ECO-UNESCO
Ireland's Environmental Education and Youth Organisation

Nature in the Park

A self-guided handbook for primary school teachers to facilitate the use of local parks as outdoor classrooms

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Dublin City Council

An Action of the Dublin City Biodiversity Action Plan 2015-2020

Contents

Outdoor Safety Guidelines
Parkland Visit

1. If possible, contact the park's gardener in advance of your visit as they will have extensive knowledge of the history and ecology of the park. Contact Dublin City Council's Parks & Landscape Services for the relevant gardener.

2. Please advise students to wear appropriate footwear e.g. runners or waterproof footwear. If it has been raining, advise Wellingtons.

3. Ask students to wear clothing that is appropriate e.g. school tracksuit or otherwise just in case they dirty their clothes.

4. Please ask the students to bring their coats or rain gear to school as the weather can be unpredictable.

5. Bring a first aid kit with you for any cuts or stings.

6. Let them enjoy themselves and learn lots about nature.

Student Starter Activity 1

Making a Nature Diary

Student Name: _____

A good way to study nature is to simply to look and listen! If you write things down that you see and hear, you will remember them afterwards. Make a nature diary and you will soon see how nature changes during the different seasons.

To make your nature diary, you will need:
- Notebook
- Pencil
- Colouring pencils/ crayons

What to do:

1. Every time you visit a park, you are visiting a habitat. This is a place where animals and plants live.

Include the following information:
- Date (e.g. Wednesday 21st June 2019)
- Weather (e.g. Cloudy)
- Season (e.g Autumn)
- Habitat (e.g. Woodland, Grassland, River Edge, Flower Bed)

2. Make a list on a different page of all the different types of animals and plants that you see. Each type of animal or plant is called a species. Where do you see them? What are they doing?

3. You might see something that you've never seen before, such as a rare bird like a kingfisher. Write about it, draw it or take a photo. Stick your photos into your diary.

4. Sometimes you might see an animal or a bird that you do not recognise. Make a drawing of it in your diary or take a photograph. You can identify it with a field guide when you get back to class. Make a note of different colours, patterns and write about where you saw it and what it was doing.

Photocopy This

Student Starter Activity 2

Journey to the Park

Student Name: _____

**Before you begin your journey to the park,
try to find a map of the area
around your school and park.**

1. Locate your school on the map.

2. What is the distance from your school to the park in kilometres?

_____km

3. Are you travelling by bus, walking, or getting a lift in a car?

_____

4. How much time did your journey to the park take?
Record the direction travelled e.g. North, South, East or West

_____

5. Record the names of all the Towns and Villages that you pass by on your journey.

_____

7. Do you pass by any public buildings such as a Library, Court House, or County Council Offices? If so, list them.

_____

8. Make a list of habitats that you see on your journey in the spaces provided below e.g. Do you pass by a river, a beach, a forest or a pond?

1. _____
2. _____
3. _____
4. _____

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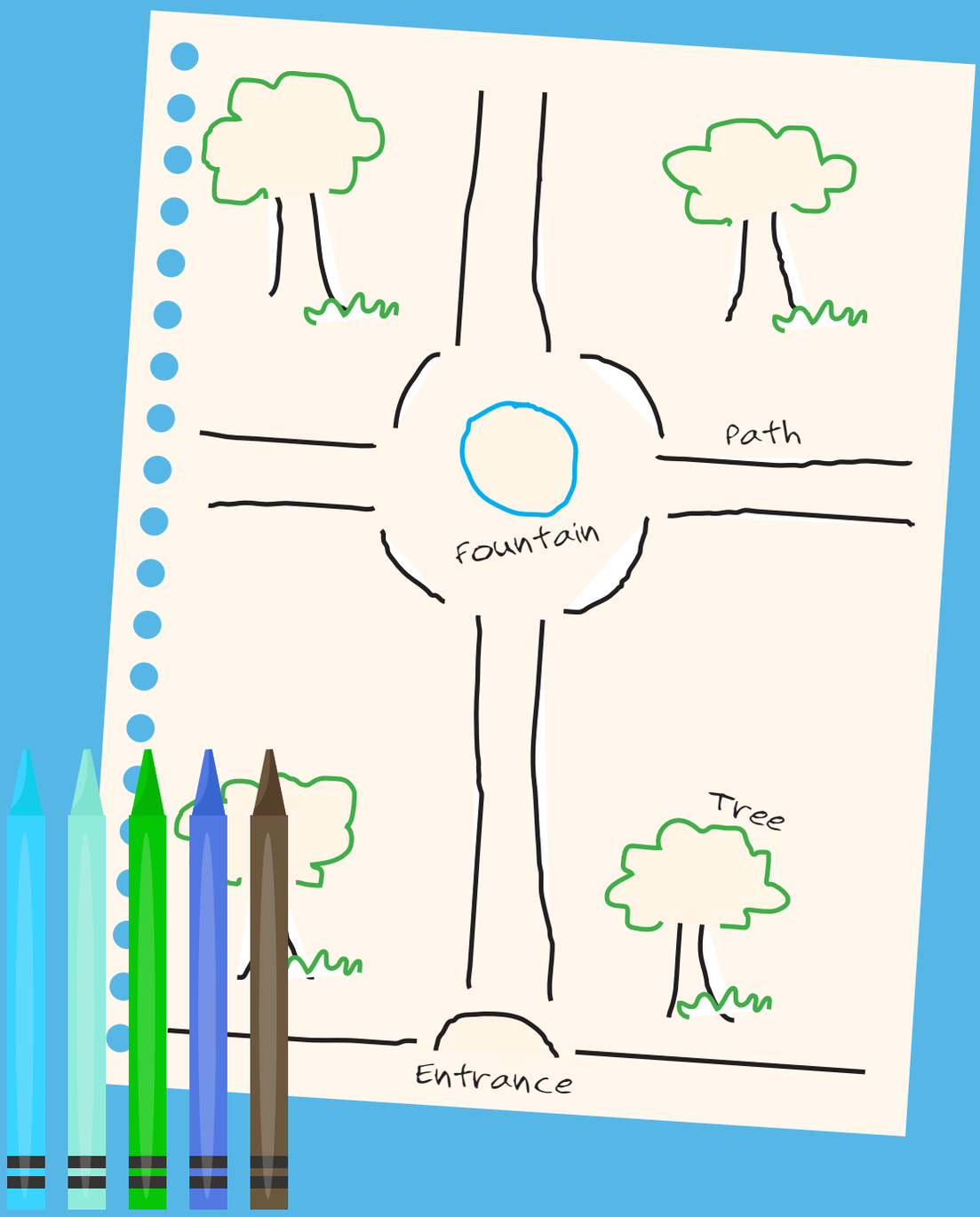
Student Starter Activity 3

Making a Map

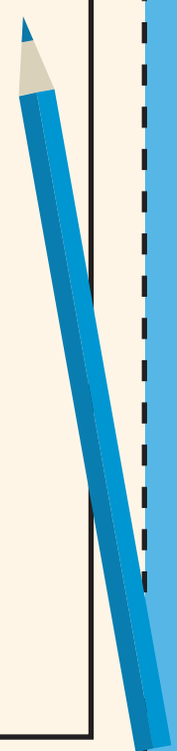


Student Name: _____

It is important to first get a good idea of your study area by drawing a map of it.

Draw a map of your study area in the box provided and include the different nature features such as grass, trees, a river and man made features such as a bridge, drainage pipe or playground.

Draw and label any important features. For example, a bridge over a stream or a pipe running into water.



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Student Starter Activity 4

Be a Park Explorer

Student Name: _____

Open your Senses - Touch, Listen, Smell!

You will need:
- Pencil and nature diary
- Camera (if available)
- Magnifying glass (if available)

What to do:
Follow instructions 1 - 10 and write the answers to the questions in your diary:

1. Using your nature diary, write down the name of your park, date of your visit and what the weather is like on that day.

2. Jump up and down on the ground in the park. Is the ground hard or soft?

3. What can you smell in the park? Breathe through your nose!

4. Listen for sounds! What do you hear? Make a list of the different sounds.

5. Listen for bird songs. How many do you hear?

6. Feel a patch of grass or a piece of moss. How does it feel to the touch?

7. Feel a patch of lichen or the bark of a tree. How does it feel to the touch?

8. What colours can you find in the park? Make a list of the different colours.

9. How many shapes can you see? Look at the leaves, flowers and trees.

10. Find nature in action, record what you saw in your nature diary.

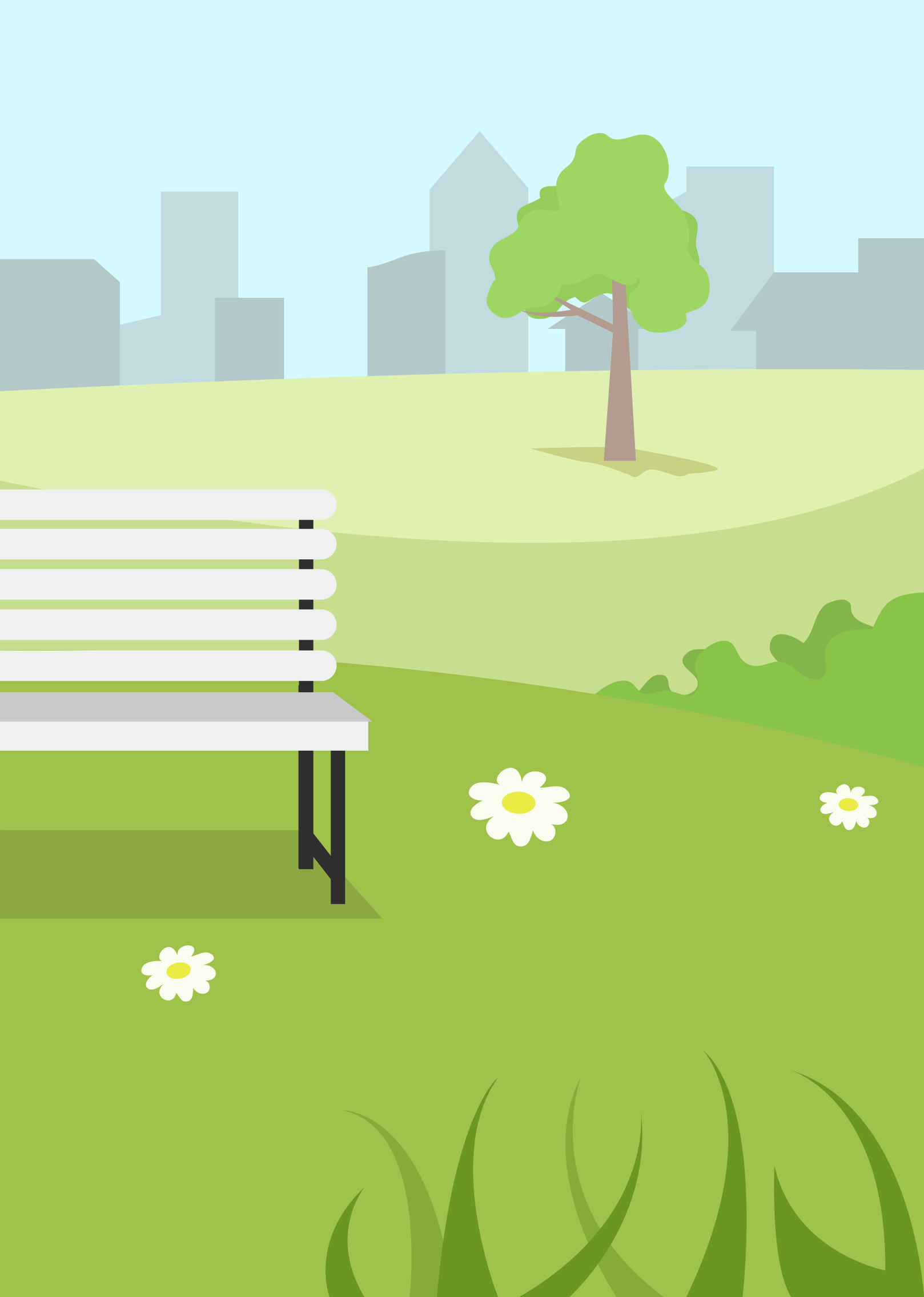
For Example ----> a spider trapping a fly in its web

Back in class:

Write about your time spent in the park using the words you learned during the park visit.

! Photocopy This

Exploring Dublin's Parks with Activities



Activity Index

Student Worksheets

Programme 1

Plants & Vegetation

Teachers Instructions: Activities 1-2

Photocopy student worksheet on page 42 - 44

Plants can be either herbaceous or woody. Most herbaceous plants have stems that are soft, green and contain little woody tissue. These plants die to the ground each year. Most annual and perennial flowers fall into this category along with vegetables and house plants.

Background information:

Herbaceous
Plants with stems that are non-woody and die back to the ground every year. Some herbaceous plants include Marigolds, Grass, Tomatoes, Green Beans and Geraniums.

Woody
Plants with stems that are hard. These stems usually don't die back to the ground during the Winter. These are stems we use to make things like furniture and houses. Examples of woody plants include Oak Trees, Maple Trees, Lilacs, Apple Trees and Ivy.

Life Cycle
A plant's life cycle describes how long a plant lives or how long it takes to grow, flower, and set seed. Plants can be either an annual, perennial, or biennial.

Annual
A plant that completes its life cycle in one growing season. It will grow, flower, set seed, and die. Examples of annual plants include Marigolds, Tomatoes and Poppies.

Perennial
A plant that lives for 3 or more years. It can grow, flower, and set seed for many years. Underground parts may regrow new stems as in the case of herbaceous plants, or the stems may live for many years like woody plants. Examples of perennial plants include Daisies and Roses.

Biennial
A plant that needs two growing seasons to complete its life cycle. It grows vegetatively (produces leaves) in one season, then it goes dormant or rests over the Winter. In the Spring, it will begin to grow again and grow flowers, set seed, and die. The seed that is left behind on the ground germinates and the cycle begins again. Examples of biennial plants include parsley, Carrots, and Foxglove.

Basic parts of most plants:

Roots
The roots help provide support by anchoring the plant and absorbing the water and nutrients needed for growth. Plants can have either a taproot system (such as Carrots) or a fibrous root system (such as Turf Grass). In both cases, the roots are what carries the water and nutrients needed for plants to grow.

Stem
Stems carry water and nutrients (taken up by the roots) to the leaves. The food produced by the leaves moves to other parts of the plant. The cells that do this work are called the Xylem cells (pronounced zylem). They move water. The Phloem (pronounced floam) cells move the food. Stems also provide support for the plant allowing the leaves to reach the sunlight that they need to produce food.

Leaves
Leaves are the food making factories of green plants. Leaves come in many different shapes and sizes. A simple leaf is made of a single leaf blade connected by a petiole to the stem e.g. Oak leaf. A compound leaf is a leaf made up of separate leaflets attached by a petiole to the stem e.g. Ash leaf.

Leaves are made to catch light and have openings to allow water and air to come and go. The outer surface of the leaf has a waxy coating called a cuticle which protects the leaf. Veins carry water and nutrients within the leaf. Leaves are the site of the food making process called photosynthesis. In this process, carbon dioxide and water in the presence of chlorophyll (the green pigment) and light energy are changed into glucose (a sugar). The energy rich sugar is the source of food used by most plants. Photosynthesis is unique to green plants and supplies food for the plant and oxygen for other forms of life, like people. A green plant helped make the oxygen you are breathing today.

Flowers
Flowers are important for making seeds and producing pollen. Once the flowers ovule has been fertilised by pollen that is produced by the anther, it becomes the seed and the ovary of the flower become the fruit. This is a very important part of the life cycle of plants.

Petals are also important parts of the flower because they help attract pollinators such as bees, butterflies and bats with their colours. You can also see tiny green leaf-like parts called sepals at the base of the flower. They help to protect the developing bud (seed).

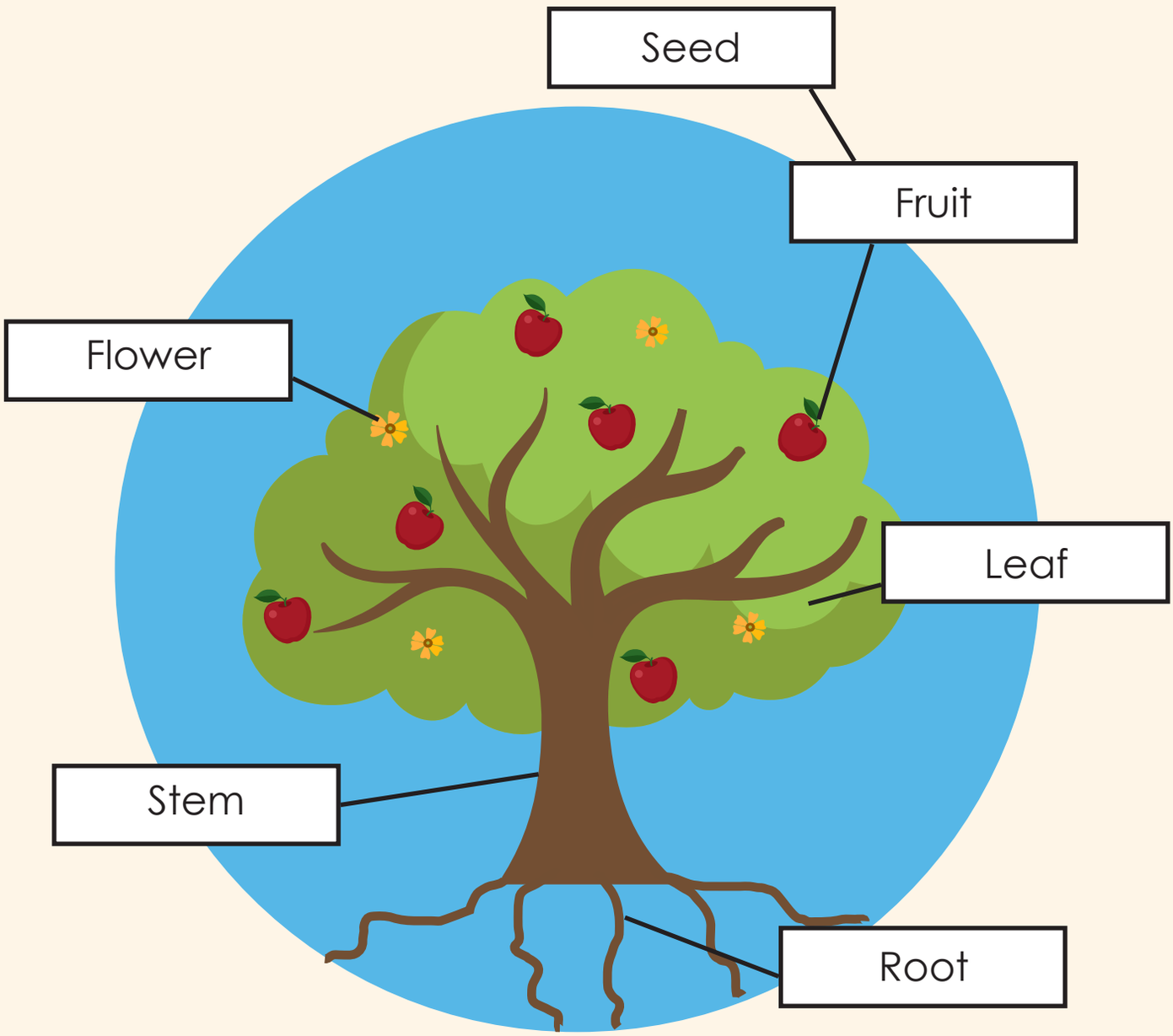
Plant Parts - Fruit
The fruit is the ripened ovary of a plant containing the seeds. After fertilisation, the ovary swells and becomes either fleshy or hard and dry to protect the developing seeds. Many fruits help seeds spread e.g. Maple seeds. Many things that we label as vegetables are really fruits e.g. Tomatoes, Cucumbers and Beans.

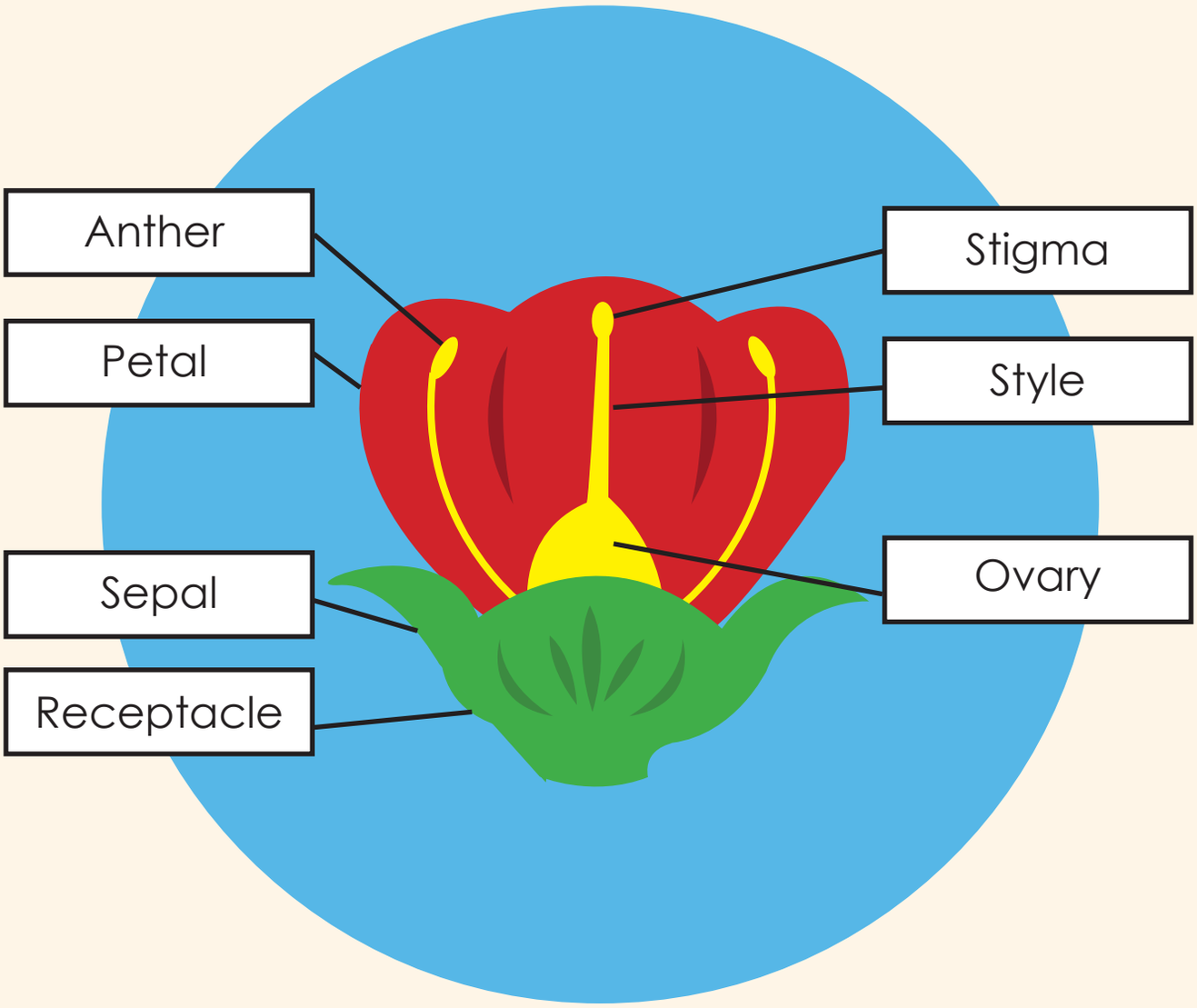
Every seed is a tiny plant (embryo) with leaves, stems, and root parts waiting for the right conditions to make it germinate and grow. Seeds are protected by a coat. This coat can be thin or thick and hard. Thin coats don't protect the embryo very well but thick coats can let the embryo survive tough conditions. The seed also contains a short-term food supply called the endosperm, which is formed at fertilisation but is not part of the embryo. It is used by the embryo to help its growth. Seeds are a plant's way of getting from one area to another by either wind, water or animals.

Programme 1

Plants & Vegetation

Teachers Instructions: Activities 1-2




Anther
Petal
Sepal
Receptacle
Stigma
Style
Ovary

Programme 1

Plants & Vegetation

Teachers Instructions: **Activity 3** Plant Count

Photocopy student worksheet on page 45

To find out what plants live in your park, you will need to spend some time examining a small area of the park very closely with an instrument called a quadrat. A quadrat is a square wooden/steel frame that you place on the ground to look at the plants living within the square. It is usually a half metre squared. It is a tool used to measure the amount of plants or vegetation in an area.

Use a Collins Wildflower I.D. Field Guide to help you. Available in your local Library.

You will need:
- Pencil and your nature diary
- Half metre square frame or quadrat
- Hand lens or magnifying glass
- Camera (if available)
- Collins Wildflower I.D. Field Guide

What to do:
1. Divide the students into groups of 5 or 6 depending on class size. Give each group the chance to throw a penci; three times. The quadrat is then placed over the pecil, with the pencil at the centre of the quadrat.
2. Ask them record their findings in each quadrat. This is called random sampling.
3. With the aid of a guide book, identify the plants you find in the quadrat or square frame.
4. Make drawings or take pictures of the plants you cannot identify.
5. On the worksheet, the students can record their findings.
6. Ask them to count plants numbers and consider how abundant certain plants are by the amount of times they occur in each throw.
7. Back in class, make a check list of plants found in the park you visited. Organise a class discussion on the plants you have discovered, considering the time of year, and the type of area you studied. For example, was it shaded by trees or out in the open? Was the ground soggy or dry? Were they planted there by somebody or did they grow naturally?

Seasons Guideline:
Autumn: Leaves falling from the trees. Getting colder in temperature.
Winter: Very cold, very little growth in plants, trees bare of leaves.
Spring: Flowers beginning to blossom, leaves growing on trees, getting warmer, animals re-emerge with lots of energy.

Teachers Instructions: Activity 4 Be a Leaf Collector

Photocopy student worksheet on page 46

Collecting and drawing leaves will teach children to identify local trees and plants. This exercise will also introduce them to a visual form of recording and help them maintain confidence and interest in drawing as a means of communication. This project is best conducted in the Autumn or early Winter as the leaves begin to fall.

You will need:
- Leaves from different types of trees
- Nature diary
- Collins Tree Guide Book (included)
- A pen
- Glue
- Paper
- Pencil or fine-line pen

What to do:
1. Ask your students to go outside and collect some Autumn leaves. They should choose ones with no holes or tears that are not too dry or scrunched up.
2. If they have collected lots of the same ones, they should put the leaves into piles e.g. all the Oak leaves together, all the Chestnut leaves etc. Choose the best leaves.
3. Get the students to organise the leaves into a line; start with the smallest, simplest leaf, then the next smallest and so on.
4. On a new page in their nature diary, they need to write the date and the title 'My Leaf Guide'. On the next page, they should stick their first leaf down.
5. They should continue sticking the leaves in their book, one or two on each page.
6. Use the Collins Tree Guide to identify what tree the leaf belongs to.
7. When they've finished, place their nature diaries under a pile of books for a month. This will preserve the leaves, and their 'Leaf Guide' will last a long time.
8. The students may want to draw some of the leaves. Ask them to lay their chosen leaf carefully on the table.
9. Encourage them to look closely at the leaves, noticing the shape, the veins, the margin (or edge) and the stalk.

Tips and Advice:
- Don't be put off if you don't know the names of some of the plants or cannot find them in the Tree Name Trail Guide. Some will be from ornamental trees rather than native species, and will be difficult to identify.

Information on leaves:
- Compound leaf: a leaf made up of small leaflets which all join to the midrib of the leaf. If the leaflets do not go right to the midrib, they are called lobes, not leaflets.
- Midrib: the central vein of a leaf.
- Margin: the edge of the leaf.
- Palmate leaf: resembles an outstretched hand.
- Linear leaf: a long, thin leaf-shape.
- Leaflets: lots of mini leaves which make a whole leaf.

Programme 1

Plants & Vegetation

Teachers Instructions: Activity 5 Discover Hedgerows

Photocopy student worksheet on page 47

This activity is designed to introduce the students to a hedgerow habitat. Hedgerows are man-made structures introduced as field boundaries. A hedgerow is a linear strip of woodland. Irish hedgerows have only become a familiar feature of our landscape within the past 300 years. In many of our parks, they are the remnant field boundaries of land that was once agricultural fields and has been changed by people over the years.

They keep their structure by being maintained by park staff, but if left uncut and unmanaged they can grow into tall trees and thicker vegetation.

Hedgerows are extremely important for wildlife as they act as wildlife corridors allowing animals and plants to move from one habitat to another. Wildlife depend on the presence of hedgerows for finding food, providing food and shelter, and giving them protection from predators such as larger mammals e.g. foxes and birds of prey.

Some mammals will not travel in open fields as they would be open to predation and hence they use hedgerows. Bats use hedgerows like we use roads, allowing them to move between their roosting sites and their feeding sites.

Hedgerows are an important habitat for birds. Two-thirds of Irish bird species live in hedgerows. Hedgerows provide birds with food, nesting sites and singing posts.

Insects and other invertebrates can be found in each layer of a hedgerow e.g. the many cobwebs spun by spiders. Like a woodland, hedgerows are made of three layers; Herb, Shrub and Tree layers.

Hedgerows are protected under the Irish Wildlife Act, which makes it illegal to destroy vegetation growth by trimming from the 1st March to 31st August. This is nesting season for birds and it is to protect their nests from destruction.

Programme 2

Trees & Grassland

Teachers Instructions: Activities 1-3

Photocopy student worksheet on page 48, 49 & 50 !

This programme is designed to introduce school children to a woodland habitat. The programme aims to encourage children to use important skills like exploring, observing and recording. It will help them discover the plants and trees in a woodland and the layers in which they are found. They will see the importance of light and plants competing for it. Children will expand the use of their senses to experience the sounds, smells and textures of the woodland and by the end of the programme will have discovered how a woodland works.

You will need:
- Pencil
- Collins Tree Guide book (available from local library)
- Bag (paper or plastic) for collecting samples from your tree
- Measuring tape

Activities 1 - 3

Woodland Structured Layers
Give a talk to your students about the woodland structure while walking through the trees. Looking closely at each layer as described on their worksheet. They will learn about the role of the organisms that make up these layers. They will also be shown how to recognise a number of plants and then be able to record these in their nature diaries.

Food Web in the Wood
Following completion of the woodland layers worksheet, the students will participate in the creation of a foodweb and a discussion on how everything in the web is linked and of equal importance. Illustrate what would happen if something became extinct. This will also introduce the concept of the foodchain. Firstly, get each student to draw a picture of an animal, insect, plant, tree or bird on a piece of paper or card. When these are complete, they can then be used to illustrate the food chain and how it is formed.
Give a piece of the string to each child holding a picture of a plant. We ask all the creatures who like to eat plants to take some string until they are all connected together. Eventually we have everyone connected together, right up to the top predators.

Ask your students the following questions:
1. What have they constructed?
2. What does it look like? (a spider's web)
3. What are we in the web?

Answer: We have created a food web and this is how a woodland works and how energy flows through an ecosystem. We can demonstrate how everything is important and depends on each other in a food web by asking one of the living things in the web to play dead and crouch down. This will put a strain on the string. Get that group to gently pull on the string, in the end everyone will feel the strain.

Teachers Instructions: Activities 4-7

Photocopy student worksheet on page 51, 52, 53 & 54 !

The following activities are interactive worksheets that are practical investigations into the wonderful world of trees such as measuring the height of a chosen tree, calculating how old the tree is, and discovering what lives inside it. It incorporates Ecology and Maths and develops skills and concepts in regard to trees. The activities are self explanatory on the student activity worksheets.

Some of the skills and concepts can be replicated and repeated for shrubs and grasslands.

You will need:
- Pencil
- Measuring tape
- Stick
- Greaseproof paper or ordinary white paper
- Crayons
- Sellotape
- Tweezers
- Magnifying glass
- Large white sheet of paper
- One long stick
- Collins Tree Guide book (available from your local library)

Teachers Instructions: Activity 8 Bug Hunt

Photocopy student worksheet on page 56 !

Insects (invertebrates) live in different areas in the park. Some prefer the ground, while others are found in the trees or feeding on flowers.

Catching and drawing insects from your park will teach children to look closely at their basic structure and what vocabulary to use when describing them. It also increases their understanding of different wildlife and where they live.

You will need:
- Insect pots (any container that allows you to see-through the lid)
- Magnifying glasses (if available)
- A piece of card or paintbrush (for humanely picking up insects!)
- Soil
- Small pebbles or a stone
- Nature diary
- Pencil
- Garden trowel for digging
- Collins Tree Guide Book (available from your local library)

Programme 2

Trees & Grassland

Teachers Instructions: Activity 8 Continued

What to do:

1. Help your students prepare clean insect pots by putting some damp soil or compost in the bottom and adding a stone or two for weight.

2. Go to your park and help them to find some insects. They like to hide in cool, damp places such as among dead leaves/wood, on trees and under rocks. The children can try carefully moving stones, looking in the compost bin and examining flowers, leaves and the soil.

3. Your students can collect them carefully by using a piece of card or a paintbrush to pick them up and put them in the insect pots.

4. Give your students a magnifying glass to watch what the bugs do. They can put them on a clean piece of paper if they want to look more closely at them. How many legs do they have? What colours are they? Do they have any patterns on their bodies? What do their faces look like? How do they defend themselves?

5. Explain that because insects are really important to their habitat, we must return them to their homes carefully. Draw one or more of the insects that they saw in their nature diary. Tell them to make their picture nice and big.

Background Information:

- Stress that it is important to respect the 'bugs' and not to harm them in any way. e.g. worms have delicate skin that can easily be damaged by handling, long exposure to sunlight and very dry conditions.
- Some bugs can bite e.g. Red Ants and Mosquitoes. Others are reputed to bite but do not usually do so e.g. Earwigs and Shield Bugs.
- There is no need to put holes in the lids of the insect pots, particularly as they will be releasing the insects after the drawing activity.
- Try not to catch bees and wasps. Many flies and hoverflies mimic these as a way of keeping safe. These are good insects to get to know because you can observe them without the risk of getting stung.
- During your bug hunt, explain to them that insects are a type of organism (living animal) that have different jobs in their habitat (where they live). They are decomposers of dead organisms such as leaf litter each Autumn and are food for other animals such as Spiders.

Common bugs that they may find:

Ants	Grasshoppers
Aphids	Ground beetles
Butterflies	Hoverflies
Centipedes	Leafhoppers
Cockchafers	Ladybirds
Crickets	Longhorn beetles
Daddy-long-legs	Millipedes
Earwigs	Moths
Woodlice	Spiders
Flies	Weevils

Definitions of the different organisms:
-Invertebrate: an animal without a backbone
-Arachnids: arthropods with four pairs of legs, no wings and usually two body parts.
-Arthropod: animals which have a segmented body, a hard external skeleton and jointed appendages that are used for feeding, feeling and walking.
-Insect: a small creature with three body parts (head, thorax and abdomen) and three pairs of legs. Many have wings and undergo complete changes of shape during their life cycle.
-Myriapods: a loose grouping of arthropods typified by centipedes and millipedes.

Teachers Instructions: Activity 9 Be a Grassland Detective

Photocopy student worksheet on page 57

There are different types of grasslands, some are like garden lawns and mown many times throughout the year but others may be only mown once or twice allowing for a great number of \different plants and animals to live in them. To find out what plants live in a grassland of your park you will need to spend some time examining a small area of the park very closely with a quadrat. A quadrat is a square wooden frame that you place on the ground to look at the plants \living within the square. It is usually a half metre square. Use a Wildflower Collins Field Guide to help you, available from your local library.

You will need:
- Pencil and notebook
- Half metre square frame or quadrat
- Magnifying glass (if available)
- Camera (if available)
- Collins Wildflower Field Guide (available from local library)

What to do:
1. Divide the students into groups of 5 or 6 depending on class size. Give each group the chance to throw a penci; three times. The quadrat is then placed over the pecil, with the pencil at the centre of the quadrat.
2. Ask them record their findings in each quadrat. This is called random sampling.
3. Use the Wildflower Collins Field Guide to identify the plants you find in the quadrat. They can record their findings in the Activity Worksheet 9. Make drawings or take pictures of the plants you cannot identify.
4. The students will be asked questions about the amount of different species of plants found so they can establish what is the most dominant species of plant in their grassland habitat.
5. When the students are back in class, make a check list of grassland plants. Organise a class discussion on the plants you have discovered, considering the time of year, and the type of area you studied. Background information on the different grasslands are described in your park's introduction.
6. Throw the quadrat three times, so you get to look at three different areas in the grassland.
7. This activity can be repeated in different types of grassland and a comparison can be made regarding grassland management by Dublin City Parks Staff and their mowing regimes. When a grassland is able to grow tall, the greater the amount of wildlife you will find.

Programme 3

Water & Aquatic Life

Teachers Instructions: Activity 1 Your Water Study Area

Photocopy student worksheet on page 58

This programme is designed to introduce your students to an Aquatic Habitat. The programme aims to encourage children to use important skills like exploring, observing and recording to help them to discover the plants and animals in a water body such as a river or pond. It will also help them explore how people impact on water quality and the importance of water conservation. The following activity worksheet will assist the students in discovering a water habitat and the wildlife that depend on it.

Background Information:
There's nothing like a glass of clean, cool water when you're thirsty! But water is not only refreshing, it's essential. For people and wildlife alike, fresh water means life, but supplies are limited.

Water is a finite resource hence why we rely on the water cycle to recycle the worlds water supplies so that our rivers, lakes and wetlands are available for humans and wildlife to enjoy. Water is a scarce resource, only 3% of all water on earth is freshwater.

People use water for drinking, bathing, watering crops, flushing the toilet, cleaning the house, and even for providing electricity through hydropower stations. While people rely on water, 40% of the world's fish species live in freshwater and about 12% of animal species need a source of fresh water.

Many of our water habitats are referred to as wetlands e.g. Marshes, Turloughs, Bogs and Ponds. They are under threat from pollution, drainage and reclamation. People have altered and tried to control the flow of rivers by building dams, canals and collecting water in reservoirs to pump it into our homes.

Some definitions:
Algae: Small, simple plants which either float in the water or cover stones and larger plants. They are the food of most freshwater herbivores.
Plankton: small plants and animals which float in the water without having to swim.

How have aquatic wildlife adapted to an underwater life?
Animals and plants have adapted themselves to a life in freshwater habitats. You will not find them in salt water habitats like the sea, estuaries and mudflats. In order to survive in water they overcome some problems such as their need for oxygen to live.

They get oxygen in different ways:
1. Across the body wall: Oxygen in the water passes through their skin, straight into the body where it is needed.

2. Gills: These are special structures through which oxygen can enter the body. The position and shape of the gills vary from animal to animal but all gills have the following features: a large surface area, thin walls to allow oxygen to pass through, and a blood system to transport oxygen around the body.

3. Snorkels: Insects which live on land breathe through holes called spiracles. Most aquatic insects have an ability to open and close them. They are located on the last abdominal segment that has the ability to reach up to the surface and breathe in air.

4. Scuba Divers: Beetles, Water Boatman and Water Spiders have hairy bodies which collect air bubbles from the surface. They take the air down with them and have spiracles that open directly into the air bubbles.

What can you do?
This background information provided above illustrates the message of the importance of freshwater to us and wildlife. Conduct the activity worksheet and collect information on your water habitat. This can be developed into a great school project.

Programme 3

Water & Aquatic Life

Teachers Instructions: Activity 2 Taking Measurements

Photocopy student worksheet on page 59 !

This activity is designed to allow school children to understand the different features of a river or stream. By taking measurements of a river or stream, we can see how wide and deep it is. Different wildlife can be found in different rivers and streams according to how wide or deep they are. Some prefer deep pools in rivers while others prefer shallow streams with rocks exposed on the river bed. The width and the depth of the river can often tell us the volume of water in it and allow the students to observe their local river or stream, recording information about it.

Recommended:
A bridge may be used to take depth readings. Tie a weight onto the end of a line of string. From the bridge, lower the weighted line into the water. Tie coloured ribbons on the line at 5 metre fixed intervals. As the weight bottoms, an observer on the bank can record the number of ribbons visible above the waterline

Teachers Instructions: Activity 3 Temperature Flow Rate

Photocopy student worksheet on page 59 !

Wildlife are sensitive to temperature changes in the water. If the water gets too warm, some wildlife will leave that section of the river as they would be intolerant to the changes. The flow of the river is important. When a river is on a steep slope, the flow of the river is fast. When it reaches the middle stages it begins to slow down. When it enters the sea it is very slow and full of sediment. The flow of the water also tells us the strength of the force of water and whether the river will be taking parts of the river away by erosion or dropping materials it holds by deposition.

You will need:
-Thermometer
-Timer (e.g. watch with second hand or stopwatch)
-Float (such as a bottle cork)
-Metre stick

What can you do?
Instruct your students to conduct the exercises in Activity Worksheets 2 and 3. Assistance will be required with taking these measurements according to the size of the river or stream. If it is shallow and small in size, wellingtons will be required but the recommendation on depth readings from the middle would allow for easier application of this section of the activity.

Safety Tip!
Wash hands after contact with pond or river water. Also remember to take care around water, no matter how shallow it seems. Wear old clothes and wellingtons. Give this safety instruction to your students prior to your visit.

Programme 3

Water & Aquatic Life

Teachers Instructions: Activity 4 Water Quality Test

Photocopy student worksheet on page 60

You will need:

-Collins Guide to Freshwater Insects (available in local library)
-Examples of Freshwater Invertebrates Sheet (opposite page)
-White container or tray
-Fishing net
-Nature diary

Some water animals are good swimmers, others cling to plants or stones. They must be able to do this or they would be washed away in the current. Fish are the main swimmers. When you see lots of fish, the water is clean. Animals that cling to plants and stones often have shells. The most common ones are snails and freshwater mussels. Many animals lay their eggs on plants.

When you see different kinds of animals, the water is good. If you do not see many animals, the water is probably polluted. Some animals like Stonefly Larvae and Mayfly Larvae are very sensitive to pollution. They disappear from a water habitat as soon as there is any pollution. Other animals are not as sensitive and can be found in polluted water, they are called indicator animals. Their presence or absence tells us if the water is polluted or not.

What can you do?
Investigate the animals that live in your pond or river. First fill up your white containers with pond or river water. This is so the invertebrates don't dry out and die. Then taking turns, sweep the fishing net through the water and empty the contents into your white container.

What did you find?
Using your field guide, write a list of the animals you have seen into your nature diaries. If you can't name it, describe what it looks like, so you can look for it in a book in the library.

Remember water safety!
-Handle all animals very gently.
-Return all animals safely to the water.
-Always be careful around water, no matter how shallow it seems.
-Wash hands after contact with pond or river water.
-Wear old clothes and wellingtons.

Stoneflies

Mayflies

Caddis Flies

Damsel & Dragon Flies

Flies & MIdges

Water Bugs

Dobson Flies

Beetles

Water Mites

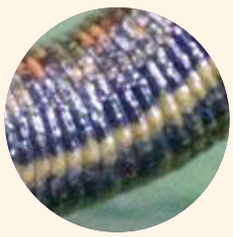
Crayfish & Freshwater Shrimp

Side Swimmers

Snails

Mussels

Leeches



Programme 3

Water & Aquatic Life

Teachers Instructions: Activity 5 Water Wildlife Zoologist

Photocopy student worksheet on page 61

This programme is designed to introduce students and teachers to the wonderful water world of wildlife and where they live. It will help you to investigate and observe wildlife and gather skills of recording and tracking wildlife.

Aquatic wildlife live in habitats that contain water, either saltwater or freshwater. An animals habitat provides a particular set of conditions needed for its life. A habitat may be large, for example, a river or small like a pond or a bucket of water.

You will need:
-Collins Freshwater Insect Guide (available at your local library)

Different Aquatic Animals

Mammals: Animals with a backbone that can maintain their own body temperature. They are covered in hair and sweat glands and give birth to live young e.g. Bats, Otters and Mink. Waterways are a source of food for these animals.

Invertebrates: Animals with no backbone. Insects, slugs, crustaceans and spiders lack a backbone. They usually have their skeletons on the outside to protect their soft bodies e.g. Water Snail, Pearl Mussel and Pond Skater.

Birds: Animals that are warm blooded vertebrates that have wings, feathers and a beak that sometimes fly. They lay their eggs in their nests during their nesting season. Often nest along waterways in the banks and eat the fish, flies and insects e.g Kingfisher, Heron and Wagtail.

Amphibians: Amphibians have a backbone but spend part of their life in water and part of land. They are cold-blooded vertebrates e.g. the Common Frog and Smooth Newt.

Fish: Animals with a backbone that live in water and are covered in scales. They have gills for taking oxygen from the water and have fins as their limbs e.g. Salmon, Trout and Roach.

In Spring, food becomes more plentiful and the animals become lively again - actively foraging for food and laying their eggs. Amphibians like the common frog lay their eggs (frog spawn) at this time. Frog spawn can be found in water that is very slow moving or still e.g in a pond or puddle.

Food is very important to animals as it gives them life and energy to forage for food. This is the cycle of life, and is how energy flows between the different animals. This is illustrated in the food chain.

Carnivore: An animal that eats other animals
Herbivore: An animal that only eats plants
Omnivore: An animal that eats both plants and animals as part of a mixed diet

Some animals are called **predators** as they hunt and kill other animals for food. The animals being hunted are called their **prey.**

Wildlife rely on freshwater to drink and bathe. They sometimes eat other animals that live in water. For example, a heron will eat fish, or a bat will eat midges that are attracted to the moisture in water.

Recording wildlife
Wildlife recording is very important as it helps us to know what wildlife lives in your park, how many different types of animals there are, and whether from year to year the numbers change. This can tell us about changes in their environment. Recording can also tell us information about where they like to live and how they behave.

A wildlife record needs to contain four vital pieces of information:
1. What was seen? (the animals name)
2. Where it was seen? (give as much detail as possible)
3. When it was seen ? (the date of the sighting)
4. Who you are

Photographs are very useful in verifying identification with books from your library. Other important information is to describe any activities that the animal is doing such as nesting, resting in the sun, preening its feathers, flying, or feeding.

What you can do?
Bring the students on a walk along the river or to a pond and record what wildlife they see. Once they have recorded their wildlife in the field using the worksheet provided, they can put the information together back in class. See how many records you have made on different visits to your park and you will start to get an idea of what type and how many different wildlife live in the water habitat of your park.

Programme 4

Wildlife Habitats

Teachers Instructions: Activity 1 Mini Zoologist

Photocopy student worksheet on page 62

This programme is designed to introduce students and teachers to the wonderful world of wildlife and where they live. It will help you to investigate and observe wildlife and gather skills of recording and tracking wildlife.

Biology is the study of living things. Ecology is the study of the relationships of living things with their environment. An Ecosystem is when the different living things live together within their living environment or habitat.

A Habitat is the place where animals normally live. An animal's habitat provides a particular set of conditions needed for it to live. A habitat may be large e.g. a woodland, or small e.g. branch on a tree.

Different Animals

Mammals: Animals with a backbone that can maintain their own body temperature. They are covered in hair and have sweat glands. They give birth to live young and suckle e.g. Humans and Foxes.

Invertebrates: Animals with no backbone. Insects, Slugs, Crustaceans and spiders don't have a backbone. They usually have their skeletons on the outside to protect their soft bodies.

Birds: Animals that are warm blooded and have a backbone that have wings, feathers, a beak and sometimes fly. Most birds can fly but some cannot e.g. Ostrich. They lay their eggs in their nests during nesting season e.g. Robin, Blackbird and Swan.

Reptiles & Amphibians: Amphibians have a backbone but spend part of their life in water and part of land. Reptiles also have a backbone but spend all their life on land. Both are cold-blooded vertebrates e.g. the Common Frog, Smooth Newt and the Common Lizard.

Species: Refers to different types of animals. For example, there are two species of squirrel in Ireland, one species is the red squirrel and the other species is the grey squirrel.

Most of our mammals are nocturnal, which means they sleep most of the day but come out to look for food at dusk when it gets dark until dawn. In November, most of our animals activities slow down and some such as the hedgehog go into hibernation. This is to conserve energy when food is scarce. If they use too much energy at this time, they could die of starvation and exhaustion. In Spring, food becomes more plentiful again and all the animals become lively again, actively foraging for food.

Food is very important to animals as it gives them life. It gives them the energy to look for food. This is the cycle of life and is how energy flows between the different animals. This is illustrated in the food chain.

Carnivore: An animal that eats meat (another animal). They have sharp teeth to eat meat.
Herbivore: An animal that only eats plants.
Omnivore: An animal that eats both plants and animals as part of a mixed diet.

Some animals are called **predators** as they hunt and kill other animals for food. The animals being hunted are called their **prey.**

Recording wildlife
Wildlife recording is very important as it helps us to know what wildlife lives in your park, how many different types of animals there are and whether from year to year the numbers change. This can tell us about changes in their environment. Recording can also tell us information about where they like to live and how they behave.

A wildlife record needs to contain four vital pieces of information.

1. What was seen? (the animals name)
2. Where it was seen? (give as much detail as possible)
3. When it was seen? (the date of the sighting)
4. Who are you?

Photographs are very useful in verifying identification using Collins Field Guides from you library.

Other important information is to describe any activities that the animal is doing such as nesting, resting in the sun, preening its feathers, flying or feeding.

What you can do?
Bring the students on a walk through the park and record what wildlife they see. Once they have recorded their wildlife in the field, they can put the information together back in class. See how many records you have made on different visits to you park and you will start to get an idea of what type of animals are in your park and how many are there. Use the Collins Wildlife book series to help you identify what you saw. These books can be found in your local library.

Programme 4

Wildlife Habitats

Teachers Instructions: Activity 2 Pond & River Dipping

Photocopy student worksheet on page 63

You will need:
-White container (e.g. a bucket or an ice cream tub) one per group of 4-5 students.
-Fishing net, 4-5 to share between entire class
-Collins Freshwater Insect Guide (available in the library)
-Nature Diary
-Pencil per student

Preparation:
1. Gather together the above materials.
2. It is recommended that the students are divided into small groups of approximately 4-5 students, with one white container per group.
3. It is up to the teacher to decide how they will take the samples. Please see below.

Option 1: The teacher fills the buckets with pond water and sweeps the fishing net through the weeds, handing them to the student. The student then examines the contents of the bucket.

Option 2: The teacher allows the students to fill the buckets up themselves and to sweep the fishing net through the weeds, all under supervision.

Background information:

Definitions:
-Algae: Small, simple plants which may be single-celled, and which either float in the water or cover stones and larger plants. They are the food of most freshwater herbivores.
-Aquatic Invertebrate: An animal which does not have a backbone and lives in water.
-Plankton: small plants and animals which float in the water without having to swim.

Safety Tip!:
Wash hands after contact with pond or river water. Take care around water, no matter how shallow it seems. Wear old clothes, high viz jacket, a buoyancy aid and wellingtons.

Teachers Instructions: Activity 3 Wildlife Tracker

Photocopy student worksheet on page 63

The purpose of this activity is to have the students observing and looking for evidence of animals in their park. The first part of the activity worksheet outlines what tracks and signs animals leave behind them. As many of our animals are nocturnal, you might not see any during the day, but this activity will show the students that animals are there even if they don't see them.

You will need:
-Magnifying glass (if possible)
-White tray (helps show any materials clearly because of the white background

What can you do?

1. Pick a good place to look in the park. If there is nothing there, move onto another site.

2. Divide the students into groups and give them one copy per group of the activity worksheets. They must work as a team, looking for evidence of animals such as their droppings, a burrow or even the trail of a snail that it makes when moving.

3. When the students have finished writing in their findings, compare them with their classmate findings.

4. Once they have completed this activity congratulate them for becoming Wildlife Trackers. Note: If you don't know what something is, take a photograph or get the students to draw pictures in their nature diaries.

Teachers Instructions: Activity 4 Be a Stonewall Detective

Photocopy student worksheet on page 64

An old wall is a habitat for many creatures and plants. The creatures like to live in the cracks and crevices, where they feel safe.

You will need:
-Nature diary and pencil
-Ruler or metre stick
-Magnifying glass (if available)
-Insect pots (e.g. jam jars)
-Piece of card or paintbrush (for gently picking up insects)

What you can do?
1. Find a wall that acts as a boundary for the park or lies within the park. If the wall has any plants (such as Ivy or Buddleia) growing from it, it would be an interesting wall for watching wildlife. You can find a picture of the plants mentioned in a Collins Wildflower Guide Book.

2. Students should bring their nature diaries for recording or drawing any of their findings. Get them to investigate the wall for plants and animals. They can use the magnifying glass and insect pots to have a closer look at the wildlife they find.

3. Get the students to follow the instructions of their two worksheets and fill out their answers in the spaces provided.

4. Return the creatures back to the wall or near the wall into the wild again.

Programme 1

Plants & Vegetation

Activity 1: Be a Plant Detective

Student Name: _____

Pick a plant to investigate in the park. At different times of the year plants change, as they are in flower during Spring and Summer, but may be in fruit in Autumn and Winter.

What season is it? _____
What month is it? _____
Is your plant in flower? **yes** or **no** _____
If no, move on to page 43
What colour is your flower? _____
How many petals has your flower got? _____
What is your plant's name? _____

Draw a picture of your plant or the flower and label the parts.

The next step in identifying your plant is that your must look at the leaves.

What shape is your leaf? Draw the leaf.

How many leaves are on each branch?

_____

Is there just one leaf or many leaves together?

_____

Having looked at your plant, can you identify what plant it is?
Plant Name: _____

In your classroom, can you find out any other information on your plant, such as;
Where is it from? When does it flower? How does it grow?

_____
_____
_____
_____
_____

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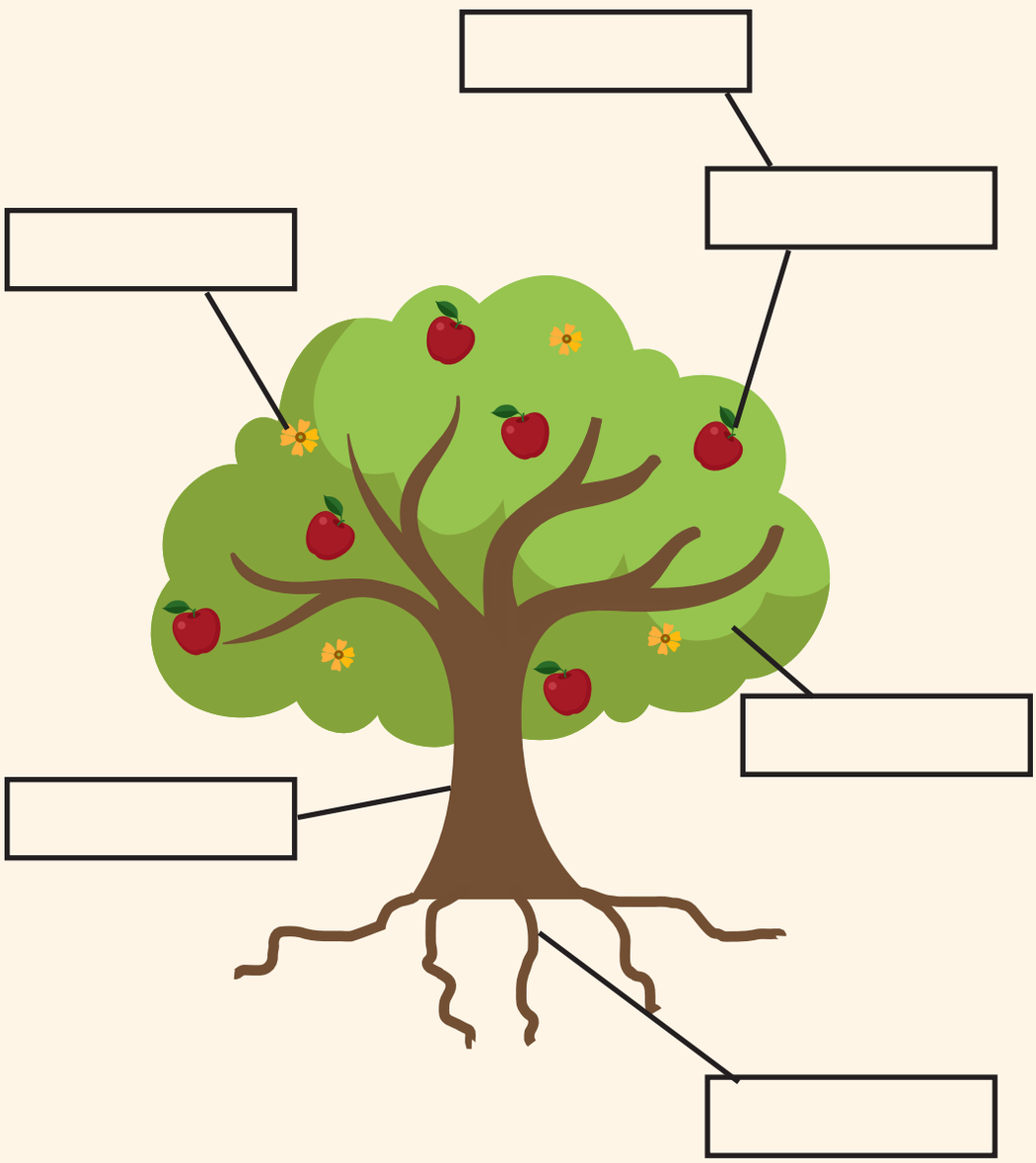
Programme 1

Plants & Vegetation

Activity 2: Identify Parts of a Plant

Student Name: _____

Hint:
You find this inside the fruit



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Activity 3: Plant Count

Student Name: _____

Student Instructions:

Following your teacher's instructions, please record your findings in the table below for your teams three throws of the quadrat.

Site 1	Site 2	Site 3

1. What season is it and how can you tell?

_____

2. What type of plant have you seen the most in each site?

_____

3. Would you say it is **abundant** (lots of them) or **scarce** (very few of them). (Circle the word the describes what you see)

4. Observing your surroundings in the Park, do you see any wildlife such as flying insects (e.g. butterflies or hoverflies)?. Describe what you see.

_____

_____

_____

5. Observing your surroundings in the Park, has their been any other activity, e.g. has the grass been mown, or plants eaten? Describe what you see.

_____

_____

Photocopy This

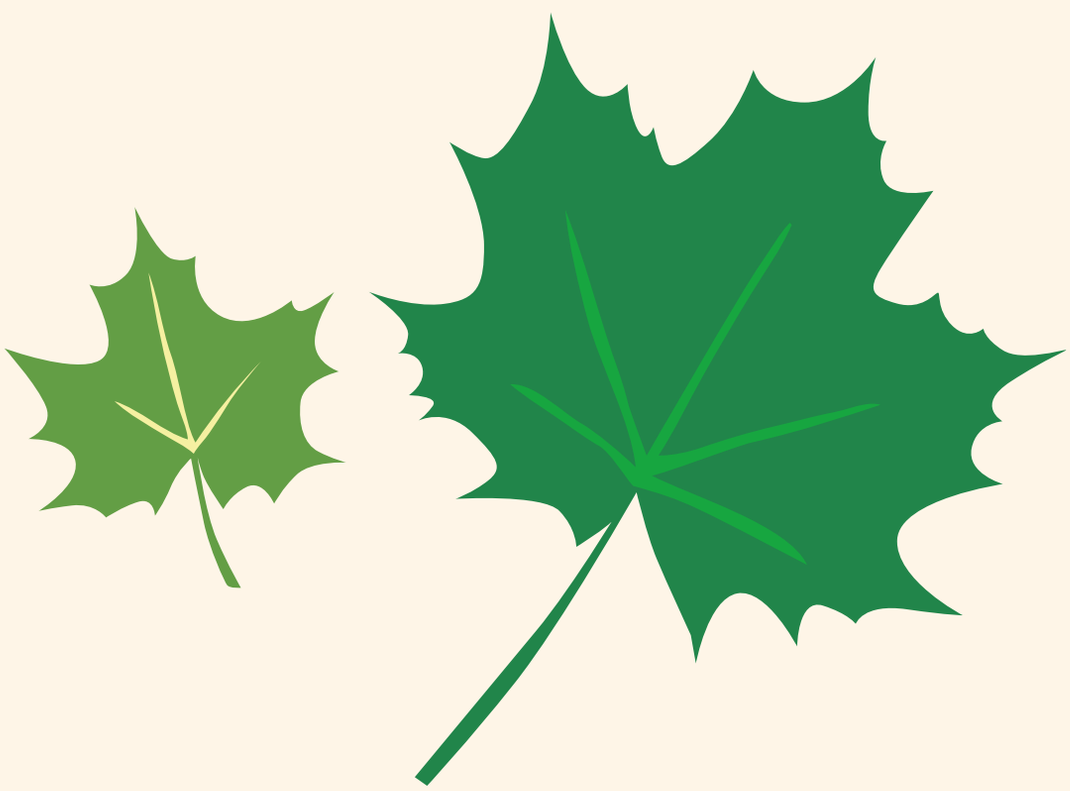
Programme 1

Plants & Vegetation

Activity 4: Be a Leaf Collector

Student Name: _____

Your teacher will help you
to carry out this activity in your nature diary



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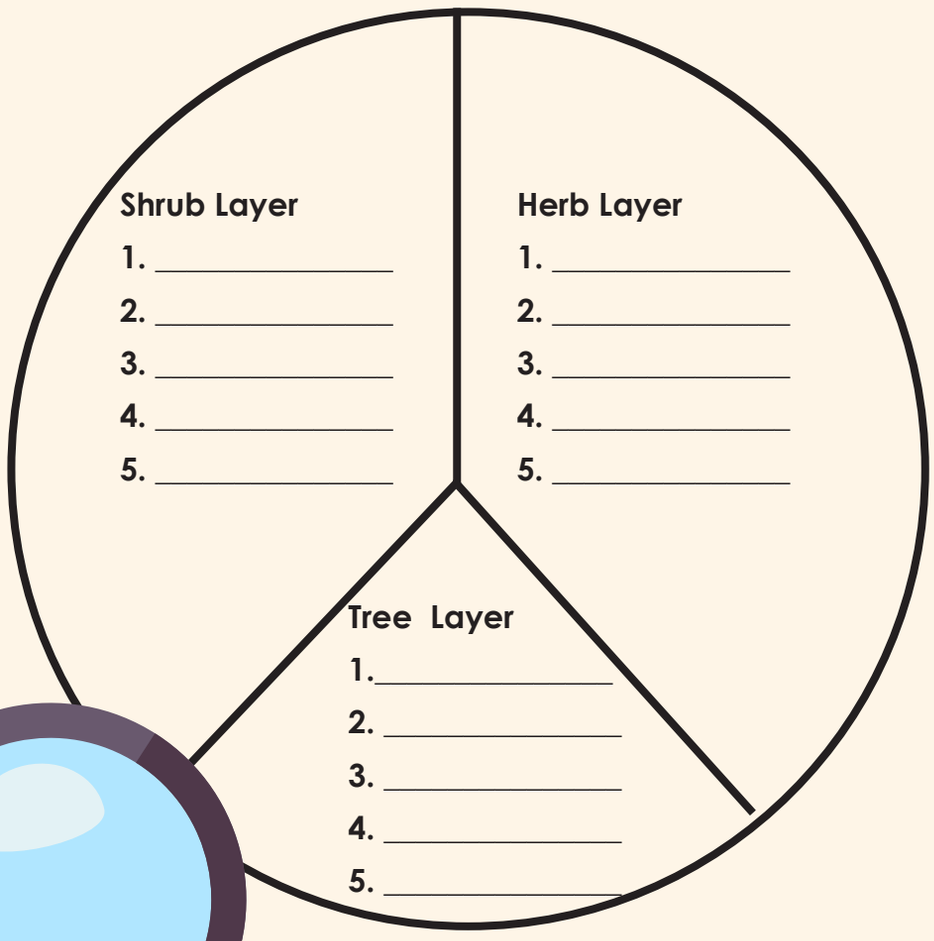
Activity 5: Discover Hedge Rows

Student Name: _____

Hedgerows are an important place where wildlife such as Badgers, Foxes, Mice, Shrews, Stoats, Birds, Invertebrates and Insects live. They depend on the trees and plants to live.

Bring a magnifying glass and white container to collect any wildlife. Investigate the plants and animals of the hedgerows in your park. Record what you find.



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Programme 2

Trees & Grassland

Activity 1: Tree Trail

Student Name: _____

You will need:
- Pencil
- Collins Tree Guide Book (available from your local library)
- Bag for collecting samples from your tree

1. Choose a tree to study in your park.

2. Collect a leaf from your tree and if available, some seeds and fruit (late Summer/ Autumn), from the same tree on the ground layer. Place whatever you have collected in your bag.

3. What is the name of your tree? _____
(Use the Collins Tree Trail Guide to identify your tree from the leaves, bark or seeds)

Trees are divided into two main groups. A flattened and wide Broadleaf tree loses its leaves every Autumn and are called decidous, but a Conifer is evergreen and keeps its needle like leaves all year round.

4. Is your tree a Broadleaf or a Conifer?
_____

5. Draw and label two things that have found from your tree. (e.g. leaf, fruit, cone, flower)

! Photocopy This

Activity 2: Woodland Structure

Student Name: _____

A woodland consists of four layers that make up the woodland structure. Not all woodlands have every layer. It depends on how much light can reach through to the woodland floor.

1. Canopy Layer: You can find Oak, Yew, Ash, Birch, Beech and Scots Pine.

2. Shrub Layer: You can find younger trees or smaller trees such as Hazel, Hawthorn, Honeysuckle, Holly, Elder.

3. Herb Layer: You will find ferns and woodland plants at the lower layer. They rely on the upper layers and amount of light that is able to get through so that they can grow. If the canopy or shrub layer is very thick and dark, there will not be many plants in the herb layer.

4. Ground Layer: You can find dead leaves and rotting logs, mosses and ground ivy.

Student Instructions:
Take a walk through the trees.
Mark an area 10 x 10 metres with string or sticks using your measuring tape.

Study the woodland structure within this area.
In your study area, identify what trees, plants and other vegetation are in your woodland.

List two trees in the Canopy Layer: _____
List two shrubs in the Shrub Layer: _____
List two plants in the Herb Layer: _____
List two things in the Ground Layer: _____

Observe your study area. It is very important how much light the trees and plants get from the sun. Some need more light than others and that is why trees grow really tall and others are small. Plants and trees use the light from the sun to make their own food as part of a process called photosynthesis. It is a source of food and oxygen for all living organisms on the planet.

Is your study area dark or bright? _____

! **Photocopy This**

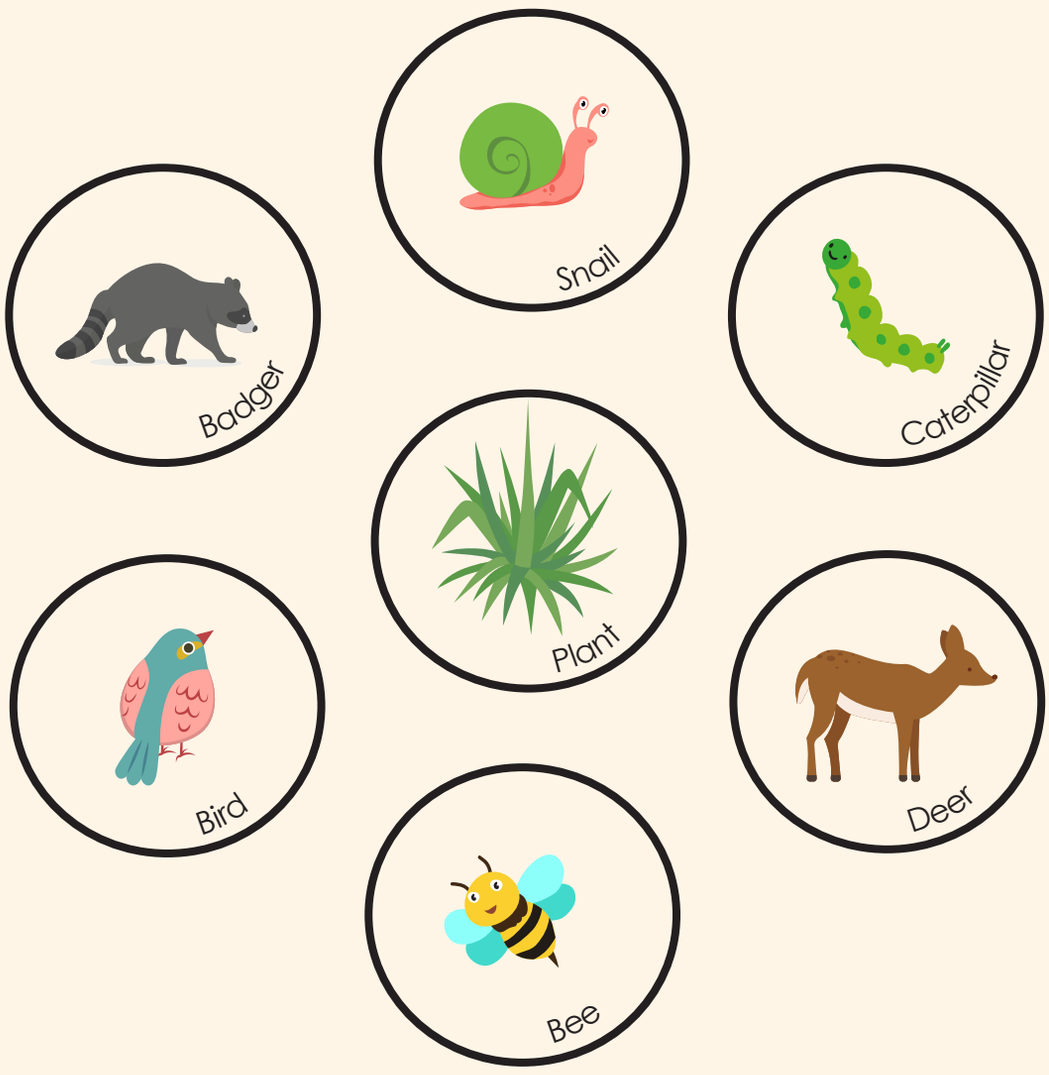
Programme 2

Trees & Grassland

Activity 3: Create a Food Web

Student Name: _____

Draw lines to connect the animals and plants together. Start with the plant, what eats plants? Then connect the smaller animals to other animals that eat them. For example: Snails eat plants, the Badger eats the Snail. What else do Badgers eat?



! Photocopy This

Activity 4: How Tall is Your Tree?

Student Name: _____

You will need:
-Pencil
-Measuring tape
-Stick
-Friend!

Student Instructions:
1. Get into a team of two people.

2. Stand in a place where you have a good view of your tree.

3. Hold your pencil upwards and at arms length.

4. Walk backwards until the pencil seems to be the same height as the tree. Keep one eye closed while you do this. Ask your friend to watch you so that you don't walk into anything or fall over!

5. Do not move from this spot. Turn your pencil sideways, positioning one end of it so that it looks like it is against one side of the tree.

6. Ask your friend to walk to that side of the tree carrying the stick, which you have brought.

7. Shout 'STOP!' when your friend reaches the end of the pencil. Ask them to mark the spot with the stick.

8. Measure the distance from the tree to the stick. This is the approximate height of the tree. Repeat the exercise to make sure that you did it correctly.

9. The height of our tree is____metres.

! Photocopy This

Programme 2

Trees & Grassland

Activity 5: How Old is Your Tree?

Student Name: _____

You will need:
- Measuring tape
- Pencil

Trees found in Open Spaces:
If the tree is in an open space, then its girth (width) will have increased by about 2.5 cms every year. For example, if the girth is 30 cm, then divide 30 by 2.5 to get the approximate age.

Trees found in Wooded Areas:
If your tree is growing in a wooded area, then its girth (width) will have increased by 1.25 cms every year. If your tree girth is 30 cm, then divide 30 by 1.25 to get the approximate age. (Your teacher can help you with the maths)

Student Instructions:
1. Looking at your tree, how many years old do you think it is? _____

2. Measure the girth (which is the measurement around the whole trunk) by placing a tape around the trunk and measuring the girth in centimetres (cms).

3. Record your findings here:
Our Tree grows in an open space _____ (yes/no)
Our Tree grows in a wooded area _____ (yes/no)
The girth of our tree is _____ cms.
Our tree is _____ years old.

4. Is your answer the same as what you thought in question 1.?
_____

5. Now look for an older or younger tree of the same species and measure its age.

The girth of the second tree is _____ cms.

! Photocopy This

Activity 6: Bark Rubbing

Student Name: _____

You will need:
- Greaseproof paper or ordinary white paper
- Crayons
- Sellotape

Student Instructions:

1. Sellotape the greaseproof paper securely onto the trunk.

2. Use a crayon to rub firmly over the whole sheet. You will see how the bark pattern begins to show on the paper. Do not try to fill in the blank spaces as they make up part of the pattern.

3. Write your name and the species (type) of tree e.g. Oak, Elm, Chestnut on the top of our bark rubbing.

4. Describe the bark of your tree.

_____

_____

_____

5. Look at your friends bark rubbing. Are they different? **Yes / No**
(Draw a circle around your answer)

6. Describe how they are different. (Hint: Look at the shapes, are they straight lines, diamond or circular?)

_____

_____

_____

Programme 2

Trees & Grassland

Activity 7: What Lives in Your Tree?

Student Name: _____

Ants have six legs, Spiders have 8 legs, Woodlice usually have 14 legs, and Worms have no legs! There any many different types of bugs living in just one tree or one patch of soil so get investigating! Small creatures like some type of trees better than others, so find out what likes to live in your tree.

You will need:
- Tweezers
- Magnifying glass (if available)
- Pencil
- Large white sheet of paper
- One long stick
- Collins Tree Guide book (available from your local library)

Student Instructions:
1. Place your large white piece of paper or sheet directly under your tree.

2. Use your long stick to shake the branches of the tree overhead. Be gentle with the tree and the creatures living in it.

3. Count the number of creatures that fall onto the white sheet.

How many different types are there?_____

Photocopy This

4. Use the tweezers or your fingers to pick up one insect to study with your magnifying glass. Using the Insect Field Guide (page 31) to try to identify your creature:

Type of creature: _____
How many legs does it have? _____
Does it have wings to fly? _____
What colour is it?_____

You can also search the bark for bugs. Look into the cracks in the bark or on the ground under dead leaves and rocks.

5. Make a big drawing of your creature on this worksheet.
Label the parts e.g. legs, head, body, wings, antennae.

Name your Creepy Crawly: _____

Programme 2

Trees & Grassland

Activity 8: Bug Hunt

Student Name: _____ **Photocopy This**

Student Instructions:
Today, you will be investigating the world of creepy crawlies (also called bugs, insects and invertebrates). On this worksheet, you are going to record what you find. You will be looking at three areas to discover where bugs live.

Record your findings in the table below.

Under Rocks	Dead Wood / Leaves	On Trees

1. Where did you find the most creatures?

_____

2. Name an animal that eats bugs & insects!

_____

3. Why are insects important?

_____

Activity 9: Be a Grassland Detective

Student Name: _____ **Photocopy This**

Student Instructions:
Following your teacher's instruction, please record your findings in the table below for three throws of the quadrat.

Site 1	Site 2	Site 3

1. What season is it and how can you tell?

_____

2. What type of plant have you seen the most in each site?

_____

3. Would you say it is **abundant** (lots of them) or **scarce** (very few of them). (circle the word that describes what you see)

4. Observing your surroundings in the grassland, do you see any wildlife such as flying insects e.g. Butterflies, Hoverflies or Grasshoppers? Describe what you see.

_____

_____

5. Observing your surroundings in the grassland, has their been any other activity, for example, has the grass been mown? Describe what you see.

_____

_____

Programme 3

Water & Aquatic Life

Activity 1: Your Water Study Area

Student Name: _____

1. What type of water body are you studying? Circle your answer.

River Pond Lake Puddle

Describe what your study area looks like?

_____

_____

2. Describe the bank or edge of your water body e.g. clean, presence of litter.

_____

_____

3. What makes up most of the rubbish? e.g. plastic, cans, bottles, paper, anything else?

_____

_____

4. Does the water look clean? Yes/No _____

5. Does the water smell? Yes/No _____

6. Can you see any animal life e.g. fish or insects? Yes/No _____

7. Make a list of the things you see in the water.

_____

_____

Photocopy This

Activity 2: Taking Measurements

Student Name: _____

To understand features of rivers and streams, we take measurements of the river so that we know how big or small it is. The depth of the river often decides on what type of wildlife that live in it. In a river, different sections can be at different depths, as the force of the water and materials erode the bed (bottom and sides) of the river.

Using a metre stick:

1. Measure the depth of the stream at the edge. Your teacher will measure it in the middle if safe to do so.

Depth: Edge_____ Middle_____

2. Use a compass. Find the direction the stream is flowing. e.g. North, South, East or West?

_____

Activity 3: Temperature Flow Rate

Temperature of Water Habitat

To measure temperature and flow rate you will need:

-Thermometer
-Timer (e.g. watch with second hand or stopwatch)
-Float (such as a bottle cork)
-Metre stick

What to do:
1. Hold a thermometer in a shady spot for 30 seconds and read the temperature of the air from the thermometer.
2. Put the thermometer into the water for 30 seconds and read the temperature of the water from the thermometer.
Air temperature: _____
Water temperature: _____ _____

Flow Rate of Stream/River

Use your watch and your float.

1. Measure out a length of 5 metres along the bank of your river/stream and mark the spot with a bag or a stick. Place your float (cork) in the water at the point where you began measuring.

2. Time how long it takes it to travel the 5 metres.

Distance: _____

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Programme 3

Water & Aquatic Life

Activity 4: Water Quality Test

Student Name: _____

What do your findings tell you about the water?

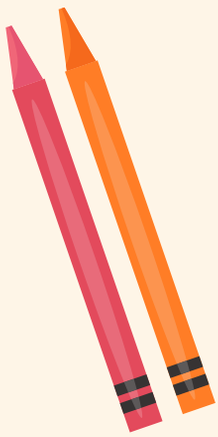
Count how many and what type of aquatic insects you have seen in your white container. Place a tick on the line that describes what you have discovered.

Indicator animals for clean, unpolluted waters

Stonefly	Many _____	Some_____	Few_____
Mayfly	Many _____	Some_____	Few_____
Freshwater Shrimp	Many _____	Some_____	Few_____
Caddisfly Nymphs	Many _____	Some_____	Few_____

Indicator animals for polluted waters

Water Louse	Many _____	Some_____	Few_____
Leeches	Many _____	Some_____	Few_____
Snails	Many _____	Some_____	Few_____



What have you learned about your water habitat?

_____

_____

_____

_____

_____

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Activity 5: Wildlife Zoologist

Student Name: _____

Choose a species to study (e.g. Ducks, Otter or Fish) and record the number of times you see it. When you record a sighting of this animal, you can take down information about the time, date, weather and habitat on this sheet. You can use this worksheet every time you visit your park. This way, you will build up information on your chosen animal. Try going back at different times of the year to see if your chosen species can be seen.

You will need:
-Collins Freshwater Insect Guide (available at your local library)

Record details:

Name of Park:_____ Date: _____

Animal to be studied: (e.g. a Mallard Duck)
_____

How many animals of this species can you see?
_____

What is the weather like?
_____

Time of day: _____

What is the animal doing? _____

Describe the habitat:
_____
_____
_____

Any other information:
_____
_____
_____

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Programme 4

Wildlife Habitats

Activity 1: Mini Zoologist

Student Name: _____

Choose an animal to study (e.g. a bird in the park) and record the number of times you see it. When you record a sighting of this animal, you should write down information such as the time, date, weather and habitat on this sheet. You can use this sheet every time you visit your park. This way, you will build up a great deal of information about your chosen animal. Try going back at different times of the year to see if your chosen species can be seen.

Record details:

Name of Park:
_____

Date:_____

Animal to be studied: (e.g. Grey Heron)
_____

How many animals of the same species can you see?_____

What is the weather like?
_____

Time of day:_____

What is the animal doing? _____

Describe the habitat:
_____
_____

Any other information:
_____
_____

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Activity 2: Pond & River Dipping

Student Name: _____

Beneath the surface of the water lives rich and varied animal and plant life. Dip into the world of a pond or river using a fishing net and discover the creatures that live there.

You will need:
-White container (such as a bucket)
-Fishing net
-Collins Freshwater Insect Guide (available in your local library)
-Nature diary
-Pencil

1. Fill your white container with pond water. You will then have something to put your animals in as soon as you catch them.

2. Sweep the fishing net through the weeds & water.

3. Carefully put the contents of the net into the white container by floating the net in the water.

4. You will soon catch many different animals and plants.

5. Identify the species you have found and make notes and drawings in your nature diary.

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Activity 3: Wildlife Tracker

Student Name: _____

Record your findings

Where are you in the park?_____
Date: _____

What have you found? Fill in your findings in the boxes below.
Compare with your classmates, what did they find?

Droppings				
Footprints				
Signs of Feeding				
Nests or Burrow Holes				
Other Signs				

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Programme 4

Wildlife Habitats

Activity 4: Be a Stonewall Detective

Student Name: _____

Investigate a stone wall in your park.
Stone walls are home to many creatures and plants. They like to live in the cracks and crevices where they feel safe.

With help from your teacher, complete the following questions. The answers are on your park wall.

1. How many different types of plants can you see growing on the wall?_____

2. Are any of these plants growing on your wall?

Buddleia is also known as the butterfly bush. It is a purple flowered plant with long leaves. It originally came from China. Butterflies are attracted to its nectar.

Buddleia: **Yes / No**

Lichen is a plant that likes to grow on walls. Sometimes it looks like an old map because it can be brown and full of lines. Lichens absorb water from the air. Most lichens do not like pollution at all and will not grow in an area that has a lot of air pollution from traffic fumes or factories.

Lichens: Yes / No

Describe what you see:

_____

_____

_____

_____

3. How high is your wall?
Using the metre stick or ruler, What height is the wall? _____

4. Search the wall.

Use your paintbrush or piece of card to pick up a creature and put it in your insect pot. Remember to be very gentle with your creature. They like to hide in the cracks in the walls for safety so this is a good place to look.

What colour is your creature? _____

How many legs has it got?_____

How many parts of the body? _____
(if its body has got 3 parts, antennae (feelers) and 6 legs, it is an insect)

Does it have wings? _____

If so, how many? _____

What is your creature called? _____

5. Draw a sketch of it in your nature diary

6. Below is a list of some of the creatures that might be living in your wall.

Can you find any of them? Circle the ones you can find.

Woodlouse	Grasshopper	Bee
Snail	Ground Beetle	Spider
Worm	Frog	Earwig
Ant	Slug	Ladybird
Milipede	Centipede	

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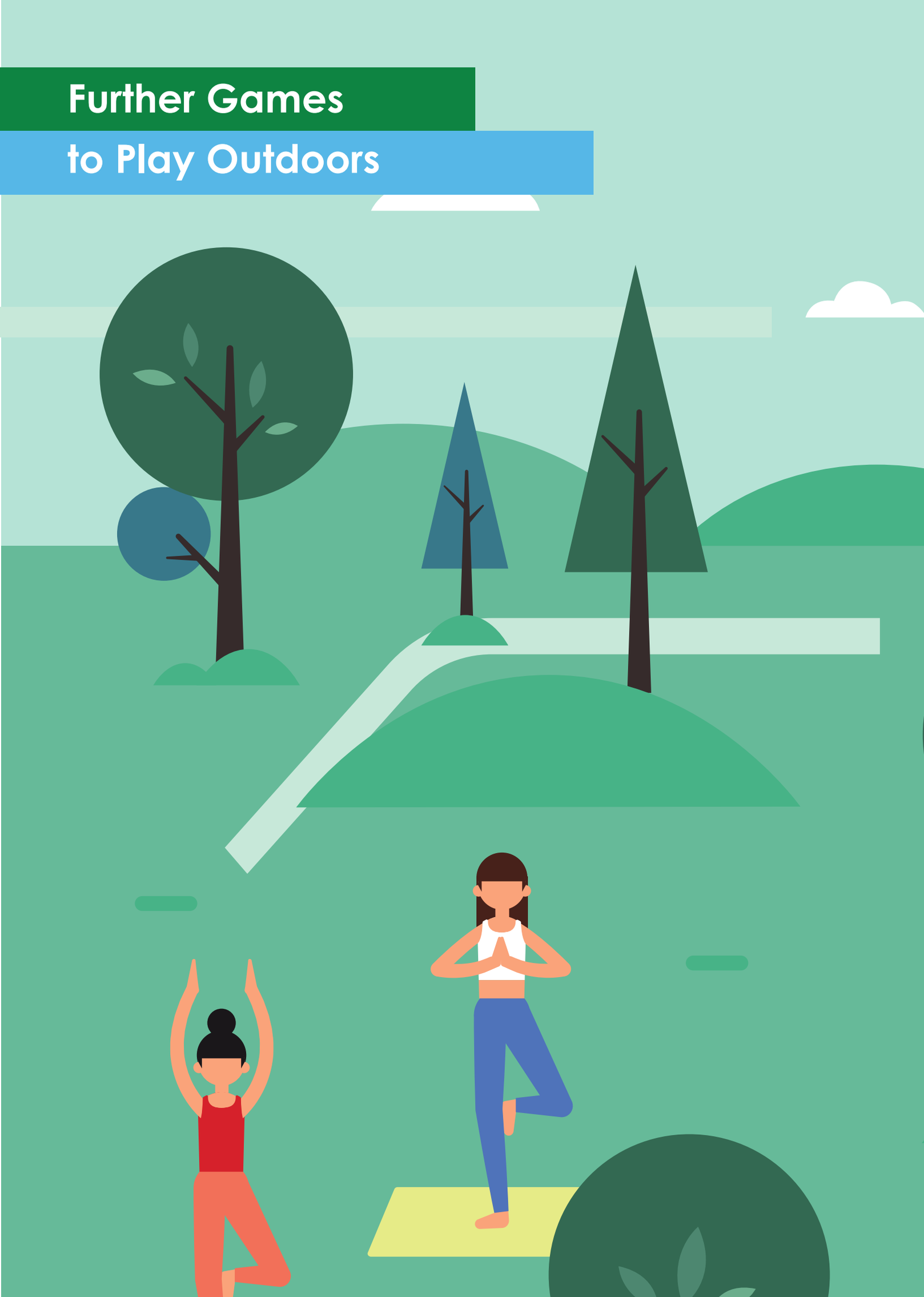
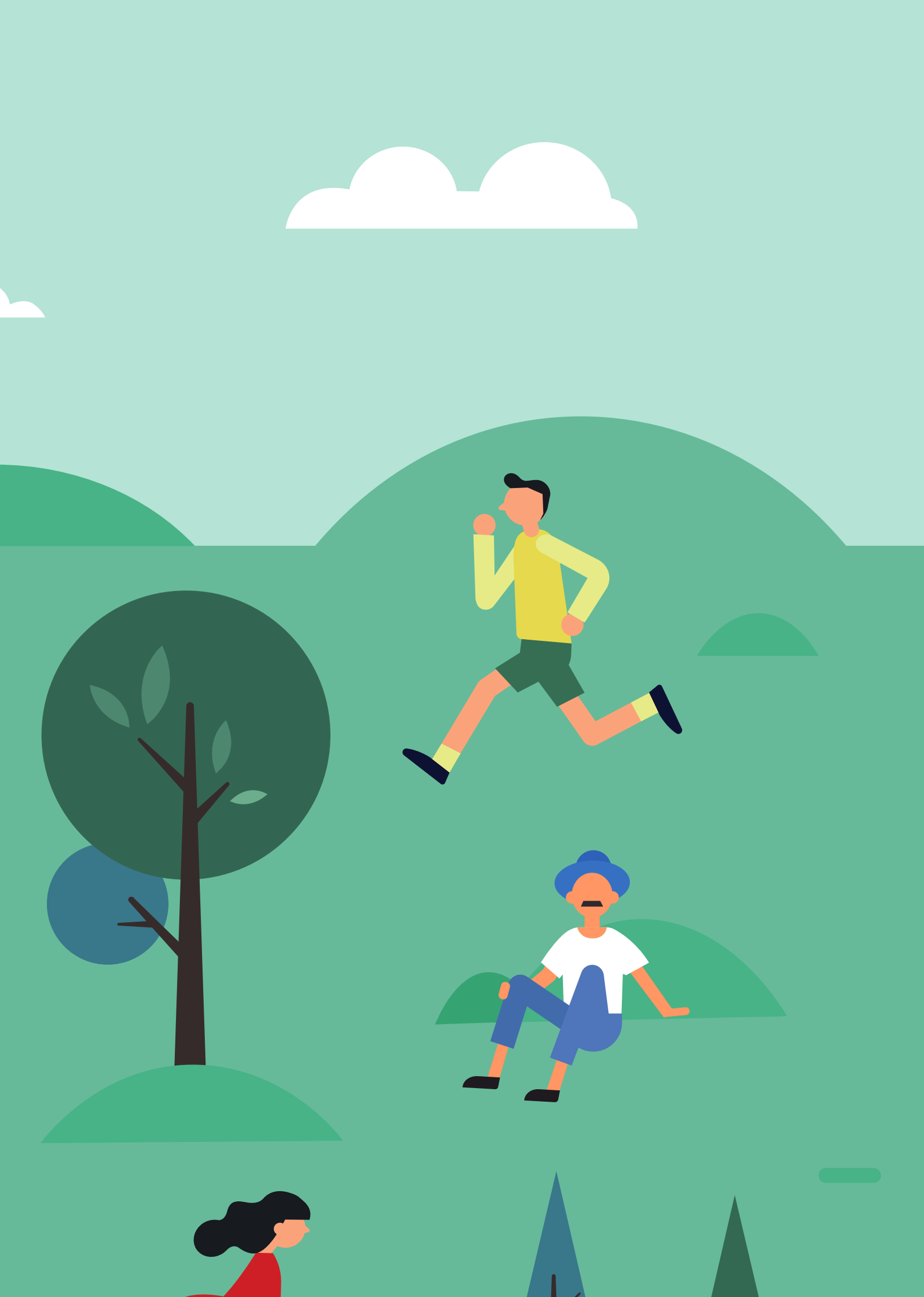
Further Games to Play Outdoors





Animal Behaviour

Howl your way around the jungle to find your fellow animal!

Duration: **5 minutes**

Number of players: **8 and upwards**

Equipment: **Blindfolds (optional)**

This is a fun game to play as a warm up game, or to test the group's knowledge of animal behaviour!

You will need an even number of people in the class to play this game. Give a piece of paper to each student with an animal name written on it. Make sure there are pairs of each animal that you give out.

Ask the students to behave like the animal, by only making the actions and sounds of the animal (no words!), and to try and find their paired animal in the room. The game ends when all students have been paired with their animal.

If you want to challenge your group, you can play the same game but with blindfolds for each student, instructing them to move around the room carefully, making the sounds of their animal. The game ends when all animals have been paired.

Evolution Game

Evolve your way through millions of years from fish-to-chicken-to-ape!

Duration: **5 minutes**

Number of players: **4 and upwards**

This is a fun game that introduces the idea of evolution and life changing over time in a fun and energetic way.

The first step is to teach all students how to play rock, paper, scissors. The winner is decided by the best of three rounds.

Once everyone understands this game, tell everyone that they are going to play a game where they move around the room acting like different animals. Firstly, they go back in time, to an era before there was life on land. They are all microscopic fish/jellyfish swimming around in the sea, and they need to compete against their fellow fish to try and become a higher lifeform. They swim around the room randomly until the teacher shouts 'SURVIVE!', at which point they play rock, paper, scissors with the person nearest to them.

Whoever wins the best of three rounds gets to become a Bird. The remaining fish carry on trying to overcome another fish, but the birds can now only evolve if they beat another bird. They must wait for more birds to evolve before challenging them. Whoever loses in a bird match returns to the level below them, i.e. fish.

After becoming a bird, there are two more stages to reach before reaching the modern age: ape and human.

This activity can lead onto some surprisingly rich conversation topics, such as: What do you think 'survival of the fittest' means? Are some animals better adapted than others because they have been around for a shorter period of time? If humans can evolve and learn new skills, what do you think they should be able to do? What would you like your children to be able to do if they could evolve?

Bat and Moth

Use Echolocation to find your prey

Duration: **10 minutes**

Number of players: **4 and upwards**

Equipment: **Blindfold**

This educational game teaches students about the way that bats hunt for their prey. This is a great exercise to practice perspective-taking and raise awareness of biodiversity. Best played in the outdoors or a large open space.

Bats use a technique called 'Echolocation' to catch insects, in which they make high pitched sounds and use their very good hearing to find insects by listening for echoes. The sounds they make are so high that humans can't hear most of them, but children can hear them more often than adults because they can hear higher sounds!

Ask what the group knows about bats. Point out that the phrase "as blind as a bat" is actually incorrect as bats can see almost as well as humans can! The difference is that bats don't rely as much on their vision as they do on their hearing to catch insects.

Ask for a volunteer to be the bat. This person has to play the role of the bat at night, when they would not be able to see anything – this is why they are wearing a blindfold! Everyone else playing the game is playing the role of the moths.

Within a medium-to-large marked area – which can be designated by chairs, clothes on the ground or natural barriers such as trees – the bat tries to catch the moth with their hands, while the moths move around to avoid the bat. The secret weapon of the bat is that whenever it says 'BAT', all of the moths must reply with a loud 'MOTH'. This helps the bat to locate the moths, and the moths must respond every time the bat calls!

Once the bat touches a moth, the moth is eaten by the bat and out of the game.

Owl Name Game

Call your friend's name before the owl catches them!

Duration: **5 minutes**

Number of players: **8 and upwards**

This is a great way to refresh everybody's name, and to learn about the effectiveness of animals who warn their group about hunting animals, or predators.

Lots of animals live in groups. There are many advantages to this, such as sharing information about where to find food and water, and helping to look after young animals. Another great thing about living in groups, is getting a warning when a predator might be hunting for you!

In this game, one person is the owl – a predator – and the rest of the group are mice, standing in a wide circle around the owl. The owl tries to catch the mice by choosing one and running towards it in a straight line until it catches them. If any other mouse (except the one it is running towards) calls out the name of that mouse before the owl reaches them, the mouse is saved. This is how the mice warn the others to get out of the way before the owl reaches them – it is a very clever way of protecting themselves in the group. The owl then returns to the center and picks another mouse.

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