

## **Catching and identifying invertebrates**

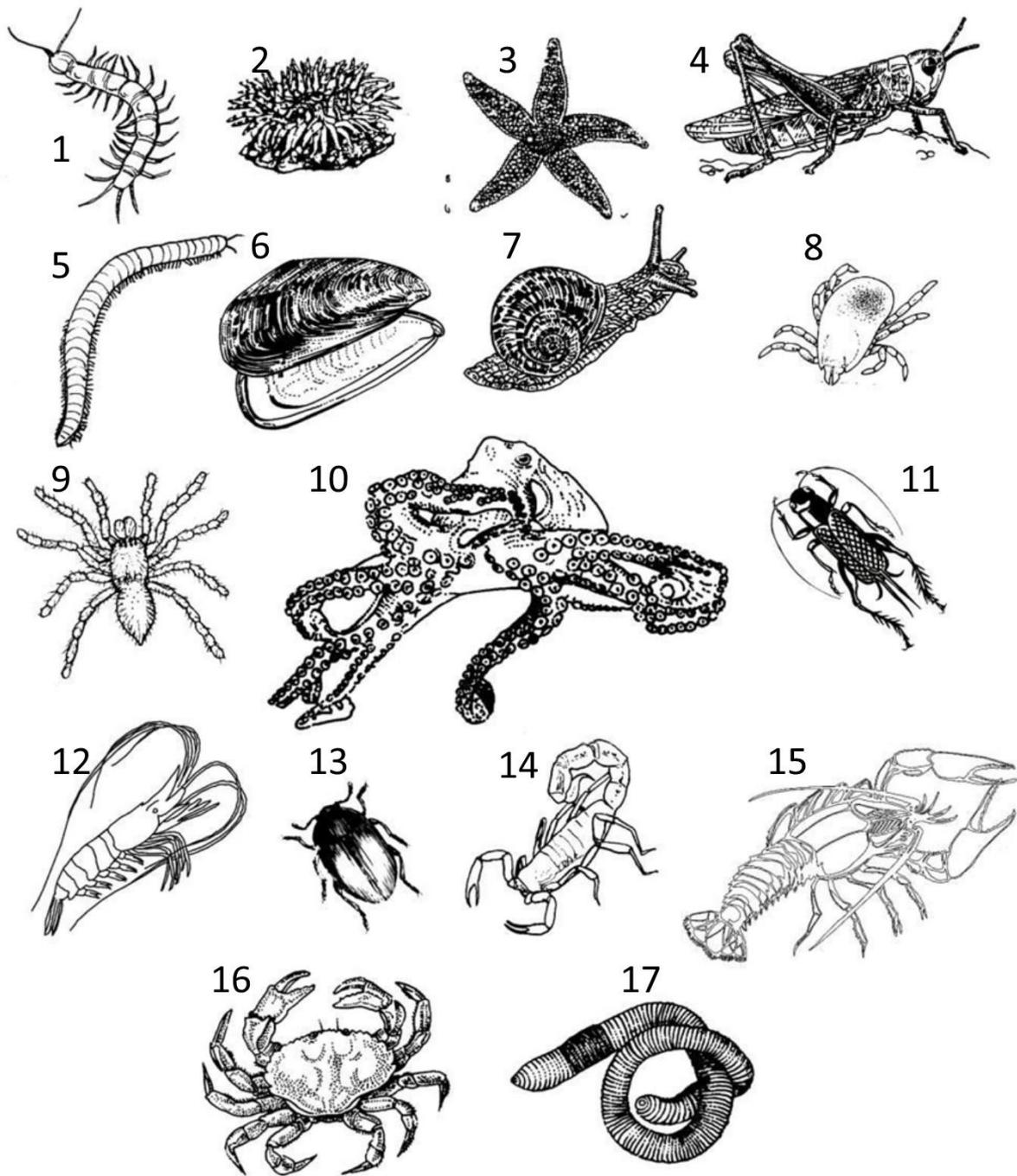
Spiders, snails, slugs, beetles, centipedes, worms, earwigs, caterpillars.....these are just a few well-known examples of the thousands and thousands of creepy-crawlies that exist all over the world. Invertebrates are animals without a backbone, and these are the largest group of animals in the world. In Ireland alone, there are over 12,000 species of known invertebrates. Unlike vertebrates (animals with a backbone) they do not have a skeleton inside of them. This makes them soft and bendy, and because of this, some of them have hard shells to live in. This strong carapace is called an exoskeleton.

### **Grouping invertebrates**

Invertebrates come in a huge range of sizes, shapes and colours. They are grouped according to their characteristics. All of the species in each class has similar characteristics. For example, all the members of the largest group of invertebrates, the arthropods, have jointed legs (rather than bendy tentacles like the octopus). Four classes of invertebrates belong to the arthropods: Insect (6 legs), Crustaceans (at least 8 legs but usually 10 legs), Arachnids (always 8 legs) and Myriapods (24 to 750 legs!). There are also other groups of invertebrates without jointed legs like starfishes, anemones, worms and snails.

### **Where do invertebrates live?**

Invertebrates can be found in almost every part of the world even in the driest places, such as deserts. In Ireland, large numbers of invertebrates are found in every type of habitat – seashores, rivers, ponds, lakes, marshes, heathlands, grasslands, woodlands, hedgerows as well as people's gardens and buildings. Different invertebrates live in different micro-habitats. Micro-habitats are small parts of larger habitats. A log is an example of a micro-habitat and many invertebrates may be found living underneath it. The log is part of a larger habitat, such as a woodland or a garden. Other micro-habitats that provide suitable homes for invertebrates are stones, bushes, trees, grass, flowers, soil and leaf litter (dead leaves on the ground). If you study the way in which animals and plants live with one another and with their environment, you are studying the balance of nature – or ECOLOGY.



Above: illustration of some types of invertebrates. How many can you name? The answers are at the end of this activity sheet!

## **What do Invertebrates eat?**

Many invertebrates are herbivores, feeding on a wide range of plant food, especially leaves, fruit, nectar or pollen. Mollusks and insects are the only classes of invertebrates which have developed mouthparts capable of grinding up the tough tissues of green leaves.

The mouthparts of some insects are specially adapted for feeding on the sap and nectar of plants. Butterflies and moths have a long thin tongue (a proboscis) which they use to reach into flowers and suck out the nectar.

Herbivorous invertebrates have to keep a watchful eye out for their predators – meat-eating invertebrates known as carnivores. For their size, carnivorous invertebrates are powerful and ferocious predators. Some of them are active hunters, being able to move fast in pursuit of their prey, whilst others set traps to catch their victims.

Some spiders spin webs with sticky threads to trap flying insects. Once the victim is trapped, the spider paralyses it with a bite. Then it wraps the insect in silk and injects it with juices (enzymes) that break down its body into a liquid which the spider can suck up.

Ground beetles run fast on long legs and hunt at night. They have powerful and sharp jaws for grabbing and crushing other insects and slugs. There are about 200 species of ground beetle in Ireland. Other predatory invertebrates on land include centipedes, harvestmen and several other species of beetles: ladybirds, soldier beetles and rove beetles.

Dragonflies are specially adapted for hunting. They have enormous eyes and strong wings which help them spot their prey. Dragonfly larvae live in freshwater ponds and they are also carnivorous. In fact, there are several fierce carnivorous invertebrates to be found in ponds: diving beetle, water boatman, water scorpion and pond skater to name a few.

## **Why are invertebrates important?**

Some people regard most 'creepy crawlies' simply as pests that need to be exterminated! Indeed, some of them can be pests to us, spreading diseases and eating our crops but in fact all invertebrates are a very important part of the life of the habitat in which they live.

Invertebrates are found in all layers of the environment, from the floor to the top of trees and they are a very important source of food for several mammals and birds. Some birds feed only on invertebrates and most seed-eating birds feed their babies on insects.

The leaf litter and soil of the woodland floor provide homes for thousands of invertebrates. Others live in and under rotting logs. Slugs, snails, earthworms, millipedes, mites, springtails, woodlice, ants, beetles and fly larvae all feed on dead leaves which fall from the trees. These invertebrates are hunted by the carnivorous beetles, centipedes, spiders and harvestmen.

Many of the invertebrates living in the leaf litter are classed as decomposers and they have a very important job to do in an ecosystem. As well as feeding on dead leaves, some of them also eat dead trees and the droppings & dead bodies of animals. In fact, any waste plant and animal material is eaten. The fragments left are then easier for microscopic worms, fungi and bacteria to feed on and break down even more, releasing nutrients into the soil. If the decomposers did not exist, then nothing would rot down and we would be surrounded by piles of dead bodies!

The mini-predators in the leaf litter are eaten by larger carnivores, such as birds, lizards, weasels and badgers. When a herbivore eats a plant and then a carnivore eats the herbivore, the sequence of events is called a food chain. Each plant or animal is a link in the chain. Invertebrates are involved in the thousands of food chains that exist in every ecosystem.

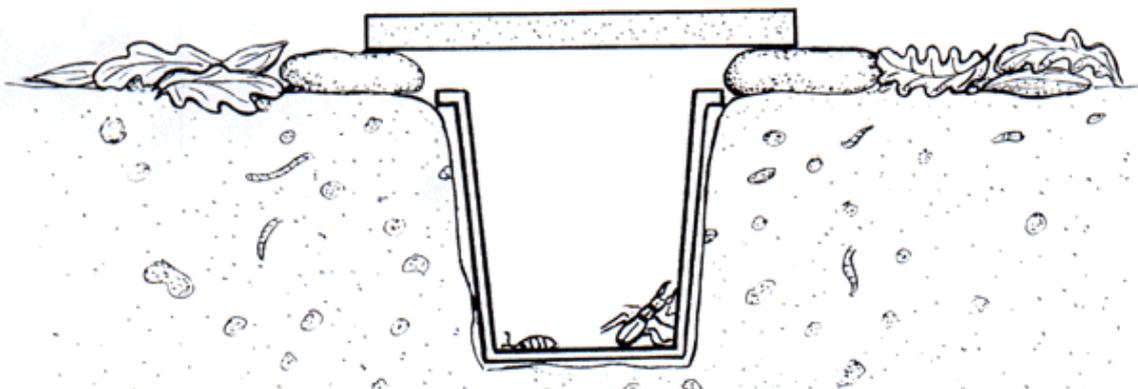
### Collecting Invertebrates

The best time of the year to go out and study these creatures is when the weather is warm, from late spring into the summer.

1) See how many invertebrates you can find in the leaves of a tree by holding a large white sheet under the lowest branches and giving them a good shake. Among the creatures that fall onto your sheet you may find beetles, spiders, lacewings, gall wasps, fruit flies, weevils and caterpillars.

2) Get a net, a large bowl or shallow tray, a magnifying glass and a notebook and go pond dipping. Remember to return all the animals to the water when you have finished.

3) Make a pitfall trap. Take a plastic cup and dig a hole in the ground. Put the plastic cup into the hole and fill back all extra spaces around the cup. Cover the cup with an elevated slate or a plastic lid. Make sure you leave about 1cm of space between the rim of the cup and the lid! Bug falling in the pit will be unable to get out. Leave the trap overnight and check it in the morning.

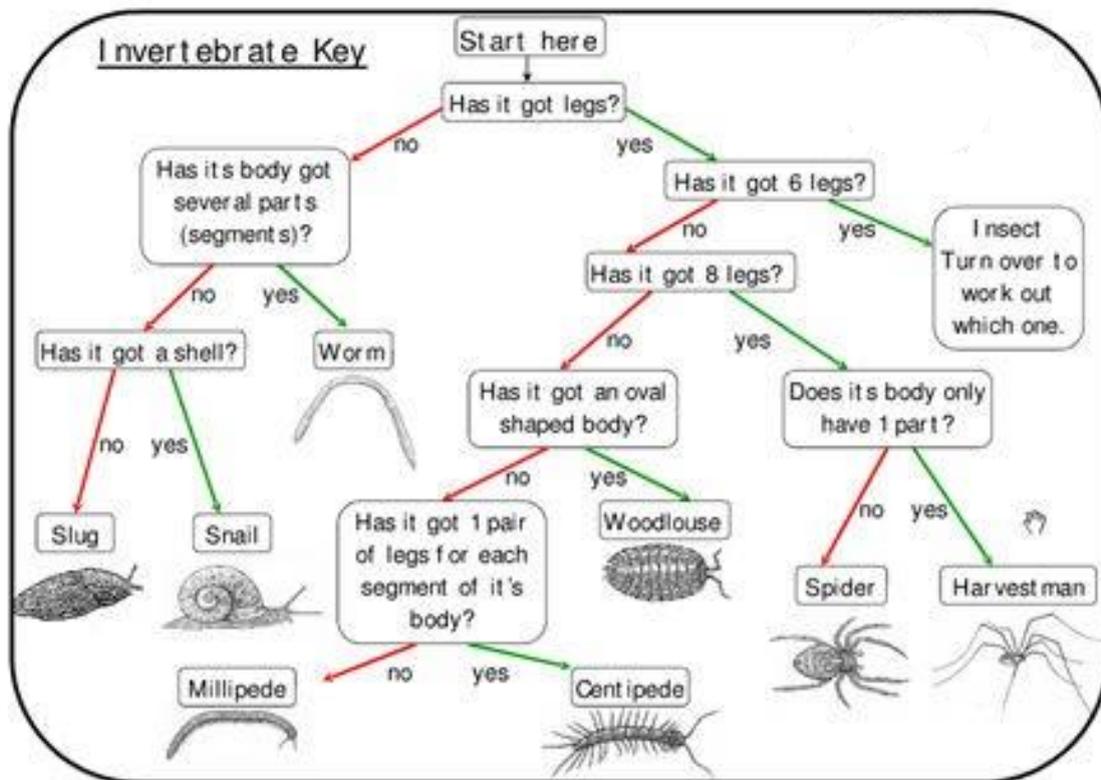


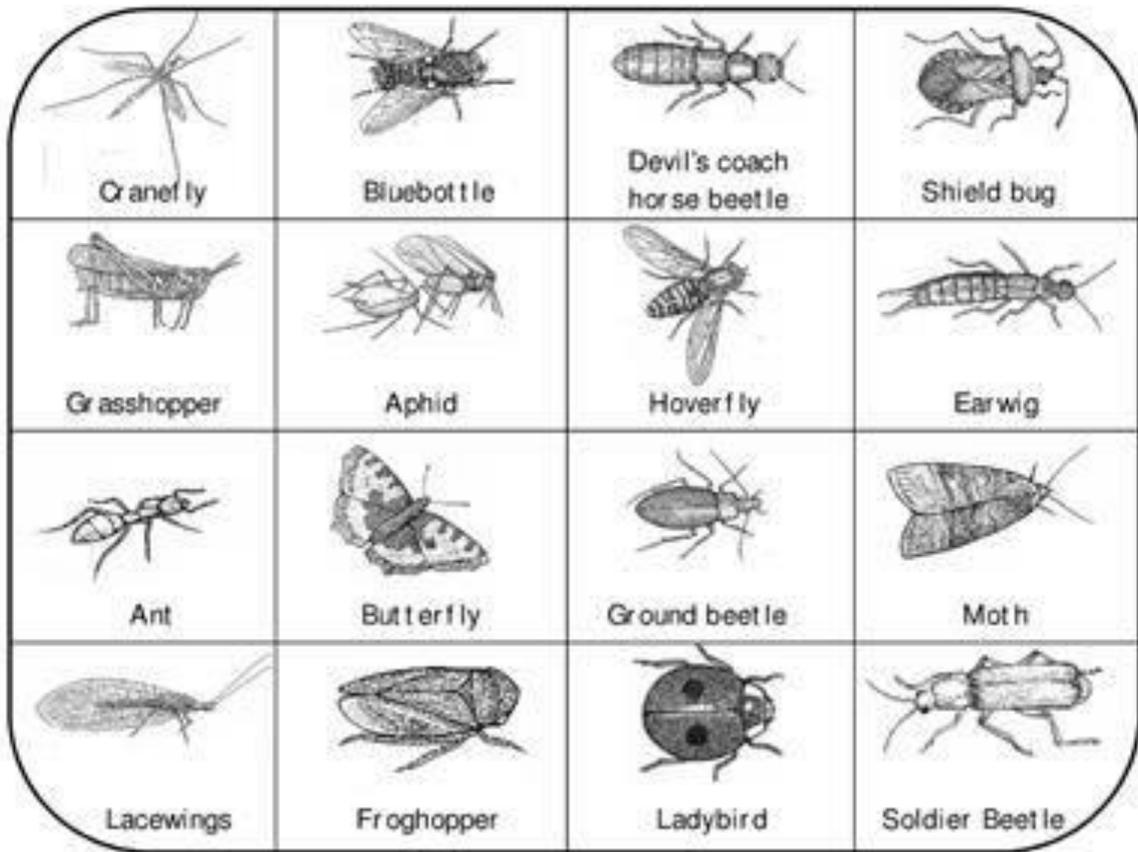
Rotting logs attract slugs, beetles, centipedes, millipedes, woodlice and a host of smaller invertebrates. Carefully roll aside a log to search for these creatures – but be sure to replace the log exactly where you found it to avoid destroying their micro-habitat.

## Identifying invertebrates

You will probably be able to name some of the more common invertebrates you find but there may be several you won't know. An identification book will help you, but you can also use a key. Here is one specially designed to identify the more common animals found living in leaf litter.

When using the key, you have to first decide whether the unknown creature has legs or not. Having decided that, follow the key down until you arrive at the name of that creature.





**It is time now to make a list of all the bugs you have caught!**

Species	How many did you catch or see?	How many legs do they have?	How many body parts do they have?

Where did catch the most bugs?

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What methods did you use to catch these bugs?

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Which bug is your favorite? Why?

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**How many invertebrates did you name? Here all the answers:** (1) Stone centipede (2) Sea anemone (3) Starfish (4) Grasshopper (5) Millipede (6) Mussel (7) Snail (8) tick (9) Spider (10) Octopus (11) Cricket (12) Shrimp (13) Beetle (14) Scorpion (15) Lobster (16) Crab (17) Earthworm

