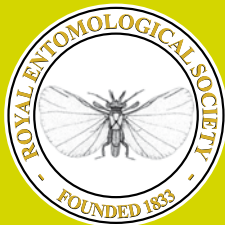




www.nationalinsectweek.co.uk



A Royal
Entomological
Society magazine
for age 7+

DISCOVER THE
AMAZING LIVES OF
INSECTS!

Issue No. 2

INSTAR

THE MAGAZINE FOR YOUNG ENTOMOLOGISTS

INSIDE...

**EXTREME
INSECTS!**

**MICROSCOPIC
WONDERS**

**MEADOW
MARVELS**

**...AND LOTS,
LOTS MORE!!**

LIFE UNDERWATER



**PAGE 4:
HOW TO HUNT FOR
INSECTS ACROSS
'THE INSECT ISLES'**



Welcome to INSTAR!

Welcome to the second INSTAR,
a magazine full of interesting
facts about insects.

INSTAR is for young people who
want to discover the amazing
world of insects.

Have fun!



If you find a word that you don't
understand then have a look at the **BUZZ**
WORDS in the first INSTAR too – read it for
free at
www.nationalinsectweek.co.uk/instar

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BUZZ WORD

ENTOMOLOGIST

Someone who
studies insects
for their job or
hobby is called
an entomologist.
Entomologists look
at where insects
live, what insects
eat and how insect
bodies work. This
helps everyone to
understand how
important insects are.



© SARAH BEYNON

▲ An entomologist at work

What's inside...



Remember to count legs!

Insects usually have six legs, three body segments, and one pair of antennae on their head (spiders, centipedes and woodlice are not insects!)



▲ A ground beetle with three body segments – head, thorax and abdomen

© COLIN REW

The Insect Isles

So far, 1.5 million insect species have been studied and identified around the world. There are more than 30 times more insects than all the birds, mammals, frogs, reptiles and fish put together! If ever an alien explorer came to visit Earth, they would describe our planet as 'the one with the insects'.

There are over 24,000 species of insect in the British Isles. Most belong to just five 'Orders' (groups of similar species). If you learn how to recognise these main groups, you'll be able to start identifying most insect species.

COLEOPTERA

Beetles
Around 4000 UK species



The first pair of wings have become hard wing casings, called elytra

24,000
UK insect species



DIPTERA

True flies
Around 7000 UK species



Only one pair of wings

HEMIPTERA

True Bugs
Around 1830 UK species



Thin piercing mouth parts

LEPIDOPTERA

Butterflies, Moths
Around 2570 UK species



Wings covered in microscopic scales

HYMENOPTERA

Wasps, bees, ants
Around 7000 UK species



Thin waist between the thorax and abdomen

Many places to call home

Why are there so many species of insect? One reason is their small size. Imagine a plant growing in your garden. There are insect species that can feed on the roots, others that burrow into the stem, and leaf-miners that live in the middle layers of leaves. Each insect has its own micro-environment, a 'niche', to live in. They can fit in many places that animals like birds and mammals are too big for.

HABITAT

A habitat is an environment in which plants and animals live - forests, meadows and ponds are all examples of habitats. Even your house is a habitat!

BUZZ WORD

There are also so many species of insect because there are lots of places that they can call home. Some have adaptations to live in cool and dark places like a forest floor, others have adaptations to live in much warmer and brighter habitats like the desert.

These are all insect larvae with adaptations to help them live in their habitats



© ROGER KEY



© ROGER KEY



© ROGER KEY

BUZZ WORD

ADAPTATION

An adaptation is a feature that helps a species survive in its environment. Big eyes to spot predators and long legs to run fast are examples of adaptations.

BUG HUNTING

with Dr Sarah Beynon

You can find out so much about insects by watching them, but first you have to find them. So that you can be the best bug-hunter around, we asked expert entomologist, Dr Sarah Beynon, for her top bug hunting tips.

Q: First of all, why should we study insects?

A: If you want to be amazed by what seems like a totally alien world on your doorstep, study insects! You can go on an insect safari pretty much anywhere and you don't really need special kit to do it.



Q: What's your favourite place to find insects?

A: My favourite place to go looking for insects is a wild flower meadow – generally, the more different species of flowers you see, the more insects you will see. However, a hedgerow covered in flowers comes in a close second, as this is often where you find the bigger insects hanging out. It's best to go looking for insects on a warm, sunny day between April and October.



Common blue (*Polyommatus icarus* – this is the butterfly's scientific name)

Q: What do you use to find insects?

A: The best bit of kit for catching insects to study is your eyes. You need to 'get your eye in' and 'think like an insect': where would you hang out if you were an insect? Probably near food and shelter! Therefore, look underneath things and on flowers and leaves! As soon as you spot one insect, you'll start to realise they're everywhere. You'll soon be seeing insects that no-one else even realised were there.



▲ Seven-spot ladybird (*Coccinella septempunctatus*)

Q: How can I see small insects better?

A: It's worth having a magnifying glass or hand lens with you to look at small insects, but you do need to catch them first. To do this, I would get hold of (or make) a pooter – a device that sucks up tiny insects without squashing them. If you don't have a pooter, I always have a pocket full of collection pots too, so I can capture any insects and to have a closer look before I release them again.

Q: Have you got any tips for new entomologists?

A: Don't be put off by all the long, scientific names of insects: it doesn't matter if you can't identify what you catch at the beginning or remember its name – you will learn as you go along. Make sure you have a good insect identification guide with you in your bag and then just look up what you find – you'll soon get the hang of it.

Make your own pooter!

With help from an adult, make two holes in the lid of an empty jar, each big enough for a plastic straw or tube. Plug the gaps using blutack or plasticine. Tie a square of muslin, old tights or gauze over the inside end of one straw – this stops you from breathing in the insects you suck in through the other straw!



You can meet Sarah and the stars of her incredible insect Zoo at Dr Beynon's Bug Farm in Pembrokeshire, Wales.
www.thebugfarm.co.uk



Dr. Beynon's
Bug Farm

Meadow Marvels

A good patch of flowers in a field is a perfect place to find insects. If you wait patiently next to them, you are likely to see loads of insects coming to feed on nectar and pollen.

Honeybees are the most well know pollinators but there are thousands of other insects that pollinate flowers too. There are 250 bee species in total in the British Isles, along with a whopping 2200 butterflies and moths, 6700 flies, and many other beetles, wasps and other insects that also visit flowers to feed on nectar and pollen.



▲ Red-tailed bumblebee



▲ Clarke's mining bee (a solitary one)

Insects don't only visit flowers to drink sugar-rich nectar. Flowers also produce pollen, which is rich in protein. Many bees and bumblebees collect pollen to feed to their young. Many of these bees use their middle legs to scrape pollen stuck on their hairy bodies into 'pollen baskets' which are special hairs on their back legs. Can you spot pollen baskets on any bees you see?

ENTO INFO: CINNABAR MOTH

COMMON NAME: Cinnabar moth

SCIENTIFIC NAME: *Tyria jacobaeae*

ORDER: Lepidoptera

FAVOURITE FOOD: Ragwort leaves

LIKE TO BE: Chomping leaves as a larvae, flying in the day as adults

SEE THEM: May - August



FACTS

- ▶ The caterpillars feed on toxic ragwort plants to become bad tasting.
- ▶ Bright orange and black stripes on the caterpillar and red markings on the adult warn predators that they taste nasty!

BUZZ WORD

POLLINATOR

As insects land on flowers to drink nectar and eat pollen, they pick up pollen on their bodies and transfer it between plants 'pollinating' them so they can make new seeds. Pollination is really important for producing many of the fruits and vegetables we eat.

Not only pollinators live in flower meadows though. Plants are food for herbivores feeding on plant leaves, stems, and roots. Insects that are predators and parasites which feed on herbivores also use plants for shelter. Meadows truly are buzzing with insects!

Read more about predators and parasites in INSTAR 1!

BUMBLE, HONEY OR SOLITARY BEE?

The honeybee is just one of many bee species in Britain. Most species are so-called 'solitary bees'. Solitary bees don't live in 'social' colonies and don't produce honey like the honeybee, but they are very important pollinators too. The larger and hairier bumblebees are also 'social', but live together in underground nests and not in hives.



▲ Honey bees guarding their colony

Meadows truly are
buzzing with insects!

Life in the dirt

Many insects flit and flutter above the flowers, but lots of other insects make dirt and the underground their home.

The best architects in the meadow have to be ants. Many ant species dig out incredible nests below the ground, building a series of tunnels to connect big chambers. Ant workers search for food outside of the nest and bring it back to feed larvae produced by their queen. Ant colonies can be huge – a nest of the common black ant (*Lasius niger*) can have over 40,000 individuals!



Look for nearby piles of the soil that ants remove when tunnelling. You might see these and the entrance holes to ant nests in the grass or in gaps between brick patios and driveways.



WASTE REMOVAL SERVICE

Soil isn't the dirtiest thing insects dig through though. There are around 60 species of dung beetle in the UK who all feed on poo. We don't have species that roll dung balls along the ground in the UK, but some of our species can bury dung over 2 m deep in the soil. That is like digging a hole 800 times deeper than you are tall.

A single cow produces nine tons of dung in a year. That's over one and a half African elephants. Without dung beetles and other dung removing invertebrates like dung flies and earthworms, an area the size of London would be knee deep in poo in that time!

ENTO INFO: MINOTAUR BEETLE



COMMON NAME: Minotaur beetle

SCIENTIFIC NAME: *Typhaeus typhoeus*

ORDER: Coleoptera

FAVOURITE FOOD: Dung from rabbit, sheep and deer

LIKE TO BE: Burying dung under the ground, particularly in sandy soils

SEE THEM: Walking around sandy grasslands at night

FACTS

- ▶ Minotaur beetles are named after the mighty 'horns' that the males use to fight each other. The females do not have horns.
- ▶ These dung beetles bury dung deep underground for their larvae to feed on.

The Insect Musicians

Rien De Keyser

On a hot summer's day, the sound of grasshoppers and crickets in the countryside is everywhere. They are a great group to begin your entomological outdoor adventures with and really stand out in the insect world, with their large hind legs, which they use for hopping away from danger. It is great fun to see them jumping away with every step you take in the long grass.

Orthoptera (the order which includes grasshoppers, crickets, and similar groups like katydids) are true sun-lovers: the majority of the 20,000 known species around the world live in tropical climates. We are lucky enough to have 33 species that can survive our cold British winters. In the UK there are several species of grasshoppers, true crickets and bush crickets, and groundhoppers. We also have one species of mole cricket – found only in the New Forest in the UK – a truly spectacular creature with wide and powerful front legs for burrowing underground.

Now, for the budding orthopterist (a young person studying grasshoppers and crickets), the first question to ask is: “**How do you tell a grasshopper and a cricket apart?**”. The most obvious difference is that grasshoppers have rather short antennae, whereas crickets usually have incredibly long antennae – often longer than their body. These long antennae wave around to detect prey or predators.

Did You Know...

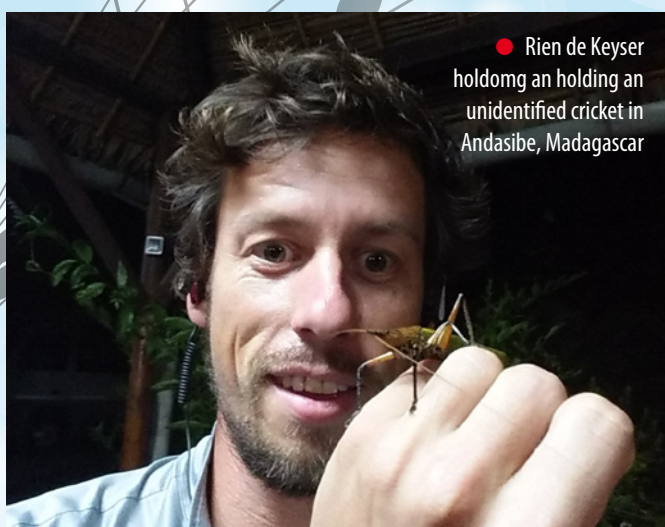
Unlike butterflies and beetles that change from larva to adult, grasshoppers and crickets do not undergo complete “metamorphosis”. In spring and early summer, you will find baby-grasshoppers and crickets that look like adults you see later in the year, just they are smaller and lack wings.





▲ A pink grasshopper

© ROGER KEY



● Rien de Keyser holding an unidentified cricket in Andasibe, Madagascar

To take your new hobby further, you only need a good pair of eyes, a good pair of ears, and a meadow with long grass. Once you've found a good spot, take your time to slowly approach an orthopteran and study it in detail. You will very quickly notice that there is a lot of colour difference between grasshoppers. I used to get very excited when I discovered pink grasshoppers in the field, and I learned that the common meadow grasshopper can be both pink and green.

Another interesting difference between grasshoppers and crickets is that male crickets "stridulate" (chirp) by rubbing both wings together and they listen with their "ears" in their front legs. Male grasshoppers on the other hand make sound by rubbing their hind legs against their wings and they have their "ears" in their bottom.

BUZZ WORD

OVIPOSITOR

Female crickets have a special feature: they carry around what looks like a fearsome sword! This is actually a harmless egg-laying organ, the ovipositor, which they use to cut holes in the ground or in plants to lay their eggs in a safe place.



© RIEN DE KEYSER

Grasshoppers and crickets are an absolute joy to study, and a challenge! They will attract your attention with their calls, but will go quiet as they spot you approaching, hiding from danger. With plenty of patience, you can slowly approach them, until they restart their song and let you enjoy their special concert. Good luck, and enjoy!

Ovipositor

GRASSLAND HABITAT

What two things do bees feed on from flowers? (Page 8)

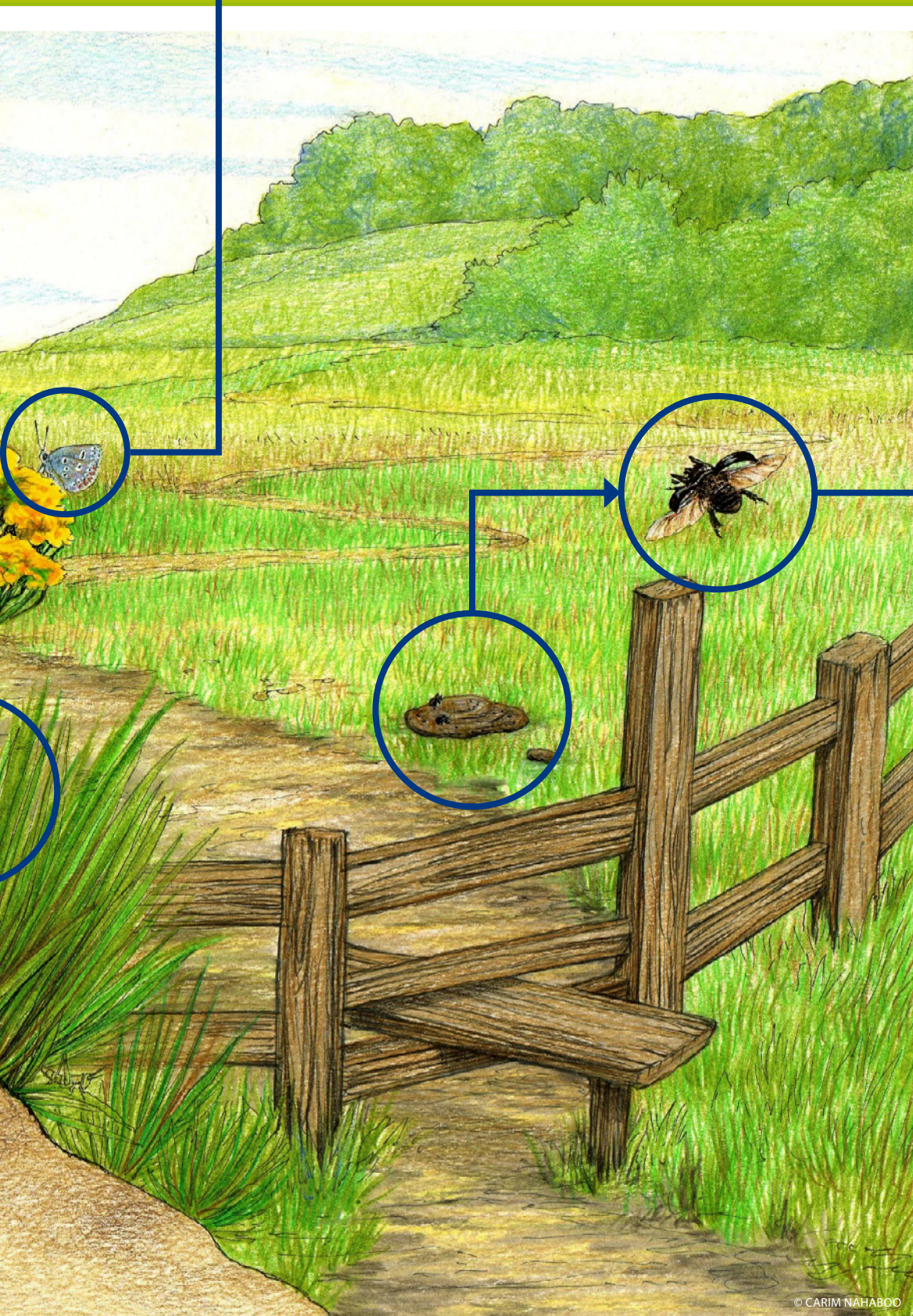
Why do some insects have bright colours? (Page 8)



What does an ant queen do? (Page 9)

How can you tell if this is a grasshopper or a cricket? (Page 10)

What do butterflies
use to drink nectar?
(Page 27)



What species
of dung
beetle is this?
Is it male or
female?
(Page 9)

POND DIPPING

Small, shallow ponds often have the most aquatic insects (aquatic means living in water). These ponds are too small for fish that eat insects, so there are lots left for you to find. Good wildlife ponds also have plenty of water plants which provide great shelter for small creatures so they get eaten less.

If you approach a pond really quietly and slowly, you can look at small insects living in the water without scaring them away. Most often they will stay close to the plants or to the leaf litter on the bottom of the pond. If you are lucky you can see diving beetles, backswimmers, and pond skaters.



If you have a net with a long handle, you can reach into the water to collect insects living on the surface. Have a plastic tub or jam jar filled with pond water ready to collect your catch so you can take a closer look. Make sure to have an adult with you and be careful not to fall in!

Walking on water

Squat down near the edge of the pond and study the surface. Can you see the fascinating creatures zipping across the surface of the water? These are pondskaters. The most common species of pondskater are very good flyers, so they are often the first creatures to arrive at a new pond.



ENTO INFO: PONDSKATER

COMMON NAME: Pondskater

SCIENTIFIC NAME: *Gerris lacustris*

ORDER: Hemiptera

FAVOURITE FOOD: Small invertebrates

LIKE TO BE: On the surface of water

SEE THEM: Warmer months

FACTS

- ▶ Pondskaters' long, water resistant legs help them stay above the surface of the water.
- ▶ They can propel themselves at up to 1.5 m per second.
- ▶ They use their front legs to detect ripples and vibrations to find prey on the water.



© PETER BARNARD

LIFE UNDER WATER

BUZZ WORD

BREATHING UNDER WATER

Whilst nearly all insects live on land, there are some insects that live most or part of their life in the water.

- The larvae of mosquitoes have a tube like a 'snorkel' to breathe underwater.
- Other insects, like water boatmen, can carry air underwater with them, trapped in hairs around their body. This air supply is similar to the bottles scuba divers use.
- Dragonfly, damselfly and mayfly larvae have gills like fish that take oxygen from the water so they don't need to visit the surface.

INVERTEBRATE

Animals without a backbone are called invertebrates. This includes insects and their close relatives, spiders, millipedes and woodlice.



ENTO INFO:

GREAT DIVING BEETLE

COMMON NAME: Great diving beetle

SCIENTIFIC NAME: *Dytiscus marginalis*

ORDER: Coleoptera

FAVOURITE FOOD: Small invertebrates, tadpoles, and fish

LIKE TO BE: Swimming in still ponds

SEE THEM: Most the year

FACTS

- ▶ The Great diving beetle is one of the largest beetles in the UK at 35 mm long.
- ▶ Suction cups on their first two pairs of legs let them keep a tight grip on their struggling meals.



ENTO INFO:

WATER BOATMAN

COMMON NAME: Water boatman

SCIENTIFIC NAME: *Corixa punctata*

ORDER: Hemiptera

FAVOURITE FOOD: Plants and algae

LIKE TO BE: Swimming under calm, still water

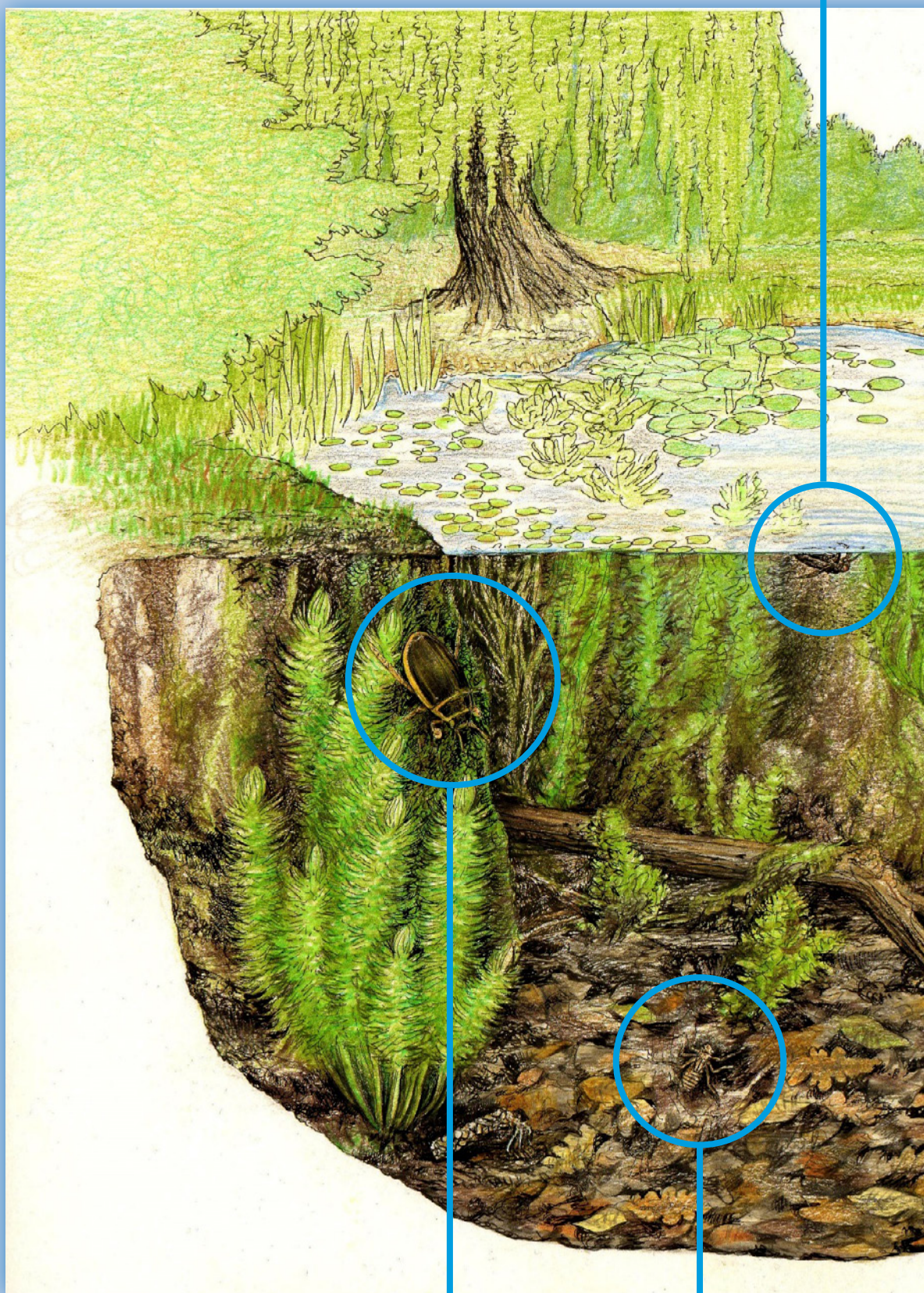
SEE THEM: Most of the year

FACTS

- ▶ The air pocket they trap around their body can let them stay underwater for up to 120 days!
- ▶ They row through the water using their back legs as oars.

POND HABITAT

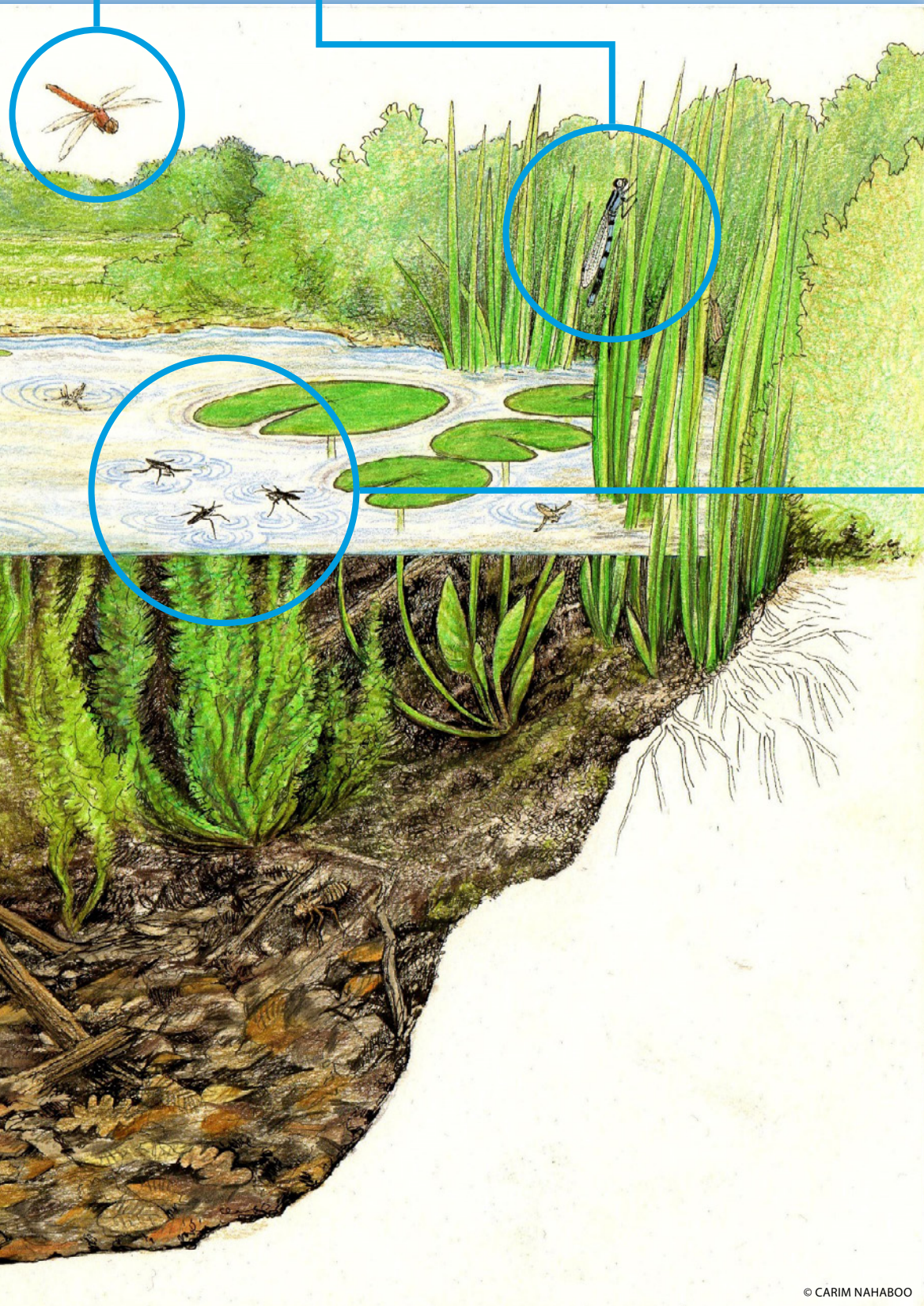
How does a water boatman trap air around its body? (Page 15)



What do diving beetles eat? (Page 15)

Can you think of how different insect species breathe underwater? (Page 15)

How do dragonflies and damselflies breathe when they are young and live under the water? (Page 15)



Do you know the name of these insects? (Page 14)

© CARIM NAHABOO

FOREST FORAYS

Forests are cool and dark places compared to open fields, with leaves forming a tree 'canopy' blocking out light. Insects are cold blooded and need warmth to be active, so many insects 'bask' during the day, sitting in sunny spots to absorb warmth. If you see a sunny spot in the forest, such as some leaves in a ray of sunshine, have a close look to see if anything is basking! You can see many butterflies perching on leaves with their wings open to absorb as much light as possible.

Tree Houses

Trees are the home of many different insects. Some insects – like caterpillars – feed on the leaves. Perhaps you can see holes cut out of leaves by these insects?

Many other insect species also eat the seeds and fruits of trees. The acorn weevil is a particularly fascinating species. Females

use their long snout (called a 'rostrum') with jaws on the end to chew deep into the centre of a young acorn where they then lay an egg. The larvae hatch from the egg and feed within the acorn as it grows. Look for acorns on the ground with small holes in them – this may have been the home of an acorn weevil! With

their long, thin rostrums and their moustache-like antennae, there are few cuter insects than the weevils.

Trees also create homes for insects on the forest floor. As leaves fall in autumn, they create 'leaf litter' that other insects shelter in and feed upon.



● Acorn weevil (*Curculio glandium*)

© ROGER KEY

Dead Wood

When trees die and fall over, a whole army of creatures will feast on them. Dead trees can also provide a great place for bug hunting. Turn over fallen branches and smaller pieces of dead wood to find lots of invertebrates, such as woodlice, centipedes and ground beetles (but please, gently put their home back in the same place you found it, without crushing any of them).

Hornets build incredible 'paper nests', usually in the middle of hollow trees. They make nest material by chewing up plants, twigs and bark and mixing it with spit to make a pulp. The pulp is then shaped into the nest which gives the colony protection against the weather and keeps their young safe.

Small holes in fallen logs show you where a wood-feeding insect used to live as a larva and has come out of the wood as an adult. Some wood-feeding insects leave beautiful patterns in the wood.

"Hornets build incredible 'paper nests', usually in the middle of hollow trees."



▲ ▼ Hornets



Defences

Insects are the meal of choice for many animals – birds, mammals, reptiles (as well as other insects) all depend on insects as a food source. But insects have many clever defences to stop being eaten.

Shieldbugs are also known as ‘stink bugs’ because of the foul smelling liquid they leave on your hand if you disturb them. This liquid is their stinky blood which they squirt out to warn away predators. The Devil’s coach horse beetle also releases a nasty smell from its abdomen to protect itself from predators, arching its bum in the air like a scorpion and opening its jaws wide when it’s threatened.

Another clever way to defend yourself is to roll up into an armoured ball. Ruby-tailed wasps (named because of their colourful, dazzling exoskeletons) curl up tight to protect themselves from being eaten. Their hard exoskeleton protects their softer body parts from being bitten.



▲ Speckled wood (*Pararge aegeria*)



● Forest bug (*Pentatoma rufipes*)
a species of shield bug.



© ROGER KEY

ENTO INFO: DEVIL'S COACH HORSE

COMMON NAME: Devil's coach horse

SCIENTIFIC NAME: *Ocypus olens*

ORDER: Coleoptera

FAVOURITE FOOD: Slugs, snails, and other insects

LIKE TO BE: In the leaf litter

SEE THEM: Between April and October

FACTS

- ▶ At up to 2.8 cm long, the Devil's coach horse is one of the largest beetles in the UK.
- ▶ Be careful as the big jaws of this species can give you a painful nip!



© ROGER KEY



© ROGER KEY

▼ Ruby-tailed wasp
rolled into a ball

ENTO INFO: RUBY-TAILED WASP

COMMON NAME: Ruby-tailed wasp

SCIENTIFIC NAME: *Chrysis ignita*

ORDER: Hymenoptera

FAVOURITE FOOD: Larvae feed on the larvae of bees and wasps

LIKE TO BE: On warm walls and tree trunks on sunny days

SEE THEM: Looking for holes in tree trunks in sunny gaps and forest edges

FACTS

- ▶ Ruby-tailed wasps are cuckoo wasps. They are called this because they lay their eggs in the nests of other insects – just like cuckoos..

FUNKY FLIES

House visit

The common housefly (*Musca domestica*) is well known in our homes for its slightly annoying buzzing but flies are incredible creatures too. Although flies only have one pair of wings, they are excellent fliers. Their second pair of wings have become small sticks called 'halteres' that help keep them steady in the air and make them really good acrobats. Their large eyes give them vision all around them, which combined with their fast reactions and flying skills make them incredibly good at escaping predators or a fly swatter.



© LIZA FOWLER

▲ Housefly

Mimicry

Why do so many insects have yellow and black stripes? Lots of birds and mammals eat insects, but wasps and bees can fight back by giving them a sting. To make sure they don't get stung again, these predators learn which colour patterns to avoid. Insects like hoverflies don't have a sting, but they copy or mimic the colour pattern to trick predators into thinking they are dangerous too.

▼ Hoverfly



© ROGER KEY

▼ Wasp



© ROGER KEY

Bloodsuckers



Although it isn't very nice to have an insect drink your blood, mosquitoes are incredible flies to study. They use the smell of our sweat and the carbon dioxide gas we breathe out to find us from far away. They use their sharp mouth parts to break through the skin and find small blood vessels to drink from. Only females drink blood, digesting it so they can make eggs. Mosquitoes in the UK can't give you any diseases, but in other countries they can give you malaria and dengue, moving infected blood from one person to another when drinking. Entomologists work hard to find ways to stop diseases carried by mosquitoes.

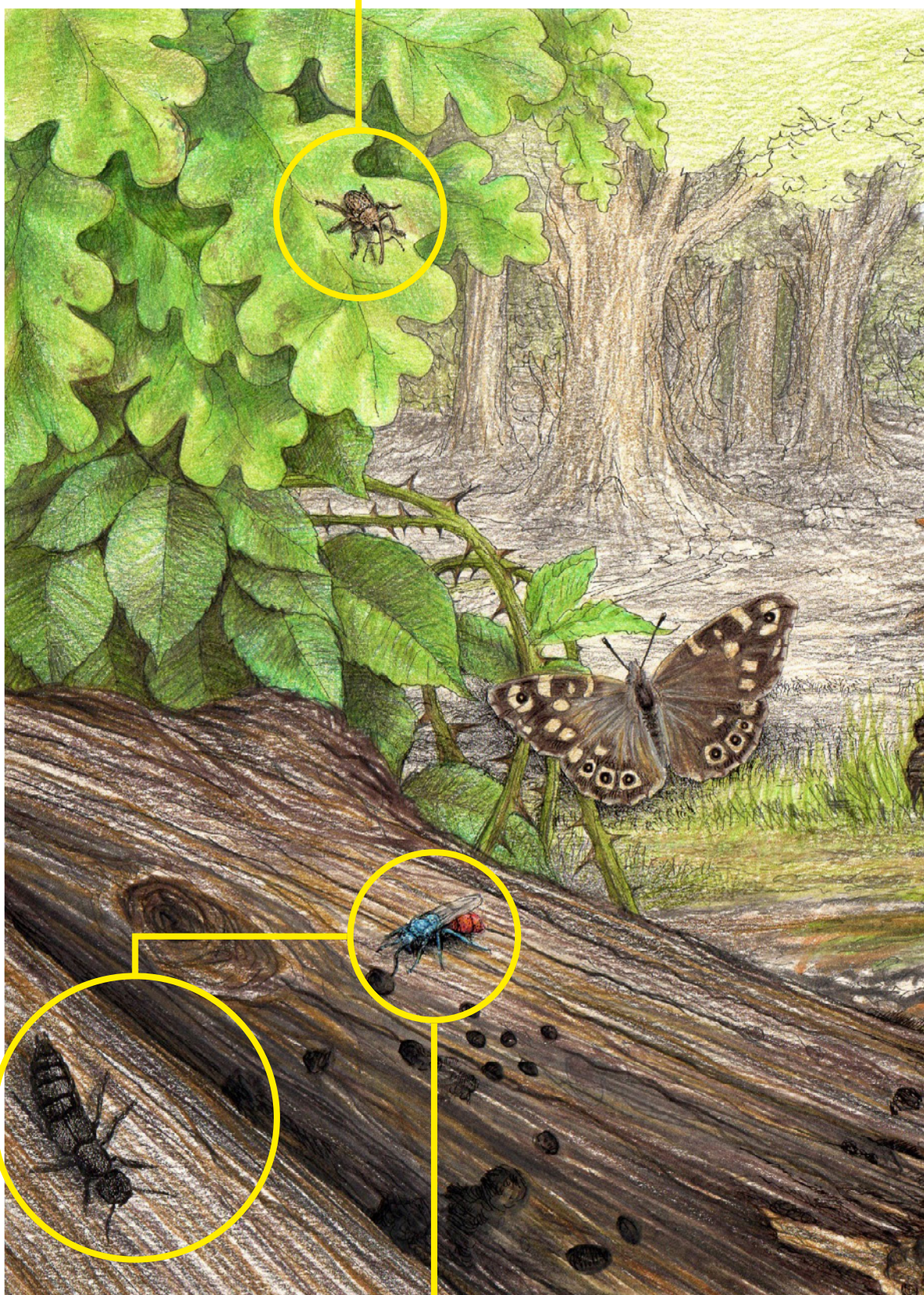
Did You Know...

Why are wasps so active at the end of the summer? When the nest is no longer active in autumn, they eat sugars from fallen fruits for energy. This is why you may see a lot of them around your fruit trees (and at your picnics and BBQs!)

If you look closely, you can see that hoverflies only have two wings instead of four like wasps, and they don't have sharp mandibles. Although a predator may be able to see the differences too, why take the risk when there are other insects to eat?

FOREST HABITAT

What is the long snout of a weevil called? (Page 18)



How do these insect species defend themselves? (Page 20)



What does a
hornet make
its nest out of?
(Page 19)

Why are
shieldbugs
also known as
'stink bugs'?
(Page 20)

Garden insects

Dr Andrew Salisbury

Andy is an entomologist at RHS Garden Wisley and is Chair of the Wildlife Gardening Forum



What better place to start hunting for insects than your own garden. Lots of plants, ponds, log piles, and compost heaps provide different habitats to find many insects and other invertebrates. Don't worry if you don't have a garden though, window boxes and hanging baskets filled with flowers can attract lots of insects such as bumblebees, hoverflies and other pollinators.

TOP 10 places and clues to look for invertebrates in your garden.



1 Leaves with holes: signs of herbivorous caterpillars and some beetles feeding on them

9 Plant parts: You might be lucky to spot a leggy harvestman (eight legs, non-insects related to spiders) on many plant parts

2 Leaves with insects and yellow/brown spots on them: signs of insects with piercing mouth parts feeding on plants e.g. aphids thrips and some true bugs



7



3 Damp areas and rotting plant material: a good home for insects and non-insects (such as woodlice) that feed on and break down wood and leaves



 **RHS**
Inspiring everyone to grow



'My favourite garden insect is the metallic green rose chafer beetle, often found on flowers. Its large white grubs are valuable recyclers, feeding on rotting plant material, they are often found in compost heaps'

4

Green algae and fungus (greyish/black moulds) growing on living plants in shady spots are good places for springtails (non-insects 'Collembola')



Evergreen plants (ones that keep their leaves all year round): good for web-spinning spiders (eight legs, so not insects)



5

Open flowers: perfect for many pollinator species (such as hoverflies, beetles and wasps) to feed on nectar



10

Garden buildings and sheds: a great place to find earwigs



6

Tubular flowers: good for pollinators with long tongues, such as bumblebees, or a proboscis, such as butterflies to feed from

8

Stems and shoots of plants with aphids: can be a good place to find ladybirds eating them!



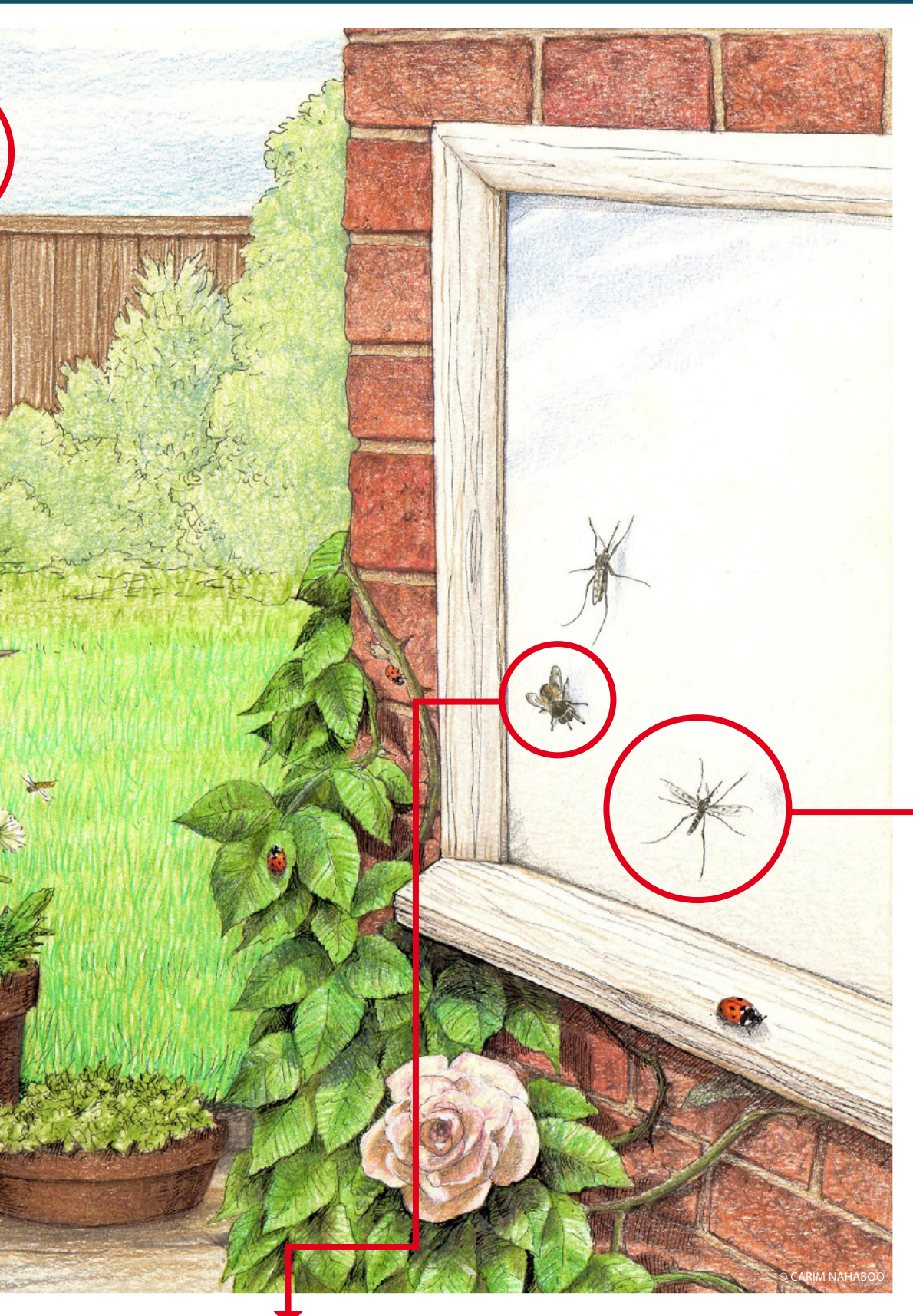
GARDEN HABITAT

How do you tell the difference between a wasp and a hoverfly? (Page 21)



Why do many hoverflies have yellow and black stripes? (Page 21)

What covers butterfly wings? (Page 4)



Do all
mosquitoes
drink blood?
(Page 21)

Why are flies so
good at flying?
(Page 21)

Extreme Insects

Insects are extreme animals with incredible shapes, sizes, defences, speeds, and many other unbelievable talents. Which of these British species is your favourite extreme insect?

LARGEST vs smallest

Males of the stag beetle (*Lucanus cervus*) measure a whopping 8 cm from their bum to the tips of their enormous antlers (which are actually mouth parts). The males use their antlers for wrestling other males, just like male deer ('stags') use their antlers. A truly spectacular sight! These beetles spend most of their lives as larvae feeding on rotting wood and it can take up to 6 years to emerge as adult beetles. It takes a long time to grow into Britain's largest beetle!

Fairyflies (actually a type of wasp in the family *Mymaridae*) are some of the smallest insects in the world. Some British species are just 0.5 - 1 mm long (smaller than a pin head). Fairyflies are so small because they lay their eggs inside the tiny eggs of other insects.



© ROGER KEY



Life on ice

Unlike most insects, the snow flea (*Boreus hyemalis*) feels quite at home in the cold. It is active during the coldest winter months and lives on the snow. These insects spend the summer as a larva feeding on moss before coming out as adults into the cold. It prevents itself from freezing to death by using its own natural antifreeze, which gives this insect the nickname the Antifreeze Scorpionfly. Can you think of a better superhero name for an insect?

WHY NOT BUILD AN INVERTEBRATE?

Peter Smithers

Do you want to build your own insect or other invertebrate? Be a true entomologist and give your exciting insects the correct number of body parts (a head, a thorax, and an abdomen) and attach the legs and wings to the right body bits.

Build a damselfly

1

Some paper cups and paper straws.

- These are used for the body parts and legs of your minibeast
- If you do use plastic ones make sure you recycle them afterwards.

2

Some sticky tape.

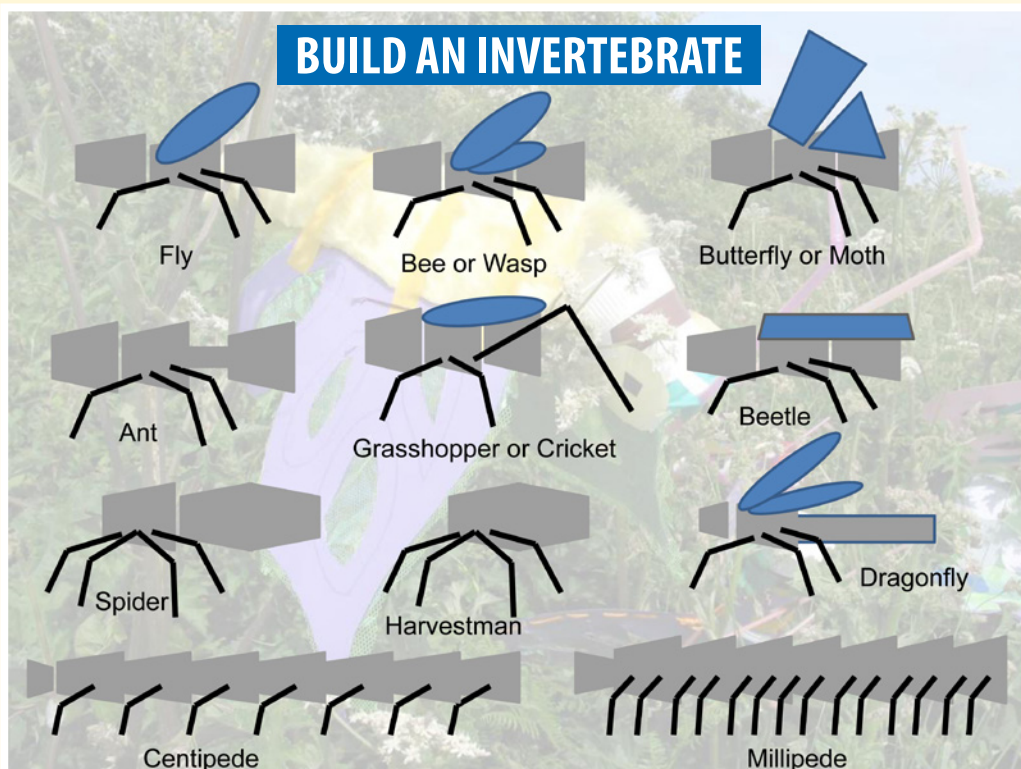
- Masking tape works well as it can be coloured in but any sticky tape will do.

3

Some card/paper and felt tip pens.

- Add a face and some wings to your model so your bug can come to life.
- Why not search online or look through INSTAR for the wings or face of your chosen invertebrate and then copy or print them on to light card?

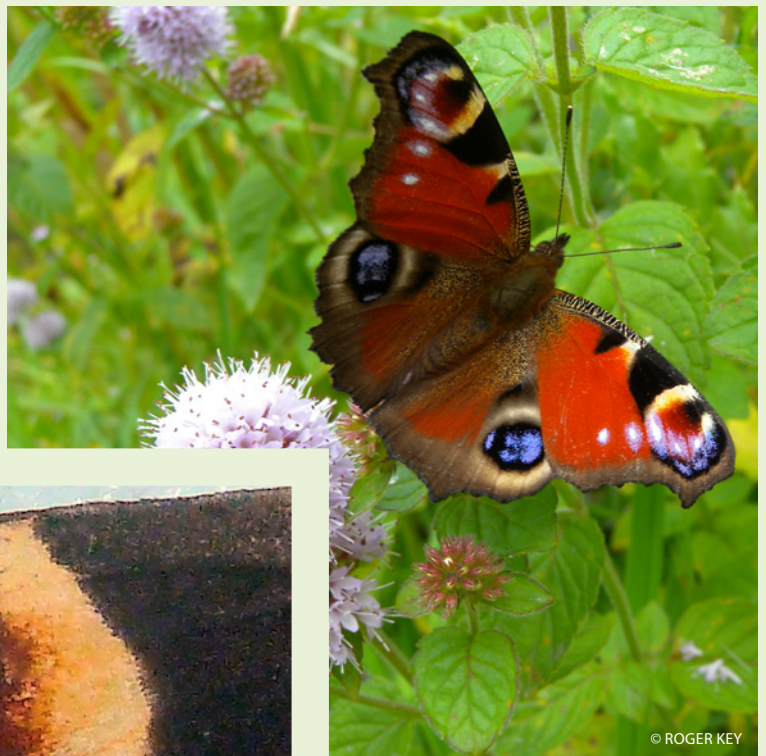
Below are some invertebrate groups you can build. After building your own bug, you'll soon know your flies from your wasps and your insects from your millipedes, centipedes and spiders. You can always build your favourite imaginary insect too made out of your favourite insect body parts. So get creative and become the entomologist you have always wanted to be.



INSECT BODIES THROUGH THE LENS



Although many insects are tiny, they are wonderfully complex animals. By using a hand lens or a microscope, we can experience their alien world and enjoy their beauty.



© ROGER KEY



Scales can be brightly coloured for sending signals to other butterflies. They can be dark to help butterflies to warm up in the sunshine.

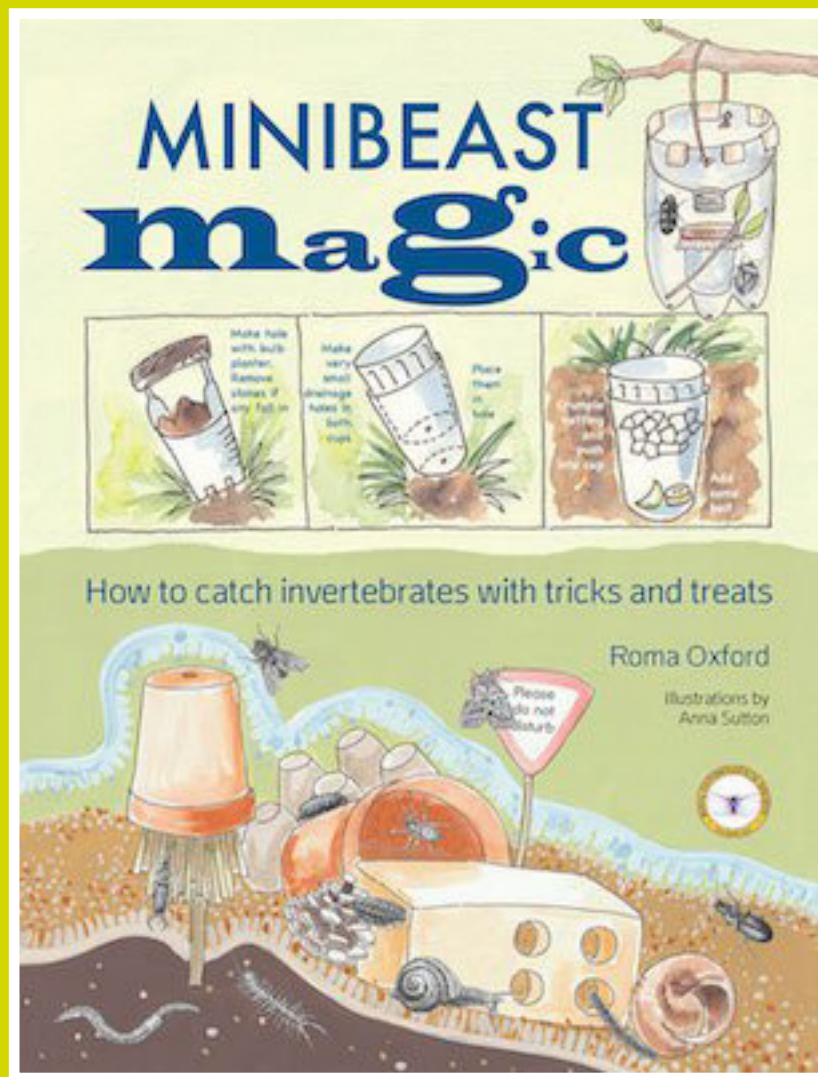


Tiger beetles are great predators. They use their sharp jaws (mandibles) to catch prey. They eat slugs and other insects and have large eyes to spot them. Look at the long legs for running quickly to catch them too!



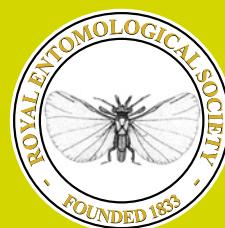
Many insect males have very larger antennae compared to females, with lots of extra branches. A 'feather' shape increases the area to catch chemicals in the air. These chemicals help the males to find the female insects.





If you would like to learn more about how to catch invertebrates then look for 'Minibeast Magic' by Roma Oxford and Anna Sutton – available from the Field Studies Council (www.field-studies-council.org)

INSTAR



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