



Conservation Education

SPRING TERM 2005

ISSUE ELEVEN

Published by the
Young People's Trust for the Environment
3 Walnut Tree Park, Walnut Tree Close,
Guildford, Surrey, GU1 4TR
Tel: 01483 539600
email: info@yptenc.org.uk
Web site: www.yptenc.org.uk
ISSN 0262-2203

Director: Peter Littlewood

Contents

2 Insects
Arachnids

3 Crustaceans
Annelids
Others Myriapods

4 Home Sweet home!
Slugs-Yum!
Food Glorious Food!
Divers, Snorklers,
Swimmers & Skaters

5 Food Web
Did you know?
All Creatures Great & Small

6 Going... Going... Gone!
Become a Bug-Hunter!
Activity Ideas

7 What is it?
Butterfly or Moth?

8 Nature News

Minibeasts

Spiders - aaaarrggh! Slugs - yuk! Wasps - ouch! This is many people's first reaction to the sight or mention of many of our minibeasts. The word 'minibeast' itself is misleading. It literally means 'very small (mini), dangerous animal (beast)' and indeed some of them are harmful - to both animals and humans. However, most of them are harmless and do, in fact, play a very important role in gardening and farming. All of them play a vital role in the life of the habitat in which they live.

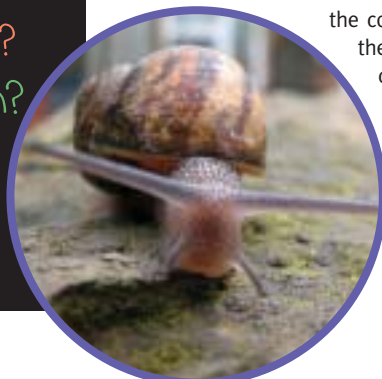
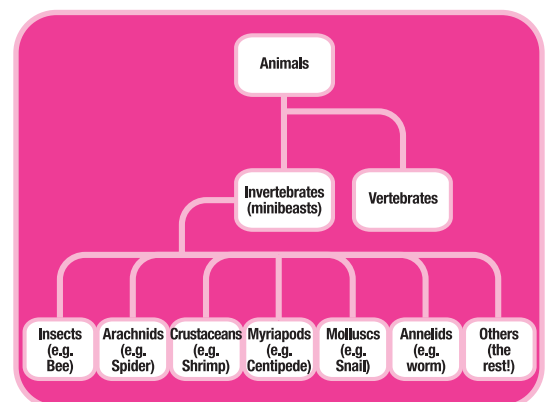
What's in a Name?

So which creatures are minibeasts? Basically they are anything that you would call a creepie-crawlie, a bug or a grub. Some minibeasts fly, some crawl, some swim, some wriggle and others squirm. But they all have one thing in common - they do not have a backbone. Scientists call these animals invertebrates (we, like tigers, mice, crocodiles, frogs, birds and fish are vertebrates because we have a backbone). Because minibeasts do not have a backbone, they don't have a skeleton like we do - some have a skeleton outside their bodies! It is a hard protective casing and scientists call this their exoskeleton (exo = outer). It protects their internal organs and is waterproof too.

Minibeasts are very numerous - 95% of the earth's creatures are minibeasts; there are 2500 species of minibeast in the UK alone! They survive in every type of habitat in the world, from the coldest ice caps to the hottest, driest deserts, from the deepest oceans to the highest mountains. Quite simply, minibeasts are everywhere!

How do we sort them all out?

It is estimated that there are about 30 million species (different types) of invertebrates in the world! To make it simpler to understand them all, they are put into groups. Look at the diagram below to see how some minibeasts are sorted.



Insects

Let's take a closer look at the largest group - the insects. There are more insects in the world than all the animals on Earth put together!

Friend or Foe?

Insects can sting, suck blood and bite - take the bees, wasps and midges, for example. Others damage clothes (one species of moth) and some spread disease (mosquitoes spread malaria in some hot countries). No wonder many people don't like them!

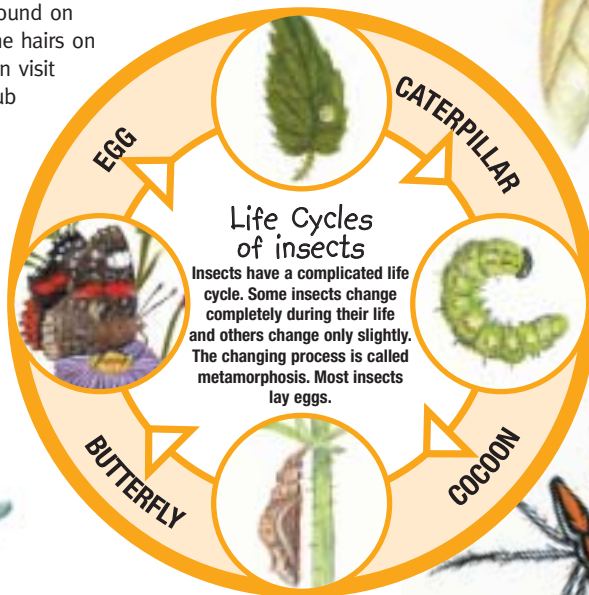
However, insects have their uses as well. Let's look at why we should encourage insects into our gardens.

Bees and butterflies - Bees make honey for us by collecting nectar from flowers - lots of people like honey on their bread! Butterflies visit flowers too, to drink the nectar and as the bees and butterflies crawl around on the flower, the pollen sticks to the hairs on their legs and bodies. If they then visit another flower, the pollen may rub off onto the new flower, thus mixing the pollen of the two flowers together. This process triggers pollination, which means that the flower can now produce new seeds, and therefore new plants can grow. This process is essential in the survival of plant species. It is also very beneficial to farmers and gardeners who want their crops and flowers to grow as well as possible.

Bees also provide us with beeswax, which is an excellent furniture polish, and royal jelly, which is used as a gel for healthy skin.

The silkworm - which is not a worm, but the caterpillar of the silkworm moth from China - makes a cocoon out of lengthy threads of silk from two glands on its head. Each thread can be up to 900m long! Humans use the silk threads for making gorgeous material for expensive clothes.

Ladybirds are great to have in the garden. They eat aphids (greenfly and blackfly), which eat garden plants, so gardeners like having lots of ladybirds around.



What do all insects (like a wasp) usually have?

- A** 3 parts to their body - the head, thorax and abdomen
- B** 2 eyes
- C** 2 antennae for feeling and smelling.
- D** 6 jointed legs at some point in their lives
- E** 2 wings* (some have two pairs) at some point in their lives

* All minibeasts with wings are insects but not all insects have wings!

Examples of insects: butterflies, bees, wasps, beetles, ants and flies.



Arachnids

If you suffer from 'arachnophobia' you, just like Little Miss Muffet, are scared of..... Spiders

Many arachnids are aggressive predators - they catch and eat other animals. Some female spiders eat the male after mating!
Many spiders spin webs to catch their prey, such as flies.

HELP! There's a spider in the bath

Spiders are probably the least popular of our minibeasts. How many people do you know who are scared of spiders? However, none of the spiders that live in the UK is poisonous, so we really don't need

to be afraid of them. In fact, spiders are excellent at keeping the fly numbers down and of course, provide a good snack for animals like birds and shrews. So always make sure that if you do find a spider in the house, don't kill it - just carefully move it out into the garden using an upturned jar and a piece of card!

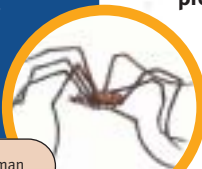


Arachnids are minibeasts with...

- A** 2 parts to their body: their head and thorax joined together and the abdomen
- B** 8 legs
- C** 2 pincers for biting or piercing prey

No antennae

Examples of arachnids: spiders, daddy-long-legs (harvestmen) and scorpions.



Harvestman

Crustaceans



Friend!

Shrimps eat algae and decaying plants and the freshwater variety do a fine job of keeping your pond clean. Shrimps look like mini prawns, are flattened sideways and swim on their sides by wiggling all of their 14 legs. Shrimp pic

Most (but not all) crustaceans live underwater and have:

- A hard outer shell or case
- 10 or more legs
- 2 pairs of antennae

Examples of crustaceans: crabs, shrimps, woodlice.

Annelids

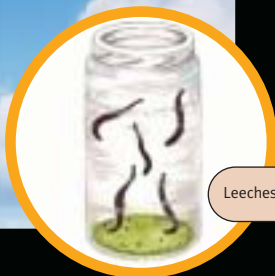
Annelids are the worms and leeches of the world. There is only one major part to their body, but, unlike snails, it is long and segmented, or divided up into similar sections. There are 13 different types of earthworms in Britain. It is estimated that in 2 hectares of soil there could be 3 million earthworms, which mix up and move 18 tons of soil per year!

Friend or Foe?

Earthworms are excellent for gardens as they mix dead leaves into the soil and allow air to get in. This makes the soil more fertile and helps plants to grow better.

In some countries leeches are disliked because they suck blood and can spread disease. In Britain, however, they are far too small to be able to get through our skin so no need to worry about them!

In the past, doctors used tropical leeches to remove infections from people's wounds and leeches can also be used to forecast the weather. In jars, leeches often come out of the water because of changes in the air pressure, which people cannot sense. These changes often come before rain or dry spells. Very useful if you are planning a bar-b-que!



Leeches in a jar!

Molluscs

These minibeasts have just one main part to their body. Some have a shell and they all have one muscley foot or tentacles to help them move around. Most molluscs are slimy – like slugs and snails. This helps them slide along the ground. Look out for the slimy snail and slug trails on the lawn in the morning. These animals tend to come out at night when it is dark and damp. This means they are less likely to get eaten and they won't dry out and die. During the day they hide under rocks and logs to avoid the dry sunshine.

Examples of molluscs: slugs, snails, octopus



Yellow Slug

Myriapods

This word 'myriapod' literally means 'many legs' and examples are centipedes and millipedes.

Millipede or centipede? Don't know which one is which? Here are some differences, so you'll know next time:

- Millipedes are cylindrical (like a pencil) and have up to 200 pairs of legs. They are herbivores and can produce a foul smelling liquid when faced with danger.
- Centipedes are flattened and have between 15 and 177 pairs of legs. They are carnivores and in some countries they have a poisonous bite. The house centipede can detach its legs when captured by a predator!



Millipede



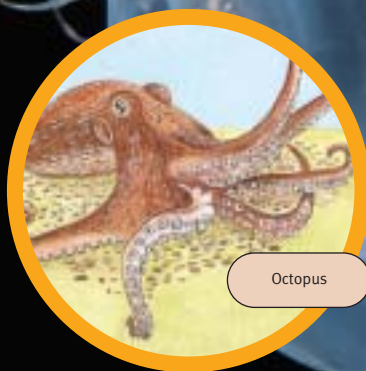
Centipede

Others...

What can you find out about Cnidarians (jellyfish) and echinoderms (star fish)?

So you can see that minibeasts come in all shapes and sizes. Some are so small we can't see them without a magnifying glass or microscope. Others, like the octopus could hardly be called mini!

When we talk about minibeasts we normally mean the small ones we find in our parks, gardens, woods, ponds and even houses.



Octopus

Home Sweet Home!

Minibeast Habitats

Minibeasts like to hide from their predators, and many don't like bright sunshine. You'll find them in dark, damp nooks and crannies. Others can be found when they are out and about looking for food.

'On leaves or stems'

'Under logs and rocks'

To find minibeasts in your garden or park, the best places to look are:

- under leaves on the ground (centipedes, slugs)
- under logs or rocks (woodlice, slugs)
- on bright flowers (butterflies, bees)
- on leaves or stems (greenfly, caterpillars)
- on dead animals (beetles, flies)
- in the soil (worms)
- on ripe fruit (wasps)
- in long grass and hedges (harvestmen, spiders)
- in a pond or stream (boatmen, freshwater shrimps, dragonfly nymphs).

Food, Glorious Food!

What do minibeasts eat?

Some minibeasts, like greenfly and caterpillars, are plant eaters and like all other plant-eating animals they are called herbivores. Plants have lots of tasty parts, such as the leaves, stem, sweet syrupy nectar and the sticky pollen. The minibeasts' mouthparts will be specially adapted, or designed, for eating and drinking plant material.

Other minibeasts are carnivores, which means that they eat meat (other animals). This means that they are predators. They will have special jaws to help them catch their food and eat it, like spiders, beetles and ladybirds.

Divers, Snorklers, Swimmers & Skaters

Aquatic Minibeasts

The minibeasts that live in water are either able to breathe underwater or have special ways of getting enough oxygen to survive in water. e.g. water scorpion. All watery minibeasts can swim or have very good anchor systems!

Let's take a closer look at some of the minibeasts you might find in your school or garden pond:

Pond Skater - this insect actually has 6 legs, not 4. The front two are shorter and used for catching food, not moving around.

Water Boatmen - These water bugs are clever - they are excellent swimmers and they can fly! They swim on their backs and carry a bubble of air on their bodies to allow them to breathe underwater.

The **Water Scorpion** isn't a scorpion at all - it's an insect not an arachnid. The sharp needle-like spike on the end of its abdomen is actually a snorkel that it sticks out of the surface of the water to enable it to breathe!

Water Spider - this unusual underwater arachnid lives in a spun silk home, like an old fashioned diving bell. The bell contains air for the spider to breathe so it can remain underwater. Young water spiders use empty snail shells to live in until they can spin their own bell.

Ramshorn Snail - this snail looks like the horns of a ram (male sheep), hence its name. This clever mollusc keeps air in its shell so it can breathe under water.

Dragonfly Nymph - this fierce predator lurks in the mud and silt at the bottom of the pond. To move around, it squirts water out of the tip of its abdomen, which propels it forward! Dragonfly nymphs have amazing jaws that shoot out in front of the head when they catch their prey. Eventually the nymph will turn into a beautiful dragonfly that flies around in the air above the pond. They grow wings under their skin before shedding it and drying out in the sun.

Did you know!

Slugs and snails have thousands of tiny teeth on their tongue! This helps them munch their way through the leaves in your garden!

Some minibeasts, such as earwigs, beetles and some slugs eat dead things (detritus), like rotting leaves, dead wood, droppings and dead animals on the ground. This is an important role in nature as all the rotting material is broken up by the minibeasts (the detritivores) into smaller pieces. Bits which aren't eaten are then small enough to be broken down even further by bacteria and fungi (decomposers). Any goodness left then rots down back into the soil, ready to be used again by the trees and plants growing there. It's just like recycling - nothing is wasted and the habitat is even kept nice and clean for us. What a good job some minibeasts like eating rotting plants and animals!

Decomposer Minibeasts

Slugs - Yum!

Minibeasts themselves can make a very tasty meal or snack for some birds and animals, especially shrews, thrushes, moles and hedgehogs. A larger carnivore, such as a fox, weasel or cat, in turn often eats these animals. This process creates a kind of sequence called a food chain. Minibeasts can be found in the majority of food chains in every habitat:

What eats minibeasts?



Some minibeasts even eat other minibeasts:

How do minibeasts avoid being eaten?



Mimicry:
Emperor Moth



Camouflage:
Stick Insect

To protect themselves from predators, minibeasts use a variety of methods.

Some hide well, some taste nasty (butterflies), some are poisonous (ladybirds), some sting (wasps) some look poisonous but are actually harmless and some try to look like another, bigger animal altogether.

Pretending to be something else is called mimicry because they are mimicking another creature to fool their predators.

If they look like their background so they blend in and cannot be seen, it is called camouflage.

Ladybirds

The ladybird is thought to have got its name way back in the middle ages. Huge swarms of pests destroyed all the crops of food so the farmers prayed to the Virgin Mary for help. Soon afterwards, hundreds of these brightly coloured red and black beetles flew in and ate all the pests and the crops were saved. The farmers decided to name these bugs the 'beetles of our lady'.



Fun Facts about Ladybirds

- A ladybird can eat up to 2000 aphids (greenfly) in a lifetime (about 75 per day)
- They march in a straight line until they come across food
- The male is smaller than the female
- The ladybird is considered good luck in some countries
- In folk medicine, ground up ladybirds were used as cures for crying babies, stomach ache and measles
- The Swiss call the ladybird 'God's little fatty'
- Their wings beat 85 times per second when they fly
- There are 42 species of ladybirds in the UK alone
- The number of spots on a ladybird tells which species it is, not how old it is.

Did you know?

More Fun Facts

- Butterflies taste with their feet
- Ladybirds squirt a poisonous liquid when they are threatened
- The 'horns' of a male stag beetle cannot close – they are more like deer antlers and they use them for fighting
- There can be up to 60,000 bees in one hive
- The silk from spiders is stronger than steel thread of the same thickness
- Bees keep the hive cool by fanning their wings
- Adult dragonflies can fly backwards
- Male bees have no sting and male mosquitoes don't bite
- Leeches can eat more than their own body weight in food each meal time
- Nearly all species of snail have a shell that coils clockwise
- The expression 'the bees knees' comes from the fact that bees carry pollen in sacs on the knees of their hind legs
- The building of the Panama Canal was halted for 5 years because 1000s of workers died of malaria spread by mosquitoes
- There are estimated to be 30 million species of invertebrates in the world
- Spider web silk has been used to make bandages and bullet-proof vests
- Some scorpions can go without food for a whole year
- The fastest caterpillar in the world is the Mother of Pearl Moth larva. It can travel at 38cm/second = 150mph!

All Creatures Great & Small

The Largest...

...spider in the world is the Bird Eating Spider. Its body is 10cm long and it has a 25cm leg span! That's nearly as long as a ruler!

...butterfly in the world is Queen Alexandra's Birdwing from Papua New Guinea. It has a 30cm wingspan

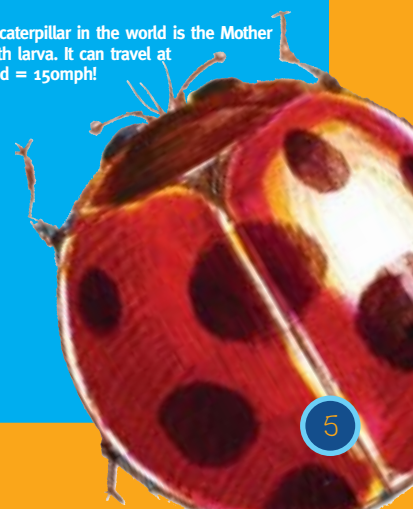
...scorpion in the world is 20cm long

...dragonfly had a wingspan of 60cm. It is now extinct.

...snail is the African Giant Snail. The largest one ever found was 39cm long with a shell 27cm high and it weighed 900g! That's nearly as much as a bag of sugar!

The Smallest...

...spider in the world is the Samoan Moss Spider. It is only 0.5mm long.





Become a Bug-Hunter!

If you want to study minibeasts more closely, there are several ways in which you can catch and look at them without harming them:

1 Lift and look

Turn over any large stones, logs, flowerpots and bits of wood to see who is lurking underneath them. Remember: our minibeasts are harmless so you can pick them up carefully to get a closer look! Put them in an old (clean) yogurt pot to make it easier to study them.

2 Rummage in the leaf litter

Take a tray with raised edges and place a piece of white paper in the bottom. Fill the tray with handfuls of leaf litter and sift through the leaves slowly and carefully. Any minibeasts will show up against the white paper as they crawl or wriggle around trying to escape!

3 Pitfall Trap

Choose a spot in the garden where you think lots of ground-dwelling minibeasts might live. Dig a small hole in the ground and put a clean, empty yogurt pot or jar in the hole, with the lip of the pot below the

surface. Put a tiny amount of food (e.g. cat food or smelly cheese) in the bottom to attract the minibeasts. Cover the pot with a raised stone or piece of wood to stop the rain getting in, like a roof. Make sure there is a big enough gap under the roof for minibeasts to get under. Leave the trap overnight and check first thing in the morning. Who's fallen in and can't get out?!



NB Ask an adult to help you with these investigations

Bug Magnets

How can I attract minibeasts into my garden?

There are many simple things you and your family or teachers can do to get those minibeasts into your garden:

- Create log piles in a sheltered corner, perhaps up against a hedge or fence. The rotting wood makes an excellent habitat for animals like beetles, woodlice and earwigs.
- Leave rocks and upturned flowerpots here and there – they provide excellent shelter for many species such as slugs and snails.
- Grow flowering plants that butterflies and bees might like.
- Leave rotting leaves on the ground for centipedes and slugs to hide in.
- Build a pond! Simpler than it sounds.
- Try not to spray chemicals on the plants in the garden. Encourage natural predators like ladybirds instead.
- Leave hollow canes stuck in the ground near a plant with lots of aphids (greenfly and blackfly) on. The canes make ideal hibernation places for ladybirds, which will emerge in the spring and eat the aphids!
- Leave a patch of stinging nettles in a corner of the garden. Many butterfly species lay their eggs on nettle leaves and ladybirds love living among nettles too.

Always handle the minibeasts very carefully (a magnified bug box is very useful) and remember to return any minibeasts unharmed to the place where you found them.

Going....Going...Gone!

Threats to Minibeasts

It is a sad fact that not all minibeasts are popular or beneficial to farmers and gardeners because they eat crops and garden plants. It is therefore very common for farmers and gardeners to spray their plants with chemicals that kill the minibeasts.

These chemicals are known as pesticides and if the farmer is to make a good living out of his crops then he uses pesticides to control the slugs, aphids and caterpillars. Of course this means that millions of minibeasts die every year. Look back at the food chains and web and think about what effect this will have on other animals.

Next time you find a slug or spider in 'the wrong place', don't kill it! Think carefully about what would happen to all the wildlife in your garden if all the minibeasts in it died.

2004: According to the IUCN*, 1992 species of insect around the world are considered to be threatened (974 of these are molluscs). In 2000 the total number was 1928 – an increase of 74 species in just 4 years.

Activity Ideas

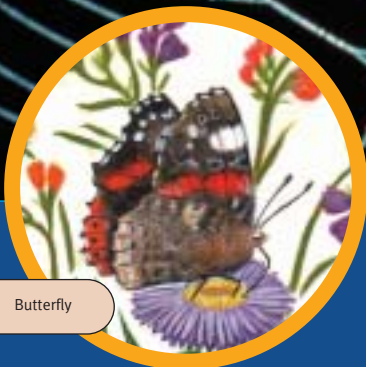
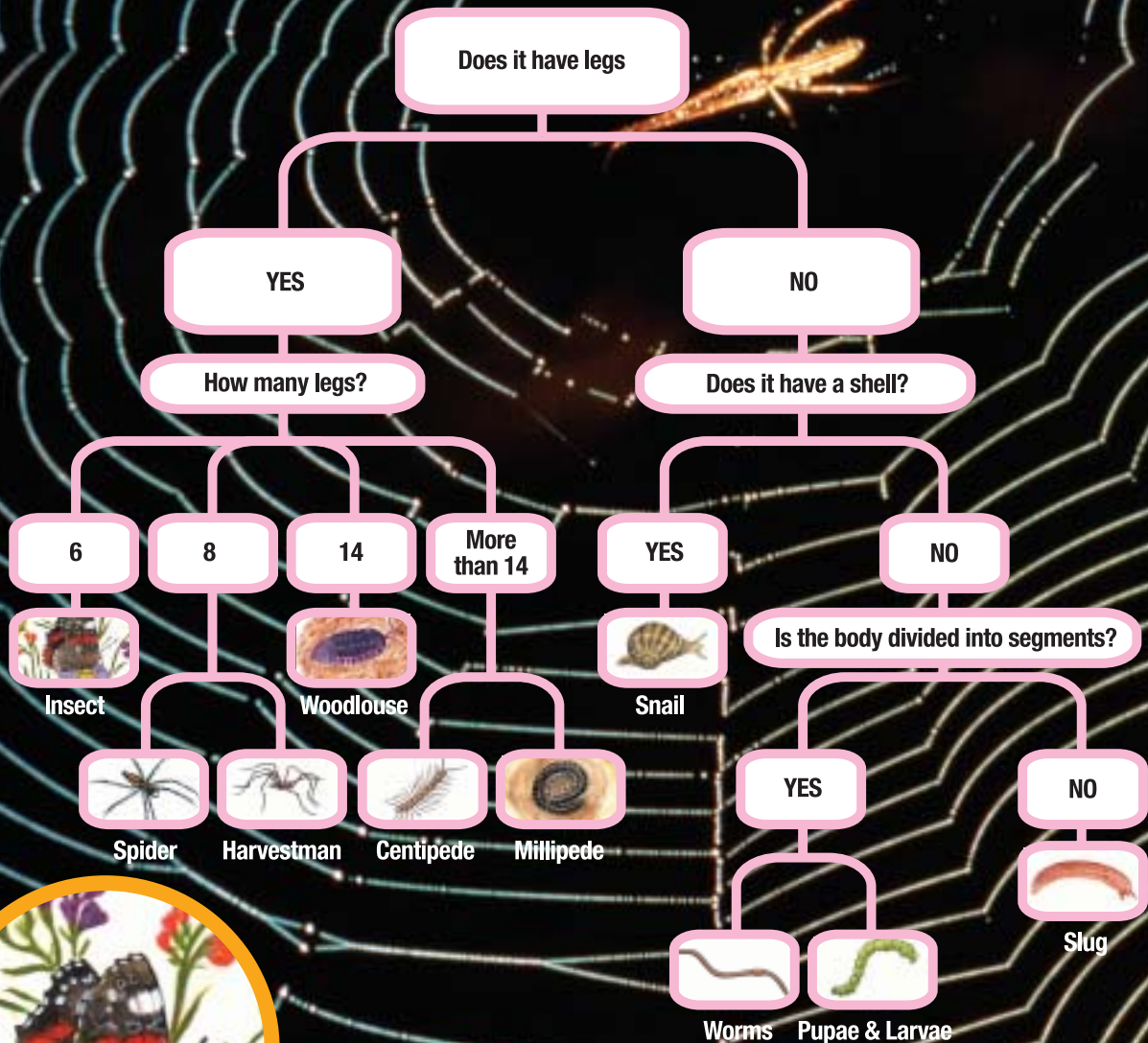
- Make your own minibeast! Collect together old cartons, wrapping paper, bottle tops and string to make your own recycled minibeast.
- Write a poem about a slippery slimy slug or a whizzing, wiry wasp!
- Make your own key to identifying minibeasts once you have caught and studied a few of your own.
- Go pond dipping with an adult. Take a pond net and light coloured plastic tray to see what lives in your local pond.
- Write a poem where each word begins with the letters of a minibeast of your choice, e.g.

'Slippery Nocturnal Amazing Interesting Life-form'

S N A I L

What is it?

Have you ever been bug hunting and not been sure what you've found? Study the animal carefully and then use the simple key below to help you find out what you've caught.



Butterfly

Butterfly or Moth?

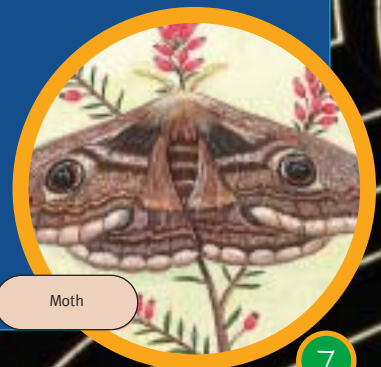
Sometimes it is very hard to tell the difference between moths and butterflies. Here are a few tips to help you:

Butterflies are usually more colourful than moths (but not all butterflies are brightly coloured!)

Butterflies' antennae are thin with clubbed ends; moths' antennae are fatter and have feathery ends

Butterflies rest with their wings upright; moths keep theirs flat.

Moths are attracted to bright lights at night time



Moth

Why not try one of our great Environmental Discovery courses in 2005-6?

The Environmental Discovery Courses run by the Young People's Trust can give young children an insight into the living world. They may not cost as much as you think either!

The Courses last five days and are available in the beautiful surroundings of the south of England, or in the spectacular scenery of the Lake District.

We've been hosting these courses for over 20 years and we know how to make them safe, secure and exciting too. Whichever location you choose, you'll be guaranteed a learning experience that will last a lifetime.

Prices are very reasonable, especially out of high season, and they can provide a focus for some excellent preparation and follow up work in the classroom, as well as giving everyone going on the trip something to look forward to during the dark days of winter.

For more details of pricing and availability contact us on 01483 539600, or check our web site: www.yptenc.org.uk

Coming soon: Test your environmental knowledge with our online quiz: go to www.yptenc.org.uk for details.

You can download copies of all issues of Conservation Education including this one from www.yptenc.org.uk/docs/downloads.html

Our web site contains fact sheets on a wide range of environmental issues and wildlife species, and is the home of our environmental news page, 'The Daily Gecko', which features environmental stories from around the world and which is updated daily. All of the Gecko's stories are archived, and the whole site is searchable by keywords.

Free School Talks

Would your pupils benefit from a talk given by one of our expert speakers?

Are the children in your school interested in the environment? Do they know about global warming or British wild animals? Are they curious about endangered animals or wildlife in the garden?

Call us

Maybe it's time to invite an expert from the Young People's Trust along to your school to give one of their informative, interesting and fun school talks. They are free of charge to any school in the catchment area - which is within a 100 mile radius of our two offices; one in Guildford, Surrey, and the other in Penrith in Cumbria.



NEWS

Nature



Young People's Trust for the Environment, 3 Walnut Tree Park, Walnut Tree Close, Guildford, Surrey, GU1 4TR
Tel: 01483 539600 Fax: 01483 301992 ISSN 0262-2203 email: info@yptenc.org.uk
Web site: www.yptenc.org.uk Director: Peter Littlewood

Photography & Illustrations by Young People's Trust for the Environment. Nature Picture Library, Manester Design & Marketing Ltd
Printed on paper sourced from sustainably managed forests.