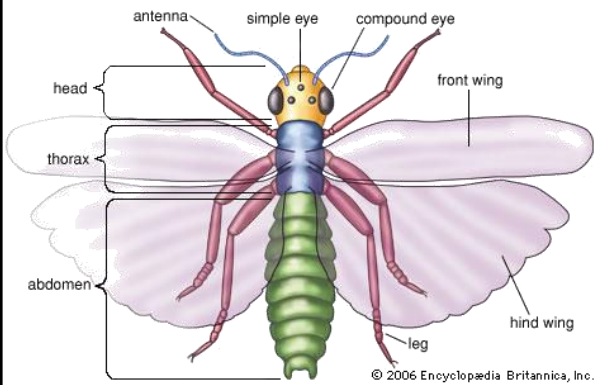


# Animal Diversity - Invertebrates

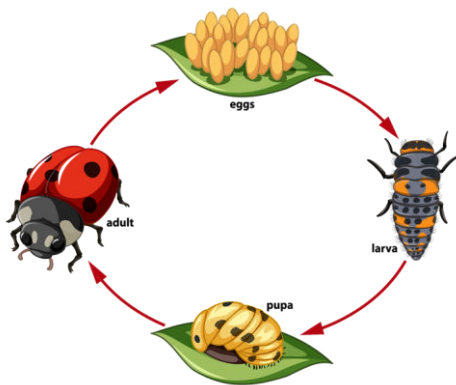
## Section 5: Insects



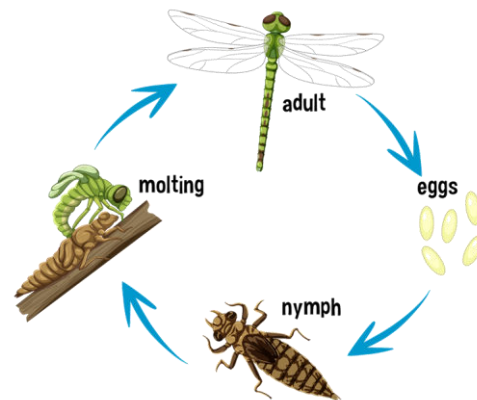
Insects are the largest, most common, and most successful arthropods. Adult insects have six legs, two pairs of wings, and a segmented body divided into three sections: the head, the thorax, and the abdomen. An insect's head is where the antennae attach. Antennae are used to not only feel objects but to smell and taste them too. Many insects have a compound eye made of thousands of lenses, making them adept at detecting

movement. The thorax is where the legs and wings attach. Wings help insects find food, escape dangerous situations, and even find and attract a mate. The abdomen contains the digestive system, the heart, and the sex organs. An insect also has mouthparts adapted for a particular way to get food. Their jaws, called mandibles, are used for chewing and grinding food.

During their life cycle, insects undergo a process in which their appearance and body systems change. This process is called metamorphosis. Each insect species undergoes either **complete metamorphosis** or **incomplete (gradual) metamorphosis**.



Complete Metamorphosis



Incomplete Metamorphosis

A ladybug undergoes complete metamorphosis in four distinct stages: egg, larva, pupa, and adult. A female lays her eggs, usually on the underside of leaves to protect them from predators. Once the eggs hatch into larvae, the growing larvae will molt four times until it's ready to enter the pupa stage. The larvae attach themselves to a leaf by their bellies and become pupa. Inside the protective pupa case wings and antennae form. When its development is complete, an adult will emerge from its pupal case with soft wings. It will take a few days for the wings to harden, then it will eat and look for a new mate to begin the cycle again.

# Animal Diversity - Invertebrates

## Section 5: Insects Continued

Other insects, like dragonflies, undergo gradual or incomplete metamorphosis, which has no distinct larval stage. A female dragonfly lays its eggs in still water or on an aquatic plant. The egg hatches into a nymph or miniature adult without wings. They hunt prey with a specialized lip. They then molt or shed their skin up to fifteen times, depending on the species. The nymph leaves water for final molt and then a fully winged adult emerges from old larval skin and searches for a mate.

Insects play a crucial role in developing ecosystems. If there were no insects, our world would crumble. Without bees pollinating our flowers, the crops we grow would fail, and without food to eat, we would starve. There are two ways insects interact with other living things. First, many are **pollinators** that carry pollen among plants. Some are disease carriers that spread disease to plants and animals, including humans. For example, a locust attack can be devastating. They can descend upon a field and completely destroy and devour its crops in minutes.

Insects are also used as a method of pest management. **Biological controls** involve releasing a living organism as a natural predator into an area to fight off a harmful insect. For example, releasing ladybugs to prey on aphids, which are detrimental to plant growth, is common practice. Integrating ladybugs in your garden can help ensure plant longevity.

### Review:

1. Identify the body parts of an insect.
2. Compare complete metamorphosis to gradual metamorphosis.
3. How do insects play a role in developing ecosystems?