

SECTION 15-1 REVIEW

HISTORY OF EVOLUTIONARY THOUGHT

VOCABULARY REVIEW Define the following terms.

1. evolution _____

2. natural selection _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. If Lamarck's hypothesis of species modification were true, the children of a person who developed large muscles by lifting weights would be born with
 - a. smaller-than-average muscles.
 - b. normal-sized muscles.
 - c. normal-sized muscles that would become larger only if the children also lifted weights.
 - d. larger-than-average muscles.
- _____ 2. What is the idea developed by Charles Lyell stating that the geologic processes that shaped Earth in the past continue to operate today?
 - a. inheritance of acquired characteristics
 - b. catastrophism
 - c. uniformitarianism
 - d. descent with modification
- _____ 3. Darwin used the phrase "descent with modification" to mean that
 - a. new species descended from preexisting species, and species must be able to change over time.
 - b. organisms that descend from high elevations are modified as they acquire new traits.
 - c. all living things descended from a recent common ancestor on the Galápagos Islands.
 - d. individuals modify their behavior to survive and then pass those modifications on to their descendants.
- _____ 4. According to Darwin's theory of natural selection,
 - a. individuals are modified by adverse environmental conditions.
 - b. the environment affects all organisms in a population in the same way.
 - c. populations of all organisms grow unchecked under natural conditions.
 - d. organisms that have more favorable traits tend to leave more offspring.
- _____ 5. In an evolutionary sense, an individual organism has high fitness if it
 - a. has a large number of acquired traits.
 - b. can run long distances without becoming exhausted.
 - c. reproduces more successfully than other individuals.
 - d. evolves into another organism rather than becoming extinct.

SHORT ANSWER Answer the questions in the space provided.

1. Why are acquired traits not directly related to the process of evolution? _____

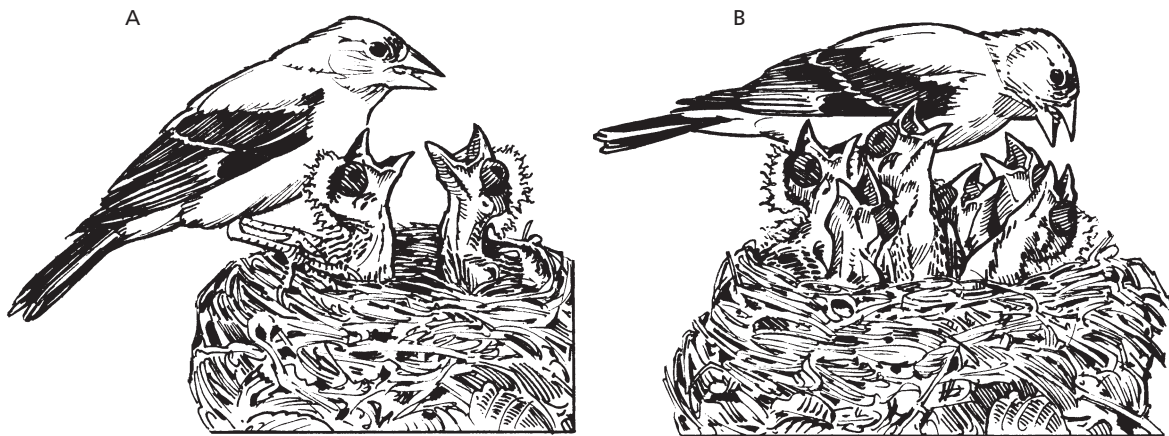
2. How did the ideas of Thomas Malthus influence Darwin's thinking about evolution? _____

3. What is the relationship between evolution and natural selection? _____

4. **Critical Thinking** If Lamarck and Darwin had debated why giraffes have such long necks, how would their explanations have differed? _____

STRUCTURES AND FUNCTIONS Use the figure to answer the following question.

Which of the parent birds shown below (*A* or *B*) appears to have greater fitness? Explain your answer.



SECTION 15-2 REVIEW

EVIDENCE OF EVOLUTION

VOCABULARY REVIEW Explain the relationship between the terms in each of the following pairs of terms.

1. homologous structure, analogous structure _____

2. fossil, principle of superposition _____

3. relative age, absolute age _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. The wing of a bat and the foreleg of an alligator are

a. analogous features.	c. vestigial features.
b. homologous features.	d. artificially selected features.

- _____ 2. Features that were useful to an ancestral organism but are not useful to a modern organism that inherited them are said to be

a. analogous.	b. homologous.	c. vestigial.	d. artificially selected.
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- _____ 3. According to the principle of superposition, the lowest layer in a cross section of a rock sequence

a. is the most recent.	c. has the fewest fossils.
b. is the oldest.	d. contains only the fossils of burrowing animals.

- _____ 4. Embryological comparisons reveal that

a. many vertebrate embryos look similar at early stages of development.	b. embryos of different vertebrates look more similar as development proceeds.
c. rabbit embryos look like adult fish.	d. gorillas begin life as fish and then develop into gorillas during an embryonic stage.

- _____ 5. Fossils are

a. remains or traces of preexisting organisms.	b. all extinct organisms.
c. deeply buried sedimentary rock strata.	d. from animals but not plants.

SHORT ANSWER Answer the questions in the space provided.

1. When trying to determine the evolutionary relationship between two species, would a biologist concentrate on homologous features or analogous features? Explain why. _____

2. If an animal has a vestigial structure, what might a biologist infer about the animal's evolutionary history? _____

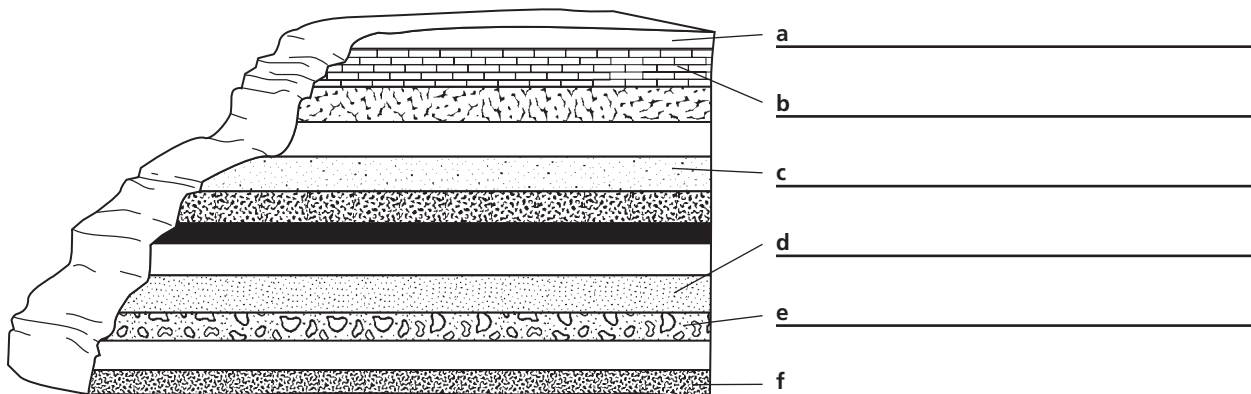
3. How does biogeography contribute to an understanding of evolution? _____

4. Explain the evidence that indicates that species evolve over time.

5. **Critical Thinking** Why do vestigial structures persist in modern organisms? _____

STRUCTURES AND FUNCTIONS Indicate the relative ages of the fossilized organisms listed below by placing them in a strata on the diagram of a cross section of sedimentary rock below.

trilobites, mammal fossils, oldest fossil, youngest fossil, first land plants, first dinosaurs



SECTION 15-3 REVIEW

EVOLUTION IN ACTION

VOCABULARY REVIEW Provide one example for each of the following terms.

1. adaptive radiation _____
2. artificial selection _____
3. coevolution _____
4. convergent evolution _____
5. divergent evolution _____
6. resistance _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. What is the process called by which different species evolve similar traits?

a. coevolution.	c. divergent evolution.
b. convergent evolution.	d. adaptive radiation.

- _____ 2. The evolutionary pattern illustrated by the finch species on the Galápagos Islands is an example of

a. coevolution.	c. divergent evolution.
b. convergent evolution.	d. artificial selection.

- _____ 3. Divergent evolution would be most likely in which of the following situations?
 - a. A group of organisms is isolated from the main population on three isolated islands with different environmental conditions.
 - b. Individuals in a large population experience the same environmental conditions.
 - c. Individuals in a small population experience the same environmental conditions.
 - d. A group of organisms which are well adapted to the environment live on a remote island.

- _____ 4. The corresponding changes of two or more species that are closely associated with each other, such as a plant and an animal that pollinates it, are called

a. adaptive radiation.	c. convergent evolution.
b. divergent evolution.	d. coevolution.

- _____ 5. In artificial selection, humans select for
 - a. a desirable trait.
 - b. an undesirable trait.
 - c. a vestigial trait.
 - d. a trait that makes the organisms less fit.

SHORT ANSWER Answer the questions in the space provided.

1. What is adaptive radiation?

2. What could happen to a tree-dwelling species of lizard if all the trees in an area died?

3. Give three examples of artificial selection. Include examples of both animals and plants.

4. **Critical Thinking** Would a species that lives a long time, but has few offspring, be more or less likely to become extinct after a sudden change in its environment than a species that has a short life, but produces large numbers of offspring? Explain.

STRUCTURES AND FUNCTIONS

The diagram shows several groups of primates and a hypothesis of how they are related based on differences in DNA. What pattern of evolution does the diagram represent? According to this hypothesis, when did the rhesus monkey and the green monkey diverge? Which group of primates existed before the others?

