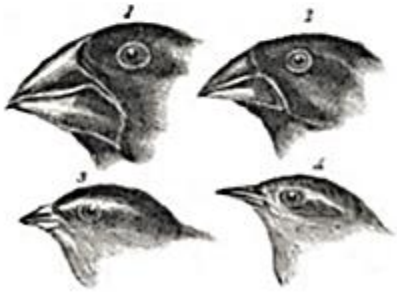
DARWIN'S THEORY OF NATURAL SELECTION

In 1831, **Charles Darwin** left England on board the HMS *Beagle*. On his five-year voyage, Darwin made many important observations, included the diversity of living things, the remains of ancient organisms, and the characteristics of organisms living on the Galapagos Islands, off the west coast of Ecuador. Many of Darwin's ideas were used to create his now-famous **theory of evolution**. A scientific **theory** is a well-tested concept that explains a wide range of observations in a clear and measurable way.

In 1835, the *Beagle* reached the Galapagos Islands in the Pacific Ocean. Darwin was surprised that many of the plants and animals on the Galapagos Islands were similar to the organisms on mainland South America. However, there were also important differences. Darwin hypothesized that a small number of different species had come to the islands from the mainland. Over millions of years, their offspring became different from their mainland relatives.



The small finches on the Galapagos Islands were noticeably different from one another. The most obvious differences were the varied sizes and shapes of the birds' beaks. Beak shape is an example of an **adaptation**, a trait that helps an organism to survive and reproduce. Darwin reasoned that plants or animals that arrived on the Galapagos Islands faced conditions that were different from those on the mainland.

Darwin deduced that the species may have gradually changed over many generations and became better adapted to their new habitats. The gradual change in one species over time is called **evolution**.

In his book *On the Origin of Species*, Darwin proposed that evolution occurs by a process called natural selection. **Natural selection** is the process by which individuals that are better adapted to their environment are more likely to survive and reproduce than other members of the same species. A number of factors affect natural selection: overproduction, competition, and variations. Any difference between individuals of the same species is called a variation. Some variations make certain individuals better adapted to their environment because of helpful traits they possess. **Darwin proposed that, over a long period of time, helpful variations may gradually accumulate in a species, while unfavorable variations may disappear.** Without variations, all members of the same species would have the same traits. Only traits that can be passed down from parent to offspring, or are inherited, can be acted upon by natural selection.