Before you begin, please email me with "doc opened" in the subject line and the following in the body:
1. Legal name (nickname in parentheses)
2. School email address
3. Student cell phone number
4. Do you have internet access at home?
5. Extracurricular activities (school and non-school), work

Thank you for your interest in AP Biology! Since it has been a couple of years since you took Biology, this summer assignment is to get you thinking about Biology again. If you have any questions, you may email me at charleen.sprabary@krumisd.net; be patient though, it is the summer and I do not check my school email daily, and will be out of town part of the summer. I will give you one BIG piece of advice…… start this early, and do it in parts. DO NOT wait until the week it is due to do the assignment. The work will be due August 14, 2019.

Format:

The summer assignment should be placed in a one-inch diameter, three-ring notebook with tab dividers separating each of the parts. The notebook should be set up in order: part one, part two and part three to follow.

1. For Parts I and II students should type all of the questions/word parts and write the answers by hand below/beside the questions/word parts.
2. Be sure to put the question and answer for each together, not on separate pages.
3. Please be sure to read over the questions to estimate the amount of space that you will need for each answer.
4. Questions and answers should be presented in numerical order within each section and students should leave space between questions.
5. The writing must be neat and clear; if I cannot read the responses, there will be no credit given.
6. Please DO NOT put the pages in page protectors.

Grading:

Each section of the assignment will be scored as shown on the rubric. The points earned will depend on detail, level of completeness and complexity of the responses. All parts of the question must be answered to earn full credit.

Part I – REVIEW

A. The Chemistry of Life

1. **Illustrate** and **describe** how the structure of a water molecule allows it to form hydrogen bonds with other water molecules.

2. **Identify** and **describe** the properties of water that contribute to Earth's suitability for life.

3. **Create** a chart that includes the 4 main groups of organic macromolecules in living things, atoms found in all members of each group, major purposes of each compound, and examples of each compound.

B. The Cell

4. **Describe** the similarities and differences between prokaryotic and eukaryotic cells. Then, select 7 eukaryotic cell organelles and for each one, **draw** and **explain** the function of the organelle.

5. **Describe** the differences between passive and active transport. For each of these types of cell transport, **describe** three different examples.

6. **Explain** metabolism. **Describe** how ATP and enzymes are related to metabolism.

7. **Write t**he equation for cellular respiration and **explain** the purpose of the process.

8. **Write** the equation for photosynthesis and **describe** the importance of it to life on earth.

9. **Draw and Label** a diagram of the cell cycle. **Briefly describe** what is happening at each phase. (including mitosis and cytokinesis)

C. Genetics

10. **Compare** and **contrast** sexual and asexual reproduction and **list** the advantages and disadvantages of each type of reproduction.

11. **Describe** the purpose of mitosis and meiosis.

12. **Describe** the structure of DNA and provide a picture.

13. How is RNA different than DNA?

14. **Explain** the process of protein synthesis.

15. **Compare** and **contrast** viruses and bacteria. **Name** and **describe** 2 diseases caused by each.

D. Evolution

16. **Explain** natural selection and **research** and **record** Darwin's role in developing the idea.

17. What scientific evidence do scientists use to support the theory of natural selection and evolution?

18. What is phylogeny? What information is used by scientists to establish the phylogeny of an organism?

E. Kingdoms

19. **Name** and **describe** the structural characteristics that all members of Kingdom Eubacteria (Bacteria) share. **Explain** the different types of nutrition acquisition, reproduction and habitats.

20. **Name** and **describe** the characteristics that all members of Kingdom Archaebacteria (Archaea) share. **Explain** the different types of nutrition acquisition, reproduction and habitats.

21. **Name** and **describe** the characteristics that all members of Kingdom Protista share.

22. **Name** and **describe** the characteristics that all members of Kingdom Fungi share. **Explain** their nutrition acquisition, reproduction and habitats.

23. **Name** and **describe** the characteristics that all members of Kingdom Plantae share. **Explain** their nutrition acquisition and different types of reproduction.

24. **Name** and **describe** the characteristics that all members of Kingdom Animalia share. **Explain** the different types of nutrition acquisition, and the general function of the nervous, circulatory, immune, excretory, endocrine, muscular and reproductive systems.

Part II – Word Parts

Determine the meaning(s) of each of the prefixes, suffixes and roots below; be sure to include multiple meanings where appropriate. This must be presented by typing the word part and then NEATLY hand writing the meaning(s) of each; do NOT simply print the document and fill in the information.

Word Part	Definition	Word Part	Definition	Word Part	Definition
A-		**-form**		**Ovo-**	
Ab-		**Gastro-**		**Path-**	
aer-, aero-		**-genic**		**Phago-/-phagia**	
Amphi-		**-gestion**		**-philic**	
Antho-		**Glyco-/gluco-**		**-phobic**	
Arthro-		**Gnath-**		**Photo-**	
-ase		**Haplo-**		**-phyl**	
-ation		**Herpe(t)-**		**-plasm**	
Auto-		**Hetero-**		**Platy-**	
Bio-		**Histo-**		**-pod or –ped**	
Bi- or di-		**Homo- or homeo-**		**Poly-**	
-blast		**Hydro-**		**Pro-/ Proto-**	
Calor-		**Hyper-**		**Pseudo-**	
Cardio-		**Hypo-**		**Pulmo-**	
Carn-		**-ic/-tic**		**Sacchar-**	
Cephal-		**Inter-**		**Sapro-**	
Chlor-		**Iso-**		**Scypha**	
Chondro-		**karyo-**		**-sis**	
Chromo-		**Lipo-**		**Some/somato-**	
Cyto-/cyte-		**-logy/-ology**		**Spir**	
-derm		**-lysis**		**-statis**	
Dia-		**Macro-**		**Synth**	
Diplo-		**Meso-**		**Therm-**	
Ect-/ecto-		**Micro-**		**-tic**	
En-/Em-		**Morpho-**		**-troph(o)**	
End-/Endo-		**Multi-**		**-tropism**	
Epi-		**Oligo(s)**		**Uni-**	
Erythr-		**-oma**		**-vore**	
Eu-		**Omni-**		**Vas-**	
Ex-/Exo-		**-ose**		**Zoo-/zoa-**	
Flagell-		**Ornith-**		**Zyg-**	

Part III – Big Ideas in Biology

The AP Biology course is centered on four Big Ideas in Biology. Think about each of the big ideas listed below and for each one write a well-organized paragraph(s) explaining the statement. Be sure to include what information from Part I would relate to these ideas. This should be NEATLY hand written on *every other line* of the fronts only of the paper.

Big Idea 1: The process of evolution drives the diversity and unity of life.

Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis (regulation).

Big Idea 3: Living systems store, retrieve, transmit, and respond to information essential to life processes.

Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties.