This **Pocket ID Guide** is part of the OPAL Bugs Count survey pack. Use it to identify the invertebrates that you find.
Getting started with identification

You don’t need fancy equipment to survey bugs. **Your eyes** are your most important tool, but these may help too.

- A magnifier
- A camera
- Pencil and paper
- A jar (to put bugs in while you identify them)

Look after yourself and the bugs you find

- Handle bugs gently. Only pick them up when necessary and always put them back where you found them.
- If you put a bug in a jar to look at it, don’t keep it for too long, or leave it in the sun.
- Always act in a safe and careful manner and tell someone where you are going.
- See the Bugs Count Field Notebook for further advice.

To upload your Bugs Count results and learn more about OPAL, visit [www.OPALexplorenature.org](http://www.OPALexplorenature.org)
How to use this Pocket ID Guide

There are ten identification cards, covering different groups of invertebrates.

It’s easiest to identify a bug by counting the **number of legs**. Then use the **colour coding** to skip to the right section.

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How to use this Pocket ID Guide

Beetles

- Pincer-shaped jaws (can be hard to see on smaller beetles)
- Hard forewing cases (elytra) to protect the delicate hindwings
- Wing cases meet in a straight line making a T shape

Top tip: Not sure if you have a beetle or a true bug? Check how the wing cases meet. Beetles have a T-shape, but true bugs usually have an X- or Y- shape (see card 3).

Common body shapes

Name of group
Main features to look for
Top tips to tell apart types of bug that look similar
Examples (images not to scale)
Cards are colour coded by number of legs

Turn to the backs of the cards for great Fact Files

Want to do more? Doing the Bugs Count survey is just the start!

Across the UK, thousands of people spend their spare time recording wildlife. On each ID card we’ve included the web address of a group that enjoys recording those particular bugs. Why not visit their websites to find out about the activities they run and how you can join in?
Snails, slugs and earthworms

**Snails**
- Soft, slimy body
- Hard, coiled shell
- Shell can vary from a sphere, to a flattened disc or a pointed spire

**Slugs**
- Soft, slimy body
- Do not have a hard, coiled shell (although a few species have a tiny disc of shell towards the end of their body)

**Earthworms**
- Long, thin body divided into segments (which look like a series of rings or stripes)
- Thickened ‘saddle’ visible on adult worms

No legs
Snails, slugs and earthworms

- There are around 150 species of land snails and slugs in the UK.
- They belong to a group of molluscs called Gastropoda which means ‘stomach-foot’!
- Earthworms belong to a group called Annelida – the segmented worms. There are 27 species in the UK.
- Slugs, snails and earthworms all need to keep their skin damp so that they can breathe. They are particularly active at night and when the ground is wet.
- All three groups are a vital food source for many other animals, including birds, mammals and amphibians.

Did you know? Reaching an incredible 16cm long, the Leopard Slug (scientific name *Limax maximus*) is one of the UK’s largest slugs. It eats fungi, rotting plants and other slugs. When mating, a pair of Leopard Slugs will often hang from a thread of mucus (slime).

Discover more about slugs and snails on the Conchological Society’s website www.conchsoc.org
For earthworms visit www.earthwormsoc.org.uk
Beetles

Pincer-shaped jaws (can be hard to see on smaller beetles)

Hard forewing cases (elytra) to protect the delicate hindwings

Wing cases meet in a straight line making a T shape

**Top tip:** Not sure if you have a beetle or a true bug? Check how the wing cases meet. Beetles have a T-shape, but true bugs usually have an X- or Y- shape (see card 3).

Common body shapes

6 legs
Beetles

• There are over 4,000 species of beetle in the UK.
• Beetles belong to a group of insects called Coleoptera.
• Beetles can be found in a wide variety of habitats on land and in freshwater.
• Most beetles are beneficial, helping to pollinate plants, reduce pests and recycle nutrients.
• Many beetles eat living plants or fungi, others are active predators of invertebrates, whilst some eat dead plants and animals – even dung!

Did you know? The Stag Beetle (scientific name *Lucanus cervus*) is the biggest beetle in the UK, growing to an amazing 7cm long! Their larvae (young) live in rotting wood for up to seven years, but the adult beetles only live for a few months.

Love beetles? Why not join the UK Ladybird Survey?
www.ladybird-survey.org
True bugs

Wing cases usually meet in an X- or Y- shape
(not true for some true bugs, like aphids and scale insects)

Top tip: Unlike true bugs, the wing cases of beetles meet in a T-shape
(see card 2)

Common body shapes

a scale insect

aphids
(e.g. greenfly)

6 legs
True bugs

• Over 1,700 species of true bug have been found in the UK.
• They belong to a group of insects called Hemiptera, which means ‘half-winged’.
• Most true bugs feed by puncturing their food and then sucking up juices using their tube-like mouthparts.
• Many species feed on plants and some can be important pests (e.g. aphids).
• Aphids feed on plant sap, which is full of sugars. They secrete some of this as honeydew. Ants often feed on this honeydew and in return protect the aphids from predators.

Did you know? The young of froghoppers protect themselves from predators and becoming too dry by surrounding themselves in patches of foam bubbles – often called ‘cuckoo spit’. They create these bubbles whilst feeding on plant sap.

Discover more about true bugs at www.britishbugs.org.uk
True flies

- Large eyes (may almost fill the head)
- Antennae often very short
- One pair of see-through wings

Top tip: Hoverflies have much shorter antennae than wasps and bees (see card 5)

Common body shapes

- 6 legs
• There are approximately 7,000 species known from the UK and more are discovered each year.

• True flies belong to a group of insects called Diptera which means ‘two-winged’.

• Although we often think of them as pests, true flies are important, whether as predators, pollinators of plants, or as food for other animals (like bats and birds). Others help break down dead plants and animals.

• There are lots of insects that have the word ‘fly’ in their names that aren’t true flies, e.g. dragonfly, butterfly, greenfly and mayfly.

Did you know? Apart from a few hoverflies which can crunch up pollen, all true flies must eat food in liquid form – whether that is nectar, dung, blood, or something else!

Mouthparts vary in shape from the long, sucking tubes of mosquitoes and bee flies, to the disc-shaped ‘hoovers’ of blowflies.

Fascinated by flies? Find out more at www.dipteristsforum.org.uk
Bees, wasps and ants

- Long antennae
- See-through wings
- Most have a narrow waist
- Bees are often hairy. Wasps and ants are not hairy.

**Common body shapes**

- **Bees**
- **Wasps**
- **Ants**
  - Usually do not have wings
- **Sawflies**
  - Usually lack narrow waist
Bees, wasps and ants

- Over 7,000 species of bees, wasps, ants and sawflies live in the UK.
- They belong to a group of insects called Hymenoptera.
- Ants evolved from wasp-like ancestors over 100 million years ago.
- Bees and wasps are incredibly important pollinators, carrying pollen from one plant to the next as they feed on nectar.
- Some (but not all) bees and wasps can sting if they feel threatened, whilst Wood Ants (below) defend themselves by biting and spraying formic acid.
- A diverse group of wasps called ‘parasitoids’ reproduce by laying their eggs inside living invertebrates.

Did you know? Ants are one of the most abundant organisms on earth. Colonies can exceed 1 million individuals. This picture shows Wood Ants (scientific name Formica rufa) massing outside their nest to absorb heat from the spring sunshine.

Buzzing about bees? Visit the Bees, Wasps and Ants Recording Society website [www.bwars.com](http://www.bwars.com)
Butterflies and moths

What is the difference between a butterfly and a moth?

Nothing really! They are very closely related and there is no one feature that separates the two. The following tips will help you decide, but there are always a few species that break the rules!

**Butterflies**
- usually fly during the day
- have ‘clubs’ (lumps) on the end of their antennae
- rest with wings closed vertically above their body

**Moths**
- usually fly at night but some fly during the day
- have pointed and often feathery antennae
- rest with their wings folded flat over their body

Long antennae
Two wings on each side (but sometimes looks like just one)
Almost all have coloured wings that are not see-through
Butterflies and moths

- There are over 2,500 species of moth in the UK but fewer than 60 species of butterfly!
- They both belong to a group of insects called Lepidoptera.
- Adult moths and butterflies feed by sucking liquids such as nectar through a straw-like tube called a proboscis.
- Butterflies and moths are important pollinators, as well as being a vital food source for other animals. In Britain, Blue Tit chicks eat an estimated 35 billion moth caterpillars every year.
- Moths are often disliked because it is thought they eat clothes and other woollen fabrics. In fact, only two of the 2,500 species of moths in the UK are likely to eat clothes.

**Did you know?** Despite their gentle fluttering flight, some butterflies and moths like this Red Admiral (scientific name *Vanessa atalanta*) migrate all the way from southern Europe or North Africa to the UK. They arrive here in spring, breed over the summer and most leave again in autumn.

Discover more about these insects on the Butterfly Conservation website [www.butterfly-conservation.org](http://www.butterfly-conservation.org)
Crickets, grasshoppers and earwigs

**Crickets and grasshoppers**

Crickets and grasshoppers have long back legs that are strengthened for jumping.

- **Crickets have long antennae**
  - usually longer than their body

- **Grasshoppers have short antennae**
  - much shorter than their body

**Earwigs**

Earwigs have a pair of pincer-shaped claspers called ‘cerci’ at the end of their brown body.
There are 33 species of cricket and grasshopper in the UK and seven species of earwig.

Crickets and grasshoppers belong to a group called Orthoptera, meaning ‘straight-winged’. It refers to the way they hold their wings in a line along their back.

Earwigs belong to a closely related group called Dermaptera.

Grasshoppers only eat plants, whilst crickets and earwigs eat other invertebrates as well as plants.

Grasshoppers sing (‘chirp’) by rubbing their back legs against their wings, or drumming them on a surface. Crickets chirp by rubbing their wings together.

**Did you know?** The Mole Cricket (scientific name *Gryllotalpa gryllotalpa*) is one of the UK’s weirdest, rarest and most spectacular invertebrates. Like moles, they use their shovel-like front legs to dig tunnels through the soil. Mole Crickets live almost entirely underground, eating the roots of plants as well as a range of soil-living invertebrates.

Want to discover more about grasshoppers, crickets and their relatives? Visit [www.orthoptera.org.uk](http://www.orthoptera.org.uk)
Spiders and harvestmen

**Spiders**

Body clearly divided into two parts:
- The front part is called the cephalothorax (and includes the head)
- The back part is called the abdomen

**Harvestmen**

- Long thin legs
- One body part which is round or oval shaped
  (unlike spiders which have two body parts)
Spiders and harvestmen

- The UK has 27 species of harvestmen and 650 species of spider.
- All UK spiders are predators of invertebrates, especially insects. They immobilise them with venom injected through their jaws (‘fangs’).
- Not all spiders use silken webs to catch their prey. Some actively hunt, and others are ambush predators that sit in likely places and wait for prey to pass by.
- Harvestmen are at their most abundant and visible during the late summer and early autumn – the traditional crop ‘harvest time’.
- Harvestmen do not produce silk or venom, but can produce a pungent smell to put off predators.

Did you know? Thin, whispy cobwebs in your house, garage or shed may well belong to the Daddy-long-legs Spider (scientific name *Pholcus phalangioides*). Originally a tropical species, it has spread around the world. In the UK it prefers to live indoors and in outbuildings. It eats a wide range of invertebrates, including other spiders!

Discover more at the British Arachnological Society’s website [www.britishspiders.org.uk](http://www.britishspiders.org.uk)
Woodlice, centipedes and millipedes

**Woodlice**
- Body divided into many segments
- 7 pairs of legs
- Oval shaped body (when viewed from above)
- Some woodlice can roll into a ball
- Usually grey

**Centipedes**
- Long, thin body divided into many segments
- At least 15 pairs of legs, but can have many more
- 1 pair of legs on each body segment
- Usually orange or yellow

**Millipedes**
- Long, thin body divided into many segments
- Usually less than 50 pairs of legs
- 2 pairs of legs on each body segment
- Pill Millipedes can roll into a ball
- Dark brown or black

More than 8 legs
Woodlice, centipedes and millipedes

• There are 39 species of woodlouse, 57 species of centipede and 60 species of millipede in the UK.

• Woodlice, centipedes and millipedes are not closely related. Centipedes belong to a group called Chilopoda, millipedes to the Diplopoda, and woodlice are crustaceans in a group called Isopoda.

• All have a large number of legs, but not thousands!

• They live on damp ground surfaces, amongst fallen leaves and decaying logs, and under objects like plant pots.

• Woodlice and millipedes mainly eat dead or damaged plants.

• Centipedes eat other invertebrates, which they immobilise using venom injected from a pair of poison claws near their head.

Did you know? Eating a woodlouse was once thought to cure stomach ache (but don’t try this at home.) Woodlice have been given many different nicknames including cheeselogs, chiggypigs and gammerzows!

Discover more at www bmig org uk
**What are insect larvae?** Most insects reproduce by laying eggs. The young that hatch from these eggs are of two types:

1. **Larvae** look very different from the adults. They feed and grow, then their skin hardens and they turn into a pupa. Inside the pupa, they undergo a complete change, before hatching as adults.

2. **Nymphs** look quite like small versions of the adult. To grow, they moult their hard skin several times, each time getting bigger and looking more like the adult.

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**Butterfly and moth larvae (caterpillars)**

- butterfly caterpillar
- moth caterpillars

**Beetle larvae**

- ladybird larva
- click beetle larva
- ground beetle larva
- stag beetle larva

**True fly larvae and pupae**

- larva (maggot)
- pupa
- bluebottle fly
Can’t find a match?

There are well over 30,000 different species of invertebrate in the UK – far too many to include in this Pocket ID Guide.

If you can’t match your invertebrate to any of the ten categories in this Pocket ID Guide – or if it is too small to identify – record it in your Bugs Count Field Notebook as ‘Other invertebrates’.

To learn more about UK invertebrates visit www.OPALexplorenature.org/bugscount.

Great resources for identifying bugs include the OPAL iSpot website www.iSpot.org.uk, and the Natural History Museum’s identification forums www.nhm.ac.uk/identification.

This guide has been developed by the Natural History Museum as part of the OPAL Bugs Count survey. Photos by Harry Taylor except where credited otherwise.

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