Discover Classification - KS3

Lesson 2a. Who lives in leaf litter?

Introduction

This lesson builds on the concepts of classification introduced in lesson 1 using the invertebrates as a focus. It introduces a selection of the main groups of invertebrates found in leaf litter, and some of the terminology used in their classification. During this process students will create their own picture guide to leaf litter invertebrates, for use later in the lesson. Leaf litter – dead plant material such as leaves and twigs that have fallen to the ground - can be found throughout the year, particularly beneath trees and hedges. It is home to a variety of insects and other invertebrates and sifting through a tray of leaves, twigs and moss is a fun and highly interactive way to explore, then identify the variety of life that can be found there. Links could be made to food chains, pyramids of number and biomass, and the involvement of these organisms in decomposition (including nutrient cycling and bio-gas generation).

Resources required

- Worksheets (Appendices 1 – 4, as required). A teacher's answer sheet is also provided.
- Leaf litter - *check your litter to ensure that it contains invertebrates beforehand. Rotting wood is particularly good.*
- A tray or newspaper to contain each group's leaf litter.
- Invertebrate collecting apparatus - pooters, plastic cups or soft brushes. You may wish to provide disposable gloves.
- The following are not essential:
- Magnifying glasses or low power microscopes to help examine and identify invertebrates.
- If you wish to utilise a more comprehensive identification guide to the invertebrates that pupils are likely to find, then the FSC foldout Woodland Name Trail (minibeasts) is a highly visual and easy to use key (website details below).

National Curriculum - Subject Focus

Key Stage 3: *All living things show variation, can be classified and are interdependent, interacting with each other and their environment.* (3.3. Organisms, behaviour and health).

For an outline of the national curriculum ***concepts, skills and processes*** also incorporated in this lesson, please see the main introduction to this resource pack.

Expectations

All students will be able to explain what an invertebrate is and recall some of the anatomical features used in their classification. They should be able to name two invertebrate groups.

Most will be able to name more than two invertebrate groups and recall some of the features used to recognize them.

Some will be able to make observations from photos and live specimens and suggest to which group different organisms belong.

Keywords

Classification, features, invertebrates, abdomen, thorax, joints, arthropod, arachnid, insect, mollusc, crustacean, centipede, millipede, taxonomy.

Useful websites

Field Studies Council - http://www.field-studies-council.org

Natural History Museum - http://www.nhm.ac.uk/nature-online/life/insects-spiders/

Buglife - http://www.buglife.org.uk/discoverbugs/

The Wildlife Trusts - www.wildlifetrusts.org

Who lives in Leaf Litter? Lesson notes

Student-Speak Learning Objectives

- **Today** we are going to see who (or more correctly, what) lives in leaf litter.
- Later in the lesson you will search through leaf litter to see what you can find and identify.
- Before we do that, I want to see how much you know about invertebrate animals, and about the way that scientists sort them into groups – a process we call classification.

Starter (10 minutes)

Provide students with the word search (Appendix 1).

Teaching Tips:

- Allow 5 minutes to find as many words as they can.
- Circulate to help individuals and quietly ask some students about the words.
- Point out the supporting diagrams (insect anatomy and the compound eye).
- After 5 minutes, advise students that there may be time to complete this at the end.

Mini-plenary:

Ask for volunteers to explain some of the words. (Some words should be obvious, eg. head. But, at this point make sure that they know what *invertebrate* means, and that they understand what *joints* are, and that *arthropods* are invertebrates with jointed legs). You could link Arthropod to Arthritis, a disease of the joints.

(NB. Taxonomy is the term given to the classification, description/identification and naming of things).

Main Activities (35 minutes)

Option 1. (10 minutes)

Appendix 2 - Invertebrates word-fill and drawing worksheet.

Appendix 3 - Invertebrates picture quiz (tests the students existing knowledge).

Completing the picture quiz (either singly, in groups or as the entire class) creates a simple picture guide.

OR/

Option 2. (10 minutes)

Invertebrate Key Activity (Appendix 4).

(Completing the Key Activity creates a simple picture guide)

Mini-plenary. (5 minutes)

Hold a quick discussion about the work done to check understanding of the key features for different groups:

- Insects have 3 pairs of legs
- Arachnids have 4 pairs
- Crustaceans have a variable number of legs. The kind that you are most likely to find in leaf litter - woodlice - have 7 pairs
- Centipedes have many legs (>7 pairs) with one pair per body segment
- Millipedes have many legs (>7 pairs) with two pairs per body segment

Leaf Litter Practical. (10 - 15 minutes)

Working individually, in pairs or small groups, students are provided with a small sample of leaf litter in a sorting tray. Using pooters, soft brushes and collecting pots (plastic cups will do), they should try to collect and sort invertebrates into different named groups (using their picture guide if necessary). They could even try to recognize sub-groups.

Mini-plenary. (5 minutes)

After an appropriate time (perhaps 10 minutes), get students to stop and gather to see what they have found. Ask students to name the groups that different things belong to, and say why.

Teaching Tips:

- This can get a little messy – you may want to put down newspaper or work outside.
- Get student groups to spread well apart, to reduce interaction between groups.
- Call everyone to a halt for the plenary and get everyone around a white tray or sheet, so all can see what's on show.
- Leaf litter is typically very safe to handle, but it is worth pre-sorting the litter to ensure that it is free of any sharp objects etc. Remember to complete an appropriate risk assessment (where necessary) and remind students to ***wash their hands*** after tidying away.

Homework ideas

a) Complete one of the worksheets not done in class.

b) Write a review of the leaf litter practical and what they found.

c) Write a short story - 'life as a leaf litter invertebrate'.

d) ICT – students could use puzzlemaker.com to create a crossword about invertebrates and get a classmate to try their crossword next lesson.

Appendix 1.

Classification Word Search

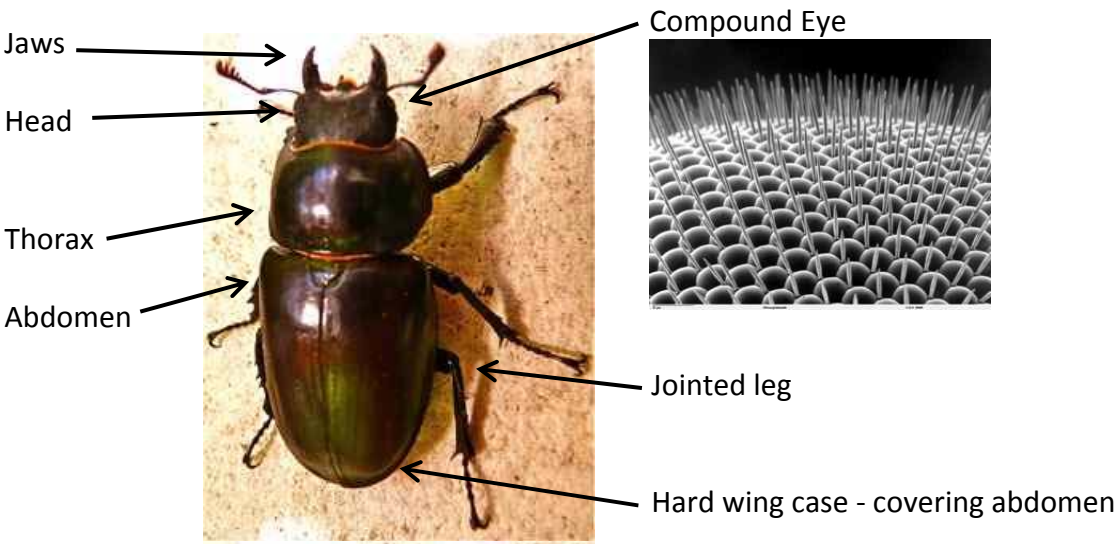
E M H E A D K D I Z B F Y R Q I J
Z X E H E N E I N D I N H C A R A
K I U M P Y B N V O R A F P I K Q
K H F N Q E G S E V G V X R Z I T
T R O U F K V E R T E B R A T E Q
C A P K M G O C T V C X C F E D E
I B H E L D Z T E B J T S L D H J
O T Y N E M O D B A T A U M E Z N
U E Z Y Y Q T H R W O X L G P D A
S F F D Q H K J A I Q O L M I O E
Z I B D O E O F T N W N O P T W C
S S Y R H I T I E G V O M Y N K A
Y B A Y N B X U I S G M H U E P T
I X X T D S Q S M B V Y B T C O S
I X S E H N P S G E L P P J M E U
L V B M R O W D I L E N N A D F R
E T H W W A R T H R O P O D G F C

Head
Abdomen
Thorax
Legs
Joints

Eyes
Invertebrate
Vertebrate
Arthropod
Arachnid

Insect
Centipede
Crustacean
Mollusc
Taxonomy

Quick Guide to Insect Anatomy



Appendix 2.

Invertebrate Animals

Use these keywords to fill-in the gaps.

centipedes	**worms**	**legs**	**spiders**
crustaceans	**backbone**	**insects**	**snails**

Invertebrates are animals without a ……..

Some invertebrates have soft bodies and no legs. Earth…….. are a good example of this.

Slugs and …… are also soft-bodied invertebrates with no legs. These belong to a **group** called the molluscs.

Other invertebrates have a hard shell (exoskeleton) and jointed ……..

These are called the arthropods.

There are several groups of arthropods.

One group, the arachnids, includes …….. and scorpions.

Another group, the ……., includes ants, bees, beetles and butterflies.

Crabs and lobsters have a thick, crusty exoskeleton. They belong to a group of arthropods called the …….. Woodlice belong to this group too.

Millipedes and …… are two other groups of arthropods.

Drawing Activity

Imagine an insect and draw it below.

Insects have a head with two compound eyes, and a thorax with three pairs of legs (and often two pairs of wings). They also have an abdomen that contains many of their internal organs.

Appendix 3.

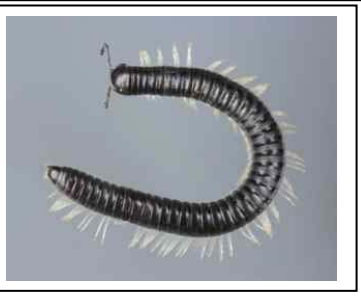
Picture Guide to Leaf Litter Arthropods

Name: Ant

Group: Insects

Name:

Group:



Name:

Group:

Name:

Group:

Name:

Group:

Name:

Group:

Extension: If you were an invertebrate, what would you be and why?

Appendix 4.

A Classification Key to some common invertebrates

Note: This key is for adult animals. The young (larvae) can look very different.

Invertebrate animal

Has proper (jointed) legs for walking. (*Arthropod*)

No proper legs.
The fleshy stumps you see on some animals do not count as proper legs.

Body has a ringed pattern around it. (*Segmented body*)
e.g. Earthworms. (Annelids)

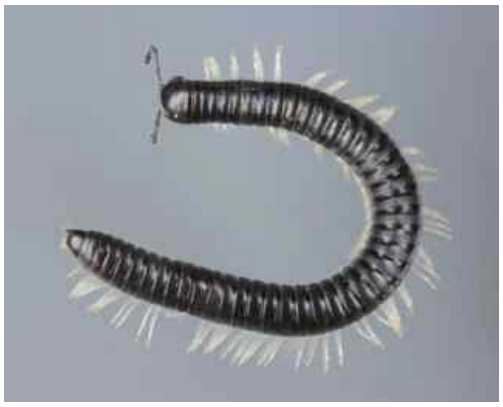
Body does not have rings around. (*Unsegmented body*)
e.g. Other worms, slugs & snails

Now complete this guide to Leaf Litter Arthropods

Match the pictures to the descriptions below, then write the names in the empty boxes.

Has 3 pairs of legs.	Has 4 pairs of legs. (*Arachnid*) Body clearly divided into a separate head and body.	Has 4 pairs of legs. (*Arachnid*) Body is not clearly divided into a separate head and body.
Has 7 pairs of legs.	Has >7 pairs of legs. One pair of legs per body segment, so the legs look spaced apart.	Has >7 pairs of legs. Two pairs of legs per body segment, so the legs look crowded together.

Appendix 4. (continued)



Millipede

Arachnid (spider)

Crustacean (woodlouse)

Arachnid (mite)

Centipede

Insect (beetle)

Answers

Appendix 2.
Backbone, worm, snails, legs, spiders, insects, crustaceans, centipedes.

Appendix 3.
Ant - Insects; Woodlouse - crustaceans; Millipede – millipedes; Beetle – insects; Centipede - centipedes; Spider – arachnids.

Appendix 4.
(Top row) Insect, spider, mite
(*Bottom row)* Crustacean (woodlouse), centipede, millipede.