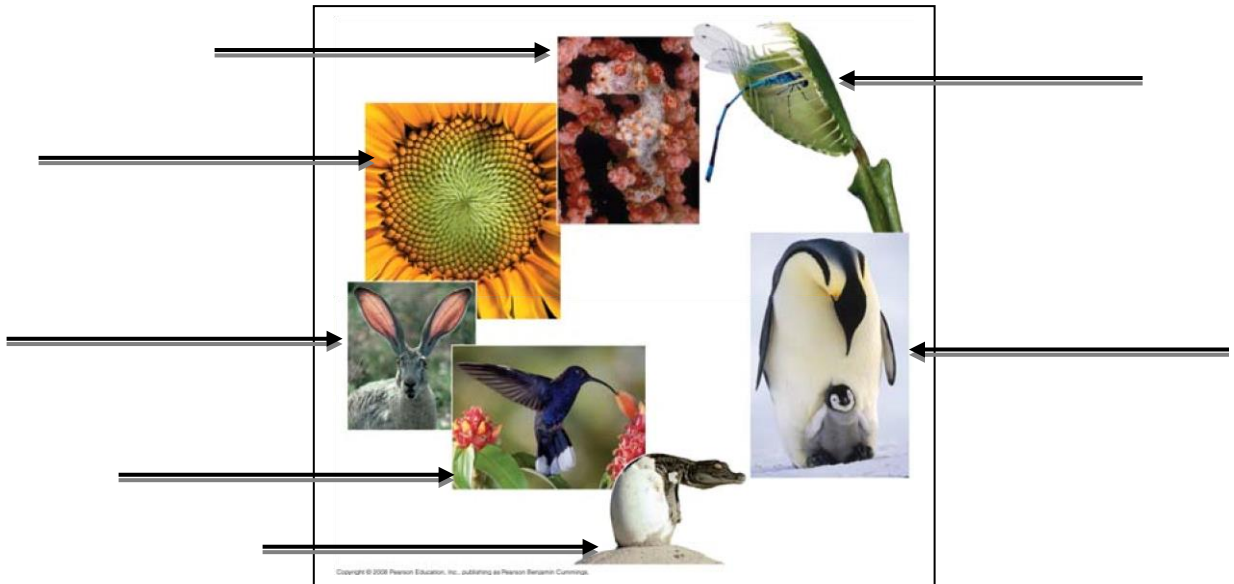


Chapter 1: Introduction: Themes in the Study of Life

Begin your study of biology this year by reading Chapter 1. It will serve as a reminder about biological concepts that you may have learned in an earlier course and give you an overview of what you will study this year.

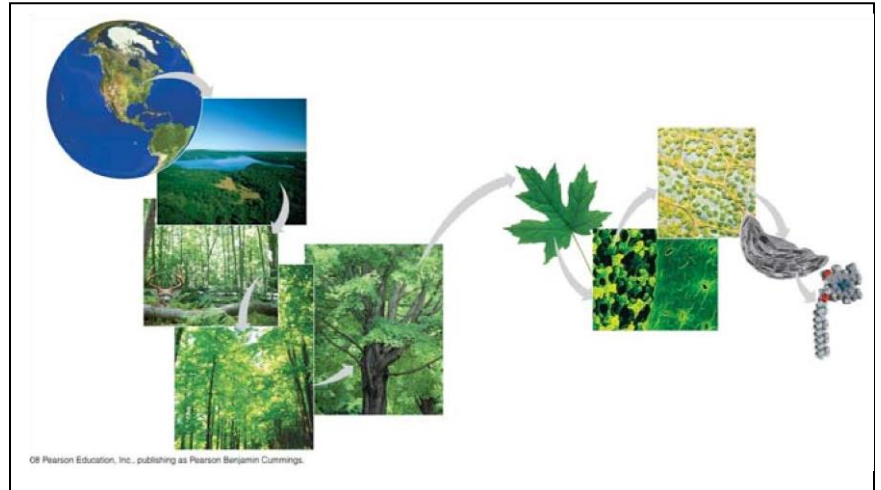
1. In the overview, Figure 1.3 recalls many of the properties of life. Label the seven properties illustrated here, and give a *different* example of each.



Concept 1.1 Themes connect the concepts of biology

2. What are **emergent properties**? Give two examples.

3. Life is organized on many scales. Figure 1.4 zooms you in from viewing Earth from space all the way to the level of molecules. As you study this figure, write in a brief definition of each level.



biosphere ecosystem community

population organism organs/organ systems tissues cells organelles molecules

4. Our study of biology will be organized around recurring themes. Make a list here of the themes that are presented, and give an example that illustrates each theme. Watch for these themes throughout your study this entire year. This will help you see the big picture and organize your thinking. (Go to the *Summary of Key Concepts* at the end of the chapter for a concise look at the themes.)

<i>Theme 1</i>	<i>Example</i>
<i>Theme 2:</i>	
<i>Theme 3:</i>	
<i>Theme 4:</i>	
<i>Theme 5:</i>	
<i>Theme 6:</i>	
<i>Theme 7: (Find it in 1.2.)</i>	

5. As you read this section, you will be reminded of things you may have studied in an earlier course. Since this material will be presented in detail in future chapters, you will come back to these ideas, so don't fret if some of the concepts presented are unfamiliar. However, to guide your study, define each of the terms in bold as you come to them.

eukaryotic cell prokaryotic

cell

DNA

genes genome negative

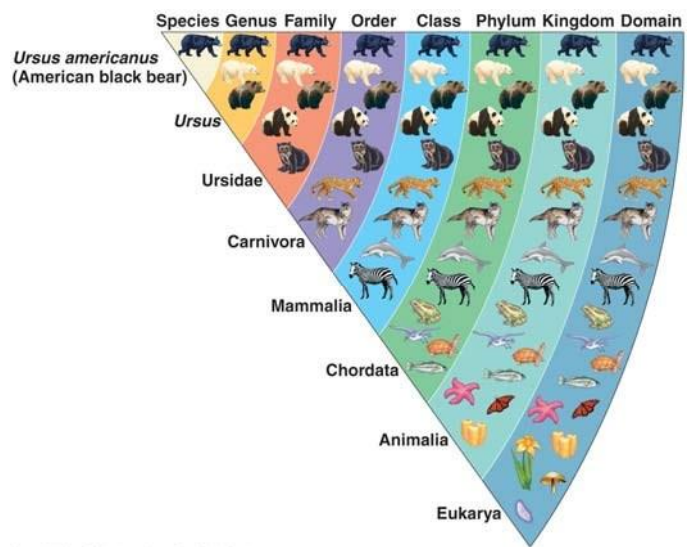
feedback/positive feedback

Concept 1.2 The Core Theme: Evolution accounts for the unity and diversity of life

6. Life is organized into groups. Study Figure 1.14.

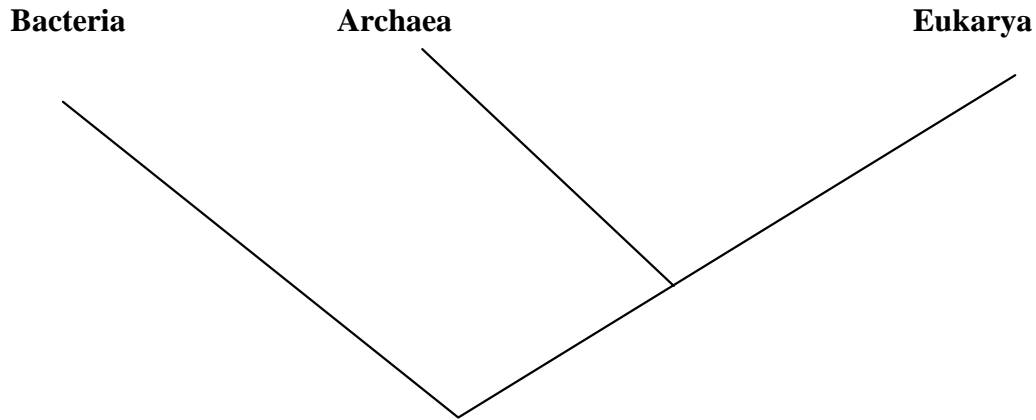
- Which level contains the greatest diversity of organism?
- The least?
- Write out the levels of organization in order.

- Most people use a mnemonic device to remember these levels. If you have one, it here.

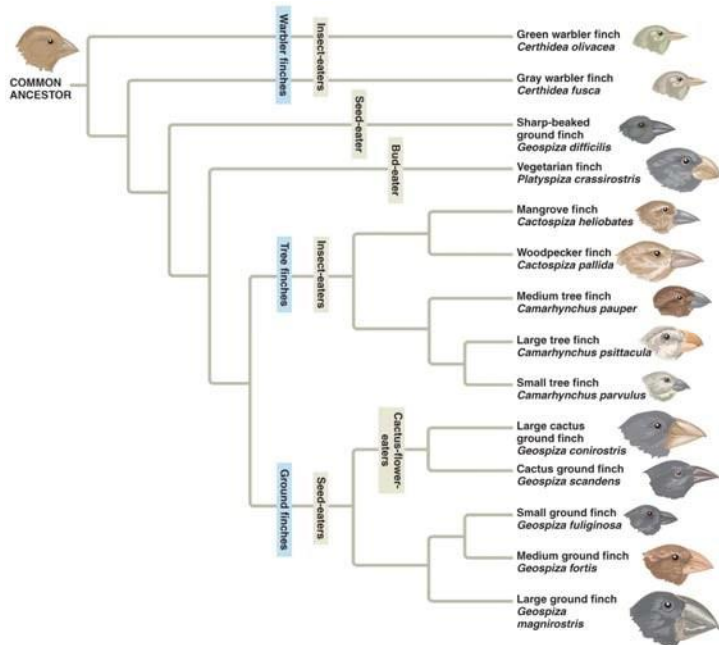


write

7. Taxonomy is the branch of biology that names and classifies organisms. Because of new molecular information, there have been many changes in placement of certain groups in recent years. Notice that all life is now organized in your text into 3 domains rather than the 5 kingdoms you may have learned earlier. Put the kingdoms mentioned in the text in the space above the proper domain names shown here.



8. What two main points were articulated in Darwin's *The Origin of Species*?
9. What did Darwin propose as the mechanism of evolution? Summarize this mechanism.
10. Study Figure 1.22, which shows an evolutionary "tree." What is indicated by each twig? What do the branch points represent? Where did the "common ancestor" of the Galápagos finches originate?



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Concept 1.3 Scientists use two main forms of inquiry in their study of nature

11. What are the two main types of scientific inquiry? Give an example of each.

12. What is *data*?

13. Distinguish between quantitative and qualitative data. Which type would be presented in a data chart and could be graphed? Which type is found in the field sketches made by Jane Goodall?

14. In science, how do we define *hypothesis*?

15. A scientific hypothesis has two important qualities. The first is that it is *testable*. What is the second?

16. Are scientific hypotheses proved? Explain your answer!

17. Look at Figure 1.24. Use it to write a hypothesis using the “If . . . then . . .” format.

18. What is a *controlled experiment*?

19. The text points out a common misconception about the term “controlled experiment”. In the snake mimicry experiment, what factors were held *constant*?

20. Why are supernatural explanations outside the bounds of science?

21. Explain what is meant by a scientific *theory* by giving the three ways your text separates a theory from a hypothesis or mere speculation.
 - 1.
 - 2.
 - 3.

Testing Your Knowledge: Self-Quiz Answers

Now you should be ready to test your knowledge. Place your answers here:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

10. _____