, technology and society relate?**
14. **Describe how the stucture of the following avian bone might relate to its function?**

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**Chapter Two Homework**

1. **What trace element is responsible for goiter?**
2. **Identify three carbon isotopes**
3. **How can radioactive isotopes be utilized in medicine?**
4. **Describe an elements appearance at its most stable state.**
5. **Describe the types, characteristics and examples of the 4 types of bonds mentioned in the text.**
6. **What role does polarity have between adjacent molecules?**
7. **Give an example of a balanced chemical reaction relevant to this course, label all reactants/products?**

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**Chapter Three Homework**

1. **What percentage of most cells is water?**
2. **Define Cohesion. Give an example**
3. **Define Adhesion. Give an example**
4. **What part of a water molecule is party negative? why?**
5. **What property of water is best represented by this picture?**

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1. **Explain why it is always more temperate in coastal areas of the globe?**
2. **What role does water play in our ability to maintain homeostatic temperature balance?**
3. **Give two examples of water as a primary solvent in our bodies?**
4. **Give two examples of water’s hydrophilic properties in nature?**
5. **Give two examples of water’s hydrophobic properties in nature?**
6. **What is the mass of one mole of Glucose (C6H12O6)?**
7. **Compare and contrast an acid with a base.**
8. **How many more time acidic is a pH of 2 than a pH of 5?**

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**Chapter Four Homework**

1. **How many bonds can carbon form?**
2. **What is the branch of chemistry that studies carbon based compounds?**

1. **What did the Miller Urey experiment explain?**
2. **Draw the Lewis dot structures for the four major elements of organic molecules?**
3. **What are hydrocarbons?**
4. **Explain the pharmacological importance of enantiomers.**
5. **What is the importance of functional groups? What can you learn about a molecule by identifying its functional groups?**
6. **Explain the significance of the relationship between ATP and ADP?**

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**Chapter Five Homework**

1. **What is the technical definition of a macromolecule?**
2. **What is the monomer for carbohydrates?**
3. **How are these monomers bonded?**
4. **Describe three carbohydrate uses in nature?**
5. **What is the difference between cellulose and starch?**
6. **What are the building blocks of lipids?**
7. **How are these monomers bonded?**
8. **Describe three lipid uses in nature?**
9. **What is the difference between saturated and unsaturated fats?**
10. **What are Trans fats, explain their relevance.**
11. **Define a steroid.**
12. **What is the monomer for proteins?**
13. **How are these monomers bonded?**
14. **Describe three protein uses in nature?**
15. **What is the difference between amino acids?**
16. **Describe why some amino acids are considered essential?**
17. **Draw an amino acid and label the functional groups.**
18. **Distinguish between the four levels of protein structure.**
19. **What is the monomer for nucleic acids?**
20. **How are these monomers bonded?**
21. **Describe two Nucleic acid uses in nature?**
22. **What is the difference between DNA and RNA?**
23. **Describe the differences and the relationship between purines and pyrimidines.**