

Chapter 15 Darwin's Theory of Evolution**Section 15-1 The Puzzle of Life's Diversity****(pages 369-372)****Key Concepts**

- What was Charles Darwin's contribution to science?
- What pattern did Darwin observe among organisms of the Galápagos Islands?

Introduction (page 369)

1. The process by which modern organisms have descended from ancient organisms is called _____.
2. A well-supported explanation of phenomena that have occurred in the natural world is a(an) _____.

Voyage of the *Beagle* (pages 369-370)

3. Circle the letter of each sentence that is true about Charles Darwin.
 - a. He was born in 1809.
 - b. He was an English naturalist.
 - c. He was 42 when he began the voyage on the *Beagle*.
 - d. The voyage lasted five years and took him around the world.
4. Label the Galápagos Islands on the map below.



5. Is the following sentence true or false? Darwin was looking for a scientific explanation for the diversity of life on Earth. _____

Darwin's Observations (pages 370–372)

6. Circle the letter of each observation that Darwin made.
- An enormous number of species inhabit Earth.
 - Many organisms seem to be poorly suited to their environment.
 - The same sorts of animals are always found in the same ecosystems in different parts of the world.
 - Some species that lived in the past no longer live on Earth.
7. The preserved remains of ancient organisms are called _____.
8. As Darwin studied fossils, what new questions arose? _____

9. How did Darwin explain differences in shell shape of tortoises from Hood Island and Isabela Island? _____

10. Darwin observed that small brown birds on the Galápagos Islands differed in the shape of their _____.

The Journey Home (page 372)

11. What did Darwin think about on his journey home to England? _____

12. After he returned to England, what hypothesis did Darwin develop to explain his findings? _____

Reading Skill Practice

You can focus on the most important points in a section by turning the headings into questions and then trying to find the answers as you read. For each heading in Section 15–1, first write the heading as a *how*, *what*, or *why* question. Then, find and write the answer to your question. Do your work on a separate sheet of paper.

Section 15–2 Ideas That Shaped Darwin’s Thinking (pages 373–377)

Key Concepts

- How did Hutton and Lyell describe geological change?
- According to Lamarck, how did species evolve?
- What was Malthus’s theory of population growth?

An Ancient, Changing Earth (pages 374–375)

1. Two scientists who helped Darwin and others recognize how old Earth is were _____ and _____.
2. Circle the letter of each idea that was proposed by James Hutton.
 - a. Earth is a few thousand years old.
 - b. Layers of rock are moved by forces beneath Earth’s surface.
 - c. Most geological processes operate extremely slowly.
 - d. The processes that changed Earth in the past are different from the processes that operate in the present.
3. Circle the letter of each sentence that is true about Lyell’s work.
 - a. His book, *Principles of Geology*, was published after Darwin returned from his voyage.
 - b. His work explained how awesome geological features could be built up or torn down over long periods of time.
 - c. His publications helped Darwin appreciate the significance of the geological phenomena that he had observed.
 - d. He stressed that scientists must explain past events in terms of processes that they can actually observe.
4. In what two ways did an understanding of geology influence Darwin? _____

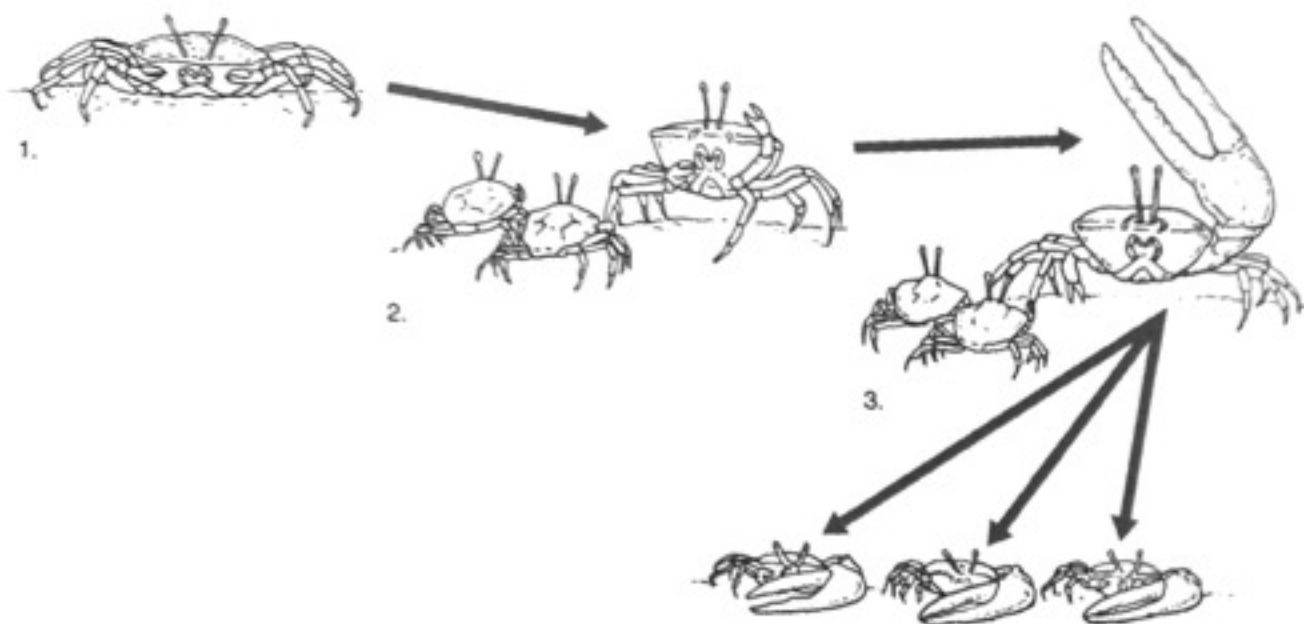
Lamarck’s Evolution Hypotheses (page 376)

5. Is the following sentence true or false? Lamarck was among the first scientists to recognize that living things have changed over time. _____
6. Is the following sentence true or false? Lamarck proposed that all organisms have an innate tendency toward complexity and perfection. _____

7. How did Lamarck propose that species change over time? _____

8. How did Lamarck pave the way for the work of later biologists? _____

9. Which step in the diagram below shows the inheritance of acquired traits as proposed by Lamarck? _____



Population Growth (page 377)

10. Circle the letter of each sentence that is true about Thomas Malthus.
- He was an important influence on Darwin.
 - He was an English naturalist.
 - He believed that war, famine, and disease limit the growth of populations.
 - His views were influenced by conditions in twentieth-century England.
11. Is the following sentence true or false? The overwhelming majority of a species' offspring survive. _____

Section 15-3 Darwin Presents His Case

(pages 378–386)

Key Concepts

- How is natural variation used in artificial selection?
- How is natural selection related to a species' fitness?
- What evidence of evolution did Darwin present?

Publication of *On the Origin of Species* (pages 378–379)

1. Is the following sentence true or false? When Darwin returned to England, he rushed to publish his thoughts about evolution. _____
2. The naturalist whose essay gave Darwin an incentive to publish his own work was _____.
3. Circle the letter of each sentence that is true about Darwin's book *On the Origin of Species*.
 - a. It was published in 1869.
 - b. It was ignored when it was first published.
 - c. It contained evidence for evolution.
 - d. It described natural selection.

Inherited Variation and Artificial Selection (page 379)

4. Differences among individuals of a species are referred to as _____.
5. Is the following sentence true or false? Genetic variation is found only in wild organisms in nature. _____
6. Circle the letter of each sentence that is true about artificial selection.
 - a. It is also called selective breeding.
 - b. It occurs when humans select natural variations they find useful.
 - c. It produces organisms that look very different from their ancestors.
 - d. It is no longer used today.

Evolution by Natural Selection (pages 380–382)

7. What was Darwin's greatest contribution? _____

Match each term with its definition.

Terms

- _____ 8. fitness
 _____ 9. adaptation
 _____ 10. natural selection

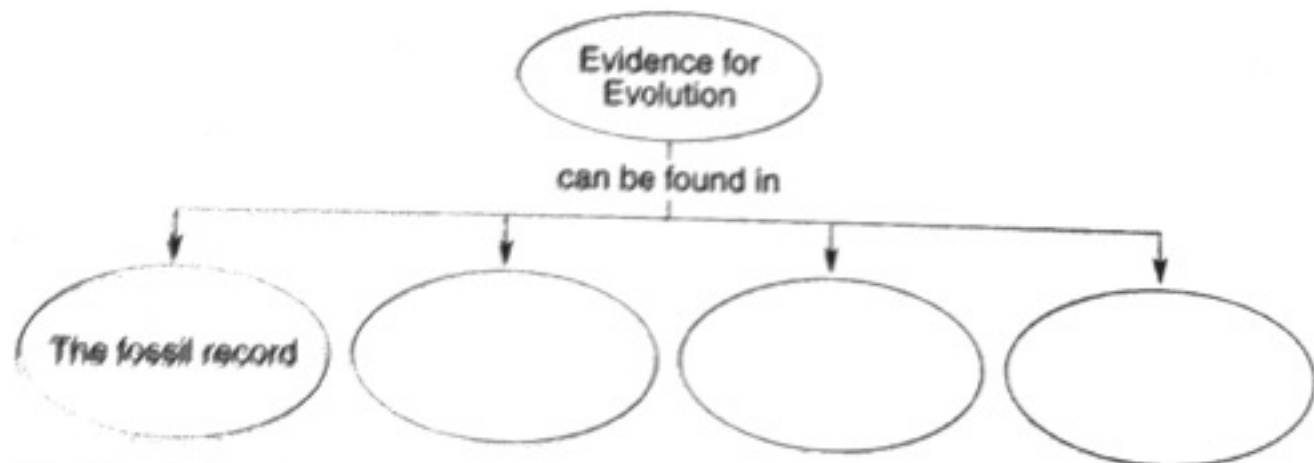
Definitions

- a. Any inherited characteristic that increases an organism's chance of survival
- b. Survival of the fittest
- c. The ability of an individual to survive and reproduce in its specific environment

11. What does the phrase *struggle for existence* mean? _____
12. Is the following sentence true or false? Adaptations can be physical characteristics but not more complex features such as behavior. _____
13. Explain what Darwin meant by the phrase *survival of the fittest*. _____
14. Circle the letter of each sentence that is true about natural selection.
- It selects traits that increase fitness.
 - It takes place without human control.
 - It can be observed directly in nature.
 - It leads to an increase in a species' fitness.
15. The principle that living species descend, with changes, from other species over time is referred to as _____.
16. The principle that all species were derived from common ancestors is known as _____.

Evidence of Evolution (pages 382-385)

17. Is the following sentence true or false? Darwin argued that living things have been evolving on Earth for thousands of years. _____
18. Complete the concept map.



19. How do fossils that formed in different rock layers provide evidence of evolution?
- _____
- _____

20. Circle the letter of the way Darwin explained the distribution of finch species on the Galápagos Islands.
- They had descended with modification from a common mainland ancestor.
 - They had descended with modification from several different mainland ancestors.
 - They had remained unchanged since arriving on the Galápagos from the mainland.
 - They had become more similar to one another after arriving on the Galápagos.
21. How did Darwin explain the existence of similar but unrelated species?

22. Structures that have different mature forms but develop from the same embryonic tissues are called _____.
23. Is the following sentence true or false? Homologous structures provide strong evidence that all four-limbed vertebrates have descended, with modifications, from common ancestors. _____
24. Organs that are so reduced in size that they are just vestiges, or traces, of homologous organs in other species are called _____.

Summary of Darwin's Theory (page 386)

25. Circle the letter of each idea that is part of Darwin's theory of evolution.
- There is variation in nature.
 - Fewer organisms are produced than can survive.
 - There is a struggle for existence.
 - Species change over time.
26. According to Darwin's theory, what happens to individuals whose characteristics are not well suited to their environment? _____
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27. Darwin believed that all organisms on Earth are united into a single tree of life by _____.

Strengths and Weaknesses of Evolutionary Theory (page 386)

28. What is the status of Darwin's hypotheses today? _____

Chapter 15 Darwin's Theory of Evolution

Vocabulary Review

Crossword Puzzle Complete the puzzle by entering the term that matches each numbered description.

Across

1. scientist whose ideas about evolution and adaptation influenced Darwin
3. ship on which Darwin traveled
7. change over time
10. explanation of natural events that is supported by evidence and can be tested with new evidence
12. economist whose ideas about human population influenced Darwin
14. remains of ancient life
15. homologous structure that is greatly reduced in size

Down

1. geologist who influenced Darwin
2. inherited characteristic that increases an organism's chance of survival
4. type of selection in which humans select the variations
5. islands where Darwin observed variation in tortoises
6. ability of an individual to survive and reproduce in its specific environment
8. type of selection Darwin referred to as survival of the fittest
9. structures that have different mature forms but develop from the same embryonic tissues
11. scientist whose ideas about evolution were the same as Darwin's
13. geologist who influenced Darwin

