

**Subclass Dicotyledonae** – those angiosperms that produce seeds that can be divided into two embryonic seed leaves (cotyledons). The embryonic food for these seeds is stored in the cotyledons.

## Kingdom Animalia

The Animal Kingdom includes those organisms that are multicellular and ingestive, meaning that they consume nutrients and digestive them within the confines of their body structures.

**Phylum Porifera** (sponges) – These simple animals lack tissues. Life processes are managed on a cellular level through the support of some highly specialized cells such as collar cells and pore cells. They have radial symmetry where their cells depend on the flow of water through a central canal to bring in oxygen-rich water and food particles and to carry away wastes.

**Phylum Cnidaria** – These animals have two tissue layers; ectoderm and endoderm separated by a less specialized layer called mesoglea. Their uniting feature is the presence of cnidoblast cells (AKA nematocysts, or stinging cells), used for defense and snaring prey. These animals have radial symmetry and two possible body forms: polyp (sessile) and medusa (motile). Although they have developed some simple nerve tissue, they lack cephalization.

**Class Hydrozoa** – (*Hydra*, *Obelia*, man-o-war). These fresh-water cnidarians have a very dominant polyp body form. Typically, they have six tentacles equipped with stinging cells surrounding a central mouth, which extends into a gastrovascular cavity where digestion occurs. They are well known for asexual reproduction by budding.

**Class Scyphozoa** – (jellyfish). These cnidarians, though they are capable of movement, are generally considered to be planktonic (floaters) in the ocean. Typically, they have a dominant sexually reproducing medusa body form, which alternates with a sessile medusa-producing polyp form.

**Class Anthozoa** – (sea anemone). These are the most massive of the cnidarians. Lacking a motile stage they can be found growing in clusters on immovable objects in intertidal and shallow waters. Their abundance of tentacles makes them relatively efficient food gatherers.

**Phylum Platyhelminthes** (flatworms). These animals are the simplest of three phyla of “worms”. They show some significant advances over the cnidarians such as: three tissue layers, bilateral symmetry, and cephalization. All platyhelminthes are flattened in a dorso-vental direction. Most platyhelminthes are hermaphroditic.

**Class Turbellaria** (planarians). These small fresh-water flatworms are quite distinctive because of their arrowhead-shaped anterior end, containing the ganglia, which mark the location of their two light sensitive eyespots. Planarians are free-living as opposed to being parasitic like the other members of this phylum.

**Class Trematoda** (flukes). These parasitic flatworms have complex life cycles with more than one host helping to ensure that the larvae are dispersed from the adults.

**Class Cestoda** (tapeworms). Similar to flukes, tapeworms have complex life cycles. Typically, the adults attach to the inside of intestinal walls of mammals by their scolex (specialized anterior end). They absorb nutrients from the semi-fecal material and develop proglottids, which are specialized segments with complete male and female reproductive organs. Mature proglottids break free and are expelled along with feces.

**Phylum Nematoda** (round worms) – (Examples: *Ascaris*, filaria worm, hook worm). Many nematodes are also parasitic, but they display some significant advances over the planarians, such as a complete tube-like intestine. This permits the development of separate mouth and anus and an internal body cavity, called a pseudocoelom, separating their intestine from their body wall. Nematodes are still disadvantaged by the lack of an internal musculature around their intestine.

**Phylum Annelida** (segmented worms). A circular body plan displaying repeating body segments is the pronounced feature of this phylum. These worms show some significant advances over the nematodes such as the development of a circulatory system, excretory system, and a true coelom, separating the digestive system from the musculature of the rest of the body. This separation allows the digestive system to specialize and develop organs. Annelids are hermaphroditic.

**Class Oligochaeta** (earthworms). The prefix “oligo” means “few”. These common free-living