

NOTES: GEORGIA HIGH SCHOOL SCIENCE TEST
THE ANIMAL KINGDOM
Classification of animals

Animal Kingdom can be split up into main groups, vertebrates (with a backbone) and invertebrates (without a backbone). When you think of an animal, you usually think of something like a cat, a dog, a mouse, or a tiger. All told, around 800,000 species have been identified in the Animal Kingdom -- most of them in the Arthropod phylum. In fact, some scientists believe that if we were to identify all species in the tropical rain forests the ranks of Arthropoda would swell to over 10 million species! Most people do not normally think of a clam, a jellyfish, or an earthworm as an animal.

Yet all of them belong to the kingdom of animals. The science of classifying organisms is called taxonomy.

In order to study living things, scientists classify each organism according to its:

Kingdom

Phylum

Class

Order

Family

Genus

Species

Usually, a species is called by its genus name (capitalized) followed by its species name (lower case), so a human being is called *Homo sapiens*. In Latin that means "wise man."

To date there are five kingdoms: Animalia, which is made up of animals; Plantae, which is made up of plants; Protista, which is made up of protists (single-celled creatures invisible to the human eye); Fungi, which is made up of mushrooms, mold, yeast, lichen, etc; and Monera, which is made up of the three types of bacteria.

The next category is the Phylum. There are several phyla within each kingdom. The phyla start to break the animals (or plants, fungi, etc) into smaller and more recognizable groups. The best known phylum is Chordata, which contains all animals with backbones (fish, birds, mammals, reptiles, amphibians). There is also Arthropoda (insects, spiders, crustaceans); Mollusca (snails, squid, clam); Annelida (segmented worms); Echinodermata (starfish, sea urchins) and many, many more.

The next category that makes up the phyla is the Class. The class breaks up animals into even more familiar groups. For example, the phylum Chordata is broken down into several classes, including Aves (birds), Reptilia (reptiles), Amphibia (amphibians), Mammalia (mammals) and several others.

The next category is the Order. Each class is made up of one or more orders. Mammalia can be broken down into Rodentia (mice, rats), Primates (Old- and New-World monkeys), Chiroptera (bats), Insectivora (shrews, moles), Carnivora (dogs, cats, weasels), Perissodactyla (horses, zebras), Artiodactyla (cows), Proboscidea (elephants) and many more.

Orders can then be broken down into Families. The order Carnivora can be broken down into Canidae (dogs), Felidae (cats), Ursidae (bears), Hyaenidae (hyaenas, aardwolves), Mustelidae (weasels, wolverines), and many more.

The next category is the Genus. The family Felidae, for example, can be broken down into Acinonyx (cheetah), Panthera (lion, tiger), Neofelis (clouded leopard) and Felis (domestic cats).

Finally, the genus is broken down into the Species. The genus Panthera can be broken down to include Panthera leo (lion) and Panthera tigris (tiger). Note that the genus is placed in front of the species.

Main group of Invertebrates are :

The largest and most commonly studied phyla of animals are:

1. Porifera (sponges)
2. Cnidaria (jellyfish, hydras, sea anemones, Portuguese man-of-wars, and corals)
3. Platyhelminthes (flatworms, including planaria, flukes, and tapeworms)
4. Nematoda (roundworms, including rotifers and nematodes)
5. Mollusca (mollusks, including bivalves, snails and slugs, and octopuses and squids)
6. Annelida (segmented worms, including earthworms, leeches, and marine worms)
7. Echinodermata (including sea stars, sea cucumbers, sand dollars, and sea urchins)
8. Arthropods (including arachnids, crustaceans, millipedes, centipedes, and insects)
9. Chordata (animals with nerve chords - this group includes the vertebrates)

At least four classification systems are in common use: Plants are classified into 12 phyla or divisions based largely on reproductive characteristics; they are classified by tissue structure into non-vascular (mosses) and vascular plants (all others); by "seed" structure into those that reproduce through naked seeds, covered seeds, or spores; or by stature divided into mosses, ferns, shrubs and vines, trees, and herbs.

All of these higher-level groupings are decidedly lopsided: the vast majority of the 270,000 plant species are flowering herbs. The categories listed below provide slightly better balance: the largest phylum has been split while the other phyla are grouped according to one or more of the methods described above.

Mosses and Allies (Bryophyta and allies)

Mosses are non-vascular plants -- they cannot transport fluids through their bodies. Instead, they must rely on surrounding moisture to do this job for them.

Though small in stature, mosses are very important members of our ecosystem. They lay the foundations for other plant growth, prevent erosion, and contribute to the lush green appearance of many forested areas.

The 24,000 bryophyte species, sometimes grouped into a single phylum are now grouped in three phyla: Mosses (Bryophyta), Liverworts (Hepatophyta) and Hornworts (Anthoceraphyta). They reproduce by spores, never have flowers, and can be found growing on the ground, on rocks, and on other plants.
Ferns and Allies (Pteridophyta and allies)

Ferns and allies have a vascular system to transport fluids through their bodies but like the mosses, they reproduce from spores rather than seeds. The main phylum, the Ferns (Filicinophyta = Pteridophyta) includes around 12,000 species.

Three other phyla are included as fern allies: the Horsetails (Sphenophyta = Equisetophyta, 40 species; right, accompanied by an orchid), Club mosses (Lycopodophyta, 1,000 species), and Whisk ferns (Psilophyta, 3 species)

Conifers and Allies (Gymnosperms = Coniferophyta and allies)

The gymnosperms add the next level of complexity to plant evolution: they reproduce from seeds instead of spores. The seeds, however, are "naked" (Greek: gummnos) -- not covered by an ovary. Usually, the seed is produced inside a cone-like structure such as a pine cone hence the name "conifer." Some conifers, such as the Yew and Ginko, produce their seeds inside a berry-like structure.

Conifers are fairly easy to identify: In addition to the aforementioned cones, these trees and shrubs typically have needle-like, scale-like or awl-like leaves. And they never have flowers.

Approximately 600 species are counted as conifers including the pines, firs, spruces, cedars, junipers, and yew. Species within the conifer ranks give us pine nuts -- pesto's magic ingredient -- as well as juniper berries for gin.

Conifer allies include three small phyla containing fewer than 200 species all together: Ginko (Ginkophyta) with a single species: the Maidenhair Tree (Ginko biloba); palm-like Cycads (Cycadophyta) ; and herb-like cone-bearing plants (Gnetophyta) such as Ephedra.

Flowering Dicot Plants (Angiospermophyta, Class Dicotyledoneae)

Angiosperms add the final improvement to plant reproduction: they grow their seeds inside an ovary (Greek: angeion = vessel) which is, itself, embedded in a flower. After it is fertilized, the flower falls away and the ovary swells to become a fruit.

Angiosperms in the class Dicotyledoneae grow two seed-leaves (cotyledons). In addition, foliage leaves typically have a single, branching, main vein originating at the base of the leaf blade, or three or more main veins that diverge from the base.

The vast majority of plants are Dicots. Most trees, shrubs, vines, and flowers belong to this group of around 200,000 species. Most fruits, vegetables and legumes come from this class.

(Angiospermophyta is also called Anthophyta or Magnoliophyta)

Flowering Monocot Plants (Angiospermophyta, Class Monocotyledoneae)

Monocots start with one seed-leaf. The main veins of their foliage leaves are usually unbranched and nearly parallel to each other. Around 30,000 plants are classified as monocots including many of the prettiest members of kingdom Plantae: orchids, lilies, irises, palms and even the Bird-of-Paradise plant. The grasses which carpet our lawns and meadows are also monocots.

Monocots provide us with our primary sources of nutrition, supplying us and the animals we eat with **grains such as wheat, oats, and corn, as well as fruits such as dates and bananas.**