Module 8: Biological Oceanography
Topic 2 Content: Marine Organism Classification Notes

Scientists now know that there are more than 250,000 known marine species in existence, and this number will rise as more species are discovered. The vastness of the ocean environment makes it difficult to estimate the total number of marine species. In an effort to organize these species and make them easier to study, scientists have created methods for classification. How are all of these organisms classified?

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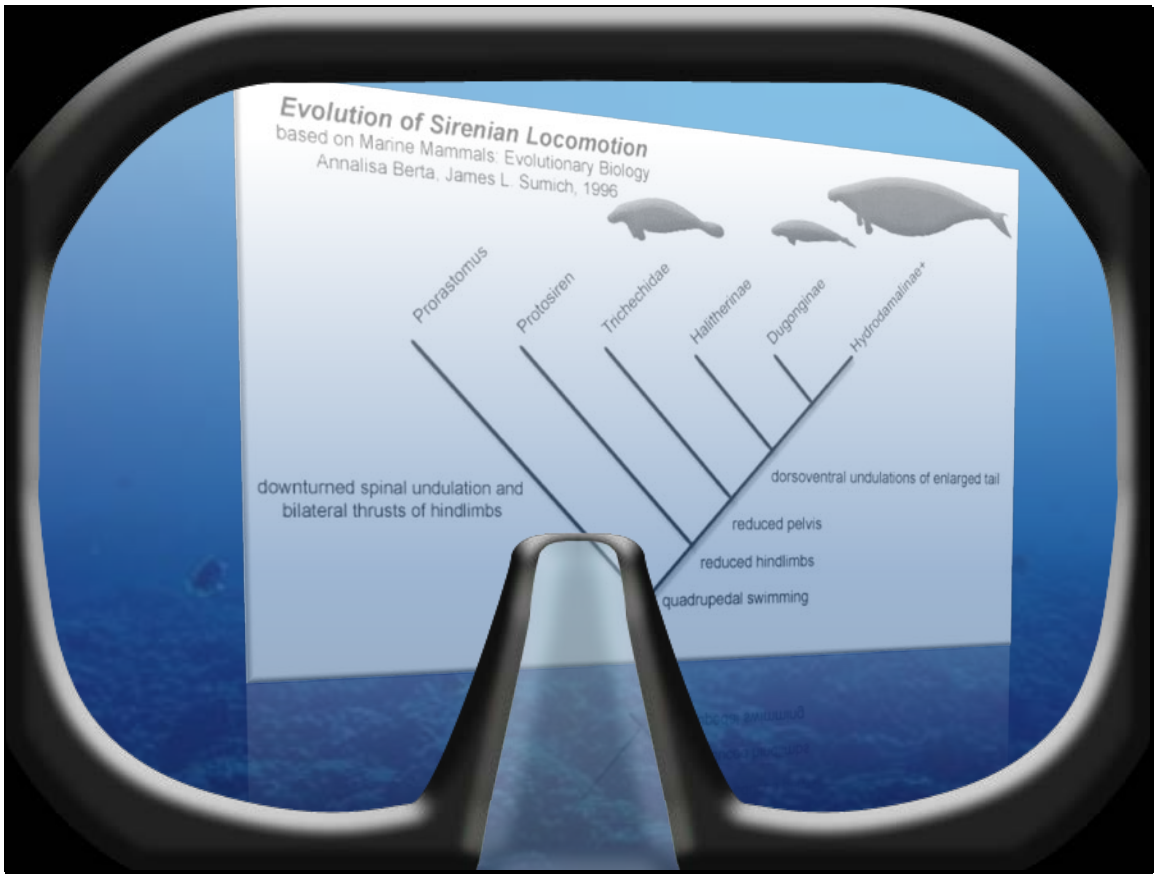


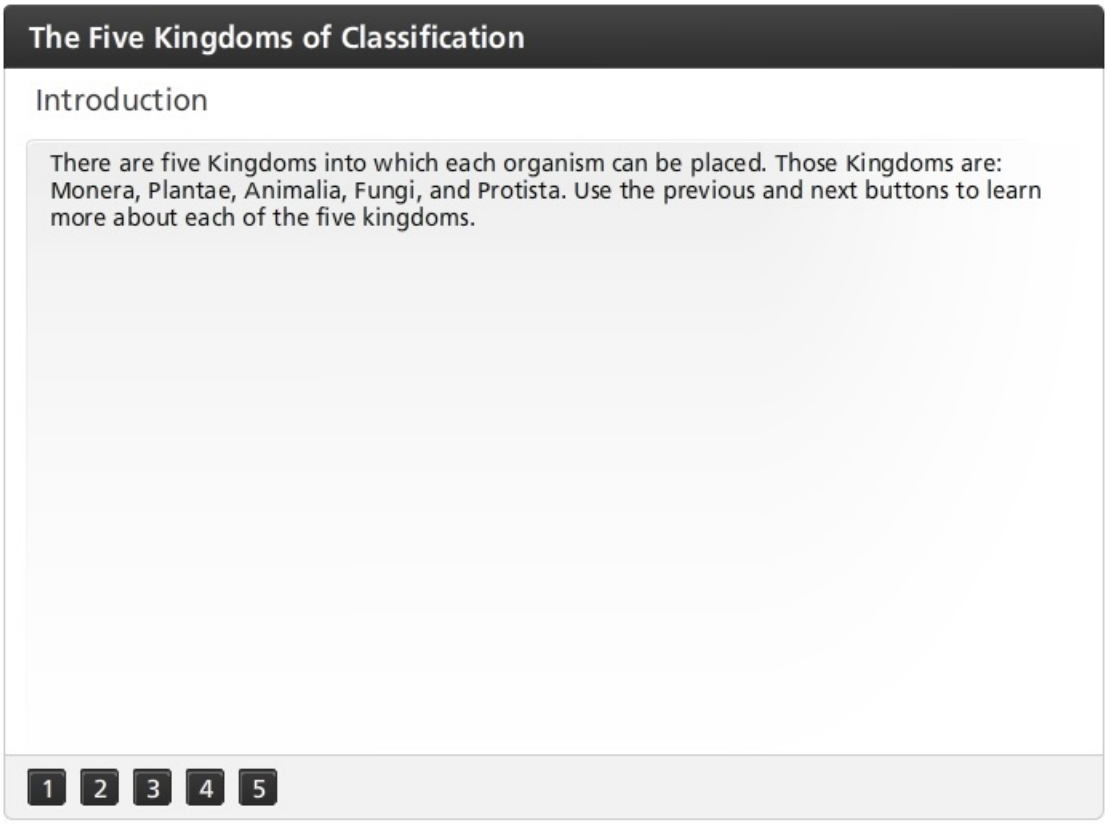
Marine organisms, like all other organisms, are grouped according to their physical characteristics. Often, these grouping are based on the theory of evolution which states that species change over time and diverge to form new species. Those species that are most closely related share a common ancestor.

Organisms that share common characteristics are grouped more closely than those that share fewer common characteristics. This type of classification is called phylogenetic classification. These relationships are often presented as tree-like structures that show the common ancestry, along with other species with similar characteristics. The phylogenetic tree shown here is for the Order Sirenia, which includes Manatee Species.

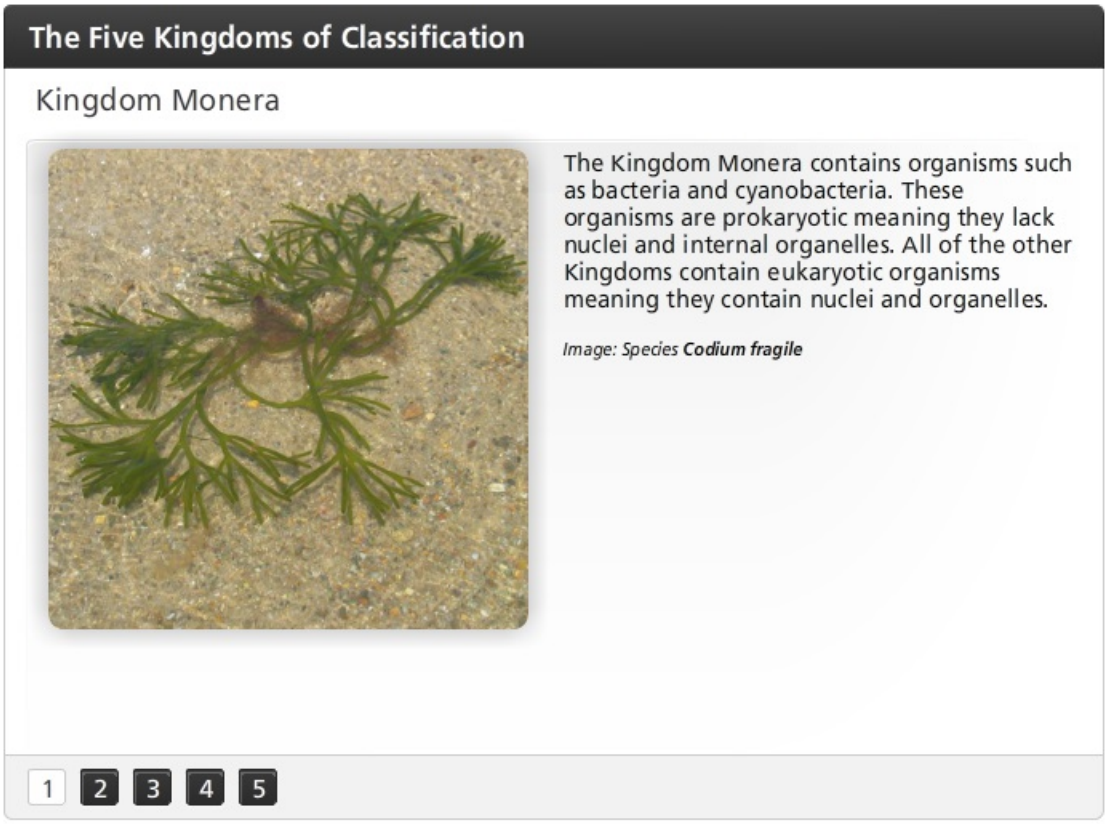
Once categorized, each organism is assigned a Latin name which is then standardized and used by scientific communities throughout the world. The categories in the scientific naming system are: Kingdom, Phylum, Class, Order, Family, Genus, and Species. Each of these categories contain like groups of the category below it. For example, each kingdom contains several Phyla, each Phylum contains several Classes, each Class contains several Families, and so on.

You can remember these categories by learning the following pneumonic: King Phillip Came Over From Germany Saturday.

Shown here are the full classifications for several marine organisms.



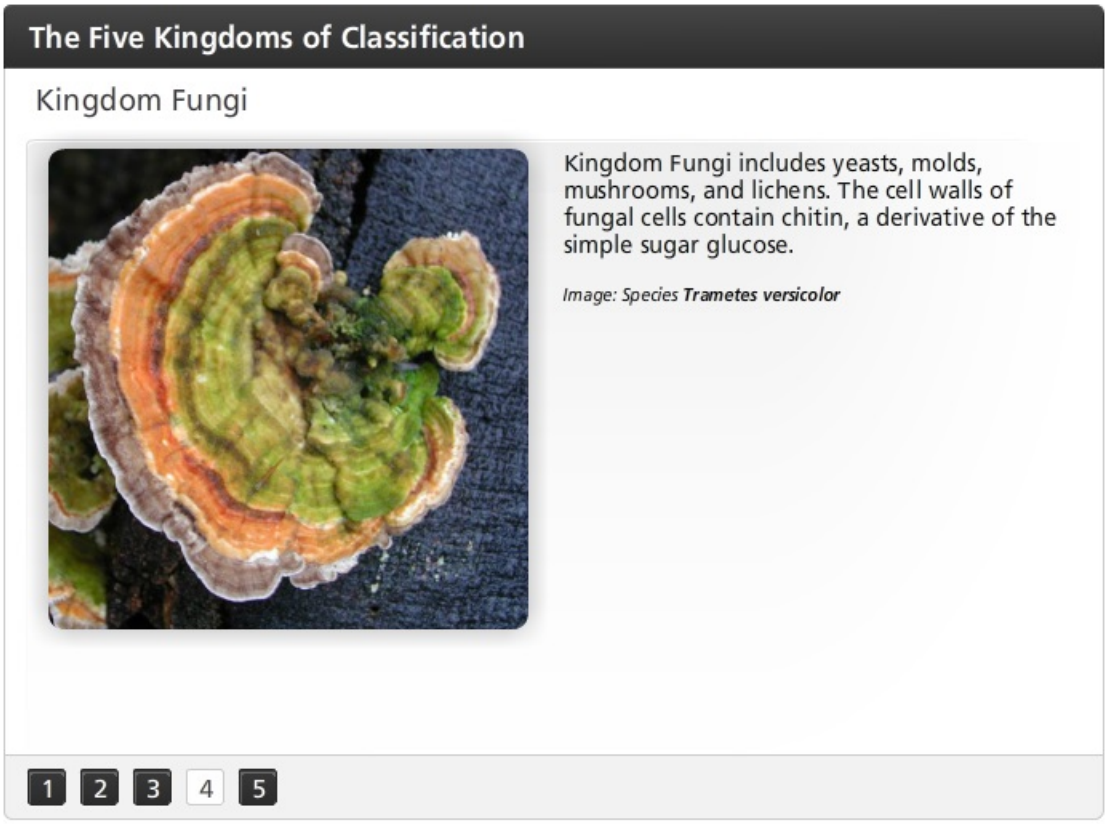
There are five kingdoms into which each organism can be placed. Those kingdoms are: Monera, Plantae, Animalia, Fungi, and Protista. Use the previous and next buttons to learn more about each of the five kingdoms.



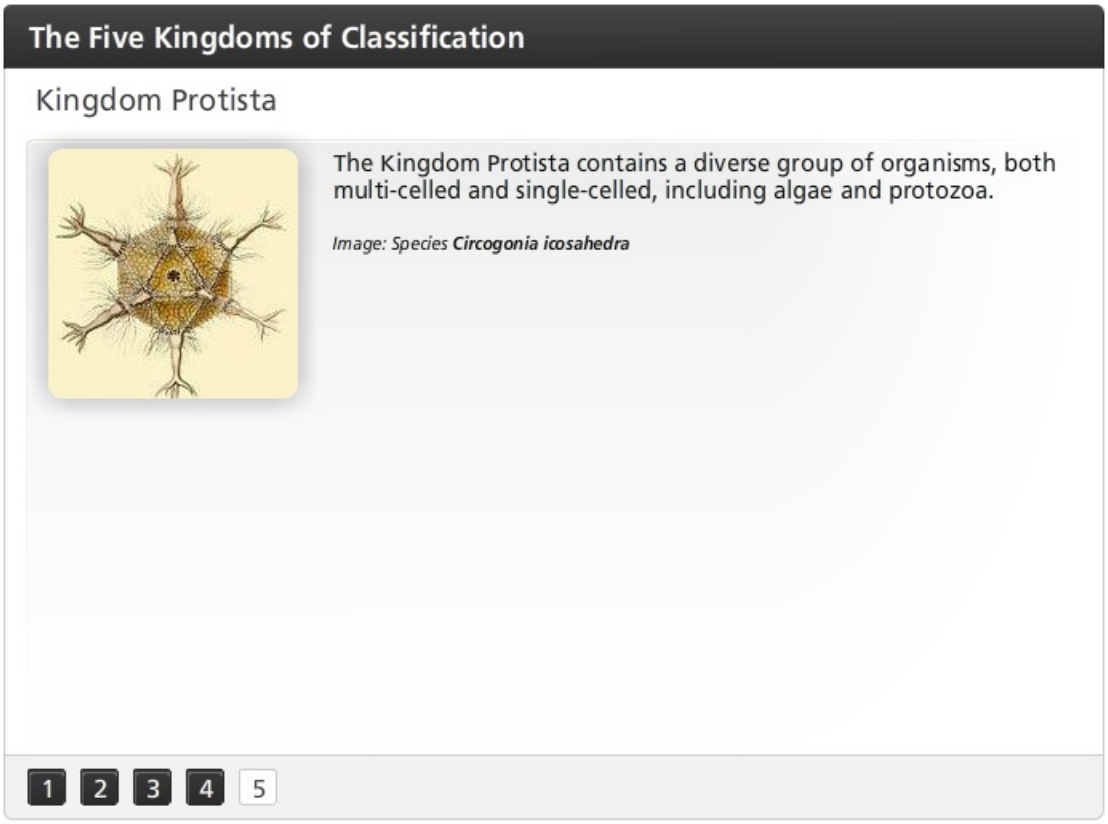
The Kingdom Monera contains organisms such as bacteria and cyanobacteria. These organisms are prokaryotic meaning they lack nuclei and internal organelles. All of the other Kingdoms contain eukaryotic organisms meaning they contain nuclei and organelles.

The Kingdom Plantae contains the photosynthetic, multi-celled plants and includes flowering plants, conifers, ferns, mosses, and green algae.

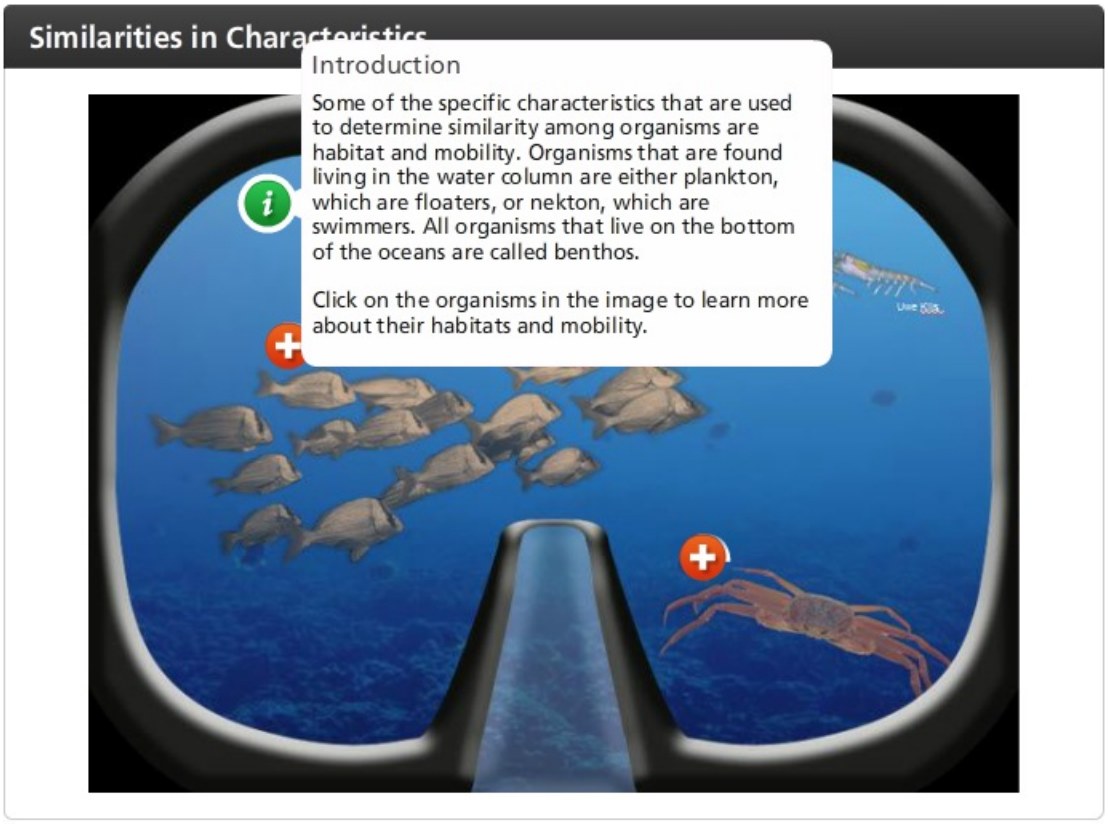
Kingdom Animalia contains all of the multi-celled animals ranging from simple sponges to complex vertebrates. Humans are classified the in Kingdom Animalia.



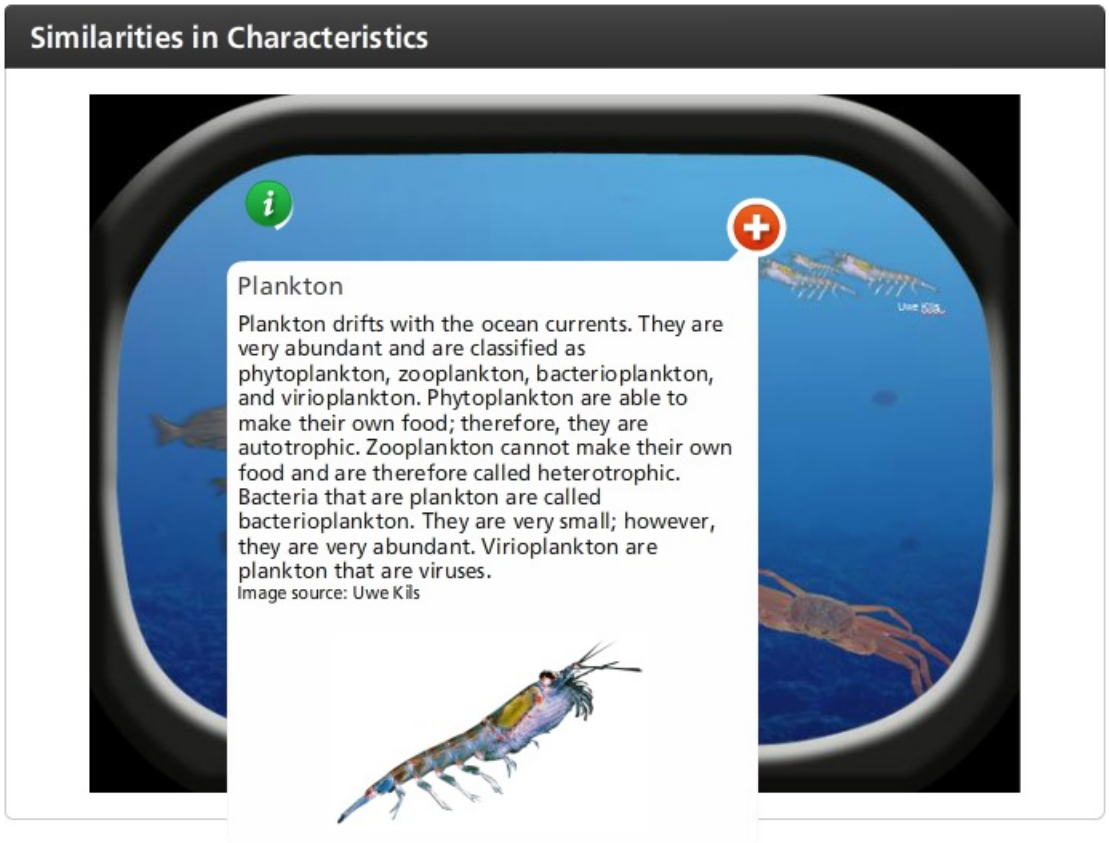
Kingdom Fungi includes yeasts, molds, mushrooms, and lichens. The cell walls of fungal cells contain chitin, a derivative of the simple sugar glucose.



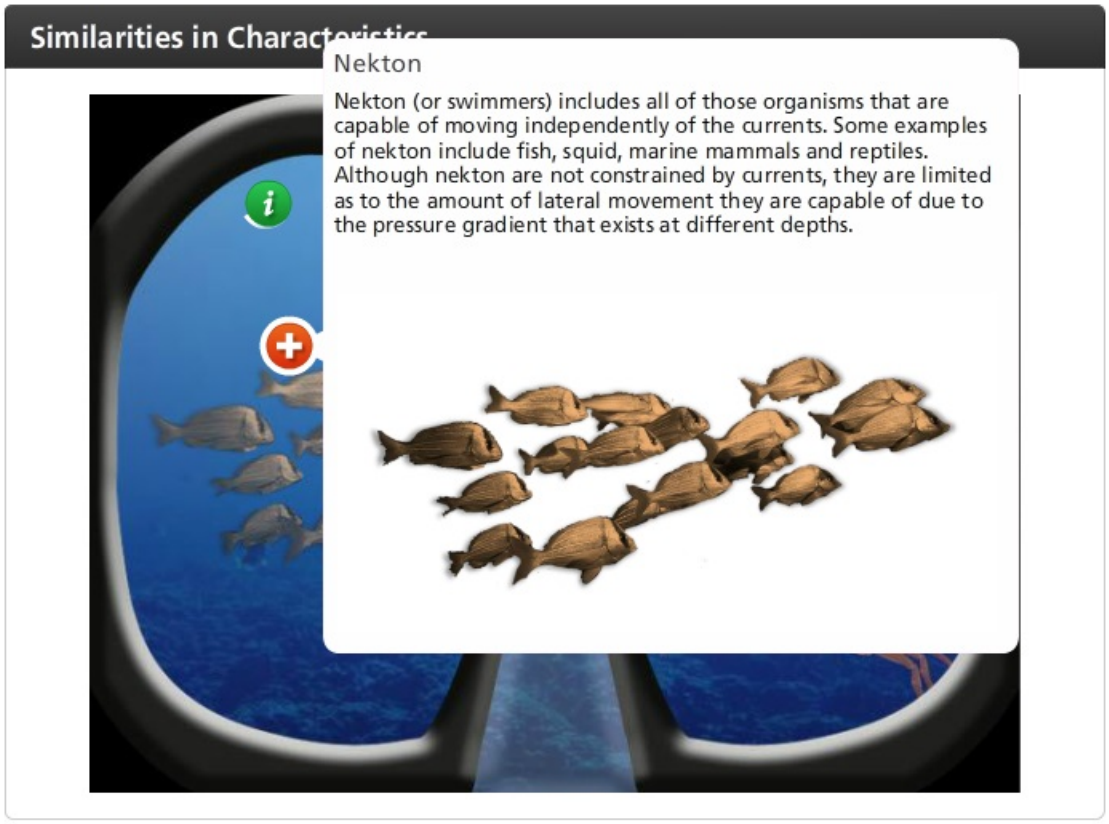
The Kingdom Protista contains a diverse group of organisms, both multi-celled and single-celled, including algae and protozoa.



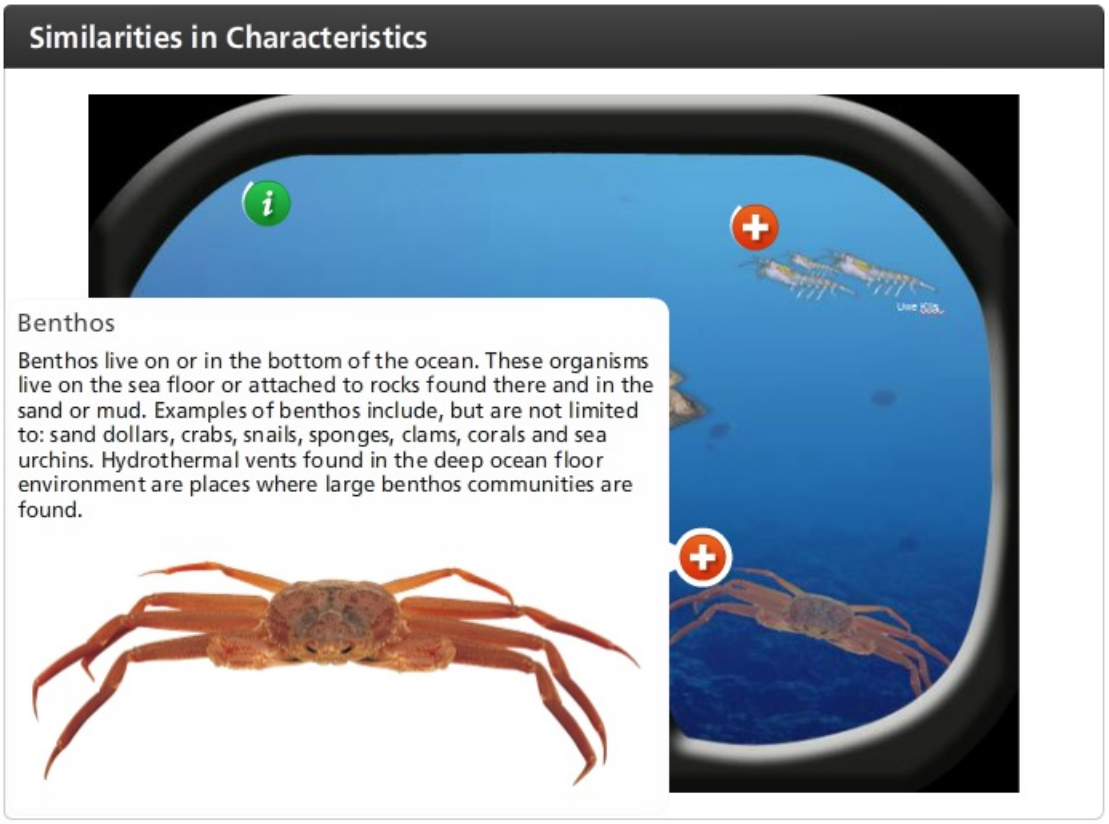
Some of the specific characteristics that are used to determine similarity among organisms are habitat and mobility. Organisms that are found living in the water column are either plankton, which are floaters, or nekton, which are swimmers. All organisms that live on the bottom of the oceans are called benthos. Click on each area of the ocean to learn about the organisms that live there.



Plankton drifts with the ocean currents. They are very abundant and are classified as phytoplankton, zooplankton, bacterioplankton, and virioplankton. Phytoplankton are able to make their own food; therefore, they are autotrophic. Zooplankton cannot make their own food and are therefore called heterotrophic. Bacteria that are plankton are called bacterioplankton. They are very small; however, they are very abundant. Virioplankton are plankton that are viruses.



Nekton (or swimmers) includes all of those organisms that are capable of moving independently of the currents. Some examples of nekton include fish, squid, marine mammals and reptiles. Although nekton are not constrained by currents, they are limited as to the amount of lateral movement they are capable of due to the pressure gradient that exists at different depths.



Benthos live on or in the bottom of the ocean. These organisms live on the sea floor or attached to rocks found there and in the sand or mud. Examples of benthos include, but are not limited to: sand dollars, crabs, snails, sponges, clams, corals and sea urchins. Hydrothermal vents found in the deep ocean floor environment are places where large benthos communities are found.