CHAPTER 10
Principles of Evolution

**SECTION
10.4**

EVIDENCE OF EVOLUTION
Reinforcement

KEY CONCEPT Evidence of common ancestry among species comes from many sources.

Darwin found evidence supporting evolution from a wide range of sources. The most important and convincing support came from fossils, geography, embryology, and anatomy.

- The fossil is a record of change in a species over time. Geologists found that fossil organisms on the bottom, or older, layers were more primitive than those in the upper, or newer, layers. These findings supported Darwin's concept of descent with modification.

- **Biogeography,** the study of the distribution of organisms around the world, reveals a pattern of evolution of organisms. Darwin's observations on the Galapagos islands, for instance, demonstrated that species can adapt to different environments and evolve into separate populations or species over time.

- Embryology, the study of embryo development, reveals that even organisms that are very different from each other in their adult forms can have similar patterns of development. Two species that exhibit similar traits during development are likely to have a common ancestor.

- Anatomy also provides insight into evolution. **Homologous structures** are features that are similar in structure but appear in different organisms and have different functions. **Vestigial structures** are remnants of organs or structures that had a function in an early ancestor. Both homologous structures and vestigial structures point to a shared ancestry among organisms that share them.

1. How did the study of fossils help support Darwin's ideas about evolution?

2. How did the study of organisms on islands help support Darwin's ideas?

3. In all animals with backbones, including humans, early embryos have gill slits that later develop into structures of ears and throats in mammals. What does this suggest about the relationship between all vertebrates?

4. What are two examples of types of body structures that provide evidence of a common ancestor among diverse organisms?