

## Chapter 5: Changes Over Time Outline

### I. Darwin's Theory

- A. Darwin's important observations included the diversity of living things, the remains of ancient organisms, and the characteristics of organisms on the Galápagos Islands.
- B. Darwin reasoned that plants or animals that arrived on the Galápagos Islands faced conditions that were different from those on the mainland. Perhaps, Darwin hypothesized, the species gradually changed over many generations and became better adapted to the new conditions.
- C. Darwin proposed that, over a long period of time, natural selection can lead to change. Helpful variations may gradually accumulate in a species, while unfavorable ones may disappear.
- D. Terms
  - a. Species
  - b. Fossil
  - c. Adaptation
  - d. Evolution
  - e. Scientific theory
  - f. Natural selection
  - g. Variation

### II. Evidence of Evolution

- A. Fossils, patterns of early development, and similar body structures all provide evidence that organisms have changed over time.
- B. Scientists have combined the evidence from DNA, protein structure, fossils, early development, and body structure to determine the evolutionary relationships among species.
- C. A new species can form when a group of individuals remains separated from the rest of its species long enough to evolve different traits.
- D. Terms
  - a. Homologous structures
  - b. Branching tree

### III. The Fossil Record

- A. Most fossils form when organisms that die become buried in sediments.
- B. Scientists can determine a fossil's age in two ways: relative dating and radioactive dating.
- C. The calendar of Earth's history is sometimes called the Geologic Time Scale.
- D. Two unanswered questions about evolution involve mass extinctions and the rate at which evolution occurs.
- E. Terms
  - a. Petrified fossil

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- b. Mold
- c. Cast
- d. Relative dating
- e. Radioactive dating
- f. Radioactive element
- g. Half-life
- h. Fossil record
- i. Extinct
- j. Gradualism
- k. Punctuated equilibria