

Some help with your homework assignment –

We group organisms based on their similarities into taxonomic groups or taxa. ( A taxon is just a named group of organisms). Linnaean taxonomy is a formal system for classifying and naming living things based on a simple hierarchical structure. Organisms are classified using an artificial system of grouping by similar features, or body construction. The major groups of organisms are subdivided into smaller and smaller groups on the basis of how closely the organisms resemble one another. The genus and species names are underlined. The name of the genus is capitalized, but the name of the species is not. The basic hierarchy is as follows:

<b>Kingdom</b>	Example:
<b>Phylum</b>	Animalia (animals)
<b>Class</b>	Chordata (chordates)
<b>Order</b>	Mammalia (mammals)
<b>Family</b>	Primates (primates)
<b>Genus</b>	Hominidae (great apes and humans)
<b>Species</b>	<u>Homo</u> (humans)
	<u>Homo sapiens</u> (human)

There are five kingdoms of organisms (Organisms from all 5 kingdoms are known as fossils.):

1. **Animalia** (animals)
2. **Plantae** (plants)
3. **Monera** (bacteria and blue-green algae)
4. **Fungi** (mushrooms, fungus)
5. **Protocista** or **Protista** (single-celled organisms)

All organisms are composed of cells. There is a fundamental difference between organisms based on the type of cells:

1. Cells with a nucleus (or nuclei) - Eukaryotic cells
2. Cells without a nucleus - Prokaryotic cells - Kingdom Monera only.

Revisions of this classification scheme have been proposed, based on evolutionary relationships determined through the study of molecular structures and sequences. In one revision recently proposed, organisms would be grouped into three superkingdoms or domains:

1. **Bacteria** (monera)
2. **Archaea** (sometimes called archaebacteria (perhaps incorrectly))
3. **Eucarya** (animals, plants, fungi, and protists)

Animals can be grouped into the **invertebrates** (animals without backbones) and the **vertebrates**.

There are more than 20 invertebrate Phyla, but the chief ones that are preserved as fossils include:

1. Phylum **Porifera** - the sponges
2. Phylum **Cnidaria** (formerly Coelenterata) - the corals and jellyfish

3. Phylum **Bryozoa** - the colonial moss animals
4. Phylum **Brachiopoda** - the brachiopods or lamp shells
5. Phylum **Arthropoda** - the insects, crabs, shrimp, lobsters, trilobites and eurypterids
6. Phylum **Mollusca** - the clams, snails, octopus, squid, nautilus, and ammonites
7. Phylum **Echinodermata** - the starfish, sand dollars, sea urchins, crinoids, and blastoids

The vertebrates (including us) belong to Phylum Chordata (referring to the nerve chord that extends down the center of the spine). Important groups in vertebrate paleontology are:

#### Phylum Chordata

Subphylum Vertebrata - bilateral symmetry, bone and/or cartilage

Class **Agnatha** - jawless fish (Cam-R)

Class **Acanthodii** - primitive jawed, spiny fish (Dev - Perm)

Class **Placodermi** - archaic jawed fish (Sil-Perm)

Class **Chondrichthyes** - shark, skate, ray (Dev-R) cartilagenous fish

Class **Osteichthyes** - bony fish, crossopterygians (Sil-R)

Class **Amphibia** - frogs, salamanders, labyrinthodonta (Dev-R)

Class **Reptilia** - turtle, snake, lizard, alligator, dinosaur (Penn-R)

Class **Aves** - birds, Archaeopteryx - (Jur) (Trias-R)

Class **Mammalia** - dog, opossum, man, horse (Trias-R)

Even the seven-fold hierarchical system, with its multiple ranks, was ultimately not sufficiently detailed. As knowledge of the natural world progressed and the number of groups of organisms identified became larger and larger, it became necessary to create further subcategories. These include Tribe between Family and Genus; and Division and Cohort between Class and Order. Moreover, each category can also have prefixes to create a higher grouping (super-), or lower (sub-, infra-) subdivisions. So now there is also superorder, suborder, infraorder, subgenus, and subspecies. Again, each is arranged in nested ranks, e.g. there may be a number of superfamilies in each infra-order, and so on.

For the purposes of this class, a Subphylum and a Superclass are the same thing.