

Darwin's Finches

▲ Justifying Conclusions

Have students examine the four finches illustrated in Figure 10-2, paying particular attention to their beaks. Tell them to imagine themselves in Darwin's place as he studied these birds. Then have them write journal pages that Darwin could have written as he later examined his notes about the finches to understand the mechanism of evolution.



Active READING

● Technique: Reader Response Logs

Students may already hold opinions about the origin of species. So that students can make personal responses to the concepts presented in Chapter 10, have them create a Reader Response Log. Remind students to divide their paper in half. On the left side of the paper, have them copy a word, phrase, or passage from the text. On the right side, have them write their reactions, thoughts, or questions regarding the entries on the left side of the paper.

Changes in Finch Population

■ Predicting Outcomes

In 1977, the Galápagos Islands suffered a severe drought. Plants that produced small, soft seeds were devastated. In turn, a species of finch that fed on these seeds was similarly affected. As its source of food became depleted, this finch population declined by 85 percent. Ask students to describe the type of finch that would have been able to survive this drought. (*Only birds with beaks strong enough to crack large, hard seeds survived.*) As a result, the composition of this species changed so that the average body and beak size of its members increased dramatically. The situation was reversed in 1983, when heavy rains prevailed.

When the *Beagle* sailed from England, Darwin, like nearly all scientists of his time, accepted the view that God was responsible for the creation of all species of organisms. According to this view, God designed each species of animal and plant to match its habitat. This explained why, for example, polar bears, which live in a very cold climate, have white fur for camouflage and a

thick layer of insulating fat beneath the skin. In addition, most scientists thought that species were unchanging.

During his journey, Darwin often left the ship to collect specimens of animals, plants, and fossils. He made careful observations and recorded them in a journal. What Darwin saw on his voyage led him to doubt the idea that species were constant.

Darwin's Finches

Darwin repeatedly saw patterns in how kinds of animals and plants differed, patterns suggesting that species changed over time and gave rise to new species. On the Galápagos Islands, 1,000 km (600 mi) from the coast of Ecuador, Darwin collected several species of finches. All of these species were similar, but each was specialized to catch food in a different way, as shown by the different shapes of the birds' bills in Figure 10-2. Some species had thick, sturdy bills for cracking open tough seeds. Others had slender bills for catching insects.

All of the species of finches closely resembled one species of South American finch. In fact, all of the plants and animals of the Galápagos Islands were very

similar to those of the nearby coast of South America. If each one of these plants and animals had been created to match the habitat on the Galápagos Islands, why did they not resemble the plants and animals of islands with similar environments that lie off the coast of Africa? Why did they instead resemble those of the adjacent South American continent? Darwin felt that the simplest explanation was that a few organisms from South America must have migrated to the Galápagos Islands in the past. These few kinds of animals and plants then changed over the years that they lived in their new home, giving rise to many new species. Change in species over time is known as evolution.



Figure 10-2
The blue-black grassquit (inset), native to the Pacific coast from Mexico to Chile, is thought to be very similar or identical to the ancestor of the Galápagos finches (below). Darwin attributed the differences in bill size and feeding habits among these finches to evolution that occurred after their ancestor migrated to the Galápagos islands.



a The woodpecker finch captures insects with its grasping bill.



b The crushing bill of the large ground finch enables it to feed on seeds.



c The cactus finch uses its probing bill to feed on cactuses.

Community Connection: Ecotourism

Ecotourism is a growing industry that is thriving in once-remote areas of the world. Although this new industry is providing a much-needed economic boost to many developing regions of the world, it is also threatening ecosystems that had been spared the adverse effects of human presence until recently. Have students search the library or an on-line database for information about ecotourism. Have them look for specific information about ecotourism in the Galápagos Islands and how it is affecting the fragile environment. Then have students debate whether ecotourism should be encouraged, restricted, or prohibited.