



The Minibeast Pack

Background information and resources for teachers

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THE ROYAL BOROUGH OF
KENSINGTON
AND CHELSEA

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To book a self led session or one led by a member of the Ecology staff or for further information contact:

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Introduction

This pack contains useful resources and ideas about minibeast hunting at Holland Park for KS1 and KS2 teachers. The content and activities can be adapted to suit the different needs of classes and age groups. It aims to give teachers a better understanding of invertebrates and habitats and provides suggestions for pre and post visit activities.

The pack contains photocopiable worksheets and identification sheets that may be used on the visit or could form the basis for follow up work.

Key vocabulary is written in bold in the text and a short definition of each term can be found in the glossary..

What is a minibeast?

The term minibeast is a more child friendly term for any small **invertebrate**. An invertebrate is an animal without a backbone and there are a vast range of different species; insects, arachnids, worms, slugs and snails are all invertebrates. Further information on commonly found species can be found on page 9.

Why hunt them?

A minibeast hunt in the wildlife area is a simple and very enjoyable way for children to discover more about the natural world. The science content can be tailored to meet the needs of any age group.



Holland Park Ecology Centre and Wildlife Area

The Ecology Centre provides a base for studying the ecology and environment of the park. It has classroom and presentation facilities, curriculum-related displays, live and static animal specimens and a reference library. A range of scientific equipment is available for outdoor use. The centre can cater for groups of up to thirty children with accompanying adults.

Holland Park Wildlife Area has a wildlife pond with dipping platform, woodland paths extending round the enclosure, and three distinct habitats to study – pond, woodland and grassland.

Sessions to the centre can be self led or led by a ecology education officer.



How to conduct a minibeast hunt

Minibeast or invertebrates are found in a diverse range of terrestrial and aquatic habitats and there are many different ways of collecting them. Three methods given are suitable for children to hunt for invertebrates in a woodland and grassland habitat.

In all collecting children should be encouraged to use a plastic spoon to pick up creatures as some minibeasts are very delicate.

Woodland floor – log turning

A great variety of invertebrates live in the leaf litter and under logs and stones. Organise your group into pairs and give each pair a magnifier pot and spoon.

Ask the children to search under logs and stones for invertebrates. The creatures found can be scooped up with the spoons and placed in pots.

Remind the children to put back the logs exactly as they found them and after examining the creatures the invertebrates should be placed back under logs.

A number of different creatures can go in one pot but large snails and slugs are best in pots by themselves as they will produce a lot of sticky slime that can cover and harm the other creatures.

H & S – The children should lift and replace logs carefully, watching out for fingers and toes. Larger logs should be lifted by adults only.



Tree beating

This method can be employed to see what creatures live in the canopy of the trees.

Equipment needed: a beating sheet, magnifier collection pots and spoons

To do tree beating one child holds a beating sheet under a branch of a tree or a bush whilst another person shakes vigorously the branch. Any creatures on the branch will fall on to the beating sheet.

The creatures disturbed tend to be fast moving ones like spiders or flying ones like lacewings.



Sweep nets

This method is suitable for finding out what invertebrates live in long grass and stinging nettles.

Equipment needed: a sweep net, magnifier collection pots and spoons

Using a sweep net a child makes broad long sweeps of the net through long grass or nettles. After sweeping the inside of the net can be examined for creatures.

Points to note: check no one will be hit by the net when sweeping and try to avoid sweep near thorny plants as these will catch on the net. If sweeping through nettles be careful examining the contents as there may be bits of nettles inside the net.



Health and Safety and Risk Assessment

Minibeast or invertebrate hunting is a very enjoyable activity but it does carry a number of potential risks but these can be easily reduced by following these guidelines

1. Group ratio – Please ensure you have a ratio of at least 1 to 6 by the pond for KS2. 1:2 for very young children.
2. Behaviour in the woods – all children should be made aware of the parameters of the minibeast hunting area.
3. To prevent infections children should be reminded not to put their fingers in their mouth, nose or eyes and should wash their hands afterwards.
4. The hazards of touching plants like stinging nettles, holly and brambles should be explained to all visiting groups. The eating of berries and fungi should be warned against as some are very poisonous.
5. The Wildlife Area is regularly checked however care should be taken walking around for trip hazards and fallen branches. On rare occasions wasps nest under logs; if you do discover a nest please vacate that area immediately and report where the nest is to the Ecology Centre.
6. Insect stings – please check with your class any children with allergies to insect stings. If any member of your group is stung by a bee or wasp please seek first aid and report the incident to the Ecology Centre.

A full risk assessment for this activity is available on our website. Please contact the Ecology centre for further enquiries. It is advisable to have the ecology centre and parks police numbers to hand when at the wildlife area in Holland Park.



Pre-visit ideas

Before coming to the Ecology Centre with your class you may find the following ideas useful to set the scene and for further learning. A minibeast hunt is often conducted as part of a science unit about the living world but there is often scope to introduce a cross curricular element as well.

The term minibeast is often used but is interchangeable with invertebrate.

- Carry out a minibeast survey/hunt in your school grounds so to compare with the Ecology area.
- Discuss the term minibeast and invertebrate – compare and contrast with other animals include themselves and other animals. Possible themes could be appearance, lifecycle, movement and how they breathe.
- Investigate the number of legs and body parts common invertebrates have.
- Ask them to research their favourite minibeast – internet or book based
- Discuss where we find minibeasts and what all animals need to survive.
- For younger children share story books like *The Very Hungry Caterpillar* by Eric Carle. For longer reads books like *Harry the Poisonous Centipede* by Lynne Reid Banks or *Charlotte's Web* by E. B. White will spark interest.
- Explain what a habitat is and talk about different habitats they might find in around the school and in Holland Park. For older children the term micro habitats could also be introduced.
- Read the letter to class (see appendix 1) as away of introducing the trip to your group and prompting questions (letter is suitable for KS1 and lower KS2).
- Work on keys to identify creatures or objects.
- PSHE work on caring for the environment and how to care and respect living things.



Post visit ideas

A minibeast hunt can form part of a teaching unit in Science. It can also be the basis for other cross curricular topics as well.

- Create mini beast clay monsters using clay and natural materials from the wildlife area.
- Create a giant land art mini beast using found materials gathered in the wildlife area – research land art by artists such as Andy Goldsworthy
- Display work about minibeasts- children could draw or paint different minibeasts this could help reinforce work on adaptation, camouflage etc.
- Literacy – children could write a story as a minibeast living in the wildlife area. Account of trip - non chronological report writing about the creatures found in the woodland.
- Challenge the children to create a fantasy minibeast that is suited to living in a particular habitat.
- Discuss the way different invertebrates use colour for warning others and camouflage.
- Research project on a habitat or type of invertebrate.
- Follow up work on food chains and comparison work on the wildlife area habitat to a more local area.
- Life cycle work.
- Use collected data to create graphs and charts on the number of different types of invertebrates found in each habitat and the number of **carnivores**, **herbivores** and **detritivores**.
- Play woodland food chain or food web games to enable children to appreciate the importance of mini beasts.
- Gardening ideas – create log piles and make ladybird hotels, plant flowers to attract bees and butterflies.



Minibeast or Invertebrates groups

This section provides some background information on commonly found woodland and grassland invertebrates.

Insects (three body parts and six legs)

All insects have three body parts – a head, thorax and abdomen and three pairs of legs as adults. They are the most common type of invertebrate with over 22,450 species recorded in the UK. Their lifecycle is egg – larva – adult. Some types like butterflies and beetles undergo complete **metamorphosis** whilst others like crickets and grasshoppers undergo **incomplete metamorphosis**.

Social insects

Bumblebee Bumble bees form small nests comprising of a queen and workers which are established yearly as only the queen bees hibernate. They are larger and furrer than honey bees and rarely sting.



Wasp Common wasps live in colonies of up to 2000. They eat sweet things. Their nests are constructed from paper pulp created by the wasp chewing dead wood. The larvae eat dead insects and carrion and the adults feed on sugary foods and the liquid secreted by their larvae.



A wasp sting's "smell" causes nearby wasps to become more aggressive.

Ant There are over 50 species in the UK. They live in large colonies run by a queen. Ants can be herbivores, carnivores or omnivores depending on the species.



Beetles

Ground Beetle Ground beetles are fast nocturnal hunters. They have powerful, sharp jaws for grabbing and crushing other insects and slugs. During the day ground beetles hide under logs, stones and dead leaves.



Ladybird Ladybirds are carnivores which mainly eat aphids. There are 46 different types of ladybird in the UK, usually seen between March and October. The Harlequin is an aggressive alien species that is now the most common species in the park.



Other insects

Earwig Earwigs are long glossy brown insects with pincer like tails. They are nocturnal and eat both animal and plant matter. Female earwigs tend to their young until they reach adulthood.



Devil's Coach-horse This is a large predatory rove beetle that eats insects, worms and spiders. It has large pincers that it uses to crush its prey. When threatened it puts its tail up like a scorpion and can emit a foul fluid. Can bite humans.



Minibeast or Invertebrate groups

Lacewings These are large green flies with long transparent wings. They are carnivorous and eat aphids. Most only live for a summer although some overwinter.



Molluscs – gastropods (muscular foot)

Glass snail This is a small snail with a thin translucent shell and blue body. It feeds on plants and algae.

Garden snail This is the most common snail species. They are hermaphrodites and lay about 200 eggs. Snails eat mainly dead or dying plant matter and hibernate during the winter. They are most active during moist warm weather. They feed using their toothed tongue known as a **radula**.



Slugs Over 30 Slug species live in the UK. Common species to the park are the great black slug (which can vary in colour from black to orange), the leopard slug (spotted) and the garden slug (black with an orange foot).



Isopods (seven pairs of legs)

Woodlice The most common of the 35 species native to the UK is the garden woodlouse. A woodlouse's diet is rotting wood and a woodlouse can spend its whole life on a single log. They give birth to over 150 babies which are carried in a pouch by the females. Some species can roll into a ball when threatened. They have many common names like pillbugs, slaters, woodbugs, doodlebugs and sowbugs.



Myriapods (numerous legs)

Millipedes Millipedes means a thousand legs but most species only have a few hundred legs. All millipedes are detritivores and have two pairs of legs per body segment.



Centipedes A hundred legs is the literal meaning of the word centipede. No species has exactly 100 legs. Centipedes are fast moving predators that kill their prey by biting and injecting poison. Large centipedes can nip humans.



Arachnids (four pairs of legs and two body parts)

Harvestman These are close relatives of spiders but cannot spin webs and do not have fangs. They are long legged and have a round body. They catch their prey by hooks on their legs.



Spiders Spiders have eight legs, two body parts, fangs and can create silk. Most species catch their prey in webs whilst others hunt or make traps. There are no native deadly spider species although large species can bite.



Annelids (segmented worm) Earthworm There are over 70 species in the UK. They eat dead organic matter in the soil and help fertilise the soil by bringing the nutrients to the surface. It is not true that cutting a worm in two results in two live worms, most often one or both parts die.



Food chains and food webs

A food chain shows a simplified feeding relationship in a habitat. They are useful to show how plants and animals are connected.

Food webs show the different relationships more fully with many interconnected food chains.

Green plants are termed **producers** as they convert energy from the sun into food for themselves by a process called **photosynthesis**.

Consumers

Consumers are animals that get their energy directly or indirectly from plants. **Primary consumers** or **herbivores** eat plants as their source of energy. Examples of herbivores in a woodland are grasshoppers and crickets.

Animals that eat other animals are called **carnivores**. In a food chain, **secondary** consumers eat primary consumers to obtain their energy while a **tertiary** consumer is one that eats a secondary consumer or other animals.

Omnivores eat both plant and animals.

Detritivores eat dead organic matter (plants or animals) to survive. In a minibeast hunt on the woodland floor the majority of the animals collected are likely to be detritivores as they are feeding on the dead leaves and wood.

Examples of animals for each group are given overleaf. Please bear in mind that this is a simplified version as many animals can be in more than one category.



Woodland Food Chains

All animals and plants need food to grow and move.

Animals that eat plants are called **herbivores**.

Animals that eat other animals are called **carnivores**.

Animals that eat both plants and animals are called **omnivores**.

Animals that eat dead plants and animals are called **detritivores**.

This is a simplified feeding or trophic level chart of the animals found in our pond.

Invertebrate Name	Feeding or Trophic level
Earthworm	Detritivore
Spider	Carnivore
Snail	Herbivore/Detritivore
Slug	Herbivore/Detritivore
Ground Beetle	Carnivore
Millipede	Detritivore
Pill Millipede	Detritivore
Centipede	Carnivore
Woodlouse	Detritivore
Earwig	Omnivore/Detritivore
Ant	Omnivore - varies with species
Caterpillar	Herbivore
Bee	Herbivore
Wasp	Carnivore/Omnivore
Ladybird	Carnivore
Springtail	Detritivore
Harvestman	Carnivore
Cranefly	Herbivore
Blowfly	Detritivore

Vertebrates

Frog	Carnivore
Newt	Carnivore
Toad	Carnivore

Identification sheets

Identification of common woodland invertebrates is very straightforward. For children it can be made easier by focusing on features like size, number of legs and number of body parts. How the animal moves and behaves is also another good tool to identification.

The following sheets and keys contain pictures of animals commonly found in our wildlife area. It may be useful to also bring a field guide like the FSC guide to identify other invertebrates as well.

The colour of the animals on the sheets is generally accurate but many animals can be differently coloured from what is showed depending on the time of year, stage in their lifecycle and individual variation.

Identification sheets 1 and 2 are suitable for foundation and key stage 1/2.




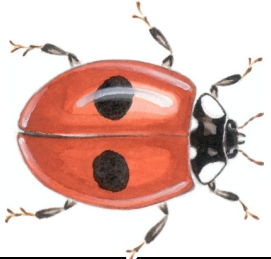
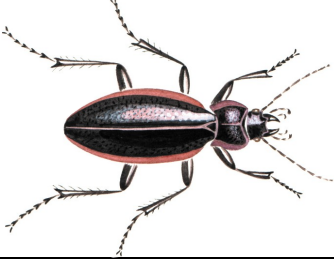


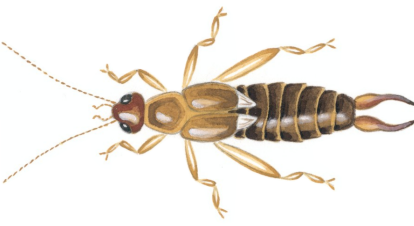

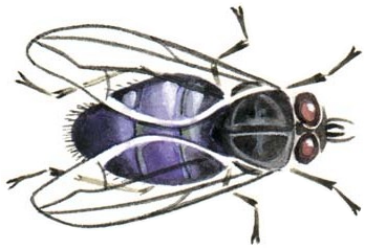
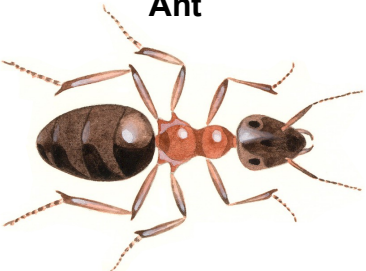






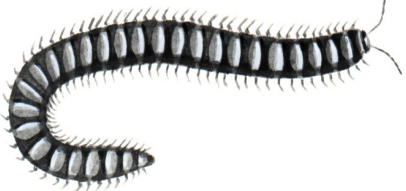
Identification sheet 3 contains more detail about the animals and is suitable for upper key stage 2

The key serves as a basic introduction to a branching database or a dichotomous key for key stage 2.









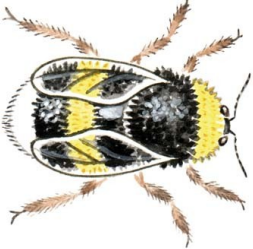
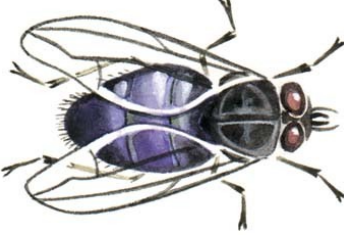
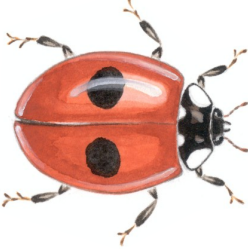
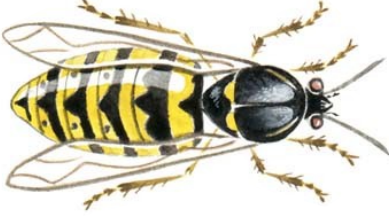













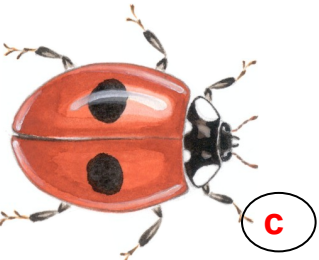
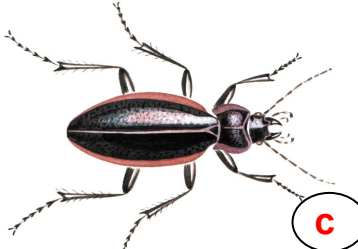


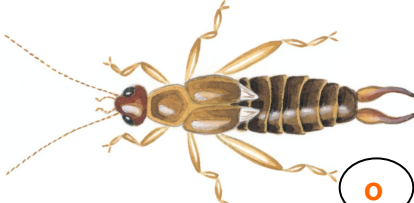
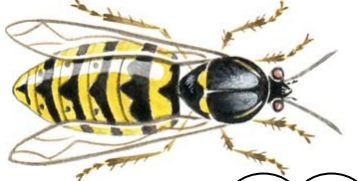
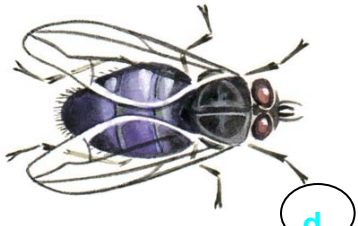
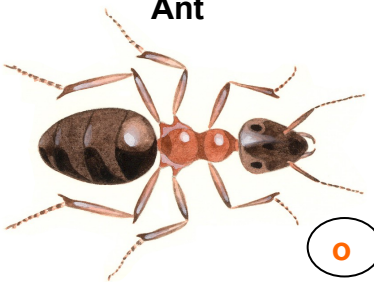





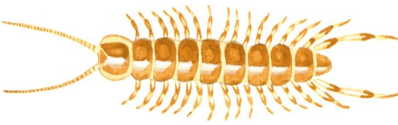
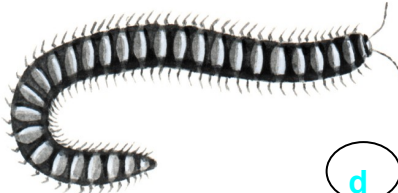
Woodland Minibeasts

Earthworm 	Slug 	Snail 
Ladybird 	Ground beetle 	Beetle larva 
Springtail 	Earwig 	Wasp 
Blowfly 	Ant 	Bumble bee 
Devil's Coachhorse 	Harvestman 	Spider 
Woodlouse 	Centipede 	Millipede 



Meadow Minibeasts

<p>Dragonfly</p> 	<p>Peacock butterfly</p> 	<p>Speckled wood butterfly</p> 
<p>Damselfly</p> 	<p>Caterpillar</p> 	<p>Moth</p> 
<p>Bumblebee</p> 	<p>Blowfly</p> 	<p>Ladybird</p> 
<p>Wasp</p> 	<p>Cranefly</p> 	<p>Shield bug</p> 
<p>Grasshopper</p> 	<p>Snail</p> 	<p>Spider</p> 
<p>Cricket</p> 	<p>Slug</p> 	<p>Harvestman</p> 

<p>Earthworm</p>  <p>d</p>	<p>Slug</p>  <p>h</p>	<p>Snail</p>  <p>h</p>	
<p>Ladybird</p>  <p>c</p>	<p>Ground beetle</p>  <p>c</p>	<p>Beetle larva</p>  <p>c</p>	
<p>Springtail</p>  <p>d</p>	<p>Earwig</p>  <p>o</p>	<p>Wasp</p>  <p>c o</p>	
<p>Blowfly</p>  <p>d</p>	<p>Ant</p>  <p>o</p>	<p>Bumble bee</p>  <p>h</p>	
<p>Devil's Coachhorse</p>  <p>c</p>	<p>Harvestman</p>  <p>c</p>	<p>Spider</p>  <p>c</p>	
<p>Woodlouse</p>  <p>d</p>	<p>Centipede</p>  <p>c</p>	<p>Millipede</p>  <p>d</p>	
<p>c Carnivore</p>	<p>h herbivore</p>	<p>o Omnivore</p>	<p>d Detritivore</p>



Holland Park Ecology Centre

Woodland Minibeasts Key

START HERE

Does it have legs?

YES

NO

Does it have 6 legs?

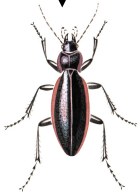
YES

NO

Does it have a hard case over its wings?

YES

NO



Ground Beetle

Does it have a narrow waist?

YES

NO



Ant

Does it have only 2 wings?

YES



Fly

Does it have 8 legs?

YES

NO



Spider

Does it have a long body?

NO

YES



Woodlouse

Does it have only 4 legs on each segment?

YES

NO



Millipede

Is the body in segments?

YES

NO

Are there more than 15 segments?

YES

NO



Earthworm



Insect larvae

Does it have a shell?

YES

NO



Snail



Slug



Holland Park
Ecology Centre

Name:

Date:

Invertebrate Survey



Invertebrate Name	Where Found - Microhabitat



Woodland Food Chains

Name:

Date:

All animals and plants need food to grow and move.

Animals that eat plants are called **herbivores**.

Animals that eat other animals are called **carnivores**.

Animals that eat both plants and animals are called **omnivores**

When you have caught some minibeasts look at each animal closely. Fill in the table below.

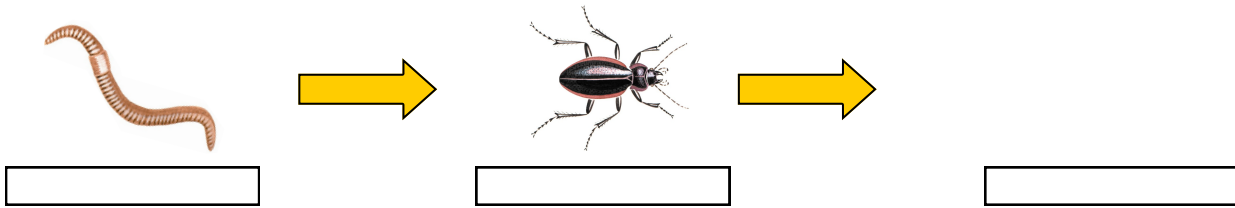
Name of minibeast	Herbivore	Carnivore	Omnivore
Earthworm			
Spider			
Snail			
Slug			
Ground Beetle			
Millipede			
Pill Millipede			
Centipede			
Woodlouse			
Earwig			
Ant			
Caterpillar			
Beetle Larva			

Which group of animals; herbivores, carnivores or detritivores are more abundant in this habitat?

Why?

Because all animals and plants depend on each other for food these relationships are called Food Chains or Food Webs.

2) Fill in the spaces in the Woodland Food Chain that is drawn below.



Now draw a food chain using of one or more of the minibeasts that you have found. You can use other larger animals such as birds or mammals in your food chain if you need to but you must use at least one minibeast.



Minibeast Investigations: Identification



Draw and label your animal.	Name your animal.	What group of animals does it belong to?	Name two characteristics of this type of animal.
1.			
2.			
3.			



Minibeast Investigations: Habitats and adaptation



Draw and label your animal.	Describe that habitat that this animal lives in	Adaptation How does your animal's shape, size and colour suit the habitat that it lives in?
1.		
2.		
3.		



Minibeast Investigations: Observation



Draw your animal	What is the name of your animal?	Where did you find your animal?	Choose 3 words from below that describe your animals habitat
1.			
2.			
3.			

Habitat Words

Dark Cold Wet Muddy Grassy Stony
Light Warm Dry Sandy Underground Leafy



Minibeast Investigations: Movement



Draw your animal	What habitat does your animal live in?	How does your animal move?	Which part of the animal's body does it use to move?
1.			
2.			
3.			

Movement Words

Wiggles Crawls Runs Slithers Slime Slowly
Quickly Legs Segments Ripple Jumps Hops



Woodland Minibeasts



Name:

Date:

There are many types of minibeasts. Some have no legs, some have 6 legs and some have many legs. This can be very helpful in identifying the animals that you find.

1) When you have caught some animals look at each animal closely and try to identify them using the number of legs to help you. Then fill in the table below.

Name of creature	No legs	Six legs	More than six legs	Number of each creature found
Earthworm				
Spider				
Snail				
Slug				
Ground Beetle				
Millipede				
Pill Millipede				
Centipede				
Woodlouse				
Earwig				
Ant				
Caterpillar				
Beetle Larva				

Glossary

Abdomen The rear section of an insect's body. It contains the heart, the stomach and the reproductive organs.

Adaptation A characteristic that makes a plant or animal particularly suited to a habitat

Antennae An insect's two feelers, used mainly for smelling and touching. They are attached to the insect's head.

Carnivore An animal that eats meat.

Consumer An animal that derives its food from another organism – plant or animal.

Ecology The study of the relationships plants and animals have with one another and the environment.

Exoskeleton An external hard body covering, providing protection and support. Many invertebrates have exoskeletons.

Food chain A linear representation of the order that organisms are eaten by each other. Shows the flow of nutrients and energy. Most food chains start with a green plant.

Food web Similar to a food chain, but the feeding relationships between all of the members of an ecosystem.

Habitat The place where a organism lives and finds food, water and shelter

Herbivore An animal that eats plants.

Incomplete metamorphosis As some insects grow and develop, their bodies change gradually during several moulting sessions until the fully formed adult emerges.

Invertebrate An animal with no backbone.

Metamorphosis As some insects grow and develop, their bodies change shape dramatically. These changes are the insect's metamorphosis.

Omnivore An animal which eats both plants and other animals.

Proboscis A hollow feeding tube which some insects use to suck up liquid foods.

Producer Plants that make their own food by photosynthesis.

Pupa A central stage in the metamorphosis of an insect. The pupa looks like a small sack, and the adult insect develops inside it. The pupa is sometimes referred to as a chrysalis.

Radula A rasping mouth organ used by molluscs such as snails.

Social insects Insects such as wasps, bees and ants that live together in colonies. They share jobs such as rearing the young and obtaining food.

Species A particular type of living thing. Over one million species of insect have been recorded by entomologists.

Thorax The middle section of an insect's body. The insect's legs and wings are joined to the thorax.

Tracheae Air tubes allowing air to pass to and from an insect's body.

Vertebrate An animal with a backbone.

Letter to read to class
Suitable for key stage 1 and lower key stage 2

Dear Class,

We are happy to hear that you are coming to Holland Park Ecology Centre to study **habitats**. The two we have in our wildlife area are a woodland and a pond. Can you think of some features each of these habitats?

At the pond, you will have the chance to do pond dipping. Can you think of instructions we will need to follow to keep everyone safe and happy by the pond? What creatures might live in our pond? If you are coming in spring you should catch some tadpoles and maybe newts. Do you know what type of animal these are and what the different stages of their **lifecycle**? Many other creatures only live part of their lives in the pond – have you ever heard of **nymphs** and **larvae**?

In the woodlands you will be hunting for **invertebrates** or minibeasts. Can you think why we will use spoons to pick them up? All sorts of invertebrates are adapted to live in different parts of the woodland. Some are **herbivores** or primary consumers; some are **predators** or **carnivores** whilst others eat dead plants and wood and are called **detritivores**. Can you think of examples of each?

Invertebrates come in all shapes and sizes and can be classified into groups by features like their number of legs and size. Do you know any creatures that have no legs, six legs or many legs? We will use identification sheets and **keys** to work out what they are.

After looking at our finds we will let them go and head back to the centre to wash our hands (why?). Hopefully by the end of the session you find lots of creatures and learn about all the things they need to thrive in their habitat. Maybe you will have gained some ideas on how to improve your school grounds for wildlife.

We look forward to seeing you all.

Best wishes from the Holland Park Ecology Team