

MINIBEASTS



Variety of Life

Approximately two million living species have been discovered and named. Because there are so many different types of animals and plants, putting them into groups with other species with similar characteristics, allows for easy identification, shows relationships between species and can possibly show evolutionary trends.



What is a minibeast?

There are official ways of classifying animals in taxonomy, however animals are often unofficially split into two groups – vertebrates (animals with backbones) and invertebrates (animals without backbones). Minibeasts is a popular term for invertebrates. There are over 1,400,000 species of invertebrate (compared to 70,000 vertebrates). 95% of all animals are invertebrates. They can be useful (bees), destructive (locusts), or even deadly (spiders).

Classifying minibeasts

Minibeasts can be classified into different groups. **Insects**, **arachnids**, **crustaceans**, **centipedes** and **millipedes** are all **ARTHROPODS** (have jointed legs and a hard exoskeleton). Other groups include **MOLLUSCS** and **ANNELIDS** (worms).

Officially animals are put into classes including Chordata (backboned animals), Arthropoda, Mollusca, Annelida (segmented worms) and Nematoda (roundworms).

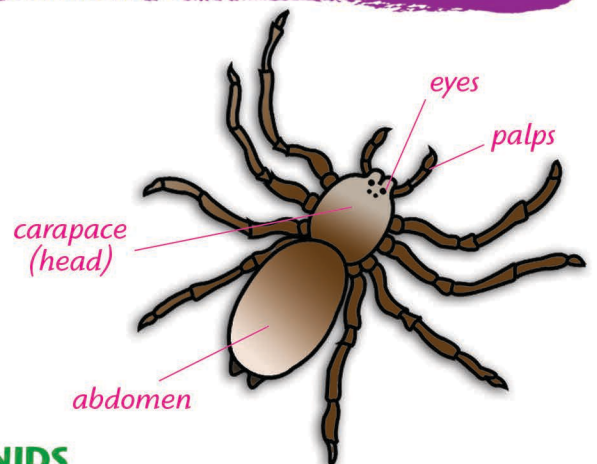
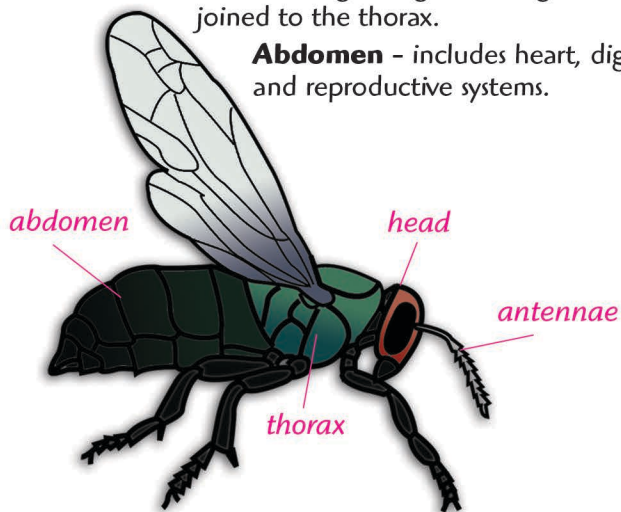
INSECTS

Adult insects have three body parts (head, thorax and abdomen) and six legs.

Head - includes antennae (used for smell and touch), compound eyes and mouthparts - either mandibles (external jaws) or modified for sucking or drinking.

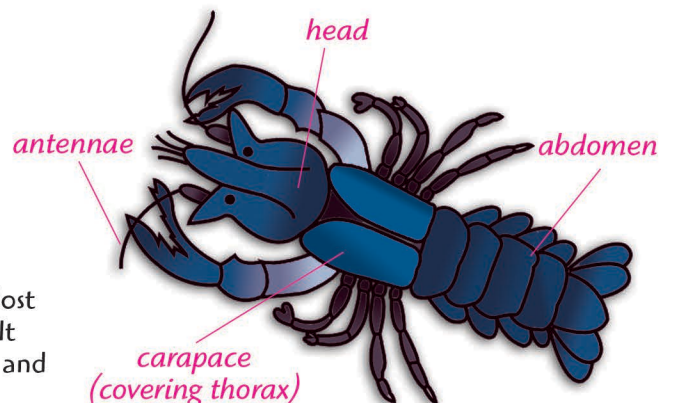
Thorax - legs, wings and wing cases are all joined to the thorax.

Abdomen - includes heart, digestive and reproductive systems.



ARACHNIDS

Arachnids are spiders, scorpions, mites and ticks. They have two parts to their body and eight legs. Arachnids shed their skin as they grow. Most arachnids are carnivorous.

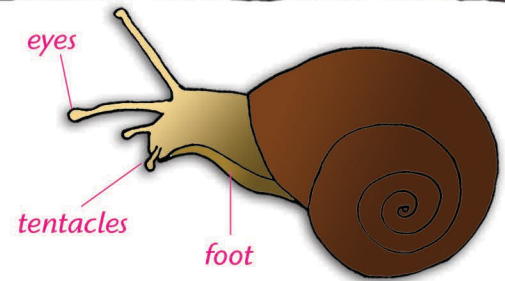


CRUSTACEANS

Crustaceans include crabs, lobsters, shrimps and woodlice. Most have ten legs although one pair is often used as pincers, adult woodlice have fourteen legs. They need damp places to live and most crustaceans live in the sea.

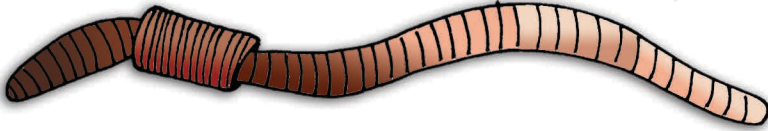
MOLLUSCS

There are 100,000 species of mollusc including slugs, snails, mussels, octopuses and clams. Molluscs are the second largest group of animals after arthropods. All molluscs have a soft body, most have an internal or external shell and move around on their foot. Squid, cuttlefish, octopus and nautilus are all cephalopods; part of their head and foot has been modified in arms and tentacles, and they move using 'jet propulsion' by squirting water out of their bodies.



ANNELIDS

This group contains worms and leeches. They need damp conditions to absorb oxygen through their skin. They are slow moving and have soft bodies and so often live underground for protection (whether on land or in underwater sediments).



OTHER INVERTEBRATE GROUPS

There are many other invertebrate groups containing animals such as corals, sponges, jellyfish, flatworms and roundworms.

Life Cycles

Most minibeasts hatch from eggs and develop into adults. The butterfly life cycle is typical of many insects, although lots of species (e.g. cockroaches and dragonflies) hatch into a nymph stage which develops directly into an adult. Aphids are unusual in that females give birth to live young that are produced asexually (without mating) throughout the summer, before mating and laying eggs in autumn. These hatch the following spring.

Most minibeasts reproduce sexually (two individuals swap genetic material), land species use internal fertilisation, whilst those living in water use external fertilisation.

The Life Cycle of a BUTTERFLY

The metamorphosis of a large white butterfly

Larva = Caterpillar

The egg hatches into a tiny larva (caterpillar).

Egg
Yellow egg.

Adult butterfly
Large white adults only live for a short time and can only feed through their straw-like proboscis. They will fly, mate and reproduce.

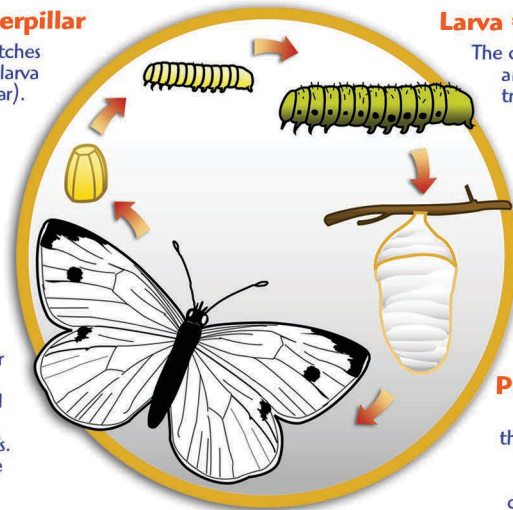
Larva = Caterpillar

The caterpillar eats and grows a tremendous amount.

The caterpillar attaches itself to a twig or wall and forms a hard outer shell.

Pupa = Chrysalis

Inside the pupa, the caterpillar changes into a butterfly. Pupae are often camouflaged to hide from predators.



Minibeast colours

Minibeasts can be masters of camouflage such as stick or leaf insects or brilliantly coloured to warn of danger (e.g. wasp stings) or foul taste (e.g. ladybirds). Some even mimic each other - just like hoverflies pretending to be wasps.

Minibeast defenses

Many minibeasts have tough exoskeletons to protect themselves from danger whilst others can be extremely venomous - box jellyfish, Brazilian wandering spiders, death stalker scorpions, blue-ringed octopuses and some cone snails can all be deadly to humans!

A collection of ants carrying green leaf-shaped signs with various facts about insects:

- There are over one million known insect species.
- One in three insects is a beetle (about 400,000 known species).
- There are 24,000 species of insect in the UK.
- Some termites build mounds over eight metres high.
- The rhinoceros beetle can lift an object 850 times its own weight.
- All spiders produce silk but not all make webs.
- Some monarch butterflies migrate over 3,000 miles (5,000 km) from Canada to Mexico.
- Out of 50,000 spider species, fewer than 30 are dangerous to humans.
- One species of millipede has 650 pairs of legs.
- There are 35 native UK woodlice species.
- Giant squid can be over 10 metres long.
- Giant clams can be one metre long.
- Common octopuses are very intelligent and can camouflage themselves in seconds.
- The giant Gippsland earthworm can be over two metres long.

MINIBEASTS at Drusillas

Giant African land snail / Marginated snail

(*Achatina sp.*)

Originally from African forests, but have been introduced to other areas. They feed on leaves, fruit and vegetables and can be a serious pest to farmers as they can grow to 30cm long and have few predators. They move on their single foot and are hermaphrodites (both male and female). Snails aestivate (are dormant) if it gets too dry.



Mexican red-knee tarantula

(*Brachypelma smithi*)

Found in forests and stony scrubland in Mexico. Feed on insects and small lizards which are killed by venom injected by their large hollow fangs. They can live for 20 years. This is a protected species as many have been captured for the pet trade.

We show spider skins to classes at Drusillas; live tarantulas are only shown on special event days.



Giant African millipede and Tanzanian red-legged millipede

(*Diplopoda sp. and Epibolus pulchripes*)

Giant African millipedes are from West African rainforests whilst red-legged millipedes are from grasslands and forests in Kenya and Tanzania. They are detritivores – eating rotting fruit and vegetation from the forest floor. There are over 10,000 species of millipede, including large ones in many tropical countries. They have two pairs of legs on each segment and one species (from Australia) has been found with over 1,300 legs. Most are a dull brownish colour to aid camouflage, although some can be brighter to show that they are foul-tasting. Millipedes bury themselves in the soil to shed their skins.



Madagascan hissing cockroach

(*Gromphadorhina portentosa*)

These live on the forest floor in Madagascar, eating rotting fruit and vegetation. They are thought to have seven different hisses - they hiss if threatened, or during courtship to attract a mate. Cockroaches are some of the oldest species of animal in the world, having been around for well over 300 million years. There are over 4,500 species of cockroach and less than 1% are pests. Some cockroaches carry their eggs around with them; some species stick them to concealed surfaces whilst others (e.g. Madagascan hissing) give birth to live young (the eggs are held inside the body until hatching). Drusillas also has death's head cockroaches (*Blaberus craniifer*) but these are rarely used in classes as they can have wings and can move quickly.

Migratory locust

(*Locusta migratoria*)

Found in Africa, Asia and Australia. They spend part of their lives on their own but also have a gregarious phase - when they form huge swarms of up to 50 billion individuals. These are blown from one area to another by winds, and can block out the sun and cause extensive damage. A swarm can eat up to 100,000 tonnes vegetation per day. They are yellow and brown for camouflage.





Your minibeast session @ DRUSILLAS

Your 30 minute education session is all about the amazing world and the exciting variety of minibeasts. Starting by establishing what a minibeast is, a volunteer is then dressed up to demonstrate first an exoskeleton and then an insect. The world of insects is discussed and the children are given the opportunity to see the world like an insect using bug glasses. To introduce these groups, animal artefacts such as conch shells, spider skins and pinned scorpions are presented to the group. These artefacts are on loan from H.M. Revenue & Customs and allow an opportunity to touch items that pupils may not otherwise come into contact with. At the end of the session live animal encounters with minibeasts take place. Animals introduced may vary but are usually millipedes, hissing cockroaches and giant land snails. We do not show live tarantulas to groups as they can easily become stressed.

Naturally, health and safety is considered throughout and everyone is asked to clean their hands after touching animals and artefacts.

Drusillas has been donated a collection of shells and corals and these can be used in sessions to discuss sea invertebrates.

For information on vertebrates, please see the **Fur, Feathers & Scales, and Life Cycles** brochure.



Activity Ideas

- * Children write about their feelings towards minibeasts, and why they like or dislike them.
- * Minibeast match - children draw five minibeasts and write a sentence to describe each one. They pass these on to a partner who has to match up the pictures and words.
- * Children do a bug hunt in the school grounds and graph the number of different animals with 0, 6, 8 and 14+ legs.
- * Make and paint minibeasts to explore their use of colour.

FIND OUT MORE...
Useful websites:
www.drusillas.co.uk
www.wildlifewatch.org.uk
www.thebts.co.uk
www.bbcearth.com/nature
www.buglife.org.uk
kids.nationalgeographic.com/animals



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