

Name _____

Study Guide

A Section 12.1

Section 12.2 Darwin's Explanation

In your textbook, read about Darwin's gathering of data.

For each item in Column A, write the letter of the matching item in Column B.

Column A

- _____ 1. Darwin's job on *HMS Beagle*
- _____ 2. place where Darwin's observations confirmed his ideas about evolution
- _____ 3. what persuaded Darwin that the plants and animals of the Galapagos were related to those of distant lands
- _____ 4. meaning of *evolution* used in the early 1800s
- _____ 5. Darwin's description of *evolution*
- _____ 6. original basis for a theory of evolution

Column B

- a. similarities between Galapagos organisms and other forms of these organisms in distant lands
- b. fossil record and evidence from anatomy
- c. theory that embryos contain fully formed but miniature versions of the adult
- d. ship's naturalist
- e. descent with modification
- f. Galapagos Islands

In your textbook, read about natural selection.

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

7. According to Darwin's theory of *natural selection*, there is a tendency toward overproduction in nature.
8. The observation that some spadefoot toads mature faster than others illustrates Darwin's conclusion that *there are no variations* in populations.

Section 12.2 Darwin's Explanation continued

Circle the letter of the response that best completes the statement.

8. Darwin recognized that a population, not an individual,
 - a. breeds.
 - b. survives.
 - c. evolves.
 - d. mutates.
9. A genetic change that occurs in an individual rabbit eventually spreads through the rabbit population because
 - a. each new offspring in the population draws its genes from the same gene pool.
 - b. genetic change is contagious.
 - c. rabbits produce large numbers of offspring that survive.
 - d. rabbits live close together in burrows.

A Section 12.3 Origin of Life

In your textbook, read about the formation of organic compounds. Complete each statement.

1. Since 1936, when Alexander Oparin proposed that Earth's primitive atmosphere consisted of the gases _____, _____, and _____, other scientists have said that it consisted mainly of _____ and nitrogen gas.
2. _____ gas, essential to life as we know it today, did not exist in Earth's primitive atmosphere.

Chapter 12 Vocabulary

Review the new words in Chapter 12 of your textbook.

Match the definition in Column A with the correct term in Column B.

Column A

- _____ 1. study of developing organisms which provides evidence of evolution
- _____ 2. organism that requires a supply of organic material from the environment
- _____ 3. any breeding group of organisms
- _____ 4. structure that has no function in a living organism but which may have been of use to ancestors of the organism
- _____ 5. term for structures with similar origins among different groups of descendants of a common ancestor
- _____ 6. process in which an organism uses energy from chemical reactions to produce food
- _____ 7. early stage of a developing plant or animal
- _____ 8. organism that makes its own food through a process such as photosynthesis
- _____ 9. study of the structures of different organisms
- _____ 10. the entire evolving collection of genes in a population
- _____ 11. process by which the best adapted individuals in a population survive and produce similarly adapted offspring
- _____ 12. study of the chemistry of organisms
- _____ 13. trace, part, or all of an organism preserved or petrified that gives evidence of the organism's existence

Column B

- a. fossil
- b. autotroph
- c. homologous
- d. comparative anatomy
- e. - embryo
- f. natural selection
- g. gene pool
- h. population
- i. chemosynthesis
- j. comparative biochemistry
- k. comparative embryology
- l. heterotroph
- m. vestigial

B ADAPTATION AND SPECIATION

Section 13.1 Adaptation

In your textbook, read about the origin of adaptations.

Complete the table by checking the correct column for each adaptation.

Adaptation	Structural	Physiological	Behavioral
Ink of octopus			
Hummingbird's long bill			
Honeybee's dance			
Angler fish's filament			
Migration of birds			
Giraffe's long neck			
Plant stems growing toward light			
Proteins in spider's web			
Squirrels storing nuts			
Vampire bat's sharp teeth'			
Gila monster's venom			
Birds building nests			
Baleen in right whale's mouth			
Bird's song			
Efficiency of bird's lungs at high altitudes			

Section 13.2 Origins of Species

In your textbook, read about defining a species.

For each statement below, write true or false.

- _____ 1. Wood turtles and spotted turtles belong to the same species.
- _____ 2. Organisms are more often classified on the basis of physical features than according to a biological species concept.
- _____ 3. A species is the expression of those genes that have adaptive value in every population of that species.
- _____ 4. There is a gene pool for every species.
- _____ 5. An Irish setter and a golden retriever can interbreed and produce fertile offspring.
- _____ 6. Genes frequently pass from one gene pool to another.
- _____ 7. Horses and donkeys are distinct species, according to the biological species definition, because mules are sterile.
- _____ 8. All Galapagos finches belong to the same species.
- _____ 9. The Galapagos finches differ in their feeding behaviors and in their beak structures.

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B *In your textbook, read about the evolution of species.*

Name the evolutionary factor being described. Use these choices:

geographic isolation reproductive isolation genetic drift polyploidy

10. Gene and chromosome differences between two species have become so great that they prevent normal development of an embryo.
11. The formation of a canyon separates two groups of squirrels.
12. A change in chromosome number leads to the development of a new garden flower.
13. The eruption of Mount St. Helens in 1980 may have changed the distribution of some alleles in the population of mountain goats that inhabit that region.

Section 13.2 Origins of Species continued

In your textbook, read about other patterns of evolution.

Complete the table by checking the correct column for each trait or behavior.

	Trait or Behavior	Origin		
		Convergent Evolution	Mutual Adaptation	Hiding from Predators
14	Arctic fox turns white in winter			
15	Insects pollinate flowers			
16	Chameleon becomes the same color as its surroundings			
17	Tree frogs live in concealing tree leaves			
18	Fish and dolphins have fins			

In your textbook, read about the tempo of speciation.

Answer the following questions.

19. What is gradualism?
20. What is punctuated equilibrium?
21. What is an example of evidence that might be used to support the idea of punctuated equilibrium?

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C Section 13.3 Human Evolution

In your textbook, read about primate adaptations.

Complete the table by describing the usefulness of each trait.

Determine if the statement is true. If statement is False, rewrite-the-italicized words to make the statement true.

1. Studies of fossils of the australopithecines indicate that these early human ancestors had an average brain capacity *approximately the size of modern human brains*.
2. According to scientists, the evidence suggests that, in addition to Lucy, at least three other species of australopithecines probably evolved *as a result of genetic drift*.
3. Considering all the similarities and differences with respect to modern humans and the australopithecines, if these early ancestors were alive today, scientists *would not consider them to be human*.

In your textbook, read about African origins.

Answer the following questions.

4. What is the meaning of the term *australopithecines*?
5. What is one common misconception about Neanderthals?
6. Who were the Cro-Magnons and what were they like?

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C ADAPTATION AND SPECIATION

Chapter 13 Vocabulary

Review the new words in Chapter 13 of your textbook.

Use the terms below to complete the sentences. You will not use all the terms.

adaptive radiation
behavioral adaptation
convergent evolution
divergent evolution
genetic drift

geographic isolation
gradualism
physiological adaptation
punctuated equilibrium

reproductive isolation
speciation
species
structural adaptation

1. _____ names the process whereby species evolve in widely different ways and adapt to different roles in varying habitats.
2. Species not closely related can still evolve similar traits when they have similar roles in similar environments. This is known as _____.
3. An adaptive trait involving a part of an organism's anatomy, such as the hoof of a horse or the beak of a bird, is referred to as a(n)_____.
4. A(n) _____ is a group of organisms that can interbreed to produce fertile offspring.
5. The term for what happens when features of geography cause populations of plants and animals to separate from each other is _____.
6. The hypothesis that asserts that the normally slow and gradual process of evolution is broken by short periods of rapid evolutionary change is called_____.
7. The evolution of a new species is called _____.
8. The prevention of interbreeding and gene exchange among species is known as _____.
9. The situation in which there are rapid changes in gene pools in a small, isolated population is called _____.
10. _____ is a hypothesis of evolution that asserts that the changes in the evolution of species is slow and steady over very long periods of time.
11. When _____ occurs, one species evolves into two or more species with different characteristics.