Hands On Learning
with Reading Museum Service

FRESHWATER MINIBEASTS Z172

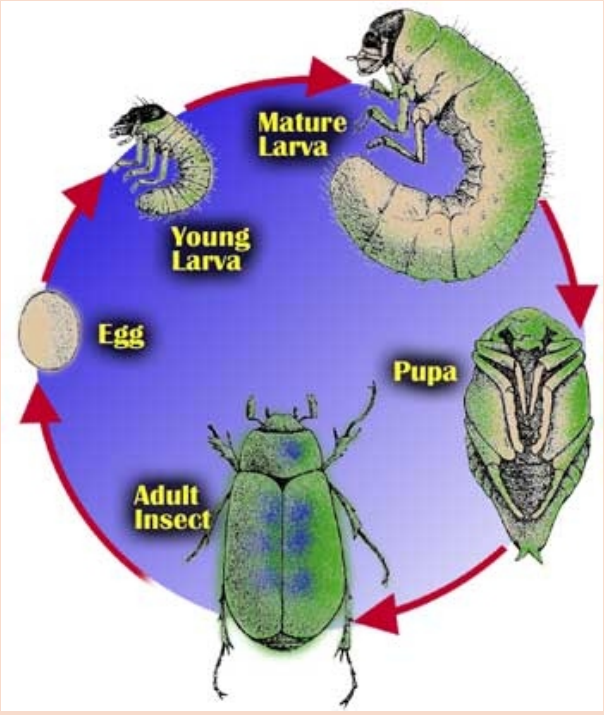
Many of the creatures in this box are insects and it is therefore useful to note the four-stage life-cycle of most insects and some of the terms associated with it.

There are more species of insect in the world than any other group, representing 80% of the world's species.

Life Cycle of Insects

All insects begin as an **egg**, which hatches to produce a **larva**, which is generally worm-like in form. The larval stage is often referred to as a caterpillar. The larva grows and eventually becomes a **pupa**, a stage sealed within a cocoon (chrysalis) in some species. In the pupal stage, the insect undergoes considerable change in form to emerge as an **imago**, or adult. Butterflies are an example of an insect that undergoes this four-stage development.

Some insects have a three-stage life cycle of egg-nymph-imago and there is no pupal stage. The **nymph** is a transitional form in which the creature is similar in form to the adults, except that the wings are not developed until the adult stage. Aphids, earwigs and dragonflies are some of the insects which have this three-stage life-cycle.



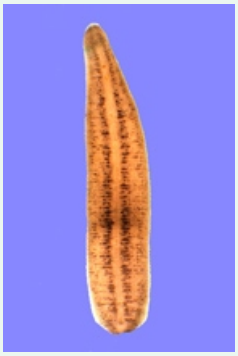
Fresh Water Sponge

A sponge is a colony of minute, simple animals which feed on particles of decaying matter. The green colour of a living sponge is caused by small plants (algae) which live within the sponge. Sponges are common in the River Thames and Kennet.



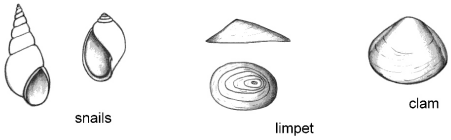
Leeches

All leeches are parasites - they feed on other living creatures. Some suck the body juices of the host - the snail leech (top) and the fish leech (bottom) do this. Others devour their prey. The worm leech (middle) does this. Most of the 13 species of British leech can be found locally.



Molluscs

Molluscs are invertebrates - animals without backbone, but with an external shell and a large 'foot'. Two different kinds of molluscs occur in fresh water. Gastropods (right) have a single spiral shell while bivalves (left) have two hinged shells. Most molluscs eat algae they scrape from rocks.



Fresh Water Shrimp & Water Slater

These two animals are crustaceans. Crustaceans are invertebrates with many pairs of jointed limbs. They have a hard outer skeleton (exoskeleton) and two pairs of antennae. These small animals are an important item in the diet of fish.



Water Slater

Fresh Water Crayfish



This creature is common in local streams. The crayfish walks about using its four pairs of legs - a fifth pair of limbs is used as pincers. When disturbed it flexes its tail and shoots rapidly backwards. It is a crustacean - belonging in the same family as shrimps, crabs and lobsters.

Mayfly Nymph



Mayfly adult

Mayflies are insects that spend most of their lives in streams as nymphs, emerging into the air briefly as adults to mate and lay eggs. Nymphs have three tail filaments. They breathe through gills. Some complete their growth in a year, but others spend two years or more in the water. The adult lives for only a few days. Nymphs often feed on algae, but adults do not eat.

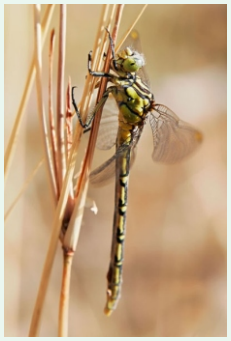
Damselfly Nymph

Damselfly nymphs are carnivorous, feeding on small aquatic organisms. The three fins at the end of the abdomen are gills through which they breathe. They also have hextendable jaws on hinged arms (called a mask) that can be extended rapidly to catch prey. Damselfly adults (below right) are similar to dragonflies, but the wings of most damselfly adults are held along the body when at rest.



Dragonfly Nymph

Dragonflies lay eggs in or near water. Most of their life is spent in the nymph form, beneath the water surface, using internal gills - located inside their bottom! - to breathe. They catch other invertebrates or animals such as tadpoles and fish. At the shortest, a dragonfly's life-cycle from egg to death of adult is about 6 months. Some of the larger dragonflies live 6 or 7 years!



Water Cricket & Water Skater

Water crickets are very common on ponds where they feed on small creatures that fall into the water. They also feed on mosquito larvae. Pond skaters row themselves across the surface film of the pond using their middle legs. The hind legs act as a type of rudder and the front legs catch food - small insects.



Water Scorpion

This insect lives on the bottom of the pond and is not a good swimmer, but crawls amongst the weed. It traps its food - other insects, tadpoles and even small fish - with its front legs. It has an air tube at the tail which carries air from the surface to the breathing pores - a bit like a snorkel!



Water Stick Insect

This water bug has a long breathing siphon which it uses to obtain air from the pond surface. It is not a good swimmer and lives among water weeds. They catch their prey by grabbing them with their front legs.



Lesser Water Boatman

This water bug feeds mainly on dead plant material which it sucks up from the bottom of the pond. They use their two pairs of hind legs for swimming. They rise to the surface of the pond to obtain air which is trapped between their wings and the body. They move from pond to pond by flying.



Lesser water boatman larva

Water Boatman

The water boatman is similar to the lesser water boatman, but differs from it in that it swims on its back, which gives rise to its common nickname 'backswimmer'.The other difference is that this species is a fierce carnivore which can kill even tadpoles and small fish. It carries a bubble of air around which gives it a silvery appearance.



Collecting air from the surface

Alderfly Larva

Alderfly larvae can be found buried in mud in almost any pond or stream. They feed on other small creatures which they snatch with their powerful jaws. Each female lays about 2,000 eggs. The larvae usually take about two years to reach adulthood (below).



Caddis Fly Larva & Cases



Most types of caddis larvae feed on vegetable material and make a protective case of sticks, shells or stones. Some stream dwelling species make no case and feed on small animals which they catch in silken nets.

Blackfly Pupae and Larvae

A number of blackfly pupae and their larvae feed on minute particles of animal and vegetable material which they strain from the water using two combs of bristles on their head. These combs are just visible to the naked eye on these two samples. Blackfly larvae live attached to stones in rapid streams by means of a sucker-like disc at the end of the abdomen .



Soldierfly Larva

You often see lots of mosquito larvae squiggling about in ponds and water butts. Soldierfly larvae behave in a similar way. They stick the tip of the tail above the surface film of the water to breathe. There are many different species.

Stratiomys potamida



Diving Beetle

No British beetle spends its whole life in water. The female diving beetle usually lays her eggs in the stems of water plants. She cuts small slits into the plant stems and lays one egg in each. The fully grown larvae pupate in damp soil near water. The adults fly at night in search of new ponds. Both larvae and adults are voracious predators. The larvae can tackle large prey such as tadpoles and small fish.



Lamprey Larva



Lampreys are primitive fish, lacking paired fins and jaws. The larvae can be found in river mud. After about four years they become adult - at which point they stop feeding on mud and eat small crustaceans or suck the blood of other fish - see photograph.

Stickleback



In spring male sticklebacks defend territories where they build nests on the bottom of the pond or stream. Males also develop a red chin and belly, which attracts females and makes other males aggressive. The male 'dances' to lure the female to lay her eggs in his nest - after which he looks after them. Eggs need plenty of oxygen to develop, so the male directs waves of oxygen-filled water over them with his fins.

Newt Tadpole

The newt is an amphibian. The female lays the eggs individually, attaching them to aquatic plants or leaves lying at the water bottom. Newt tadpoles can be distinguished from frog tadpoles by the long feathery gills which are lost when they reach maturity. Adults are nocturnal and spend the day hiding under large stones or compost heaps. They hibernate in winter.

