Name _____ Date _____ Class _____

Classifying Organisms

Guide for Reading

- Why do biologists organize living things into groups?
- What do the levels of classification indicate about the relationships among organisms?
- How are taxonomic keys useful?
- What is the relationship between classification and evolution?

Classification is the process of grouping things based on their similarities. **Biologists use classification to organize living things into groups so that the organisms are easier to study.** The scientific study of how living things are classified is called **taxonomy.**

The first scientist to develop a classification system for organisms was the Greek scholar Aristotle. Aristotle observed and divided animals into three groups: those that fly, those that swim, and those that walk, run, or crawl.

The Swedish scientist Carolus Linnaeus created a naming system for organisms called **binomial nomenclature,** in which each organism is given a two-part name. The first part of an organism's scientific name is its genus. A **genus** is a classification grouping that contains similar, closely related organisms. The second part of an organism's scientific name sets each species apart from one another in the genus. A **species** is a group of similar organisms that can mate and produce offspring that can also mate and reproduce.

Modern biologists classify organisms into eight levels. A domain is the broadest level of organization. Within a domain, there are kingdoms. Within a kingdom, there are phyla, and within each phylum there are classes. Each class is divided into orders. Each order contains families, and each family contains at least one genus. Within a genus, there are species. Organisms are grouped by their shared characteristics. **The more classification levels that two organisms share, the more characteristics they have in common.**

You can identify organisms with field guides and taxonomic keys. Field guides are books with illustrations that highlight differences between similar-looking organisms. **Taxonomic keys are useful tools for determining the identity of organisms.** A taxonomic key is a series of paired statements that describe the physical characteristics of different organisms.

The British scientist Charles Darwin published a theory about how species can change over time. He observed that two groups of the same species can accumulate enough differences over a long time to become two separate species. This process by which species gradually change over time is called **evolution.**

The theory of evolution changed the way biologists think about classification. Scientists understand that certain organisms are similar because they share a common ancestor. **Species with similar evolutionary histories are classified more closely together.** Scientists get information about the evolutionary history of species primarily by examining the chemical makeup of the organisms' cells.