AP Biology Summer Assignment 2025-2026

Your assignment will be turned in virtually through our Google Classroom (join code: 4oseb7fn) on the first day of classes.

1. Read Chapters 1-3 in our textbook: *Campbell's Biology in Focus*
2. Complete the following reading guide on Chapter 1-3.
3. Take detailed notes on Chapter 1-3 with drawings.
4. Complete the Albert.io assignment linked here: https://www.albert.io/assignment/1b31e816-8dda-4038-9c09-164df37fff19

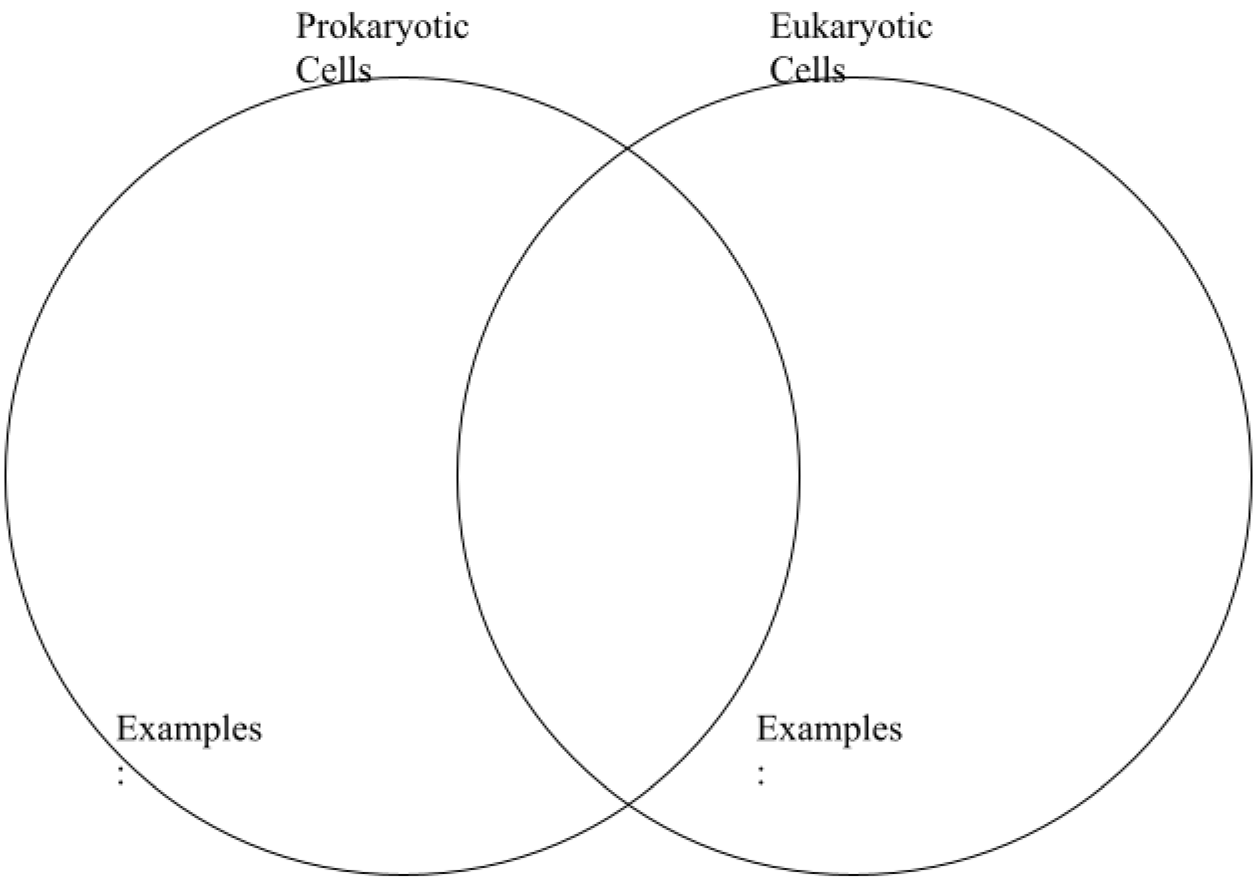
1. What are emergent properties? Explain an example not taken directly from the reading.

2. How are structure and function related? Give an example within the human body.

3. Complete the following table on the levels of biological organization.

Term	Definition
Biosphere	
Ecosystems	
Communitie s	
Populations	
Organisms	
Organs	
Tissues	
Cells	
Organelles	
Molecules	

4. Complete the following venn diagram comparing prokaryotic and eukaryotic cells. Include at least 3 examples of each.



5. What is DNA? How is it structured? What is the functional significance of DNA?

6. What is a gene? How is it structured? What is the functional significance of a gene?

7. What is a genome? Why is it important?

8. What does evolution explain? What is the result of evolution?

9. What are the three domains that encompass all living things? Generate a brief flow chart which identifies the three domains of life and defines what they are. For domains which encompass multiple kingdoms, be sure to include them as components on your flowchart under the appropriate domain.

10. What are the main points articulated in Darwin's *The Origin of Species?*

11. What is natural selection? Summarize the mechanism.

12. Describe the key elements of the scientific approach: inquiry, hypotheses, experiment, and data.

13. Define and compare inductive and deductive reasoning.

14. Why is science considered a flexible process?

15. What are the components of a strong hypothesis? Should it be testable or not? What two properties should be related?

16. What are the distinguishing characteristics of a theory? What are the differences between a theory and a hypothesis/speculation?

17. What are a few ways to approach science? Your book discusses a few including "science as a way of knowing." What are two other ways to look at science?

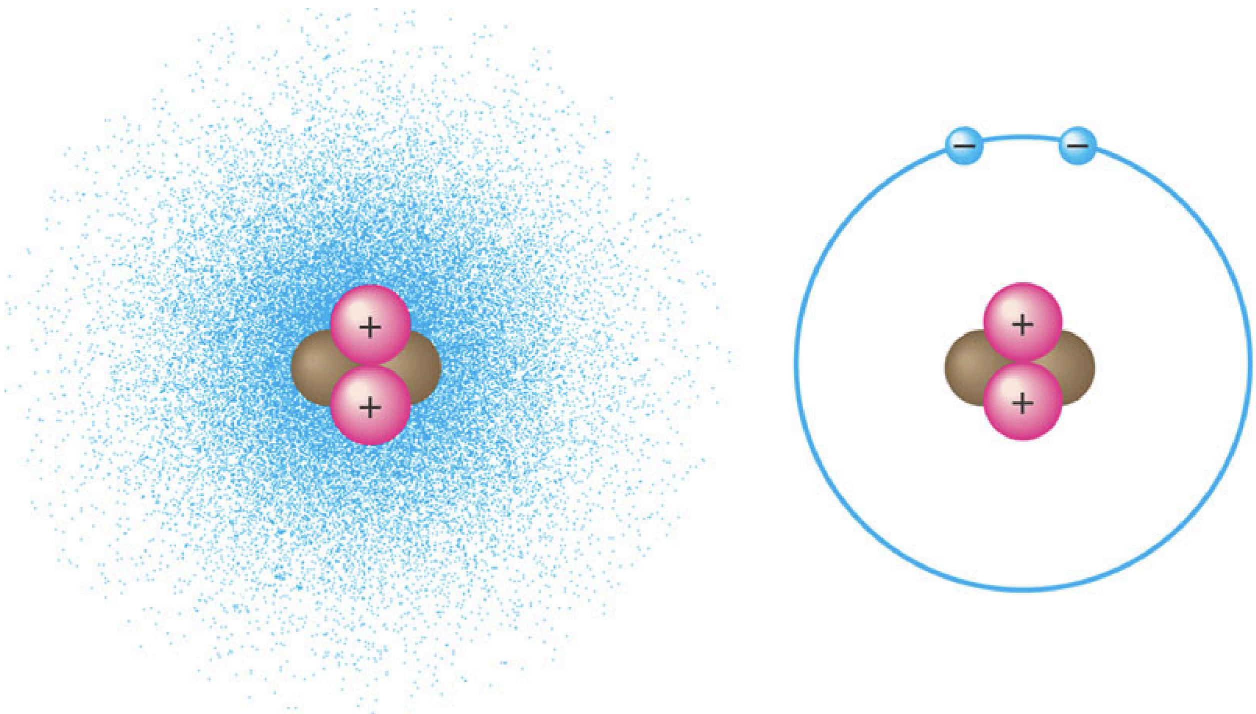
18. Define and give an example of each: matter, element, compound.

19. Which elements make up 96% of all living matter?

20. Is iron a trace or essential element? Why?

21. Is carbon a trace or essential element? Why?

22. Label the following diagram.

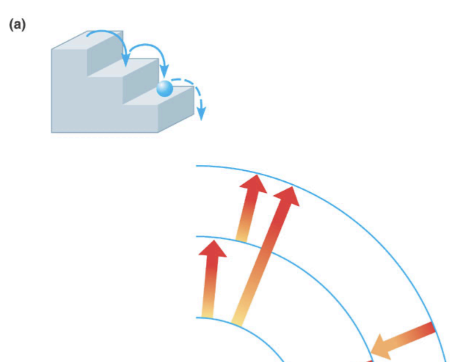


(a) (b)

23. Complete the table below.

Term	Definition
Neutron	
Proton	
Electron	
Atomic Mass	
Atomic Number	
Isotopes	
Electron Shells	
Energy	

24. Explain how the movement of electrons relates to the concept of potential energy – use the diagram below to help answer the question.



25. Which is the only subatomic particle that is directly involved in the chemical reactions between atoms?

26. Complete the table below.
27.

Term	Definition
Chemical Bond	Example:
Covalent Bond	Example:
Nonpolar Covalent Bond	Example:
Polar Covalent Bond	

	Example:
Single Bond	Example: Drawing:
Double Bond	Example: Drawing:
Valence	Example: Drawing:
Electronegativity	

28. Compare and contrast hydrogen bonds with Van der Waals interactions.

29. How are molecular shape (structure) and function related? Use an example or two to support your answer.

30. Define a dynamic chemical equilibrium in terms of quantities of reactants and products.

31. What is the difference between a compound and a molecule?

32. What makes a molecule polar? What interactions cause this behavior?

33. Describe the interactions between water molecules. How does hydrogen bonding play a role?

34. Define and give 2 biological examples of cohesion.

35. Define and give 2 biological examples of adhesion

36. Define and give 2 biological examples of surface tension.

37. List the fundamental special properties of water. Briefly explain what each means. Correlate why each property is important to living things.

38. Recall the Law of Conservation of Energy. State it below.

39. What is kinetic energy?

40. What is potential energy?

41. What is thermal energy?

42. What is evaporative cooling?

43. Define the three terms: solute, solvent, and solution. Give an example of each.

44. What makes a solution aqueous?

45. What is a hydration shell?

46. What makes a compound an organic compound?

47. Explain the four ways that carbon skeletons can vary.
    a. Length

    b. Branching

    c. Double Bond Position

    d. Presence of Rings

48. What is an isomer?

49. What are the three types of isomers? Give two examples of each.
    a.

    b.

    c.

50. Using Figure 3.6 on page 48 as a guide, create your own table of the chemical groups.

51. Create a table (on a separate paper/doc) which organizes each of the macromolecules examined in Chapter 3. Include the building blocks, structure, function, figures, and an example of each. Be as detailed and specific as

possible. (The more you include here the better of a study tool this will be.) Attach this table to the end of your assignment.

52. What is a phospholipid? Where in the cell do we see phospholipids?

53. What is the structure and function of steroids? What are some examples?

54. List and draw (by hand) the 20 amino acids of proteins. Include a photo of your drawing below.

55. What is meant by denaturation and renaturation of a protein? What causes each of them?

56. What are the nitrogenous bases? Draw the structure of each by hand and categorize them as pyrimidines and purines. Make note of how pyrimidines and purines are different. Include a photo of your drawing below.

57. Explain what it means that the arrangement of DNA is antiparallel.