

GCHS SCIENCE DEPARTMENT

AP BIOLOGY SUMMER ASSIGNMENTS



Each student anticipating enrollment in the AP Biology course for the next year must pick up a textbook from Mr. Esposito (room 210).

All prospective students will be required to complete two (2) summer reading assignments that will account for 5% of the first quarter grade. The completed assignment must be hand-written & all questions must be addressed. Restate each question, followed by your response (please answer all questions concisely & accurately).

Assignments must be done individually & without collaboration between students. The research may be done using internet resources & the textbook. If you have any questions, please email me at espositod@gcufsd.net.

A copy of the assignment and instructions for its completion are available on the Science Department main webpage at:

<http://www.gardencity.k12.ny.us/domain/1038>

The official due date for both assignments will be September 15, 2022. It is strongly suggested that you complete the first assignment, titled "Ecology & Animal Behavior", by July 31st. The second assignment, titled "The Chemistry of Life", is a review of introductory chemistry, which will serve as an important foundation for this course. In order to ensure that this information is fresh in your mind for the start of the school year, it is strongly suggested that you begin this assignment no earlier than August 15th.

Please do NOT procrastinate! Failure to stay on schedule may result in the inability to adequately complete each assignment. Be aware that late assignments will incur a 5 point deduction per day.

Good luck with your work & have a great summer. I'm looking forward to meeting you in the fall.

D. Esposito

Name _____ Date _____

AP Biology Summer Assignment 1: Ecology & Animal Behavior

Suggested Completion Date: 7/31/21

Official Due Date: 9/15/21

Unit 8: Ecology

Textbook Chapters: 52-55

I. Abiotic Factors in the Environment

1. Temperature

a) Endotherms _____

_____ b) Ectotherms

_____ c) Define & give an example of Allen's Rule _____

2. Water

a) Xerophyte Plant _____

_____ b) Hydrophyte Plant

3. Light

a) Photoperiodism _____

4. Soil & Environmental Cycles

a) Discuss the effect of soil composition on plant growth _____

b) Summarize the general significance of material cycles (e.g. nitrogen cycle, carbon cycle, water cycle).

5. Ecological Principles -define and give examples of:

a) Leibig's Law of the minimum _____

_____ b) Shelford's Law of Tolerance

_____ c) Principle of Allocation

_____ d) Principle of Acclimation

II. Biotic Factors of the Environment

1. *General Organization -Define and distinguish between:*

a) Population vs. community _____

b) Ecosystem vs biosphere _____

_____ c) Fundamental vs. realized niche _____

2. *The Ecosystem*—define and give examples of:

a) Producers _____

_____ b) Consumers

_____ c) Decomposers

_____ d) The energy pyramid -change in energy with each trophic level

e) Food chain _____

f) Food Web _____

3. Biomes

a) Create a table to summarize the characteristics (in terms of climate, flora and fauna) of the 6 terrestrial biomes (you can create a table on “Word” & attach it to the back of your assignment).

b) Explain the correspondence between latitudinal and altitudinal effects on biome distribution

4. *Ecological Succession*

a) Define and give examples of: pioneer vs. climax community _____

_____ b) Primary succession (provide example) _____

_____ c) Secondary succession (provide example) _____

d)

Eutrophication _____

5. *Interspecific Relationships* - define and give examples of:

a) Mutualism _____

b) Commensalism _____

_____ c) Parasitism

III. Growth Patterns in Populations Define

and give examples of:

a) r-strategists _____

b) k-strategists _____

Unit 7: Animal Behavior

Textbook Chapters: 51

1. Fixed Action Patterns

a) Fixed Action Pattern _____

_____ b) Sign Stimulus

_____ c) Releaser

d) Discuss the work of Tinbergen and Lorenz in Greylag geese _____

3. *Learning*- define and give examples of

a) Habituation

b) Imprinting _____

c) Conditioning _____

d) Operant Learning _____

4. *Social Behavior* -define and give examples of

a) Dominance hierarchy _____

Name_Date

AP Biology Summer Assignment 2: The Chemistry of Life

Suggested Completion Date: 8/15/21 **Official Due Date:** 9/15/21

Unit 1: The Chemistry of Life

Textbook Chapters: 2-5

1) Distinguish between covalent, ionic, & hydrogen bonds. Compare them in terms of the mechanism by which they form & their relative bond strength.

a) Covalent Bond _____

_____ b) Ionic Bond

_____ c) Hydrogen Bond

2) Explain how hydrogen bonds between adjacent water molecules govern many of the properties of water.

3) Contrast acids & bases, & discuss their properties. _____

4) Identify & draw the 6 major functional groups present in organic compounds, & describe the properties of each in terms of solubility, acidity, etc. (you may attach your drawings on a separate piece of paper include the *ionized & non-ionized forms* for acidic & basic groups).

5) Describe the properties of carbon that make it the central component of organic compounds _____

6) What molecules are the monomers of the polymers studied in Chapter 5? _____

7) Identify & describe the processes by which monomers join to produce polymers

8) Identify & describe the processes by which polymers are broken down to form monomers _____

9) What are the major functions of carbohydrates? Give an example of a mono, di, & polysaccharide. In what ways are these carbohydrates structurally distinguishable?

10) Identify the two classes of structural polysaccharides & describe the function of each. _____

11) Identify the two classes of storage polysaccharides & describe the function of each. _____

12) What are the major classes of lipids? What chemical characteristic is common to each? _____

13) What is the major function of fats? Explain the structure of a fat molecule by stating its components & how they join together.

14) What is the difference of between a saturated & an unsaturated fat?

How does the structure of a phospholipid differ from that of a fat? _____

15) How do phospholipids form a bilayer in the presence of water?

16) Describe the structure of a generalized steroid. How does one steroid differ from another? _____

17) Draw the structure of an amino acid & a dipeptide, pointing out the peptide bond.

18) Discuss the four possible levels of protein structure & relate each level to particular bonding patterns.

a) Primary Structure _____

b) Secondary Structure _____

c) Tertiary Structure _____

d) Quaternary Structure _____

19) What is protein denaturation? Identify 3 environmental factors that can result in protein denaturation.____

20) Describe the structure of a nucleotide. How do they bond to form nucleic acids?

21) State & explain the structural differences between DNA & RNA.
