

SECTION 6 - 1

SECTION SUMMARY

Classifying Organisms

Guide for Reading

- ◆ Why do scientists organize living things into groups?
- ◆ 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, crawl, or run.

The Swedish scientist Carolus Linnaeus created a naming system for organisms called **binomial nomenclature**, where 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 is its species name. A **species** is a group of similar organisms that can mate and produce fertile offspring in nature.

Modern biologists classify organisms into seven levels. A kingdom is the broadest level of organization. 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.

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 by studying fossils, comparing the body structures of living organisms, comparing the early development of organisms, and by examining the chemical makeup of cells.

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