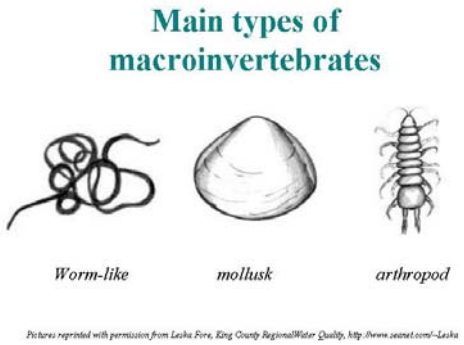
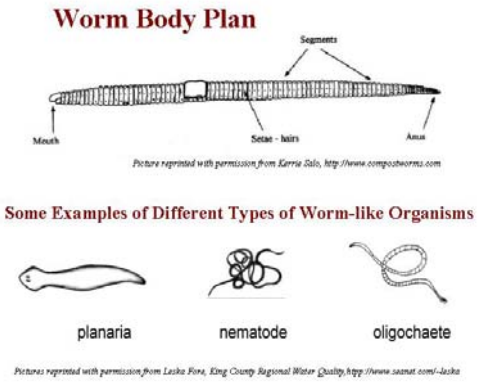
HOW TO IDENTIFY INDICATOR ORGANISMS

3 main types of macro-invertebrates
There are many types of organisms found in water. For our purposes, we will use 3 main classifications for macroinvertebrates, depending on their general shape and physical characteristics: worms, mollusks and arthropods.

Following is a brief description of the 3 main classifications.

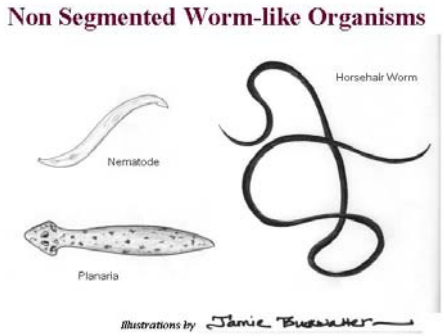




Worms
These organisms usually have simple body outline and are found in almost any type of water--from low DO and high pollution to cool streams.

Worms and the food chain
Worms are usually decomposers and are at the bottom of the food chain. Worms often are found living in the mud or leaves on the bottoms of streams and ponds and help decompose the wastes found there.

Graver Pond with Leaves



Non-segmented Worm-like Organisms
There are a variety of non-segmented worm types ranging from the flatworms (planaria) to horsehair worms and nematodes--many of which are parasitic.

Planaria live on the bottom of aquatic ecosystems, under rocks, and break down organic matter lodged there.

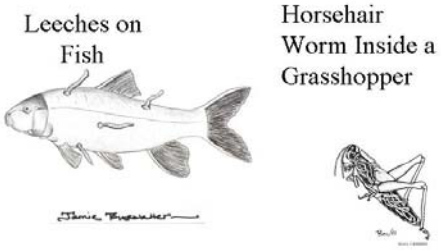
Segmented Worm-like Organisms

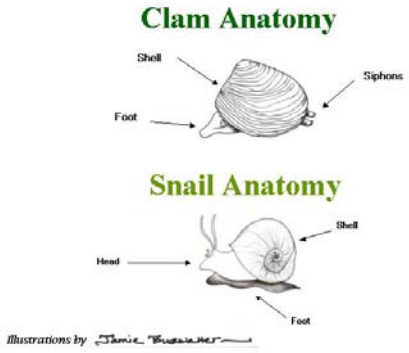
One of the most commonly found segmented worm-type organisms is the aquatic earthworm. They perform the same soil building functions in aquatic ecosystems as they do on land.

The leech, on the other hand can be found under rocks or attached to a victims skin, sucking blood.

Leeches
Leeches can be found on fish, turtles or other aquatic organisms.

Horsehair worms spend their youth growing inside crickets and grasshoppers, only to emerge as adults when they have totally devoured the host insect! These worms look like long coiled hairs and are often found in stock tanks or in the shallows at the edge of lakes. No need to worry, they don't invade humans!





Mollusks
Mollusks also have a simple body plan. There are 3 main parts to a mollusk: head, shell, and foot.

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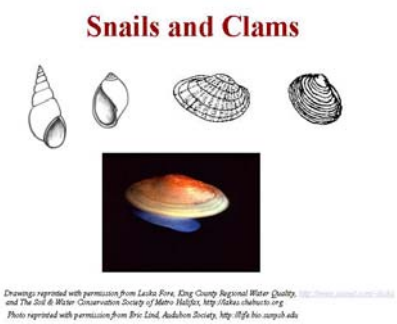
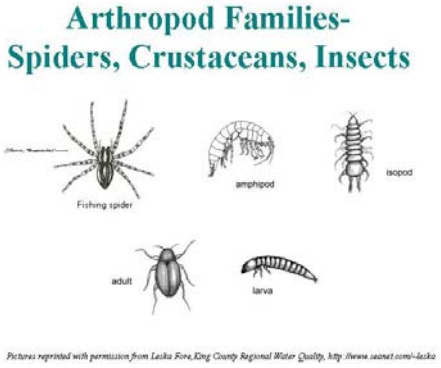


Snails
The mollusk most often found in freshwater is the snail. It is tolerant of pollution and can live in waters of varying quality. The snail is an herbivore and is commonly found under rocks or moving on the bottom eating algae or other aquatic plants

Clams
Also found on the bottom are the clams which are filter-feeder decomposers.

Arthropods
The arthropods come in many different types in a freshwater ecosystem.

Arthropod characteristics
Adult arthropods have segmented bodies and jointed appendages, which act like armor for protection, but severely limit movement. Many aquatic arthropods have gills that make them specially suited for life in the water.

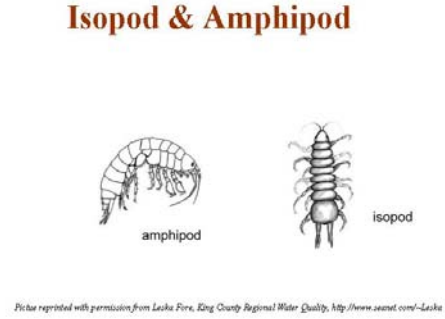


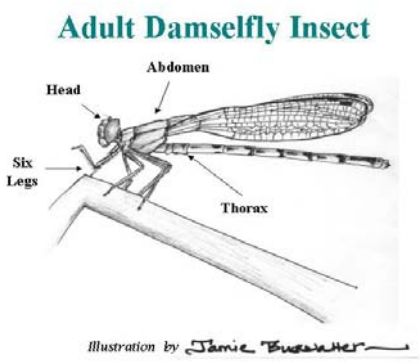
Fishing spiders
A relatively common aquatic arthropod is the fishing spider or water spider. They are interesting due to the bubbles of air they attach to their abdomens to catch fish or prey in the water. Spiders or arachnids have 8 legs and 2 body segments.

Crustacean characteristics

Tiny crustaceans such as isopods and amphipods act as decomposers on the bottom of streams and ponds.

Crayfish are larger crustaceans and they eat a variety of foods, even each other!

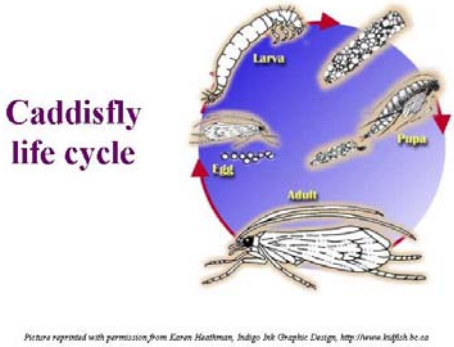




Insct characteristics
Insects have 6 legs and 3 body segments in the adult form and are the most common arthropods in most freshwater ecosystems.

Life cycles
The water supports the young arthropods of certain species, allowing them to be wormlike in the larval stage- grubs.

From larvae to adult
Insects have many larval forms, which look totally different from the adults, thus consulting a field guide is essential.



Some insects hunt the bottoms to find prey- other insects or even small fish and tadpoles.

Use a Field Guide!
A field guide can help in a more in-depth study and proper identification of aquatic organisms