



Kew Wildlife Zone: Wildlife Habitats and Activities

Here are three types of habitats you might find locally, or may even be able to create: **Pond**, **Woodland** and **Grassland**.

For each habitat, there is a species list and some example food chains. There are also suggestions of what to study in each, and some suggested exercises.

| | | | |
|---------------------------------|------|---------------------------------|------|
| Activity ideas for all habitats | 2.01 | Woodland | 2.07 |
| Studying species | 2.01 | Woodland species list | 2.07 |
| Habitat food chains | 2.01 | Some woodland food chains | 2.07 |
| Names | 2.01 | Activity ideas: | |
| Life cycles | 2.01 | Trees, Shrubs and Herbs | 2.08 |
| | | Tree Survey | 2.09 |
| Pond | 2.02 | Shaking Trees for Minibeasts | 2.14 |
| Pond species list | 2.02 | | |
| Some pond food chains | 2.02 | Grassland | 2.17 |
| Activity ideas: | | Grassland species list | 2.17 |
| Pond Plants, Pond Places | 2.03 | Some Grassland food chains | 2.17 |
| Pond-dipping | 2.05 | Activity ideas: | |
| | | Diversity Window | 2.18 |
| | | The Dinner Tray Food Pyramid | 2.20 |
| | | Parachute Test – Seed Dispersal | 2.22 |

2.0

Supported by:

the **Hanson**
environment fund



Activity ideas for all habitats

Studying species

In this chapter, there is a species list of the living things you might find in each habitat. Let children each choose a plant or animal from the species list from your habitat and research it (using books, the web, and where possible, observation).

You can use the organism factboxes (chapter 3) photocopied onto card and cut out, as a way to distribute organisms between children, and as the basis for research.

Each child can then:

- Create a fact book about that plant or animal. The fact book should be interesting to someone who doesn't know about the organism already. It could include information about what the organism looks like, where it lives (the habitat, and the locations within it, e.g. pond margins, treetops), how it breeds, how it fits into a food chain (what it eats and is eaten by).
- Write a poem about the plant or animal
- Write a story about the habitat that involves some of organisms as characters.

Groups of children can:

- Create a poster about the habitat and the organisms in it. Individuals can offer their research and poems, and groups can work together to find overall information on their habitats and food chains within it.

Habitat food chains

Devise food chains for your habitat. You can use the organism factboxes to help you.

You can represent these as drawings (remember the arrow represents the flow of energy through the food chain, and can be read as 'is eaten by'. Children often get this the wrong way round).

Names

You don't have to know the right names for plants. Invent them! Look carefully at each plant and, in discussion, decide which features are characteristic. Suggest names based on these features. E.g. a thistle might be the 'Sore bottom plant' – if you sit on it!

A lot of scientific (Latin) plant and animal names are created like this – e.g. *longifolia* means 'long leaves', and the name *Primula japonica* just means a primrose from Japan.

Life cycles

Can you find insect eggs, larvae (grubs or caterpillars), pupae/chrysalises, adults? Are there any adult insects mating? Use these as starting points to discuss insect life cycles.

Health and Safety reminder

Before visiting any natural habitat, familiarise yourself with the Health and Safety information in Chapter 7.

Pond

There are different zones in a pond habitat. Some things live in the open water, others float on the surface, some prefer the shallows, while others grow in the muddy margins.

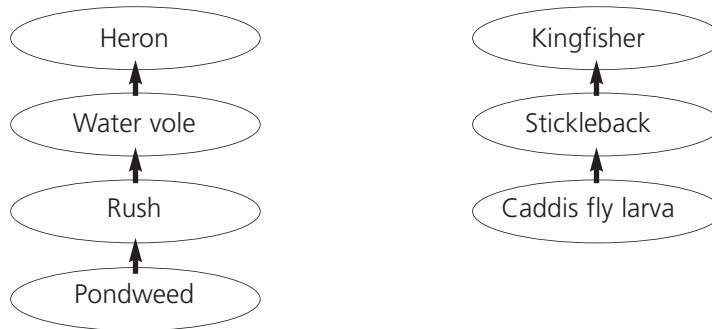
Pond species list

Here are just a few of the plants and animals you might see in and around a pond.

| | | | |
|----------------|------------------|----------------|----------------------|
| Plants | Waterlily | Fish | Invertebrates |
| Alga | Yellow Flag | Stickleback | Backswimmer |
| Bogbean | | | Caddis Fly |
| Duckweed | Mammals | Birds | Damselfly |
| Kingcup | Water Vole | Duck (Mallard) | Dragonfly |
| Pondweed | | Heron | Great Diving Beetle |
| Reed | Reptile | Kingfisher | Pond Skater |
| Rush | Grass Snake | Swallow | Water Boatman |
| Sedge | | Swan | Water Flea |
| Water Cress | Amphibian | Coot | Water Snail |
| Water Crowfoot | Frog | Moorhen | Whirligig Beetle |
| Water Mint | Smooth Newt | | |
| Water Plantain | Toad | | |

Some pond food chains

These are just two examples. Use the species cards in chapter 3 to create your own.



Activity ideas

Pond Plants, Pond Places (p.2.3)

Pond-dipping (p.2.5)

Pond Plants, Pond Places

Key themes

- The variety of life (biodiversity) in a pond habitat.
- Observation of unfamiliar plants.

Equipment needed

Notepad and pencil

Long pole marked in 10 cm graduations.

Long tape measure (optional)

What to do

Explain that this exercise is to look for patterns in the way pond plants grow and to investigate whether particular types of plants are restricted to particular places.

CURRICULUM LINKS:

Science

- Sc1 Investigative skills: Planning 2 (a-b); Obtaining and presenting evidence (e-f); Considering evidence and evaluating (i-j)
- Sc2 Life processes and living things: Living things in their environment. Adaptation 5 (b-c)

Geography

- Geographical enquiry and skills 1(a-b)
- Using appropriate fieldwork techniques 2(b)
- Identify and describe what places are like 3(a)
- Recognise and explain patterns made by features in the environment 4(a)

Art and design

- Exploring and developing ideas 1(a-c)
- Investigating and making art, craft and design 2(c)
- Visual and tactile elements 4(a)

Pond safety

Be aware of the Health and Safety issues when working with water.

- Do not go into the water, or stand on edges that might be unsafe or give way. Be aware that duckweed or leaves floating on the water may look solid to children, who may try to walk on it. If they are not sure, encourage them to discover for themselves by testing it with a long stick.
- Be very gentle with pond creatures. Not just because you could hurt them – some bite!
- There is a very small risk of catching Weil's disease from pond water. You should not put your fingers or anything else that has touched the water into your mouth, nose or eyes. Any cuts or grazes should be covered with a waterproof plaster.
- Always wash hands after pond-dipping. Take antibacterial wipes if you are not anywhere near a clean water supply.

See chapter 7 for more on Health and Safety.

Children should stand at the edge of the pond and observe where the different plants in it live.

How many different places can they identify? The list could include:

- Muddy margins
- Roots in shallow water but leaves sticking out into the air
- Floating on the surface of shallow water
- Growing under shallow water
- Roots in deep water but leaves sticking out into the air
- Floating on the surface of deep water
- Growing under deep water

Using the pole, record the depth of water at each of these places. If the pond is not too large, children can work in groups to measure its diameter using the tape measure.

Children should sketch at least one plant from each of the places. They could try to identify some of the plants too.

Choose some words to describe the plants' texture, e.g. leafy, sword-like, stiff and sharp, soft and floppy, bright and colourful.

Discuss how the plant's shape and texture could be an adaptation to where it lives. E.g:

The wide shallow leaves of waterlily help it to float on the surface.

The weed under the water can be soft and floppy because the water helps to support it.

The bogbean has flowers on stiff stems that stick out of the water. If the flowers were under water, bees and other pollinators couldn't visit them.

Children can then think of some things that each of the plants could offer to the animals living in the pond, e.g.

Soft, juicy, tasty leaves

Somewhere dark to hide

A way of climbing out of the water

Somewhere to lay eggs

More advanced children could imagine what a cross-section of the pond would look like, and draw their plants in the correct places on it.

You could try to identify your pond plants using field guides.

Back in the classroom

A pond cross-section could form the basis of a long mural or poster, with children drawing in their own plant(s), in the correct part of the pond. The depth recordings could be used to help make the drawing accurate. Children may need to consider scale factors if the drawing is not life size.

Pond animals could also be added to the picture.

Pond-dipping

Key themes

- The variety of life (biodiversity) in a pond habitat.
- Adaptations needed for living underwater.
- Observation of unfamiliar creatures.

CURRICULUM LINKS:

Science

Sc2 Life processes and living things: Variation and classification 4(a-c); Living things in their environment; needing protections (a). Adaptation 5 (b-c); Micro-organisms (f)

Equipment needed

Long-handled nets

White trays, or ice-cream tubs, margarine pots or other white containers (a white background makes it easier to see the creatures you find)

Clear jars for observation (plastic is safer than glass). You can buy Perspex ones with magnifiers in the lid. Bug pots are available from schools suppliers.

White plastic spoons

Paintbrushes

Magnifiers for looking at smaller creatures

Identification guide to pond creatures

Old clothes and wellington boots

Pencils and notebooks for recording

Camera (optional)

What to do

Have some white trays or tubs ready, with an inch or so of pond water in them.

Use the nets to sweep the water. Examine the contents of each net by tipping it into the white trays. You may need to turn the net inside out and shake it to gently remove any creatures that are clinging to it.

The best places to sweep are usually in and around water plants. Sweep gently - be careful not to uproot plants or damage them. You could also sweep the mud at the bottom of the pond, but this will make the water murky, so do this away from the plants.

Examine the catch. If you want to have a closer look at a creature, carefully transfer it to an observation jar, using the spoons or paintbrush. Don't use tweezers or your fingers – this could damage it.

Record the creatures you find by drawing them. Identify them if you can, using books or other pond life guides. The Field Studies Council produces a laminated guide, The Freshwater Name Trail – a key to invertebrates of ponds and streams, which is splash-proof.

Small pond creatures easily become stressed. Put a small piece of pondweed into the white tray to give them somewhere to hide or cling to. Do not leave the trays in full sun – the water will get hot and kill the creatures. Put the organisms back into the pond where you found them as soon as you have studied them. Do not take them back to the classroom, as they are unlikely to survive.

Pond safety

Be aware of the Health and Safety issues when working with water.

- Do not go into the water, or stand on edges that might be unsafe or give way. Be aware that duckweed or leaves floating on the water may look solid to children, who may try to walk on it. If they are not sure, encourage them to discover for themselves by testing it with a long stick.
- Be very gentle with pond creatures. Not just because you could hurt them – some bite!
- There is a very small risk of catching Weil's disease from pond water. You should not put your fingers or anything else that has touched the water into your mouth, nose or eyes. Any cuts or grazes should be covered with a waterproof plaster.
- Always wash hands after pond-dipping. Take antibacterial wipes if you are not anywhere near a clean water supply.

See chapter 7 for more on Health and Safety.

Ideas for discussion/research

- What adaptations do your creatures have to help them live in a watery habitat? E.g. gills instead of lungs, a way of carrying an air supply, a snorkel-like tube for breathing, webbed feet for swimming, long tail for swimming, long oars-like legs for swimming.
- Are the creatures you caught from around the plants different from those from the mud? Which were only found in one place? Why do you think this is?
- Some creatures start their lives in ponds then change and become creatures of the land or air. Frogs, dragonflies and damselflies do this. These are good examples to discuss for Life Cycles. Each stage of the life cycle has different adaptations.

Woodland

A deciduous woodland has broadleaved trees, like Oak and Beech, that drop their leaves in winter. A coniferous woodland, in contrast, has Pine and other conifer trees that keep their needle-like leaves throughout the year. Mixed woodlands have both types of trees.

Deciduous woodland tends to have much more biodiversity than a coniferous woodland. This is because more light can reach into the woodland. When the trees are bare in early spring, sunlight reaches the woodland floor, so lots of herbs like bluebells and primroses can grow. (Herbs are low-growing plants).

Deciduous woodlands also tend to have a layer of shrubs, like Hawthorn, Hazel, Holly and Elder. These shrubs often have berries or nuts that are good for wildlife.

Woodland species list

Trees

Ash
Beech
Cherry
Elm
Field Maple
Oak

Shrubs

Bramble
Elder
Hazel
Holly

Herbs

Bluebell
Fern
Foxglove
Herb
Herb Bennet
Ivy
Nettle
Primrose
Rosebay Willowherb

Teasel
White Dead Nettle
Wild Garlic

Fungi

Bracket Fungus
Fly Agaric
Honey Fungus
Jelly Fungus
Oyster Mushroom
Sulphur Tuft

Plant/Fungus

Lichen

Mammals

Badger
Bat
Deer
Fox
Hedgehog
Stoat
Weasel
Wood Mouse

Amphibian

Toad

Birds

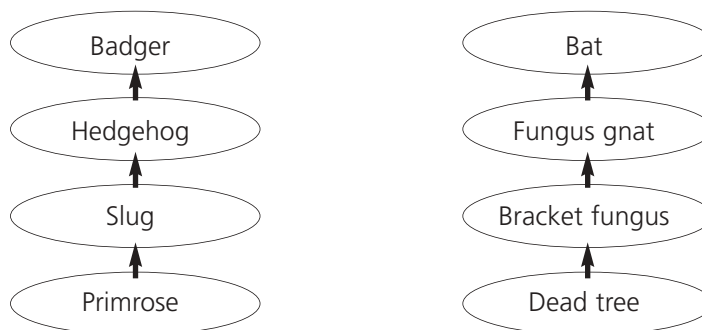
Blackbird
Bluetit
Chaffinch
Great Spotted
Woodpecker
Great Tit
Green Woodpecker
Greenfinch
Jackdaw
Robin
Sparrowhawk
Tawny Owl
Wood Pigeon

Invertebrates

Ant
Aphid
Beetle
Brimstone Butterfly
Butterfly
Caterpillar
Centipede
Earthworm
Elephant Hawk Moth
Fly
Ground Beetle
Holly Blue Butterfly
Ladybird
Longhorn Beetle
Millipede
Slug
Snail
Speckled Wood
Butterfly
Spider
Stag Beetle
Woodlouse

Some woodland food chains

These are just two examples. Use the species cards in chapter 3 to create your own.



Activity ideas

Trees, Shrubs and Herbs (p.2.08), Tree survey (p.2.09), Shaking trees for minibeasts (p.2.14)

Trees, Shrubs and Herbs

Key themes

- Exploring the range of different plants and types of plants found in a habitat.
- Encouraging observation and identification of 'same' and 'different'
- Biodiversity needs space!

Equipment needed

Envelopes, three per group of children.

Labelled: TREE, SHRUB, and HERB

Plant identification books (if available)

CURRICULUM LINKS:

Science

Sc2 Life processes and living things: Variation and classification 4(a-c); Living things in their environment 5.

Mathematics

Ma2 Number and algebra: Using and applying number 2(f), Calculations 3(a)

Ma4 Handling Data; Problem solving 1(a); Communicating 1(f); Processing, representing and interpreting data 2(a-d)

Art (if extending the activity to use the collected leaves). Exploring and developing ideas 1(c), Investigating and making art, craft and design 2(a,c)

What to do

Each group should collect a single leaf of as many different types of plants as possible, putting them into the appropriate envelope as they collect. Remember, trees are large, and usually have a single trunk; shrubs are smaller than trees, with woody stems and often more than one trunk; herbs are the smaller plants that are not woody. Encourage children to recognise different species using differences in leaf form – a plant with three leaflets is different to one with lobed leaves. A plant with dark glossy green leaves is different to one with soft furry ones. Be aware that sometimes leaves change form as they age.

At the end of the allotted time, count how many different types of leaves (species) there are in each envelope and record the results on a chart:

| Group/child's name | Number of Trees | Number of Shrubs | Number of Herbs |
|--------------------|-----------------|------------------|-----------------|
| | | | |
| | | | |
| | | | |
| | | | |

The data can be presented as a frequency chart.

There should be lots more types of herbs than trees (especially if collecting was done along a path or woodland edge). Discuss why this might be, thinking about the amount of space each plant takes up. Remember that each plant needs other plants of the same type to pollinate it, too. Message: biodiversity needs space!

Leaves can be scattered back onto the woodland floor, or taken back to the classroom to be identified and/or pressed for display. Leaves are good for collage work because of their diversity of shapes and colours.

Tree survey

Key themes

- Getting to know a tree
- Measuring, observing and recording information
- Describing a tree

Equipment needed

Long tape measures (50 metres)

1-metre rulers

Wax crayons

Notepads and pens

Sheets of paper

Copies of tree survey sheet

How to do it

Discuss with the children things that they think they should record when 'getting to know' their tree. Think about the things that are measured or described for people (e.g. height, waist measurement, hair colour). Which of these would work for trees too? What alternatives would be better?

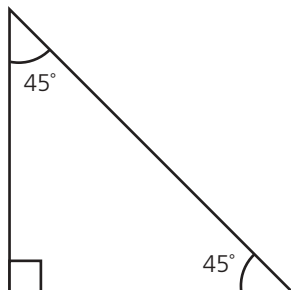
Children should work in pairs to explore their chosen tree in a woodland. It is easier to use trees on the edge of a woodland, as for the height measurement the children will need to walk away from the tree and still be able to see the top of it.

Measuring your tree

How tall is the tree?

Before you begin the measuring exercise, discuss with the children ways they could measure the height of a tree. Suggestions might include climbing to the top and dropping a weighted string down to the ground and measuring the length of the string, or chopping the tree down and measuring it on the ground. Discuss why these methods could be difficult or harmful to you or the environment.

Explain that mathematics can help you to measure the height of a tree easily, using the rule that an isosceles right angle triangle (a triangle with one right angle and two corner angles of 45 degrees) has a base that measures the same as the height.



CURRICULUM LINKS:

Science

- Sc1 Investigative skills: Planning 2 (a-d); Obtaining and presenting evidence (e-h); Considering evidence and evaluating (i-m)
- Sc2 Life processes and living things: Life processes in plants 1(b); Green plants 3(d); Variation and classification 4(b); Living things in their environment.

Geography

- Geographical enquiry and skills 1 (a-c)
- Using appropriate fieldwork techniques 2(b)
- Identify and describe what places are like 3(a)
- Recognise and explain patterns made by features in the environment 4(a)

Mathematics

- Ma2 Number and algebra: Using and applying number; Communicating 1(f)
- Ma4 Handling data; Problem solving 1(a); Communicating 1(f); Processing, representing and interpreting data 2(a-d)

There are (at least) two ways of doing this.

The slightly silly method:

Walk away from the tree until you think you are as far away from it as the tree is tall. Turn your back to the tree, stand with your feet apart, bend over and look at the tree through your legs. You should just be able to see the top of the tree where your legs meet. If you can't see the top of the tree, walk further away and try again. If you can see lots of sky above the top of the tree, move closer and try again.

When you have reached the right spot, stop and ask your partner to measure the distance along the ground from your head to the base of tree. This measurement will be roughly equal to the height of the tree.

NB: The accuracy of this exercise depends on creating a 45° viewing angle through the legs. The exact angle will depend on the flexibility of the child! If lots of children measure the same tree and come up with different figures, this could be a point for discussion.

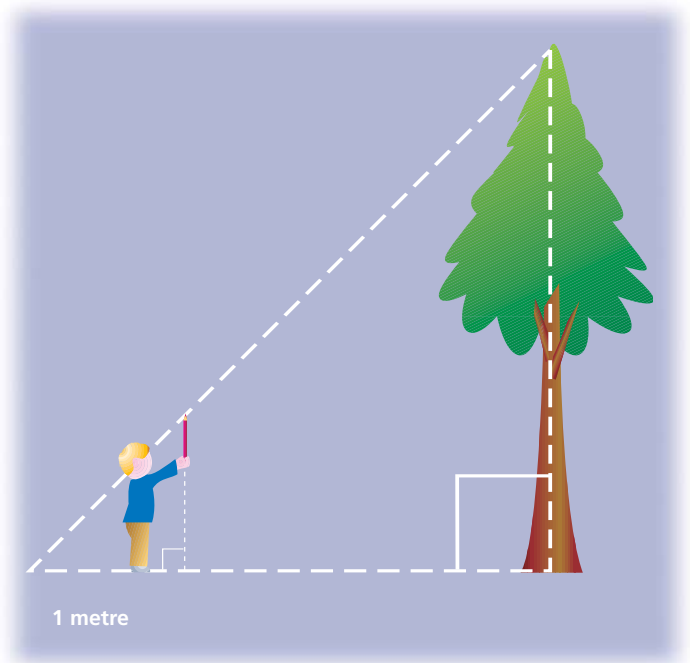
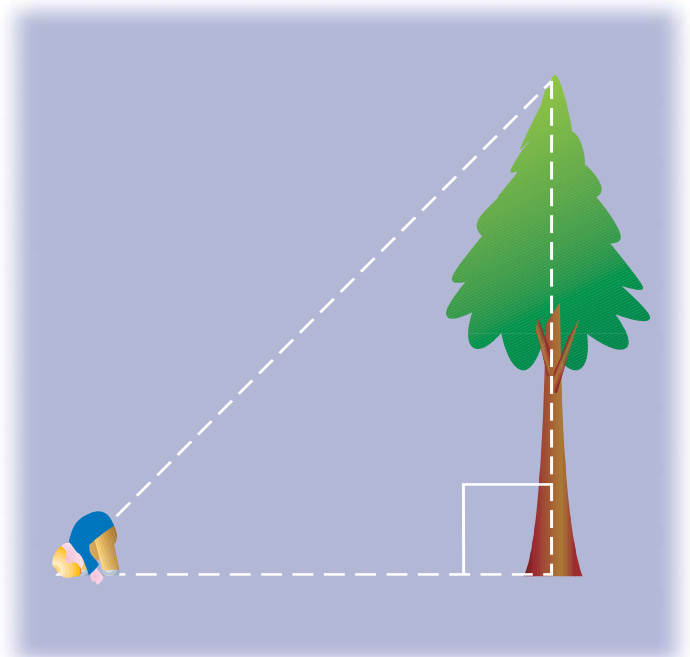
The pencil method

(more accurate, and more appropriate for children wearing skirts):

Hold a pencil vertically by the base at arm's length.

Sight along it and walk to where the top of the pencil looks to be in line with the top of the tree.

The distance you are standing from the tree, plus one metre, is approximately the same as the height of the tree



What is the tree's girth (circumference)?

Measure the circumference of a tree by wrapping the tape measure around its trunk, at the height of the child's chest. Trees are measured at chest height because some spread out towards the base. You should also avoid measuring where a branch emerges, as this will also make the measurement bigger than it should be.

Record the measurement in centimetres.

How old is the tree?

Before taking any measurements, encourage the children to look at, touch, or hug their tree, and guess at how old it is.

One way to measure a tree's age is to chop it down and count the growth rings in the trunk. A less destructive way is to estimate it from the trunk's girth.

On average, a tree's girth grows 2.5 cm every year (this is not true for very old or very young trees, but is a good approximation for most trees). So to estimate a tree's age, divide its girth by 2.5.

$$\text{Girth (cm)} \div 2.5 = \text{Age in years}$$

Is this figure close to the guess?

NB: To do this sum without a calculator: double, then double again and knock of the last digit.

How much space does the tree take up?

To measure how much area the tree canopy covers, one partner walks to the edge of the canopy and stands directly under the outermost leaves, holding one end of the tape measure. The other partner walks with the tape measure to the far side of the tree on the opposite side of the trunk, until they are under their outermost leaves. Measure the distance between the two. This is the diameter of your tree space. Assuming your tree has a roughly circular shape, the area can be calculated from this diameter.

$$\text{Area} = \pi \times \text{diameter}$$

NB: π (Pi) is approximately 3.14 (use 3 for an easier calculation)

So if your tree's diameter is 5.30 metres, the area of ground its canopy covers is:

$$3.14 \times 5.3 = 16.6 \text{ m}^2$$

Describing your tree

What are the leaves like?

Is it

- a conifer, with needle-like leaves, like a Christmas tree,
- a broad-leaved evergreen, like Holly (with dark, glossy leaves),
- or a deciduous tree like an Oak? (Deciduous trees drop their leaves in autumn and produce fresh ones in spring)

What shape are the leaves? Draw one or make a rubbing on your record sheet: put a leaf under the page (this works best if the leaf is upside down so the veins are showing). Then carefully rub over it with the area of the page with flat edge of a wax crayon. The edges and veins of the leaf should show up.

Flowers and fruit?

Are there any flowers or fruit/seeds? What are they like?

What is the bark like?

Smooth, grooved, lined (do the lines go across or up and down?), peeling, cracked, knobbly?

On a separate sheet of paper, make a bark rubbing.

What is on the ground below your tree?

Is there leaf litter? Are there any plants? Are there any clues about the animals that live in the tree (e.g. droppings, feathers, nibbled seeds or berries, tracks)?

How would you describe your tree?

Think of words to describe your tree. They could be sight words (dark green, massive, drooping), sound words (rustling, creaking), smell words (piney, musty), touch words (rough, prickly), or other descriptive words (elegant, graceful, ancient).

Collecting the data

Record your results on the tree survey sheet.

When you get back to school, you could pool all your class's results.

| Child's name | Type of tree (e.g. Oak, Sycamore, Hawthorn) | Girth | Height | Estimated age Girth (cm) x 2.5 |
|--------------|---|-------|--------|-----------------------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Presenting the data

Discuss ways to use and present the data. This could include calculations of the range and average girth and height for each type of tree, graphs and frequency charts. More advanced children could plot tree height against tree girth.

Present your tree data as bar charts, distributions etc.

Do the tallest trees always have the biggest girth?

Discuss some of the issues your figures raise, for example:

- Which type of tree is, on average, the largest?
- If there are more small trees and only a few really large ones, discuss why this is the case. For more advanced children, this could lead to a discussion of competition for light and space.
- Do you think your woodland has been planted, or have the trees grown naturally? (Plantations usually have lots of trees of the same age.)
- Encourage children to research their tree species (using the web or books) to find out if the ones they measured are 'typical' for the species.
- Discuss which trees you would choose for a small habitat area in a school or garden, based on their maximum size.

Other activities based on your tree survey

Write **poems** based on the descriptive words chosen for the tree.

Make a **collage** with leaf or bark rubbings.

Pretend you are a **Wildlife Estate Agent** trying to sell your tree as a new home for animals.

What features would you want to advertise? e.g.

Holes in the trunk offer spacious accommodation for bluetits

Lovely peeling, furrowed bark – perfect hiding places for minibeasts

You could design cards like those in an estate agent's window with a photograph or drawing of each tree, the description and the price. Look at some examples for ideas of how these look.

Tree survey sheet

Name:

I was helped by:

Location of tree:

Type of tree:

My tree is m tall My tree trunk's girth (circumference) is cm

My tree's age is:
Girth \div 2.5 = age \div 2.5 = years

My tree's canopy area is:
Canopy diameter \times pi = area m \times 3.14 = m

My tree is this shape:
(Drawing of the whole tree's shape)

My tree's leaves are this shape:
(Drawing (or leaf rubbing, if the leaf will fit))

The flowers, seeds or fruits of my tree look like...

Under my tree there are...

Words that describe my tree:

Shaking Trees for Minibeasts

Key themes

- The variety of life (biodiversity) that lives on a tree.
- Observation and recording.

Equipment needed

Large white cloth or sheets of A3 paper

Tubs or clear plastic observation pots (you can buy Perspex pots with magnifiers in the lid)

Magnifiers

Paintbrushes for picking up minibeasts

Plastic spoons, also for picking up minibeasts

Pencil and paper for recording

CURRICULUM LINKS:

Science

Sc1 Scientific enquiry: Investigative skills 2(a-m)

Sc2 Life processes and living things: Variation and classification 4(a-c); Living things in their environment; needing protections (a). Adaptation 5 (b-c);

Mathematics

Ma2 Number and algebra: Using and applying number 1(f,h)

Ma4 Handling data; Problem solving 1(a-e); Communicating 1(f-g); Processing, representing and interpreting data 2(a-d)

How to do it

Explain to the children that they are going to discover some of the creatures that are living on the tree. Discuss the problems of finding the creatures – many are small, hiding or camouflaged. One solution is to knock or shake the creatures from the branch so they are easy to see and count.

Put the white cloth or sheets of paper on the ground underneath a low branch. Give the branch a shake, or a sharp tap with a stick, to dislodge any minibeasts in the leaves. These should fall onto the sheet.

Observe the range of minibeasts that you see on the sheet. Make a brief list of these, with frequencies (you could make tally marks).

| E.g. Tree species: | Oak |
|---------------------------|------------|
| Small green caterpillar | 3 |
| Ants | 10 |
| Small round black beetle | 1 |
| Small long black beetle | 2 |
| Reddish beetle | 1 |
| Green aphids | 25 |

Select ONE minibeast for closer study.

Carefully transfer it into an observation pot, using the paintbrush. Don't use your fingers, as you could easily hurt it.

Put all the other minibeasts back onto the tree they came from.

Draw your minibeast. You could attempt to identify it too.

What do you think it eats? If it moves quickly, it is probably a predator that chases other minibeasts. If it moves slowly it is probably a herbivore that eats the tree.

Does it have any special markings? Is it camouflaged (the same colour as the leaf or the bark?) or does it have bright colours, which may be a warning to predators that it tastes horrible?

Back as a class

You could pool the results. If different groups looked at different species of trees, you could compare results between tree species.

What is the average number of minibeasts per 'shake' for each tree species?

What is the average number of different types of minibeast for each tree species?

Discuss why different tree species might give different results?

Discuss whether this method of collecting minibeasts is a good one. Would it have missed some of the creatures that depend on the tree? Discuss some of the problems you may have had (e.g. things flying away before they could be recorded!)

This activity is modified from the WildThings activity sheets from Wild About Leicester, www.wildaboutleicester.co.uk

Tree minibeast recording sheet

Tree species:

Minibeasts found:

My minibeasts:

Name (if you can identify it)

Drawing of my minibeast:

Words that describe my minibeast:

Grassland

There are many different types of grassland, from a mown playing field to ancient meadows.

Grasslands with flowers (rather than those that are mown) are best for these exercises as they have a greater diversity of plants in them.

Grassland species list

These are just two examples. Use the species cards in chapter 3 to create your own.

Herbs

Buttercup
Cocksfoot Grass
Daisy
Dandelion
Speedwell
Teasel
White Dead Nettle
Grasses
Foxtail Grass
Rye Grass
Yorkshire Fog

Fungi

Field Mushroom

Invertebrates

Ant
Aphid
Bumble Bee
Common Blue Butterfly
Dragonfly
Earthworm
Fly
Ground Beetle
Honey Bee
Hoverfly
Ladybird
Meadow Brown
Butterfly
Slug
Small Tortoiseshell
Butterfly
Snail
Soldier Beetle

Reptile

Grass Snake

Mammals

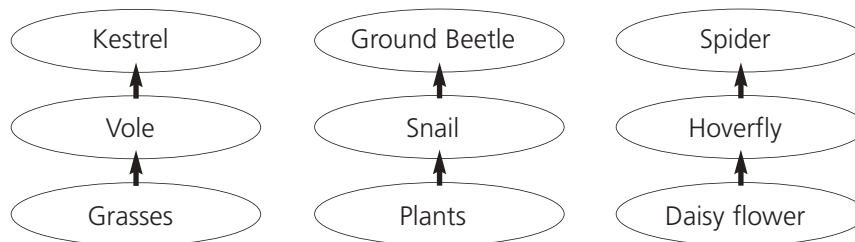
Fox
Rabbit
Shrew
Stoat
Vole
Weasel
Wood Mouse

Birds

Blackbird
Black-headed Gull
Canada Goose
Chaffinch
Crow
Goldfinch
Jackdaw
Kestrel
Starling
Swallow

Some Grassland food chains

Here are some examples of grassland food chains. Use the species cards in chapter 3 to create your own.



Activity ideas

Diversity Window (p.2.18)

Dinner Tray Food Pyramid (p.2.20)

Parachute test – Seed Dispersal (p.2.22)

Diversity Window

Key themes

- The diversity of plants within a grassland
- Observational and recording skills
- Designing and making a tool (quadrat)

Equipment needed

Quadrats (or the materials to make them)

Recording sheets

Pencils

How to do it

Before your habitat visit – designing and making quadrats

Design a quadrat as a class exercise. A quadrat is a frame with a square hole measuring 25 cm x 25 cm. The frame can be used as a viewfinder, or to mark out a fixed area of ground. For random sampling of grassland, the person doing the survey throws the quadrat onto the ground, often backwards over their shoulder so that the sample is truly random and they aren't picking a patch with nice plants in it! (Be aware of health and safety issues if children are throwing quadrats).

CURRICULUM LINKS:

Science

Sc1 Investigative skills: Obtaining and presenting evidence (e-f); Considering evidence and evaluating (i-j)

Sc2 Life processes and living things: Green plants 3; Variation and classification 4(c); Living things in their environment. Adaptation 5 (b-c)

Geography

Geographical enquiry and skills 1(a-b)

Using appropriate fieldwork techniques 2(b)

Identify and describe what places are like 3(a)

Design and Technology

Developing, planning and communicating ideas 1(a-d)

Working with tools, equipment, materials and components to make quality products 2(a-e)

Knowledge and understanding of materials and components 4(b)

Art and design

Exploring and developing ideas 1(a-c)



Discuss the design features that you need to incorporate: e.g. it needs to be robust to cope with being thrown; it might need to be water resistant if the grass is damp; you might want to make them easy to transport; there needs to be a way of fixing the corners into right angles.

Discuss the materials to use. This could be cardboard with paper fasteners, or wooden strips.

Remember, for the hole to be 25x25cm, the pieces have to be longer!

In the grassland

Working in pairs or threes, one child should **stand** holding the quadrat frame level with the ground at about chin height. The child who is 'observer' then looks through the frame and describes all the different things they can see to the rest of the group. They can then make a quick sketch of what they can see.

Children should then **kneel** on the ground and repeat the process, reporting on what they see and sketching the view.

Children should then lay the frame on the grass and **crouch or lie down** close to it. This time they observe very closely and report all the details of what they can see to the group, and make a detailed drawing (not a sketch). What are the different shapes and colours of leaves? Are there any flowers? What are they like? Are there any minibeasts? What are they doing?

Back as a class

Talk about the different things they have seen. How did the view change as they moved closer? What would a hoverfly or an ant's eye view be like?

This activity is modified from the WildThings activity sheets from Wild About Leicester, www.wildaboutleicester.co.uk

The Dinner Tray Food Pyramid

Themes

- Food pyramids
- Observation of evidence for feeding

Equipment needed

School dinner trays, one per pair of children.

The trays should be painted with a sun, a green area for primary consumers (herbivores), a red area with green circle inside for secondary consumers (things that eat plants, hence the green inside), and red area for predators that eat other animals (see diagram).

Chinagraph pencils or washable OHP pens, for writing on trays

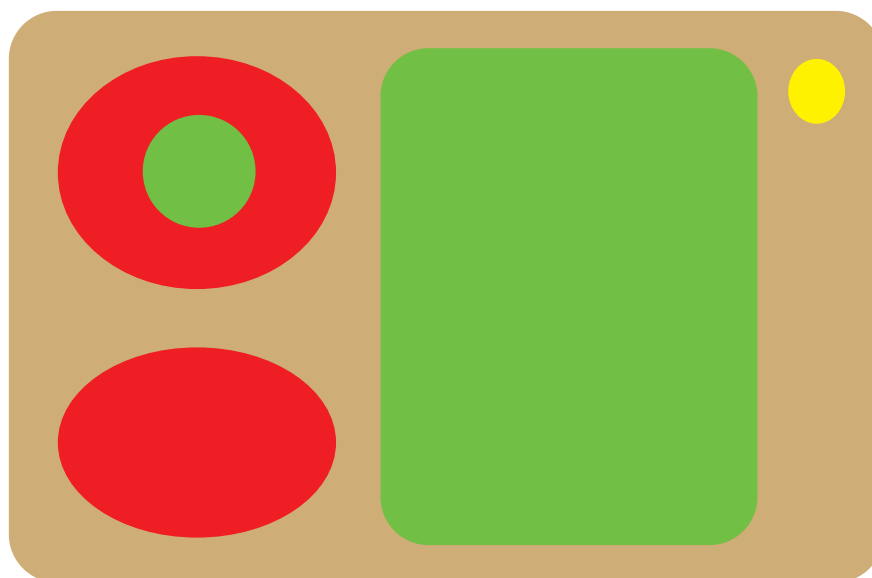
CURRICULUM LINKS:

Science

Sc1 Life processes and living things: Life processes 1(b); Living things in their environment 5(a-c)
Feeding relationships 5(d-e).

Mathematics

Ma4 Handling Data; Problem solving 1(a);
Communication 1(f); Processing, representing
and interpreting data 2(a-c)



How to do it

Working in pairs in the grassland, children should spend a fixed amount of time collecting evidence for methods of feeding. All green plants are producers, using energy from the sun, so children should collect evidence for this in the form of one leaf for every different type of plant they can find. Children may need help to see the large variety of plants around them. Don't forget that grass is a plant, and that there are different types of grass if you look closely (some have soft leaves others are glossy, and each type has a characteristic flowerhead). There should also be lots of other types of plant, e.g. daisy, dandelion, clover. All these producers should be put on the green section of the tray. There should be lots!

The herbivore section (the red one with the green centre, is for animals that eat plants. You may be able to find some animals (e.g. caterpillars, snails or woodlice). These might not stay on the tray though! It is kinder to the animal to draw a quick sketch of it on a small scrap of paper, and put that on your tray section instead, then the animal can be carefully returned to where it was found. You should also be able to find evidence of herbivores, in the form of leaves with holes chewed in them. Pick these leaves and put them in the herbivore section of the tray too.

The predator section is for animals that eat other animals. They include spiders, many birds and mammals. You won't be able to put these on your tray, so each time you find a carnivore, make a quick sketch and put that on the right section. You might also find evidence for carnivores, in the form of feathers, droppings or fur. These can go on the tray too. Don't touch droppings with your fingers. Use a leaf to pick them up, and always wash your hands afterwards. Or you could draw a quick sketch.

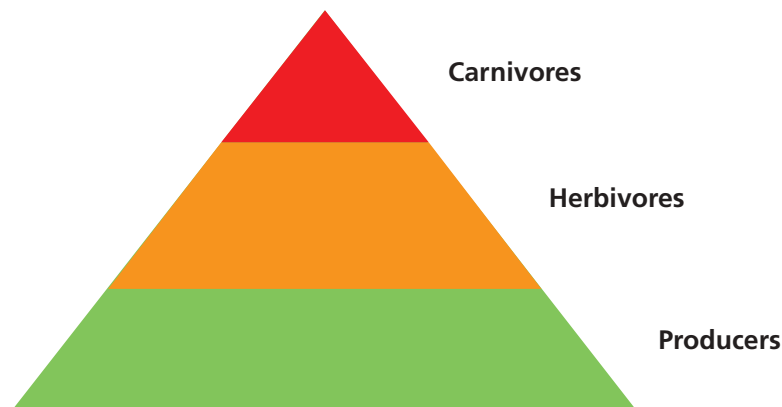
At the end of the search time, children should count all the organisms and evidence they have collected in each section. They can record the number for each by writing it directly on the tray section using the chinagraph pencils. All organisms should be carefully returned to the places that they were found.

Presenting the data

Each tray should end up with lots of producers, some consumers and only a few carnivores.

Discuss ways of present this data that shows the numbers as an area (e.g. a frequency diagram).

This arrangement is known as a food pyramid.



In all habitats, there is a food pyramid. A habitat can only support a few carnivores because they need lots of food – a fox might eat one rabbit every day – that's 365 in a year! All these rabbits and other herbivores need to eat plants, so a habitat needs a huge amount of 'green stuff' to support a medium number of herbivores. Without the green plants, the whole food pyramid collapses.

Parachute Test – Seed Dispersal

Key themes:

- Seed dispersal

Equipment needed:

Access to seeds with parachute hairs (e.g. dandelion or thistle), and/or wings, (e.g. ash or sycamore)

Scissors

Tape measures

Pencils and paper for recording

Small pots with lids for seeds (two per group)

Large white sheet (optional but useful)

A gentle breeze!

CURRICULUM LINKS:

Science

Sc2 Life processes and living things: Green plants, reproduction 3(d); Living things in their environment, Adaptation 5(b-c).

Sc4 Forces and motion: 2(b-c)

Mathematics

Ma4 Handling data; Problem solving 1(a); Communication 1(f); Processing, representing and interpreting data 2(a-d)

How to do it

This simple experiment could be done anywhere outside where a range of plants grow. It works best in autumn when lots of plants have seeds, but you should still be able to find seedheads in early summer. You will need seed with parachute hairs, e.g. dandelion or thistle.

To test how effective parachutes are as a means of seed dispersal, the children should collect seeds, then trim the hairs off some of them, using scissors or fingernails. Working in groups, the children then measure how far the seeds travel when dropped from an outstretched arm. The measurement should be along the ground in a straight line across the floor, from under the dropper's hand to wherever the seed lands. Doing this over a white sheet makes it easier to see where the seed lands. Otherwise, each group should have a dedicated 'watcher' who can immediately mark with a finger where the seed dropped.

The test should be repeated for a few sets of seeds, with and without parachutes, and the measurements recorded in an appropriate way.

Sycamore and Ash have wind-dispersed seed that use propellers rather than parachutes. A similar technique can be used for these, trimming off the wing. Encourage children to discuss why these larger seeds do not have parachutes.

You could even test for animal dispersal methods. One way to do this is to have an old set of big white, or light coloured socks. A student can put one over their foot and then walk across grassland, or through woodland – or even just outside in any grassy school play area. On returning to the classroom students can see if they have picked up any seeds on their socks. Which ones stick best? Have a look at them closely. Some may have little hooks, like Velcro, others are very pointy and stick into the cloth. Discuss which may work best.

Presenting and using the data

Discuss ways to present the data. Calculate the average (mean) distance for with and without parachute (or with and without wings). Which design is the most effective?

Encourage the children to discuss why seeds need to disperse. This is particularly obvious with trees. What would happen if the seeds dropped straight down and landed under the tree – would they have enough light to grow? Competition for light and other resources can then be discussed in more detail with older children.

Extension work

Investigate parachutes based on the observations from your seeds, and other research. Using 'fair test' systems (i.e. changing one thing and keeping others the same), discuss and design parachutes of different sizes. Which ones will take longer to fall to the floor?