Foghlaim Páirceanna Náisiúnta
National Parks Learning

Invertebrate Identification & Ecology

This key aims to identify the common groups of invertebrates that you may find in Irish woodlands, rural areas or gardens.

About This Key

This key is intended for a secondary school level ecology study of a land habitat. If you wish to study an aquatic habitat, you will need a different key.

You may find something less common that is not represented here.
Do not worry if you cannot identify your creature. Simply record it as a species unknown.

There are thousands of invertebrates in Ireland. Many need a microscope to be identified to species level. This key aims to identify only to group level.

You may wish to use a specific key to fully identify your invertebrate to species level. For example, butterflies are an easy group to study.

How to Find Invertebrates

Use a bug jar to hold your invertebrate while you examine it.
If you do not have a bug jar, any clear jar with a lid will do.
A magnifying glass will help you to examine your specimens.

Direct Searching

Look under stones and logs, and in vegetation.

Net

A net is useful to catch flying insects.

Beating Tray

Use a beating tray and a stick to collect invertebrates from trees and shrubs.

Pitfall Trap

A tub dug into the soil will trap creatures that live on the ground.

Moth Trap

Night-flying insects can be sampled with a special trap that has a strong light.

Pooter

Only very small invertebrates can be sucked up with a pooter.

Be Kind

Please remember to be gentle when handling invertebrates. They are easily damaged.

When you have finished examining a creature, return it to the same place where you found it.

Respect the habitat. Replace logs and stones exactly as you found them.

How to Identify Your Invertebrate

First, count the legs.

No Legs → Go to page 3

6 Legs → Go to page 4

8 Legs → Go to page 6

More than 8 Legs → Go to page 7

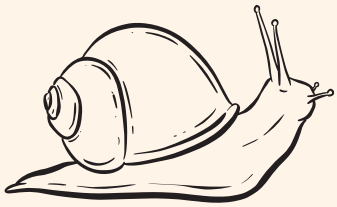
Invertebrates with no legs

Slugs & Snails (Molluscs)

Features

- No legs.
- A soft body with a broad, flattened foot.
- Two pairs of retractable tentacles – a long pair with eyes, and a shorter pair to feel their surroundings.
- A single breathing hole, usually on the side of their body behind the head.
- SLUGS have no shell.
- SNAILS have a shell.

Slug



Snail

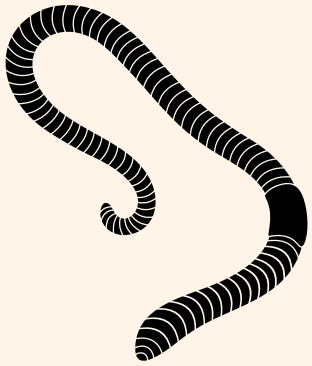
Ecology

- Diet: Mainly plants and fungi. Also dung and dead animals.
- Many are decomposers.
- They have a rough tongue called a radula that they use to graze their food.
- They are only active at night or on damp days. They die if they dry out.
- Hermaphrodite. Each slug or snail is both male and female.
- Snails need calcium to make their shell. Hence, in very acid areas slugs are more common than snails.

Earthworms

Features

- No legs
- A long tube shaped body.
- The body is segmented.



Ecology

- Decomposers. They feed on dead leaves, and convert them into soil.
- Earthworms live underground in tunnels in soil. They are essential for healthy soil.
- Earthworms die if they dry out. In hot weather, they sleep in a knot deep in the soil.
- Earthworms breathe through their skin. They do not drown in puddles.
- Each earthworm has a nervous system and a gut that run the length of the body. Hence, they do NOT survive if cut in half.

Roundworms

Features

- No legs.
- A long tube shaped body.
- The body is smooth and NOT segmented.
- Most are tiny (1-8mm long).

Ecology

- Many roundworm species live in soil. One square metre of soil can hold ten million nematodes.
- Other species may be parasites in the guts of vertebrates.
- Soil nematodes feed on bacteria, algae, and other microscopic life.

Invertebrates with 6 legs

Insects

There are thousands of different insect species of all different shapes and sizes. They all share the following features.

Six Legs

If an invertebrate has six legs, it must be an insect. All insects have six legs.

Head, Thorax, Abdomen

All insects have a three part body.

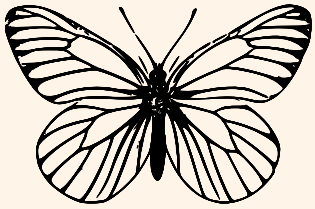
Appendages

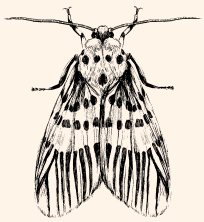
Each species may also have various appendages, such as wings or antennae.

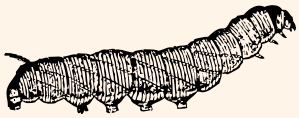
Butterflies and Moths

Features

- 6 legs and a head, thorax and abdomen.
- Two pairs of wings that are covered in very fine scales. The wings may be very colourful.
- The larvae are caterpillars with three pairs of true legs at the front, and two to five pairs of false legs for gripping at the back. (Unlike sawfly larvae that look similar but have more than 5 pairs of gripping false legs.)







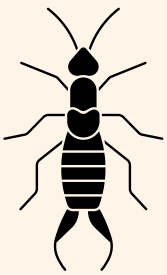
Ecology

- Butterflies and moths all belong in the family Lepidoptera. Whilst most moths fly at night, there are some colourful day-flying species.
- Ireland has 36 butterfly species, and they are quite easy to identify to species level.
- We have over 1000 moth species. Some are challenging to identify, especially the smaller micro-moths.
- Butterflies (and most moths) feed on nectar from flowers using a tube-shaped mouthpart called a proboscis.
- The larvae of butterflies and moths eat plants. Often each species has a very specific larval foodplant.

Earwigs

Features

- No legs
- Two pairs of wings. The membranous hind wings are tucked away under short leathery forewings.
- A pair of pincers on the rear end. The female has straight pincers; the male's are more curved.



Ecology

- Earwigs feed on plants, including flower petals, honeydew and small invertebrates.
- Females are good mothers and will look after the young.

Invertebrates with 6 legs

Bees & Bumblebees

Features

- 6 legs and a head, thorax and abdomen.
- Two pairs of wings.
- Females have a sting, but most are too small or too gentle to sting people.
- Bumblebees are very hairy, often with stripes of yellow, black, white or red.
- Honeybees are not as hairy as bumblebees.
- Most solitary bees are smaller than honeybees. They come in a variety of colours.

Bumblebee

Honeybee

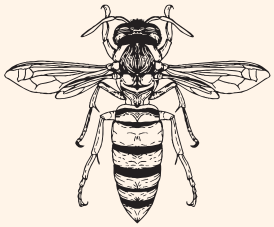
Ecology

- Bees are pollinators. They feed on nectar and pollen from flowers.
- Bumblebees are social and form small colonies. Only the fertilized queen overwinters to start a new colony in the spring. All the workers and males die at the end of summer.
- Solitary bees do not form a colony.
- Most Irish honeybees are domesticated and kept in hives.
- Honeybees can sting. The bee dies after stinging. Bumblebees are gentle and rarely sting. Most solitary bees are too small to be able to pierce our skin.

Wasps

Features

- 6 legs and a head, thorax and abdomen.
- They have a distinctive narrow waist between the thorax and the abdomen.
- Two pairs of wings
- Social wasps have black and yellow stripes.



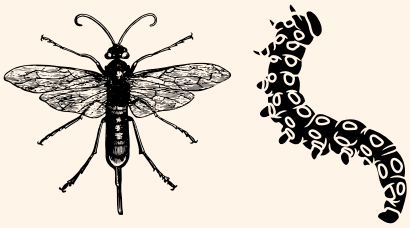
Ecology

- The common black and yellow striped wasps are called Social wasps. We also have many species of smaller solitary wasps.
- Social wasps nest in large colonies. The nest is made of paper. The wasps make the paper from chewed wood.
- Wasps are pollinators. They feed on nectar and sugary things.
- Wasps feed other insects to their young. They have a sting for hunting and killing their prey.
- Wasps can sting people, but if you ignore them, they will ignore you.

Sawflies

Features

- 6 legs and a head, thorax and abdomen.
- Two pairs of wings.
- Sawflies look like wasps, but they have no waist.
- Sawfly larvae look like moth caterpillars but have six or more pairs of false legs.



Ecology

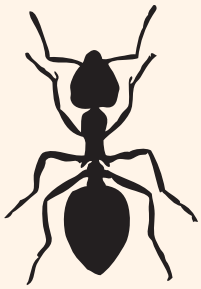
- Sawfly larvae eat leaves. Some are pests in conifer plantations.
- ·Some sawflies lay their eggs into rotting wood. (Eg: Giant Wood Wasp) These species have a large ovipositor to drill into the tree.
- They do not sting.

Invertebrates with no legs

Ants

Features

- 6 legs and a head, thorax and abdomen.
- In some species, the abdomen is subdivided, so that they appear to have a four part body.
- Elbowed antennae.
- They may or may not have wings.



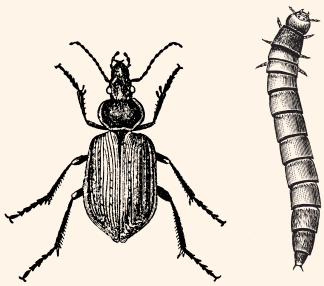
Ecology

- Ants are social insects that form large colonies with a queen (or several queens), many workers and some males.
- Ants are predators with jaws and poison glands.
- They also feed on sweet things, including sap and honeydew that they 'milk' from aphids.
- Ants form a very important part in many ecosystems. We are only starting to understand some of their many ecosystem services.

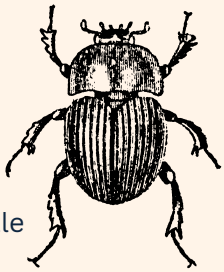
Beetles

Features

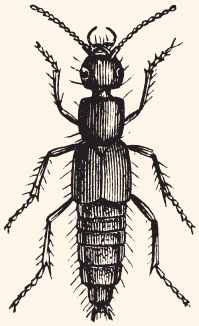
- 6 legs and a head, thorax and abdomen.
- Two pairs of wings that are hidden under a hard pair of wing cases.
- In most beetles the wing cases cover the whole abdomen. In rove beetles, the wing cases are short and the segmented abdomen is exposed.
- The larvae may look like 'mealworms'.



Ground Beetle & Larva



Dung Beetle



Rove Beetle

Ladybird

Weevil

Ecology

- Beetles belong to the group Coleoptera. There are more species of beetle in the world than any other creatures. In fact, beetles make up about 30% of all known species.
- The different species may be herbivores, carnivores, or scavengers.
- Ground beetles are very common, and can often be found under rocks and logs. They are usually black and shiny, with a sharp pair of jaws. They are predators of other invertebrates.
- Ladybirds are also beetles. The common Seven-Spot ladybird eats aphids.
- Weevils usually eat plants. They have 'elbowed' antennae that have a characteristic right angle. They may also have a long snout.
- Dung beetles, such as the large black Dor beetle are decomposers. They lay their eggs in deep tunnels that they provision with dung for the larvae to eat.

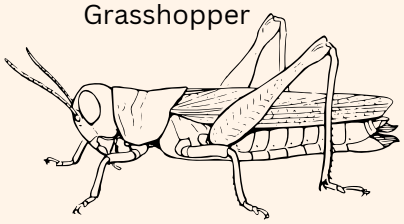
Invertebrates with 6 legs

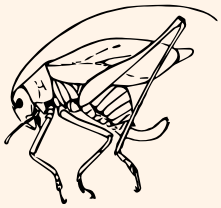
Grasshoppers & Crickets

Features

- 6 legs and a head, thorax and abdomen.
- Two pairs of wings – a pair of membranous hind wings and a pair of short hard forewings.
- The hind pair of legs are very long and used for leaping.
- Grasshoppers have short antennae.
- Crickets have very long antennae.

Grasshopper





Cricket

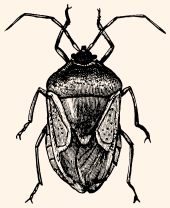
Ecology

- Grasshoppers are herbivores, and are active by day. Grasshoppers sing by rubbing their back legs off their wings.
- Most crickets eat other insects and are nocturnal. Crickets sing by rubbing their forewings together.
- Both grasshoppers and crickets have an incomplete metamorphosis. There is no pupal stage. The nymphs look similar to small adults.

True Bugs

Features

- 6 legs and a head, thorax and abdomen.
- Some have wings, some don't.
- All true bugs feed on liquids using a piercing proboscis.
- Typical true bugs include aphids (greenfly), shieldbugs and plant hoppers.



Shieldbug

Aphid

Ecology

- Most suck plant juices, although some predate other invertebrates.
- Plant hopper nymphs may make a protective coating of froth, called cuckoo spit.

Lacewings

Features

- 6 legs and a head, thorax and abdomen.
- Two pairs of fine membranous wings.
- Many species are bright green with red eyes.

Ecology

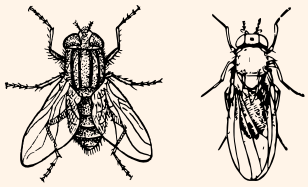
- Some lacewings are predators, feeding on aphids and other small insects. Others feed on pollen.
- Most are nocturnal.

Invertebrates with 6 legs

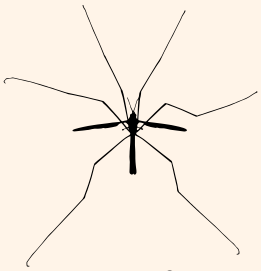
Flies

Features

- 6 legs and a head, thorax and abdomen.
- Only one pair of wings.
- The second pair of wings is modified into a pair of halters that help them fly.



Typical Flies



Cranefly

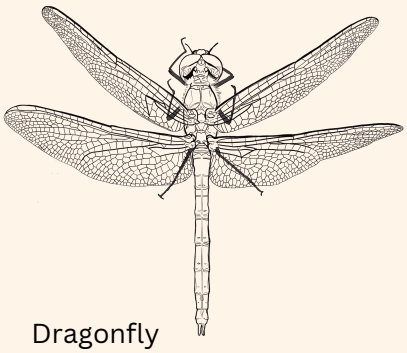
Ecology

- 1000s of species, covering many shapes, sizes and life styles.
- All feed on liquids.
- The larvae are maggots.
- Bluebottles feed on dung or carrion. The larvae feed on meat.
- Hoverflies feed on nectar and are important pollinators.
- Horseflies bite mammals, including humans, to drink blood.
- Craneflies (daddy long legs) have extra long legs, body and wings. The larvae live in the soil and feed on grass roots. The adults do not feed.

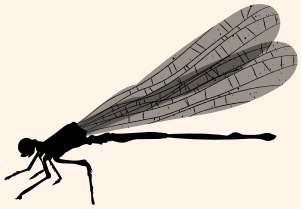
Other Insects

Features

- 6 legs and a head, thorax and abdomen.
- You may find other insects that are not represented here. Just remember, if it has a head, thorax, abdomen and six legs, it is an insect.



Dragonfly



Damselfly

Dragonflies & Damselflies

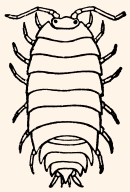
- Dragonflies hold their wings horizontally like an aeroplane. Damselflies fold their wings over their abdomen.
- Dragonflies and damselflies are aquatic insects. Their larvae develop in water.
- Dragonflies and damselflies are predators. They hunt flying insects. They may be found flying over meadows and open areas adjacent to aquatic habitats.

Invertebrates with more than 8 legs

Woodlice

Features

- Oval body, made of hard segmented plates.
- 7 pairs of legs.



Ecology

- Woodlice are crustaceans, related to crabs and lobsters.
- They live in damp, shady places and cannot tolerate drying out.
- Woodlice are decomposers. They eat rotting plant material, including dead wood.
- Female woodlice are attentive mothers. They carry their young around in a brood pouch under their belly.

Millipedes

Features

- A long, segmented body.
- Two pairs of legs per segment.
- Millipedes have over 34 legs depending on species.

Millipede

Pill Millipede

Ecology

- Millipedes are herbivores – they eat plant material.
- They are slow and gentle.
- One interesting species, the Pill Millipede, is oval in shape and looks like a woodlouse. It curls into an armoured ball for protection. Unlike woodlice, each segment has two pairs of legs, and there are always more than 7 pairs.

Centipedes

Features

- A long, segmented body.
- One pair of legs per segment.
- They have over 30 legs depending on species.
- They have a pair of poisonous fangs on the head. Irish species are too small to bite human. (Some tropical species can.)

Centipede

Ecology

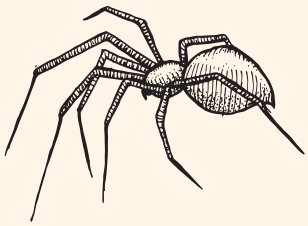
- Centipedes are predators – they hunt other invertebrates.
- They are fast.
- They hunt mostly at night.
- Most species hunt under logs and stones. They have a flattened body to enable them to fit into tight places, and the rear legs are adapted as feelers to enable them to reverse out if they need to.

Invertebrates with 8 legs (Arachnids)

Spiders

Features

- 8 legs.
- A two part body, comprising of a cephalothorax and an abdomen.



Ecology

- Spiders are predators. They eat other invertebrates.
- All spiders have spinerets and can make silk, although not all spiders make webs.
- Web-builders trap flying insects.
- Wolf spiders actively stalk and hunt prey, but don't use a web.
- All spiders bite and inject poison into their prey. They can wrap their prey in silk to disable or store it.

Harvestmen

Features

- 8 legs. The legs are usually very, very long.
- A small round one-part body. (The thorax and abdomen are joined into one part.)

Ecology

- Most harvestmen are nocturnal predators of other invertebrates. Some species eat carrion, nectar, fungi, or even bird droppings.
- Harvestmen do not have spinnerets, and do not produce silk.
- The second pair of legs are the longest and are used as feelers to detect prey and to find their way.
- If pursued by a bird, harvestmen can shed a leg. Hopefully, the bird will be distracted by the still twitching leg, whilst the harvestman runs away.

Mites

Features

- 8 legs. The legs are not very long.
- A small round one-part body.
- Very small, usually under 1mm.
- They may be bright red in colour.

Ecology

- Mites fill a variety of ecological niches. Many are decomposers.
- Red spider mites are parasitic on other invertebrates. You my see them on the legs of harvestmen.
- Ticks are parasitic mites. They feed on vertebrates, including humans.