6.6 Arthropods

Science understanding, Science inquiry

Verbal/Linguistic

Arthropods make up over 75% of all known animal species. All arthropods have a segmented body covered by an exoskeleton, and jointed limbs that enable them to move. Groups within the arthropods include the insects, arachnids, crustaceans, millipedes and centipedes.

Insects

Insects are the largest group of arthropods. Their body is divided into three parts—head, thorax and abdomen. They have a pair of antennae and a pair of compound eyes. Extending from the thorax are three pairs of legs for walking, jumping or digging. All types of insects include some individuals with wings at some stage in their life cycle. Worker ants do not have wings. Young grasshoppers do not have wings, but they are present in the adult.

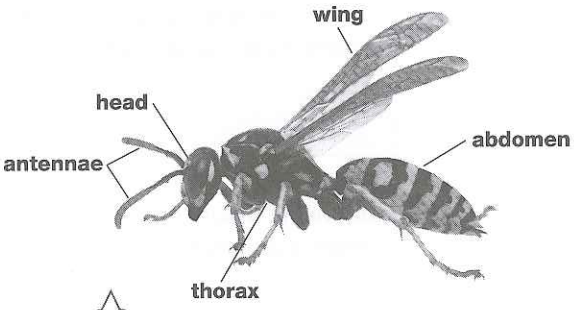


Figure 6.6.1 Wasps and dragonflies are both insects along with mosquitoes, ants, butterflies and moths.

Arachnids

Arachnids have two body parts. The head and thorax are fused to form a cephalothorax. Arachnids have four pairs of walking legs but do not have antennae. Spiders have fangs they use to capture their prey. Poison injected from the fangs paralyses or kills the prey. Many arachnids make webs to catch prey. The silk is produced by spinnerets at their tail.

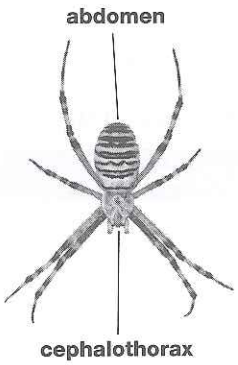


Figure 6.6.2 Scorpions, spiders and ticks are all arachnids.

Crustaceans

Most crustaceans live in water. They have a cephalothorax. Crustaceans have two pairs of antennae and usually five pairs of legs. Sometimes the front legs are modified as pincers, which are used to catch and hold prey, and as protection.

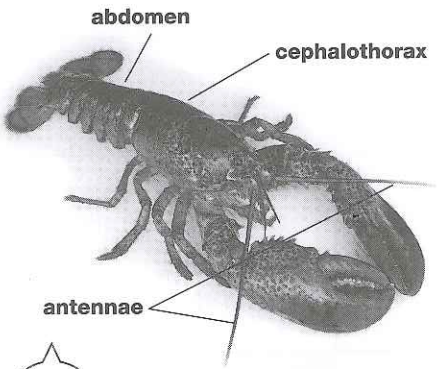


Figure 6.6.3 Lobsters and wood lice are crustaceans along with prawns and crabs.

Centipedes and millipedes

Centipedes and millipedes have legs on most of their segments. Centipedes have one pair of legs on each segment and are very fast moving. Millipedes have two pairs of legs on each segment. Although they have more legs, they are slow-moving animals.

Figure 6.6.4

Figure 6.6.5

Exoskeleton

Having an exoskeleton has advantages and disadvantages. The skeleton provides protection and waxes it contains make it waterproof, preventing the organism from drying out. This enables arthropods to live on land.

To allow movement, the exoskeleton has joints in the legs, antennae and between the segments of the body. At the joints the exoskeleton is thinner and more flexible.

Just like you, arthropods move by using muscles that act in pairs. Your muscles are attached to the outside of your skeleton. Arthropod muscles are attached on the firm ridges or bars inside the exoskeleton as shown in Figure 6.6.6. You can see the damsel fly shedding its skeleton in Figure 6.6.7.

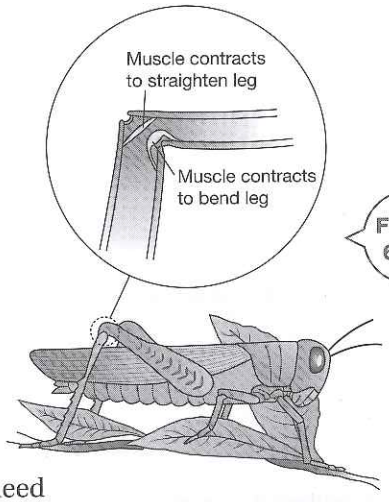


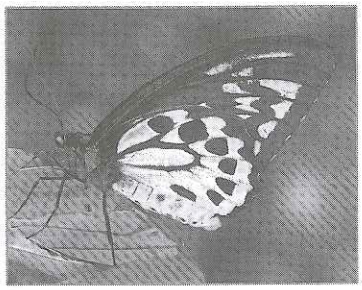
Figure 6.6.6

Arthropods shed their skeleton or moult when they need to grow. Material to make a new exoskeleton is produced before the old exoskeleton splits, releasing the arthropod. While the new exoskeleton is still soft, the arthropod puffs itself up, making its body as big as possible. This stretches the new exoskeleton before it hardens. When it is moulting, the arthropod is very vulnerable to attack by predators so it stays hidden.

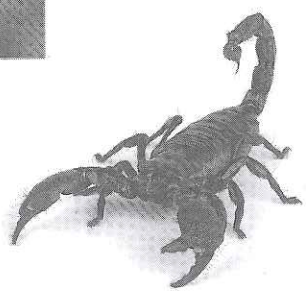
Figure 6.6.7 A damsel fly emerges from its old exoskeleton. Its wings are folded up on its back.

1 **Identify** the centipede and millipede by placing labels in the boxes shown in Figures 6.6.4 and 6.6.5.

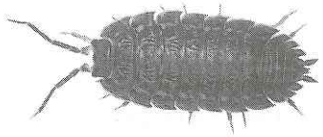
2 **Identify** and label the body parts of the butterfly.



3 **Identify** and label the body parts of the scorpion.



4 **Identify** and label the body parts of the wood louse.



5 **Identify** characteristics common to all arthropods.

6 **Compare** insects and arachnids.

7 **Contrast** centipedes and millipedes.

8 **Explain** what arthropods would not be able to do if they did not moult.

9 **Explain** why moulting is dangerous for arthropods.

10 **Explain** how arthropods make sure that there is some room for growth in their new skeleton.

11 **Compare** the way your arm (or leg) bends with the way arthropods bend their legs.