

APPENDIX: Readings for Quizzes

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Chapter 1, Quiz 3 (page 34)

Taxonomy

Among the fundamental principles of biological science is the concept of taxonomy, that living things can be classified according to their physical traits. Animals, for example, are so different from plants that they belong together in a distinct grouping, the Animal Kingdom. Those animals that have a spinal column are then further grouped together as the phylum Chordata, because this physical trait makes them so different from animals (such as insects) that do not have it. The ultimate classification, the species, is considered definitional—that is, it is the ultimate determination of whether individuals are biologically similar enough to interbreed and produce offspring that can also interbreed.

Some taxonomic terms are very familiar and have become part of ordinary conversation. A speaker of English who refers to *Homo sapiens* can legitimately expect the listener to know that this Latin phrase means “a human.” Most often-used taxonomic terms follow the pattern shown in *Homo sapiens*—a term for genus (e.g., *Homo*) followed by a term for species (e.g., *sapiens*). A common mouse is *Mus musculus*, while the kind of rat usually used in laboratory experiments is *Rattus norvegicus*. Despite their similar appearance, a rat and a mouse do not belong to the same genus, much less the same species.

A wolf is *Canis lupus*, while a dog is *Canis familiaris*. The obvious similarities between wolves and dogs reflect their membership in the genus *Canis*, but their differences are significant enough for them to be placed in separate species.

The taxonomic system currently used is essentially the one devised by the Swedish botanist Carolus Linnaeus (also known as Karl von Linné) in the middle of the 18th century. It is deeper than popular two-word terms like *Canis lupus* might suggest. The wolf belongs not only to a genus and a species but to many larger groups as well:

Kingdom: Animalia (animals)

Phylum: Chordata (vertebrates)

Class: Mammalia (mammals)

Subclass: Eutheria (placental mammals, as opposed to egg-laying mammals)

Order: Carnivora (meat-eaters)

Family: Canidae (the dog family)

Genus: *Canis* (modern dog-like creatures, such as wolves and coyotes)

Species: *lupus* (wolf)

By working backward through this system from *lupus* to *animalia*, one can see ever-larger groups to which an individual belongs. The Linnaean system of taxonomy was devised long before the genetic makeup of individuals was known, yet modern DNA analysis generally supports this classification scheme.