

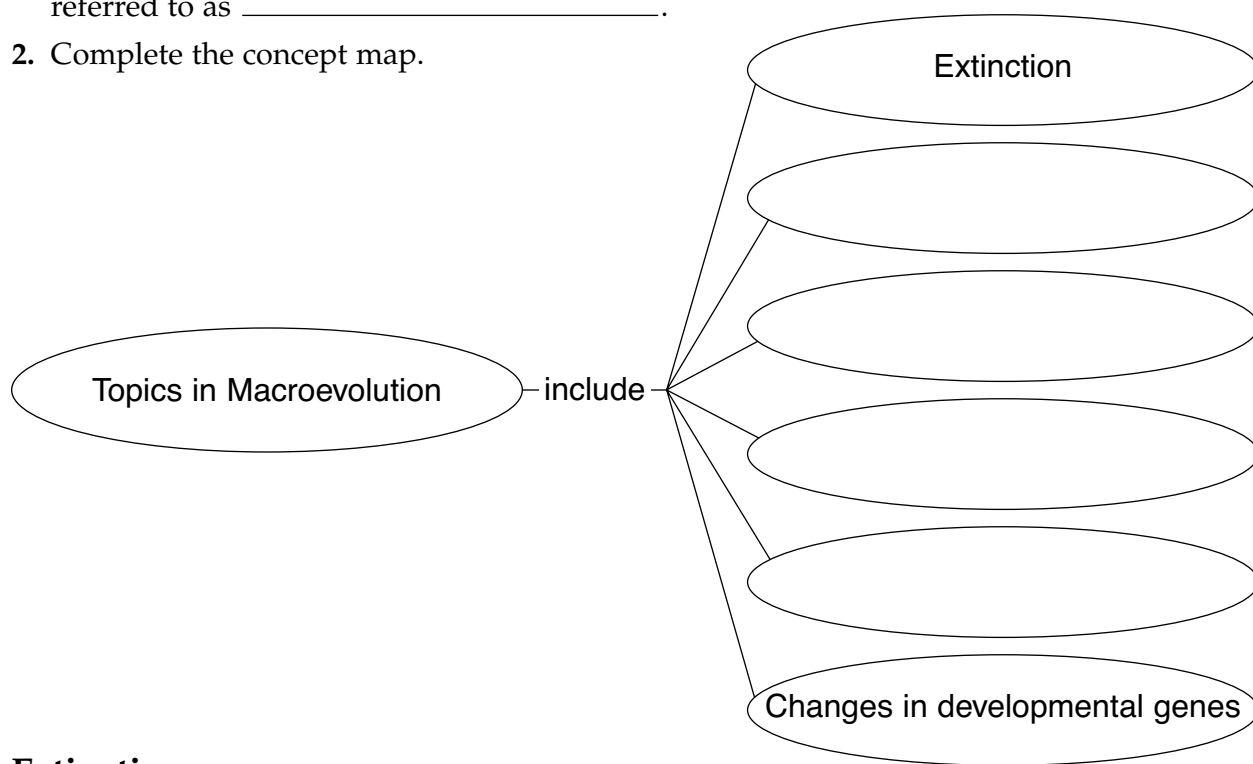
## Chapter 17, The History of Life *(continued)*

### Section 17–4 Patterns of Evolution (pages 435–440)

*This section describes six important patterns of large-scale, long-term evolutionary change.*

#### Introduction (page 435)

1. The large-scale evolutionary changes that take place over long periods of time are referred to as \_\_\_\_\_.
2. Complete the concept map.



#### Extinction (page 435)

3. What are possible causes of mass extinctions? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
4. What effects have mass extinctions had on the history of life? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### Adaptive Radiation (page 436)

5. The process of a single species or a small group of species evolving into diverse forms that live in different ways is called \_\_\_\_\_.
6. What led to the adaptive radiation of mammals? \_\_\_\_\_  
 \_\_\_\_\_

### **Convergent Evolution** (pages 436–437)

7. The process by which unrelated organisms come to resemble one another is called \_\_\_\_\_.
8. Circle the letter of each choice that is an example of convergent evolution.
- a. Bird's wing and fish's fin
  - b. Shark's fin and dolphin's limb
  - c. Human's arm and bird's wing
  - d. Human's leg and dolphin's limb

### **Coevolution** (pages 437–438)

9. The process by which two species evolve in response to changes in each other over time is called \_\_\_\_\_.
10. How have plants and plant-eating insects coevolved? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### **Punctuated Equilibrium** (page 439)

11. The idea that evolution occurs at a slow, steady rate is called \_\_\_\_\_.
12. What are some reasons rapid evolution may occur after long periods of equilibrium? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
13. The pattern of long, stable periods interrupted by brief periods of more rapid change is called \_\_\_\_\_.
14. Is the following sentence true or false? Evolution has often proceeded at different rates for different organisms. \_\_\_\_\_

### **Developmental Genes and Body Plans** (page 440)

15. How can hox genes help reveal how evolution occurred? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
16. Is the following sentence true or false? Changes in the timing of genetic control during embryonic development can contribute to the variation involved in natural selection.  
\_\_\_\_\_

## WordWise

Match each definition in the left column with the correct term in the right column. Then, write the number of each term in the box below on the line under the appropriate letter. When you have filled in all the boxes, add up the numbers in each column, row, and two diagonals. All the sums should be the same.

### Definition

- A. Scientist who studies fossils
- B. Term used to refer to a species that has ceased to exist
- C. Process by which a single species evolves into many different forms
- D. Microscopic fossil
- E. Unit of time into which eras are subdivided
- F. Length of time required for half of the radioactive atoms in a sample to decay
- G. Method of determining the age of a fossil by comparing its placement with that of fossils in other layers of rock
- H. Pattern of evolution in which long stable periods are interrupted by brief periods of more rapid change
- I. One of several subdivisions of the time between the Precambrian and the present

### Term

1. extinct
2. relative dating
3. half-life
4. era
5. period
6. paleontologist
7. microfossil
8. adaptive radiation
9. punctuated equilibrium

A _____	B _____	C _____	= _____
D _____	E _____	F _____	= _____
G _____	H _____	I _____	= _____
= _____	= _____	= _____	= _____