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AP Biology Summer Assignment for the Academic Year 2020-2021

Welcome to AP Biology at Colton High School where you will gain a deeper comprehension and appreciation for the living world. Being enrolled in an advanced placement course requires the work ethic of studying progressively (a routine of studying), being punctual in every sense, having a strong interest for the course, a willingness to learn in study sessions, reading, comprehending, analyzing written text, and committing information to memory . The following summer assignments will ease your transition as you prepare for the discipline-specific, inquiry and reasoning methods of this course. Please note that consistent pacing and time-budgeting for the amount of content that must be studied will be a mark of your success.

The units covered in this course:

Unit 1: The Chemistry of Life
Unit 2: The Cell
Unit 3: Genetics
Unit 4: Mechanisms of Evolution
Unit 5: The Evolutionary History of Biological Diversity
Unit 6: Plant Form and Function
Unit 7: Animal Form and Function
Unit 8: Ecology

Keep the following in mind when using sources for any research/study as it is important to use trusted and valid sources. Focus on educational and government sites even while*.com, and *.org sites can have valid information. Consider these questions as you do your research:

i. Why was it written?
ii. Who published it? -- Author
iii. Where and when was the information published?
iv. How is the information organized?

Assignments:

1. Use the library, text book, or educational sites on the Internet to review the parts of a cell and virus and list sources where you obtain your information.
   a. What is a virus? Sketch and label the structures (sketch using your preferred software app/tools or do by hand and capture a photo of it if you plan to share to document via Google).
   b. What is a prokaryotic cell? List and label the structures.
   c. What is a eukaryotic cell? Draw a plant and animal cell and label the structures.
   d. Describe the function of the organelles found in plant and animal cells and underline/highlight the organelles found in plant cell only.

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Reference the following website on "How Cells Divide":

http://www.pbs.org/wgbh/nova/body/howcells-divide.html

2. Compare mitosis and meiosis – noting what happens in each phase.
    a. What is the purpose of mitosis and meiosis?
    b. Sketch, label and describe what happens in each phase in the animal cell and the plant cell.
    c. Describe what happens with the chromosomes in each phase.
    d. List and describe the organelles involved.
3. Review basic chemistry:
    a. What are covalent and ionic bonds? Diagram an example.
    b. What are hydrogen bonds?
    c. Draw Lewis structures for Carbon, Nitrogen, Hydrogen, Oxygen, and Phosphorous.
    d. Explain the octet rule
    e. Describe the properties of water
    f. Contrast cohesion and adhesion
    g. What is a polar molecule?
    h. Describe why water is such a great solvent
    i. What is specific heat? What is its relationship to the calorie? Gram? And water?
4. Watch this interesting approach on some basic chemistry…
https://www.youtube.com/watch?v=QnQe0xW_JY4&list=EC3EED4C1D684D
5. There are 4 big ideas in AP Biology 1. The process of evolution drives the diversity and unity of life, 2. Biological systems utilize free energy and molecular building blocks to grow, reproduce and to maintain dynamic homeostasis, 3. Living systems store, retrieve, transmit and respond to information essential to life processes, 4. Biological systems interact, and these systems and their interactions possess complex properties. Summarize in one paragraph what each big idea means to you.
6. Choose only 1 of the 4 articles. The steps to completing the article that you choose are outlined below (a-e).

Article 1 - Ecology: **Ecological Change and the Future of the Human Species: Can Physicians Make a Difference?**
Article 2 - Technology and Safety: **Can New Technology Help Save the Ocean?**
Article 3 - Genetics: **Disease is the greatest threat to bee health. Can we protect them through genetically engineered probiotics?**
Article 4 - Botany **Rule Breaking' Plants May be Climate Change Survivors**

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a. On your document, print your first and last name on the top-right corner of your paper as you are the reviewer of the article
b. Title of the Article, Publication, Date, and Author will go beneath your name.
c. Write a 1-2 paragraph summary or abstract about the article in your own words
d. Create 2 questions about the article or the content of the article
    i. The first question should ask about anything vague in the article, which possibly needs further clarification or research.
    ii. The second question should ask how the article deals with social, ecological, political, or ethical issues.
e. The last portion of this task involves use of your **metacognitive skills**.
    i. This involves a one-page essay that imparts your view/assertion of the topic. Create a 1-sentence thesis in the first paragraph of your essay where you will make an assertion or take a side on something in the article. You will need to back up your assertions with scientific data throughout your essay.

Note:

- The AP Biology Summer Assignment is due on the first day of class.
- There will be a pretest on the first day of class.

Methods of submitting your work:

- You can share via Google docs (using your school email/Google login credentials and share to my email found in the header section of this document)
- You can submit a hard copy on the first day of class.

If you are able to check out your AP textbook over the summer, it is recommended that you read chapters 1-6.