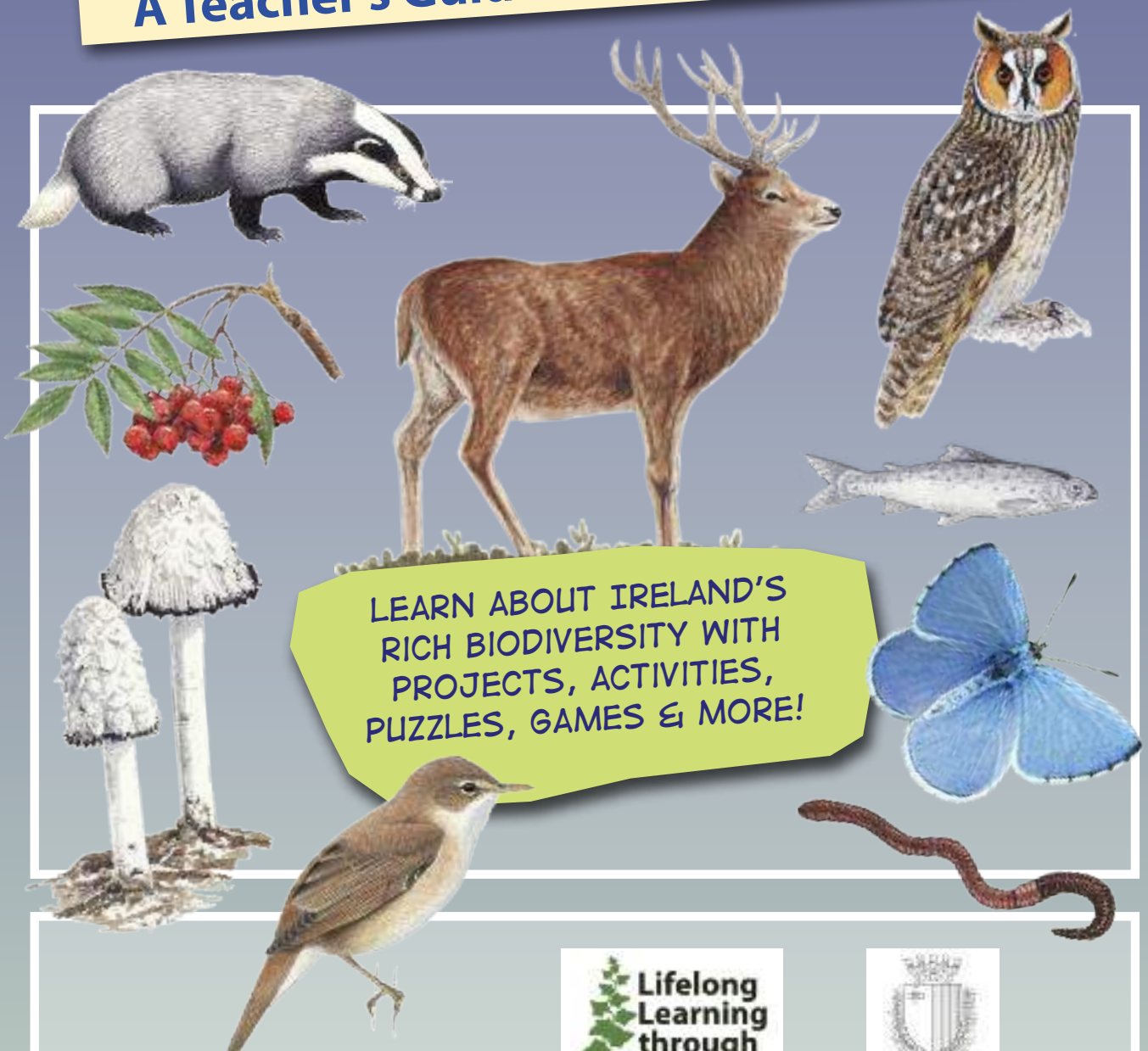
PRIMARY SCHOOL ACTION GUIDE

A Teacher's Guide for Nature Activities



LEARN ABOUT IRELAND'S RICH BIODIVERSITY WITH PROJECTS, ACTIVITIES, PUZZLES, GAMES & MORE!

BirdWatchIreland

BirdLife MALTA

Lifelong Learning through Nature

Erasmus+

rspb giving nature a home

Lifelong Learning through Nature

Lifelong Learning through Nature is a collaborative partnership project between BirdWatch Ireland, BirdLife Malta, the Ministry for Education and Employment (Malta), the Royal Society for the Protection of Birds (UK) and the Polish Society for the Protection of Birds.

The key objective of the project is to highlight the importance of learning outside the classroom and of connection with nature. Innovative ideas, resources and teacher training were first developed, trialled and implemented in Malta with input from all project partners. Following a review, the relevant programme ideas were developed and expanded to allow them to be implemented in both Ireland and Poland. This Action Guide for teachers in Ireland is the result of this process.

BirdWatch Ireland is the largest independent conservation organisation in Ireland. A registered charity, its aim is the conservation of wild birds and their natural habitats. Established in 1968, it has over 15,000 members and a growing network of 30 local branches. It managed nature reserves which protect threatened habitats and the wildlife that relies on them, works to conserve Ireland's biodiversity, produced a range of media to raise wider awareness of nature conservation in Ireland, and carries out important education, survey and research work. BirdWatch Ireland is the official Irish partner of BirdLife International, the world's largest partnership of conservation organisations, which strives to conserve birds, their habitats and global biodiversity.

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Welcome!

About this Guide

This guide aims to inspire and facilitate teachers all over Ireland in integrating nature learning into the curriculum of Primary School classes in a fun and effective way. It is not a text book but a supplementary resource of nature-related activities which teachers are encouraged to get creative with and adapt as you see fit.

The guide consists of activities in two formats; those designed for pupils and 'Teacher's sections' - these are bordered by a different colour to those designed for children. Many activities contain suggestions on how to 'simplify' or 'stretch' them to increase or reduce difficulty. All activities are suited to a range of ages and so it is at the discretion of each teacher to decide which are suitable, based on the interests and abilities of their individual class. Those that are difficult for infants could be completed as a class or with the help of a teacher/classroom assistant.

There are a number of themes covered in the guide, from being alive to boosting biodiversity in your school, which are all relevant to subjects within Social, Environmental and Scientific Education – namely the Science and Geography curricula. The key strands these topics relate to are: Living things (Science), Environmental awareness and care (Science and Geography) and Natural Environments (Geography). It is encouraged that teachers make cross-curricular connections where possible. The topics covered in each chapter are outlined on the 'Contents' page.

This resource is designed to be used primarily **outdoors** to give children the opportunity to be more connected to nature and the natural environment they are learning about. According to the Science curriculum "scientific concepts and skills should be developed **through explorations in the immediate environment** whenever possible." Even so, many of the games and activities can be run inside during times of extreme weather. If it is necessary to run any of the activities indoors, the best approach would be to teach the theory surrounding the activity indoors then run the activity itself outside when possible.

The weather in Ireland is hard to predict, to say the least, so if nature learning is on the agenda, ensure children know to have their coats and suitable shoes for that day. Nature learning can be carried out even where there is limited green space, but nearby green areas, such as parks, should also be utilised where possible.

We know that nature can be complicated, so have included morsels of background information throughout the guide, but teachers are encouraged to supplement with theory from other sources also. For difficult activities, don't be afraid to research the answers. This could even be done as a class, especially if you have the use of an interactive whiteboard.

The guide lends itself well to the spiral approach to teaching. Building on and making linkages with previous lessons (as opposed to treating each lesson as independent of the rest) is important in order to build the children's portfolio of nature education and truly make them **lifelong** lessons. For example, if the lesson is centred around human impact on habitat change and its effect on biodiversity, use the opportunity to reflect on what the students have learned previously about biodiversity and habitats. Many of the teacher's sections serve as handy review strategies to help compound the lessons children have learned, in a fun way. Don't be afraid to repeat activities, in particular games, but adapt them slightly (simplify/ stretch) to keep children engaged.

Native is best! We tend to forget we have a lot of spectacular wildlife here in Ireland. Our own wildlife is worth being aware of and worth preserving. Hence, the guide is primarily focussed on wildlife found in Ireland so that children can appreciate the wonders on their doorstep. Activities can be stretched by introducing how the lessons also apply to the wider world. For example, build food chains purely in an Irish context then explore what a similar food chain would look like in Africa.

We hope you enjoy this guide… and remember get creative and **Get Outdoors!**

Being alive

FACT FILE

Being alive? – what does that mean?

Living isn't all about running and jumping.

Some things don't look alive, but they are!

For example, plants, mushrooms and lichens are all living things even though they don't move much.

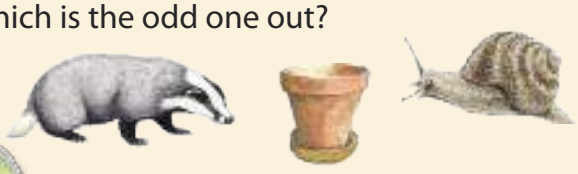
So, what makes them living things?

Well… all things are alive if they;

• Feed • Move • Feel • Grow and • Have young

1

Which is the odd one out?



Put a circle around things which are **alive**

2

Now that you know what 'being alive' is…
Go outside, take a look around you, and find some things that are **alive** and some things **not alive**.

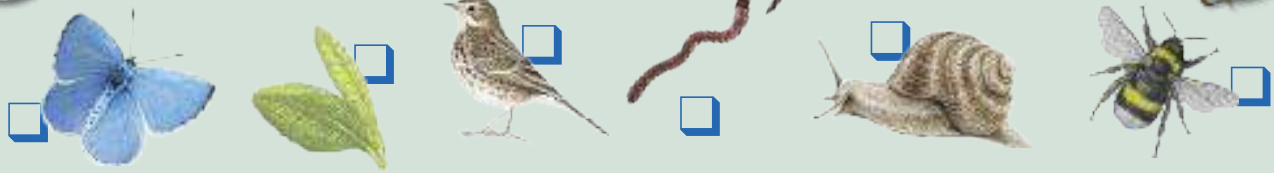
something which is **ALIVE**	something which is **NOT ALIVE**
ALIVE	NOT ALIVE
ALIVE	NOT ALIVE
ALIVE	NOT ALIVE
ALIVE	NOT ALIVE

Think about: Trees are living things. If furniture is made from trees, is it alive?
If it moves, but doesn't feel, grow, feed or have young, is it alive?
If something has animals/plants living in it, is it alive?

Being alive

3

See if you can find the living things in the pictures below.



How do you know these things are living? What do you see them doing that makes them alive?

You can 'Stretch' Activity 2 while outside by taking a closer look at what makes them living things. You can also stretch this activity by looking out for examples for Activity 3.

The butterfly is **ALIVE** because.....

The leaf is **ALIVE** because.....

The bird is **ALIVE** because.....

The worm is **ALIVE** because.....

The snail is **ALIVE** because.....

The bee is **ALIVE** because.....

Examples:

A butterfly is alive because it eats nectar.

An ant is alive because it walks.

A snail is alive because it moves its eyes.

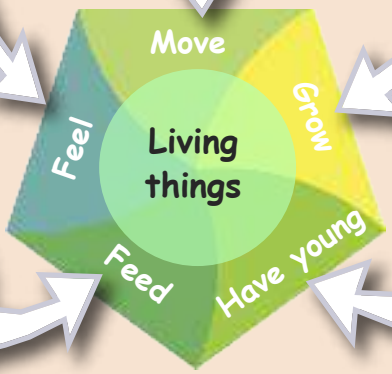
A bird is alive because it sings.

Think about: When is a leaf not alive?

4

All living things **feed** and **grow** and **move** and **feel** and **have young**. Find examples from nature around you that show these things.

Think back to Activity 3 and build on what you saw.
Remember: spiders and insect eggs, and plant seeds are examples of having young!



5 What do plants need to live and to grow?

Soil ❑ 

Sunlight ❑ 

Clouds ❑ 

Moonlight ❑ 

Rain ❑ 

Fire ❑ 

Wind ❑ 

Seawater ❑ 

Tick the box next to the things that you think plants need to live and grow.

6 Plants need light to – what?

Make electricity ❑ 

Make food ❑ 

See in the dark ❑ 

Tick the box next to the things that you think plants need light for.

7 Take a look at a tree outside. Which of the following can you see?

The tree trunk ❑

The branches ❑

Green leaves ❑

Yellow/dried leaves ❑

Flowers ❑

Fruit ❑

Which part of the plant takes up water?

- ❑ The leaves?
- ❑ The roots?
- ❑ The stalk *or* trunk?

8

Being alive

Teacher's section

Tree collage

Make a tree collage

Children gather resources from the surrounding environment, then use these to collectively produce a collage of a tree on the ground.

Materials needed: None.

Instructions:

1. Discuss with the children the common components of a tree (think back to **Activity 7**) — the roots, trunk, branches, leaves/needles, and other possible parts such as fruits, flowers or pine cones.

2. Send the children to gather resources from the surrounding area. Resource collection should not cause any damage to the environment itself, so ensure that, for example, leaves are collected from the ground and not picked from trees. Try to use natural resources such as stones, seeds, leaves, sticks and pinecones.

3. Find a space of at least one square metre and work as a group to produce a large collage of a tree on the ground.

Simplify

Focus on the two main components – the trunk and the leaves.

Stretch

Tie in with **Activity 7** and/or children can take photos of the tree collage using a digital camera or smartphone, then upload and review them upon return to school.

9 Dinner time

Trees and other plants are living things but, they are also food for others. In fact, most living things are food for something else. Have a look outside at all the different types of food.

What type of 'animal food' can you find around you, and for which animals?

Type of food.....
Location.....
Can be eaten by.....

Type of food.....
Location.....
Can be eaten by.....

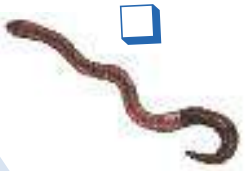
Type of food.....
Location.....
Can be eaten by.....

Type of food.....
Location.....
Can be eaten by.....

10 Dinner time

Which of these things do birds eat?

Worms ❑



Berries ❑

Leaves ❑

Nuts ❑

Think about: Bird feeders are a great way to attract birds to your school... See Activity 7 of Biodiversity Boosters.

11 Take a look outside at all the birds you see.

Write the names of **three birds** you saw today. What do they eat? Can you draw their food?

Name of bird

This bird eats

Name of bird

This bird eats

Name of bird

This bird eats

12 **Up next... Take a look at who eats whom in a simple food chain!**

Match the animals with their favourite food.

The Reed Warbler eats insects

The Moorhen picks plants from shallow water

The Little Grebe dives and swims underwater to find food

Now match the following animals with their food. In the same way as above.

13

Who eats whom?

When we connect animals with their food we form food chains. An arrow is used to point from the food to the 'eater', like the blue arrow in the first box. Food chains often begin with plants, but as you can see, they don't always have to.

Join the four pictures to form a simple food chain.

Helpful definitions

Producer The start of a food chain. These living things can make their own food and are normally plants.
Consumer Feeds on other living things.
Herbivore Only eats plants.
Carnivore Only eats animals.


Hedgehog


Fox


Spider


Merlin

Example


Snail


Leaf


Fly


Meadow Pipit


Dead leaves


Long-eared Owl

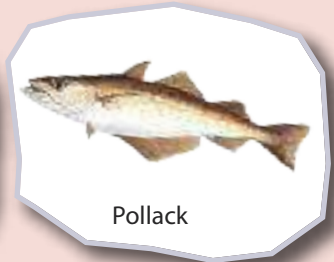

Grey Seal


Smolt


Wood Mouse


Wood Louse


Seaweed


Pollack

14 Teacher's section

Sneak attack!

Children try to sneak up on their prey without making a sound.

Materials needed: None.

Instructions

1. Get one child to sit blindfolded with the prey (something noisy such as keys, so it can be heard if the predator moves it) at their feet. Pretend the protector is a parent animal protecting its young. For example, a bird with a young chick/egg or a squirrel with its young, etc.
2. When pointed at by the teacher, another child (the predator) in the group must creep up and take the prey (more than one child at a time is fine).
3. If they are heard and pointed at by the protector, they return to the starting point.
4. Another version instead of pointing can be using a water pistol, or a torch in a dark room.
5. Discuss how difficult it is to sneak up on prey without making any noise. For many animals, it is very important not to be heard or seen so they can sneak up on their prey or to avoid being eaten. Discuss also how animals' shape/colour can also allow them to blend in with their surroundings (**See camouflage activities** in the **'Adaptations'** section).

15 Build three food chains

Build three short food chains in the boxes below. Try using living things that you have seen while outside. Remember – the arrows always point at the eater!

Producer (a plant)	Consumer (a herbivore, or plant eater)	Consumer (a carnivore, or animal eater)
EXAMPLE  Earthworm	 Common Toad	 Grey Heron
1.		
2.		

16 Teacher's section

Wildlife – Who am I?

A great game to play after learning about food chains!

Materials needed: Paper, pens, wool or string.

Instructions

1. Fix the name of a living thing to the back of each child without letting them see what it is.
2. Divide the class up into pairs. Each member of the pair is allowed to see their partner's name but not their own. The objective is to ask the other person questions about the name on their back, to find out what it is.
3. They are only allowed Yes/No questions but can keep asking until they get a 'No', then it is the other person's go.

When each child knows who they are, form a food web by standing in a circle and passing a ball of string/wool around from each species to its food.

Example Person (wearing ladybird name) asks: Is it an animal? Yes. Does it eat other animals? Yes. Does it fly? Yes. Is it a bird? NO...

Other person (wearing nettle name) asks: Is it a plant? Yes. Has it flowers? Yes. Are the flowers yellow? NO... First person's turn again.

17

Food Chain Fruit Bowl

Materials needed: None.

Instructions

Adapt the popular game 'Fruit Bowl', where everyone in the group gets one of four different names of fruits. When their fruit is called, they swap with those of the same name. When 'Fruit Bowl' is called, all players swap. Slowly eliminate spaces to create competition for a place. Instead of fruits give children labels of links in a food chain instead and call "Food chain" for everyone to swap. This can be adapted in many ways, for animals with 'Wings', plants and animals in a 'Hedgerow' and so on. Ask children to suggest which names to use – a fun way to review topics they've learned.

18

Moving around

Food gives energy to animals. Energy helps animals to stay alive and active.

Write the name of an animal that you saw outside:

Small Tortoiseshell

Walking .....

Running .....

Hopping .....

Flying .....

Swimming .....

Crawling .....

Feeding .....

Calling .....

Teacher's section

Ant trails

You may not come across many larger animals (look in the '**Wild Detectives**' for ideas on how to detect animals you can't see), so this activity is a great way of encouraging the children to notice and appreciate the smaller ones. Children explore the natural world through a simple experiment on the trail-making behaviour of ants. This is best in warmer weather, when there are more ants around.

Materials needed: None. However, you may find a magnifying glass helpful.

Instructions

1. Search the local area for a trail of ants. If you have access to the site beforehand, putting a little sugar or some biscuit crumbs down a few hours in advance may help to attract ants.
2. First, take a few minutes to observe the ants—what are they doing? Where are they going? What colour are they? How many legs do they have? If you have a magnifying glass, use it to get a closer look.
3. Ask the children to predict what they think will happen when an obstruction disturbs their route.
4. Carefully place a small obstruction (e.g. a stick or a pencil) across the path of the ants and ask the children to predict what they think will happen.
5. Watch to see what the ants do next—observe first their initial confusion, and then what solution or alternative they find.
6. Discuss the results. Explain how ants make their trails by leaving scents behind them so that other ants know where to go.
7. You may then wish to remove the obstruction and continue making observations.

Black Garden Ant

(Chris Shields - rspb-images.com)

Simplify

Omit the placement of an obstruction, spending extra time instead on thoroughly observing the ants' natural behaviour.

Stretch

Use a fun game to demonstrate the principles they have learnt. One child hides, leaving a trail of objects (e.g. stones, leaves or pinecones) on the ground, and then the others must find them by following the trail.

20 The Cycle of Life

Living things also need food to give to their young so they too can grow big and strong. Plants start their lives as seeds whereas animals are either born as babies, or laid as eggs that they will later hatch from. The young plants and animals then grow up to look like their parents.

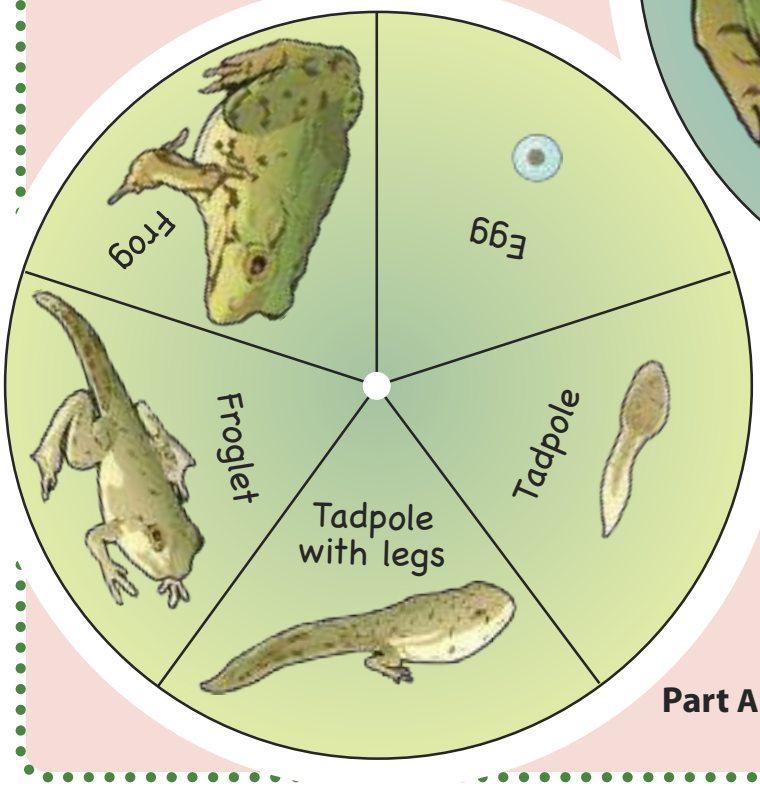
Let's take a look at the lifec ycle of an ant. Put these words in their correct place:

larva adult queen pupa
eggs adult worker

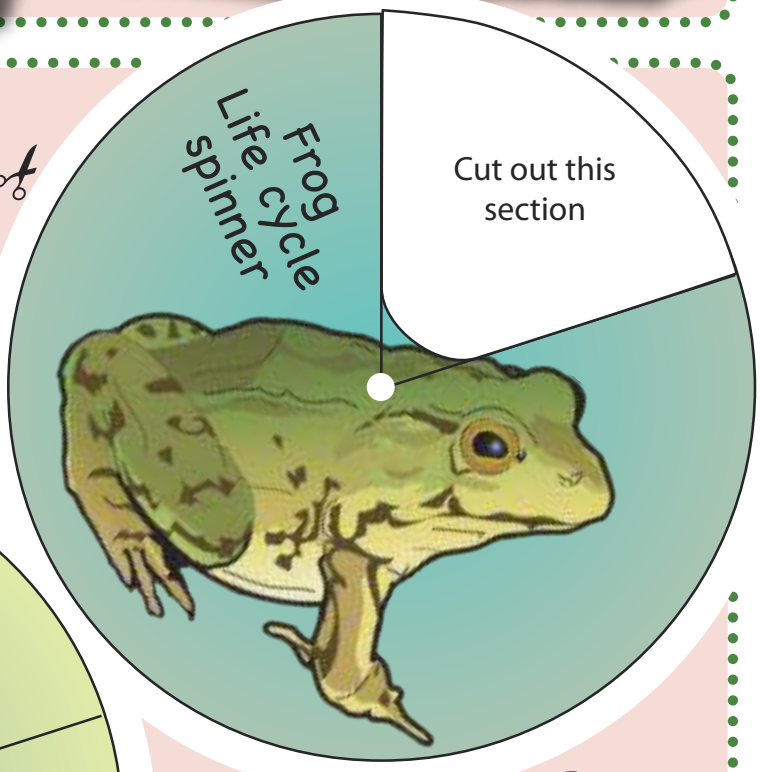
21 Life cycle Spinner

1. Cut the blank section out of **B** then place it over **A**.

2. Insert a split pin in the centre.



Part A.



Part B.

3. Glue the bottom of **A** and stick into a copy.

4. Follow the frog's life cycle as time goes by!

Biodiversity

FACT FILE

What is 'Biodiversity'?

Split the word Biodiversity into 'Bio' = living and 'Diversity = difference. Biodiversity means *all the different living things around us*.

The earth is happiest when there are lots of different types of living things, so it is important to protect our native biodiversity.

These living things are divided up as:

- **Plants**
- **Animals**
- **Fungus (like mushrooms & mould)**
- **Microorganisms (which we can't see).**

Most of what you see around you each day are either Plants or Animals, which scientists like to call Flora and Fauna.

1

Divide the following into flora (plants) and fauna (animals).

HINT! There are four of each!

Poppy
Oak tree
Spider
Tree Sparrow
Thistle
Frog
Moorhen
Scots Pine

Flora

.....

.....

.....

.....

Flora

.....

.....

.....

.....

2

Tree of life

Trees are one of the most common types of flora we see around us. Did you know, when you see a tree it is not just one living thing but many? Lots of things live in and around trees.

Find a large tree. What type of tree is it? Make a small list of animals which you find on the tree and under it.

Type of tree .....

Animals found .....

.....

.....

.....

.....

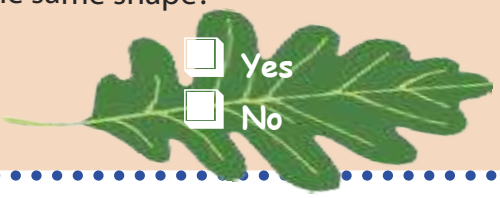
Do a sketch of a leaf from the tree

Stretch divide the animals you find into groups with Activities 8-10.

3 Trees

Have a look around outside and see if you can answer this question.

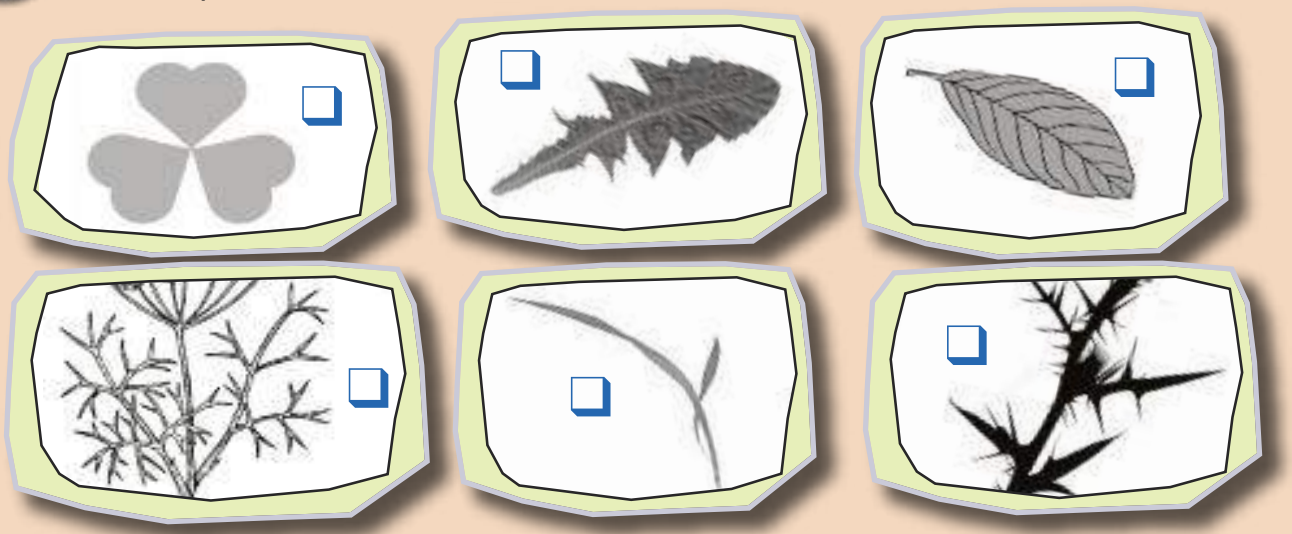
Do all the leaves have the same shape?



❑ Yes
❑ No

4 Leaf shapes

How many different plants can you find with the following leaf shapes in 10 minutes?



5 Trees, shrubs or annuals

Use a Plant ID Sheet to find the name of the plants around your school. Then classify them into **Trees, Shrubs** or **Annual Plants**.

Helpful Definitions

Tree a woody plant, usually grows from one main trunk, has few or no branches on its lower parts.
Shrub woody plant that grows from several stems (not one main trunk), branches often low to the ground.
Annual Plant not woody, their lifecycle is completed in one year; they grow from seed, flower, make seeds, and die in one growing season.

Hawthorn

Name of tree

.....
.....
.....
.....
.....
.....

Gorse

Name of shrub

.....
.....
.....
.....
.....
.....

Herb Robert

Name of annual plant

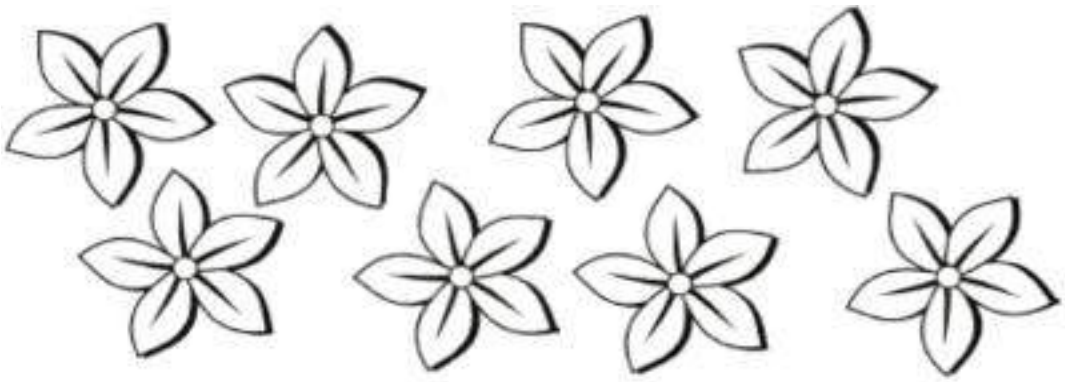
.....
.....
.....
.....
.....
.....

6 Diversity of colour

See how many different flower colours you can find.
Fill in the flowers below with the colours you have seen.

Colour them in!

Fill in the blank flowers with the colours of the flowers you see around you



Oran O'Sullivan

Stretch

You can also use colour charts from a DIY shop and, in groups, search a natural habitat to find the closest match possible. Colours as opposed to shades work best for young children.

It is useful to check what plants are flowering in advance. This activity can be carried out each season to compare the different colours, see Activity 3, in 'Adaptations'.

Teacher's section

Pinecone challenge

To show the diversity in shape, size and colour, children gather pinecones and sort them according to their various properties. This activity is best held in autumn or winter, when more pinecones will have dropped. In a beach setting, shells may be used instead.

Materials needed None.

Instructions

1. First, ask the children to gather as many pinecones as they can and put them all in a big pile. Allow enough time to do this, as this is a great opportunity for them to explore their surroundings. Ensure it is made clear that pinecones should only be gathered from the ground, not picked from trees (the same goes for only picking up empty shells). You can then work through these activities in any order.

2. As a group, sort the pinecones into piles according to size, one pile of big ones, one of medium, and one of small.

3. Line the pinecones up end-to-end from largest to smallest. If you have a large group of children, or have collected a lot of pinecones, you may find it easier to divide up the pinecones and do this activity in smaller groups. You can even turn it into a game, with an added element of competition — give each group an equal number of pinecones and ensure they all start in unison, then see who finishes first.

4. Discuss the different shapes of pinecone you have found. For example, they may be long and thin, round, or egg-shaped. Then, ask the children to sort the pinecones into piles according to shape.

5. Discuss the different colours of pinecone you have found. What different colours are there (perhaps dark brown, reddish brown, light brown or grey)? If there are enough distinctly different colours, get the children to sort them into piles according to colour.

6. Create simple shapes by laying the pinecones on the ground. See if the children can 'draw' a square, circle, rectangle and triangle.

Simplify

Use fewer, more generalised categories when sorting. For example, omit the medium size option. And instead of sorting into individual colours, simply divide into dark and light.

Stretch

Extend the drawing activity by creating more complex pictures, such as a tree or a butterfly. Discuss the function of a pinecone and why they're not the same for each tree.

8 Backbones

Have a look at the animals which would be found in the area around you and sort them into animals without a backbone and animals with a backbone.


eg, Badger


eg, Earthworm

Animals without a backbone

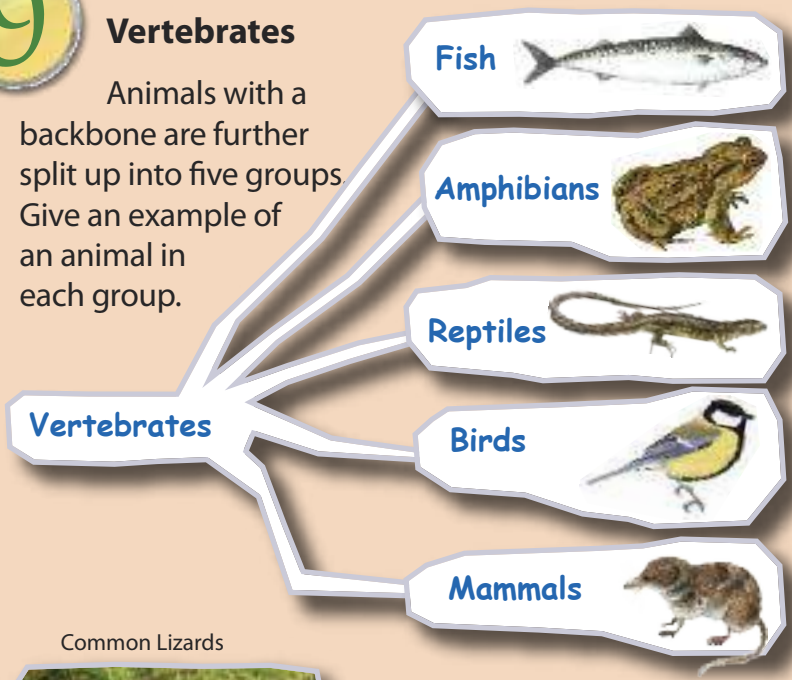
Animals with a backbone

FACT FILE

Animals that have a backbone (or spine) are called "vertebrates", whilst those without backbones are called "invertebrates".

9 Vertebrates

Animals with a backbone are further split up into five groups. Give an example of an animal in each group.



Common Lizards


Andrew Kelly

Did you know?

We have reptiles in Ireland. There are no snakes but we do have a type of lizard with no legs called a Slowworm (which mostly lives near the Burren) and the Common Lizard is found in many places around Ireland. These like to sunbathe and can shed their tail if caught by predators. Also, frogs aren't the only amphibians that live here: we have Natterjack Toads (they're endangered so can't be found in many places) and Smooth Newts too.

10 Mini-beasts

There are many different groups of invertebrates, or animals without a backbone. Some of these are described below.

Go outside and try to get a look at some of these invertebrate animals **and figure out which group they belong in...**

Arachnids Eight legs. No antennae (but often have fangs).

Insects Six legs. Antennae on head.

Molluscs No legs. Soft, moist body. Many have shells, some have tentacles.

Worms No legs, no hard skeleton. Long bodies are divided up into rings.

Crustaceans Have several legs, one pair can be claws. Tough armour on bodies. Two pairs of antennae.

Which group did you find the most of?

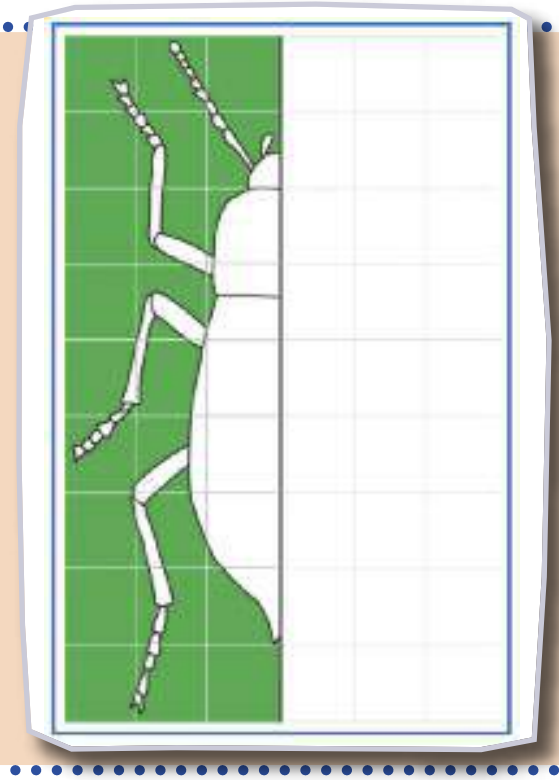
Group.....

11 Pop Quiz

Look at the bug in the picture below and pick the right words in each sentence.

1. I have **a backbone** / **no backbone**.
2. I am **an invertebrate** / **a vertebrate**.
3. I have **6/8** legs, so I'm **an arachnid** / **an insect**.
4. I am **a beetle** / **an ant**.

Great! Now complete this picture of me.



Community spirit

Just like in a town when lots of people come together, when different types of living things are found in the same place (for example living in the same tree) they make a community. This community of living things and their habitat (i.e., the place where they live) is called an **ecosystem**.

For example, hedges (which are found all over Ireland) may look like just brambles and bushes but are actually *whole ecosystems*.

What can you see?

Have a look outside and see what animals you can see.

Two insects you saw — Name? ..... Name? .....

Two birds you saw — Name? ..... Name? .....

Name five other animals you saw.

And what type of animal are they?

Mammal, mollusc, fish, crustacean, arachnid, bird, amphibian, insect or reptile


Fox (mammal)


Chaffinch (bird)

Name? ..... Type? .....

Name? ..... Type? .....

Name? ..... Type? .....

Name? ..... Type? .....

Name? ..... Type? .....


Cormorant (bird)


Dragonfly (insect)


Snail (mollusc)

Teacher's section

What's in that hedge?

Children examine a hedge for signs of plants or animals. This can be carried out at any hedge, however the larger the better, as this allows the children more to explore. A hedge in a natural setting such as the countryside is preferable as there is likely to be more to find. Hedgerows represent one of our most important wildlife habitats.

Materials needed None. However, you may find a magnifying glass helpful.

Instructions

1. Allow the children plenty of time to examine a stretch of hedgerow, looking for any signs of plant or animal life that they can find. Begin by discussing examples of what they may see and where they might find them.

2. Explain that they shouldn't be discouraged if they don't find much at first. Many of the smaller things are easily overlooked but will be found eventually if they keep looking. Encourage them to inspect the hedge from a range of perspectives, from the high and low, on the ground below, as well as considering what may be flying about in front of or above the hedge.

Hedgerow

Here are some of the things to keep an eye out for:

- Plants
- Snails
- Moss
- Lichen
- Tree roots
- Bees
- Caterpillars
- Butterflies
- Wasps or wasp nests
- Spiders or spiders webs
- Ants, beetle & flies
- Slugs or slug trails

Simplify Instead of individually, try carrying out the activity as a group or in small groups.

Stretch Ask the children to keep tally of things found as they go. For an even greater challenge, couple with activities above and separate into different categories: Flora and Fauna, Invertebrates and Vertebrates, etc.

We will look more at habitats in the next section but for now it's a good time to review the rather complex lessons learned with some fun games…

14 Stop the bus!

- Divide students into teams of three or four, or play as individuals.
- Print out empty tables (two rows and several columns) or get pupils to draw them.
- Decide, either yourself or with the students, a few different categories.
- Pick a letter; the aim is for students to think of one item, beginning with that letter, to go in each category.
- When all categories are filled they shout, "Stop the Bus!" Pause the game and check the answers.
- The first team or person to fill the row wins that round.

Use as review of recent topics and definitions. E.g. Food chains – predator, prey, carnivore, herbivore or Biodiversity – flora, fauna, vertebrates, invertebrates, etc.

Simplify
Don't choose specific letter.

Plant	Bird	Insect
Dandelion	Robin	Ladybird

Stretch
Make categories more specific/allow only Irish species

	Mammal with 4 legs	Plant with flower	Bird
P	Pine Marten	Primrose	Partridge
R			
D			

15 True-false runaround

- Choose two points a good distance apart – one for 'true' and one for 'false'. This could be a tree, or a person for example.
- Gather the group in the middle between the two points.
- Make a number of statements. Children have to decide if the statement is **true** or **false** and run to the appropriate point.
- After each statement confirm if it was true or false and the group return to the middle. At this point you could discuss/explain why each statement is true or false.

This is a good energiser and a good way to check learning at the end of an activity.

Stretch Introduce some 'Myth-busting' **true** or **false** questions, for example:

- Birds are the only animals that lay eggs. **False** Most animals lay eggs, including 2 mammals.
- Swifts never stop flying except to nest. **True** It's even believed they sleep on the wing .
- Fish are the only animals that can breathe under water. **False** All amphibians and some invertebrates can too.
- Mammals like dolphins and whales can't breathe under water. **True** They need to come up for air or they'll drown .
- There are no mosquitos in Ireland. **False** We have several species. None of which carry malaria.
- It's illegal to take a picture of a nest. **True** You must have a licence to do so .
- Bats are blind. **False** Bats see quite well but don't need to see at night.
- Some birds prey on other birds. **True** Many birds, not just birds of prey eat smaller birds.

Habitats

FACT FILE

What is a habitat?

Habitats are places that are home to living things. The main habitat types in Ireland can be divided into Water and Land habitats

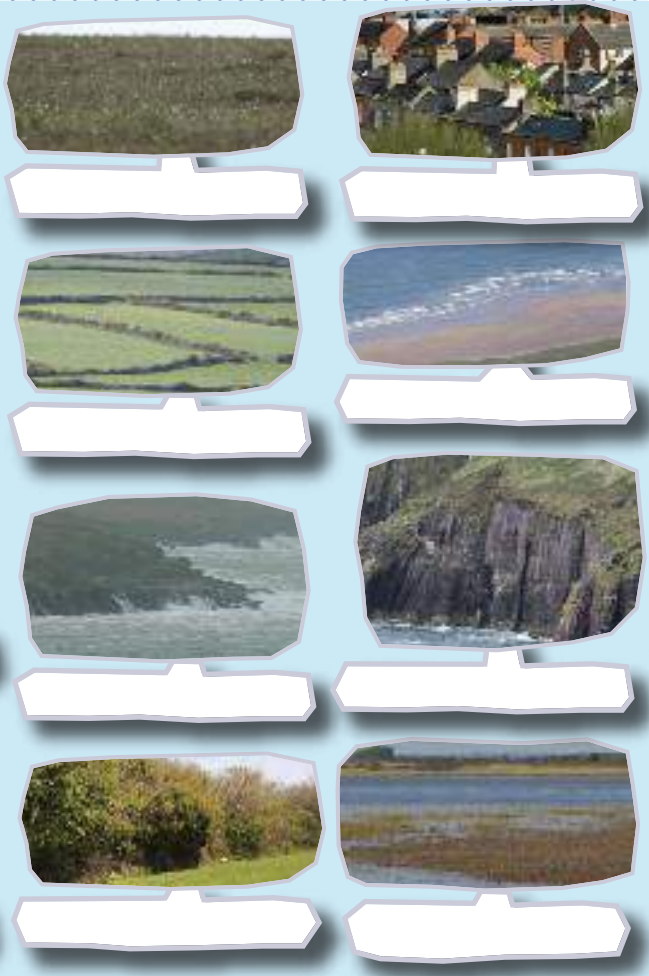
WATER HABITATS – Coastal
- Cliffs and coastland
- Estuary and Saltmarsh
- Rocky shores
- Sandy shores and sand dunes

WATER HABITATS – Freshwater
- Rivers and streams
- Lakes and ponds
- Marshes and bogs

LAND HABITATS
- Woodland
- Hedgerows
- Grassland and Farmland
- Upland
- Urban Habitats

1 Match the habitats with their name.

- ❑ Sandy shore
- ❑ Woodland
- ❑ Lake
- ❑ Saltmarsh
- ❑ River
- ❑ Cliffs
- ❑ Farmland
- ❑ Upland
- ❑ Hedgerow
- ❑ Urban habitat
- ❑ Bog
- ❑ Rocky shore



Habitats

2 Which habitats can you find at your school?

Tick the boxes of the habitats that can be found in or near your school.

❑ Flowerbed

❑ Garden

❑ Dead logs

❑ Farmland

❑ Woodland

❑ Hedgerow

Think about: What kind of living things do you think you might find in a dead log?

Garden photo: O.O'Sullivan. Others by M.O'Clery

3 Why do you think there is a need for habitats?

Living things have three basic needs; **Food, Shelter** and **Protection**. Habitats are important because they can provide all three of these things.

Let's look at habitats as a place of shelter for animals. Take a walk outside and look carefully for places that you think would provide shelter for animals.

Suggest what animals might use the place.

Example

Feature ..... Stone .....

Animal(s) ..... Slug .....

Feature .....

Animal(s) .....

Feature .....

Animal(s) .....

Feature .....

Animal(s) .....

Feature .....

Animal(s) .....

Feature .....

Animal(s) .....

Teacher's section

The Sparrowhawk and the finches

This game helps to demonstrate to children how habitats can shelter animals from predators.

Materials needed A length of string.

Instructions

1. All of the participants are finches except one who is a Sparrowhawk. Start by explaining that finches are a small bird that live in flocks and that the Sparrowhawk is a bird of prey who hunts for finches. There are two habitats in this game, the first is a woodland where the finches are safe from the Sparrowhawk as it can't hunt amongst the trees – mark this area with a length of string.

2. The second habitat is open farmland where the finches need to fly to find food – this is the rest of the space which you have (if you're in a very open area then set boundaries).

3. Start with all of the finches in the woodland and the Sparrowhawk standing next to you – perched on a tree overlooking the farmland. When you call 'fly' the finches have to leave the woodland and fly around looking for food in the open farmland. When you call 'Sparrowhawk!' the child who is the Sparrowhawk can leave your side and try to catch as many finches as possible while they race back to the woodland. The Sparrowhawk catches a finch by tapping them on the shoulder; they are then 'eaten' so they're out of the game.

Stretch

After a few goes you can explain that due to human pressures on the environment the woodland is at risk and progressively reduce the size of the woodland – do this while they are flying around finding food. For example it could be that the farmer needs more land to grow his crops, or that a developer has decided to build a hotel. You could also add a second Sparrowhawk if you want to. Continue until all the wood is removed... habitat loss is a terrible thing!

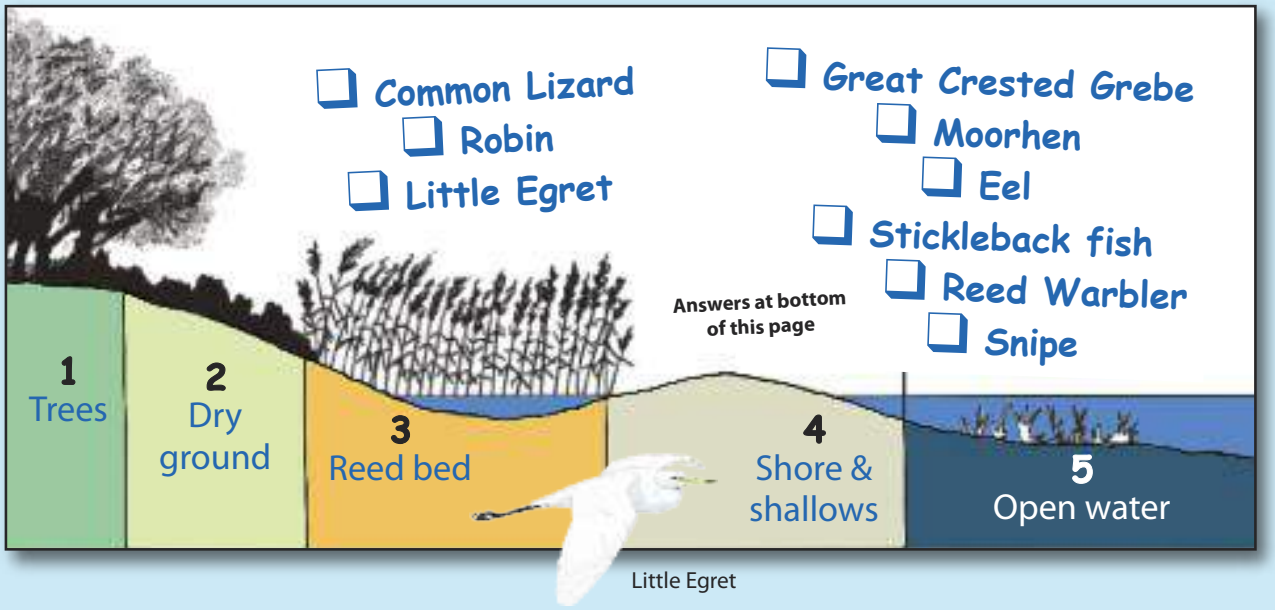
4. In order to bring everyone back into the game and to explain that we can also take action to look after the environment you can then explain that environmental charities are working to protect the habitat (this is a good place to introduce the term '**Conservation**') and a new area of woodland has been created – make a new area with the string. Everyone gets one final go running around, follow up with a discussion about what the game taught them.

Stretch further

Tie this game in with activities in the '**Human Impact**' section.

5 Where would you find them?

Number the animals according to their habitat.



Little Egret

A Walk by the Lake

Ms Fitzpatrick's class were excited about their field trip to the local Nature Reserve. They were keen to see all the habitats and wildlife at the reserve because they had just studied habitats and food-chains in their Biodiversity lessons. There they met Mr Harmey the Wildlife Ranger who would give them a tour. He led the class down the woodland path where the pupils heard a bird singing in the trees. They quickly spotted it and knew it had to be a Robin because of its red breast. They had all seen Robins before either at home or at school.

The class then came to an open area with many shrubs and rocks. Ms Fitzpatrick advised them that if they were quiet they might spot a Common Lizard. Sure enough, Ricky spied one on a nice dry rock, sunbathing before going to catch insects. Everyone was amazed as many didn't know that any type of lizard, or even reptile, lived in the wild in Ireland. Not too far from there the pupils could see the edge of the lake lined with reeds, and they could hear strange sounds coming from within. "That's a small black waterbird called a Moorhen" said Mr Harmey. Then there was a different sound, a loud song constantly changing notes and rhythm. "That one is a Reed Warbler, a bird that migrates from Africa to Ireland each spring to nest in reedbeds" he told them.

Further along the path was a bird hide, it was like a big wooden shed on stilts where they could sit and watch the birds. They hadn't even sat down before a beautiful big white bird flew from the reedbed edge and past the windows. Oonagh identified it as a Little Egret using the wall chart that hung in the hide illustrating all the birds found at the lake. The whole class agreed her ID was correct. The Ranger explained that egrets are fish eating birds and come to the lake to hunt for Sticklebacks and Eels found in the shallow water at the edge of the lake. Mr Hatch, a local birdwatcher also using the hide, let the class try his spotting scope to see birds that were far away. Brian spotted a new bird swimming far out in the open water. Again, using the chart, he figured out it was a Great-Crested Grebe, a bird specialised in diving to catch fish. Before leaving the hide Mr Hatch asked if they had seen the Snipe feeding along the shore in front of the hide. It was so well camouflaged as it quietly probed the soft mud for small worms and other invertebrates, Ms Fitzpatrick or Mr Harmey hadn't even spotted it.

On the walk back to the bus, the pupils chatted about how they were surprised by how many different uses there are for habitats. Some animals use them for food, some for shelter from predators and others for nesting. At the end of the day they thanked Mr Harmey for a great day out investigating habitats and the animals that lived there.

6 Teacher's section

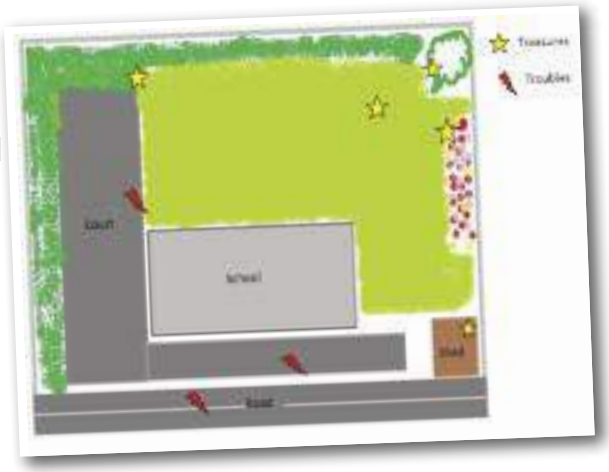
Troubles or treasures

Viewing the school grounds as their habitat, from the perspective of a living thing, students map the area based on what it has to offer and what dangers it presents.

Materials needed clipboard, paper, pencil/pen or marker (1 per group).

Instructions

1. Divide students into small groups of 3-4.
2. Have each group assess the outdoor space from the point-of-view of a living thing. Choose animals, or other living things, that you are likely to find in the area (e.g. squirrel, ant, butterfly, bird, frog, worm, snail, plant etc.).
3. Get them to explore and map the school grounds, identifying any resources (treasures) and dangers (troubles) along the way. They should view everything from the perspective of the chosen living thing. Treasures may be areas of shelter, away from human activity, a food source, a place to nest/raise young, etc.
4. Encourage students to look at the big features of the school grounds as well as the smaller details. The grounds should be examined closely (check under rotting logs, etc.) for additional treasures and troubles.
5. As the students identify treasures and troubles, they should outline and label them on a "treasure map" of the school ground from the perspective of their living thing.



Simplify Provide students with a map of the school ground and have them fill in the details.

Stretch Make a 3-D model of the features of the school grounds or map a section of your town. Tie in with the '**Human Impact**' section and look at the grounds and surrounding area from the view point of a developer also.

7

Shelter Building

A. Try building a den for a stuffed animal out of natural materials. Make sure it will keep them nice and warm.

B. Build a nest from different natural materials you find outside. Put it in a tree with eggs or small stones and see how it fares. This can be done individually or in groups.

Answers to no 5. Common Lizard, 2. Robin, 1. Little Egret, 4. Great Crested Grebe, 5. Moorhen, 4. Eel, 5. Stickleback fish, 5. Reed Warbler, 3. Snipe, 2.

8 Changing Habitats

Biodiversity is a very good thing, so it's great when there are lots of different living things around. Unfortunately, because of things like climate change and human activity, many **habitats are changing**, getting smaller or disappearing all together. A lot of living things don't like these changes because their homes are taken away or they can't find food/a place to raise their young and so there's less and less biodiversity all the time. Some of the living things have even gone ***extinct*** already.

Think about Moorhens and Coots in their habitat and, if you can, visit them there. Which of these changes do you think they would not like? Put a **sad face** beside the changes they **wouldn't** like and a **smiley face** beside those they **would like**.

- ☐ The water dries up in summer
- ☐ Some more plants and reeds grow in the water
- ☐ People throw litter in the water
- ☐ The pond fills up again with water after drying up in the summer
- ☐ After a heavy rain storm, the pond water becomes too deep
- ☐ The pond is filled with soil and made into a playground

Coot

Think about:
Do you think climate change can affect habitats of the animals and plants that live in Ireland?

Moorhen

9 Teacher's section

Killer Whales and Seals

This is a good way of showing one effect of climate change, namely, the result of rising sea levels.

Materials needed Newspaper, ropes.

What can humans do to help increase biodiversity? Have a look in '**Biodiversity Boosters**' for some simple suggestions on how you can help.

Instructions

1. Create islands using newspaper or ropes.
2. Everyone is a seal and should swim around in the sea (everywhere that isn't an island).
3. When the whale appears (when you shout "whale!") the seals must haul themselves up onto an island to avoid being eaten.
4. Make the islands smaller and progressively remove them.
5. If the children don't fit onto the island anymore then they are eaten by the killer whale and are out of the game.

Simplify You can also do the activity with one of the children getting to act as the killer whale.

Teacher's section

The race against time

Children pretend they are a parent bird trying to collect food to keep their young alive.

Materials needed Short lengths of coloured wool.

Instructions

1 It is hard work raising a child and it takes a lot of energy for birds to find enough food for themselves and their chicks during this delicate time. This game demonstrates that when there is plenty of food nearby, birds can find food easier and use less energy looking for it. However, because of habitat loss it has become increasingly difficult to find enough food and therefore to raise young.


Robin

M.O'Clery


Spotted Flycatcher nestlings

Shay Connory

2 **How to play** Decide what bird children will be and the prey they will hunt. A Barn Owl searching for mice is a good example, as their habitat has reduced a lot in recent years.

3 Place food items at various distances from the nest and give children a set amount of time to collect them all before their chicks go hungry. Two or more children can race against each other.

4 As they can only carry one item in their beak, they must return to the nest with each item they find – like a relay.

5 The richer habitat, where food is more abundant, is further away from the nest. To show this, place one food item closest to the nest (let's say 5ft away from it), then two items 10ft from the nest, three items at 15ft, and so on.

6 The food can be in plain sight or somewhat hidden so they have to search for it (e.g. woollen caterpillars in the grass).

Stretch Introduce low and high energy foods. Place low energy food nearer to the nest and high energy further away to show how it becomes harder and harder for birds to find their ideal food and so they must settle for a lower quality food source. Suggest a scenario as to why food is in short supply – for example, many of the surrounding hedges have been cut and now berries are very hard to find.

Adaptation

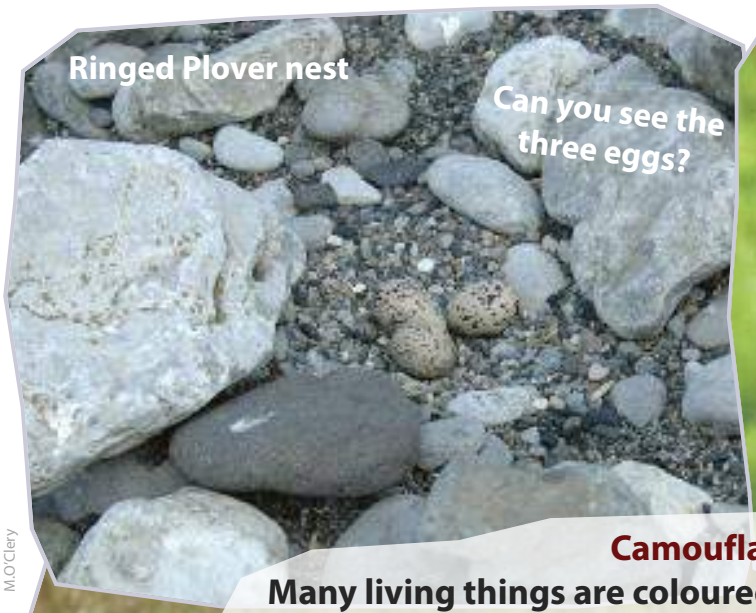
FACT FILE

What is a adaptation?

Over time living things have changed or **EVOLVED** to help them survive in their environment, and the habitats they live in. This is called **ADAPTATION**.

There are lots of different kinds of adaptations;

- Evolution of colour to attract a mate, or to hide.
- Evolution of shape to keep away predators or to be able to eat different kinds of food
- Evolution of behaviour/shape to be able to migrate, or by changing to hibernate when it gets too hot or cold.



Ringed Plover nest

Can you see the three eggs?

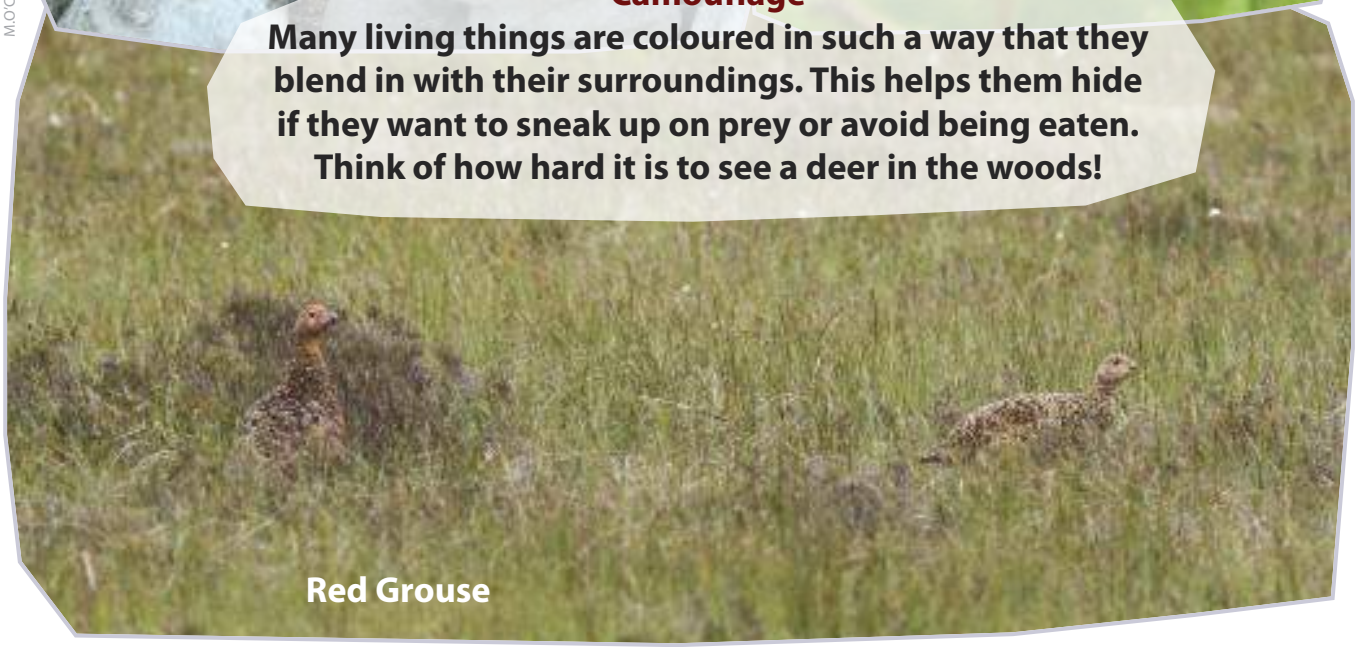
M.O'Clery

Green Shield Bug

Breffni Martin

Camouflage

Many living things are coloured in such a way that they blend in with their surroundings. This helps them hide if they want to sneak up on prey or avoid being eaten. Think of how hard it is to see a deer in the woods!



Red Grouse

1

Teacher's section

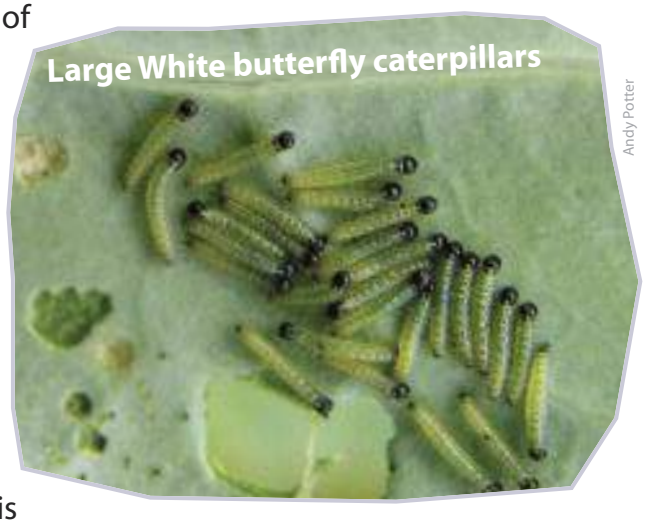
Caterpillar Hunt

Adaptation

Children learn about the concept of camouflage through role play as birds on the hunt for caterpillars to eat.

This is an active game that can be held in any setting.

Materials needed 3 or more colours of string, of which at least one must be a similar colour to the surrounding environment (e.g. a dull brown or green would be suitable for a woodland), a pair of scissors.



Large White butterfly caterpillars

Andy Potter

Instructions

1. Cut the string up into lots of small pieces of 2-5cm in length. Make sure there is an equal number of each colour.

2. Hide the string at low levels and on the ground, ensuring that the children don't see where it is hidden. You may wish to do this before the children's arrival, or whilst they are distracted with another activity.

3. Explain to the children that they will be role-playing as hungry birds and that pieces of string will represent the caterpillars that they eat.

Elephant Hawkmoth caterpillar

Dave Daly

4. Allow a set period of time (e.g. 10 minutes) for the children to find as many string 'caterpillars' as they can and bring them back to you.

5. As a group, sort all the gathered string 'caterpillars' into piles according to colour, then count how many there are of each.

6. Discuss the results, introducing the idea of **camouflage** to explain it.

Perhaps they managed to find fewer of the colours that camouflage well. Even if not, ask which colours were they thought were easier to find. Explain how some animals use camouflage to hide themselves from predators.

Simplify

Try cutting larger 'caterpillars' and distributing them more noticeably, e.g. laid on open surfaces rather than hidden.

Stretch

Try making it into a race. Divide the group into teams competing to see who can find the most 'caterpillars' within the given time. This also gives them practice at effective teamwork.

Now you see me...

This game introduces the concept of how prey use camouflage as a strategy to hide from predators.


Woodcock

Stanley Porter - rspb-images.com

Materials needed None.

Instructions

1. One person stands in a central spot in a natural habitat, and they are not allowed to move.
2. He/she counts to 20 and everyone hides.
3. When the spotter opens their eyes they have to shout out the name of any participants that they can see. If they can't tell who it is they can describe their location or clothes. If they are spotted they're out of the game.
4. The spotter counts to 20 again and participants have to move closer. If they are spotted they're out of the game.
5. The spotter counts to 20 for the last time – the person closest to the spotter who isn't caught wins.


Curlew and chicks

Derek Belsey and Cliff Reddick

Kids love a simple game of '**Capture the Flag**', whereby two teams strive to defend their own flag whilst trying to capture the flag of the other team. If you have access to a woodland, this is a great one to play in an open space and then in a woodland to show that richer habitats provide more safety from predators.

3 Seasons

Seasons create lots of change in temperature and weather which can be tough on nature, but living things have come up with lots of different ways to deal with this.

Trees lose their leaves in autumn before the cold dull winter and plants flower in spring when it's getting warm enough for the pollinators to come and spread their pollen. Animals migrate when it's too hot or cold in their country and food is harder to find and some simply sleep through the tough times.

Colours of the seasons

Which season are we in now?

- ❑ Spring
- ❑ Summer
- ❑ Autumn
- ❑ Winter

What colour are the leaves on the deciduous trees around you?

- ❑ Green
- ❑ Yellow / orange
- ❑ Brown
- ❑ There are no leaves

4 Did you know?

Leaves of deciduous trees can dry out or freeze in the harsh winter weather. So, to protect themselves, these trees take back the nutrients from their leaves – which is what causes them to change colour. They store these nutrients in their sturdy trunk and branches and drop their leaves. Deciduous trees stay dormant for the winter (like how some animals hibernate) and grow their leaves back in spring when the weather is warmer.

Leaf rubbing

Find a fallen leaf, place it on a table with the back facing up, put a thin sheet of paper on top of it and rub the side of a crayon or an oil pastel gently over the area where the leaf is.

Stretch

Repeat these activities over each of the seasons. Follow on with activity 5 of this section. For older classes, investigate what causes all the different colours in autumn leaves.

5

Teacher's section

Adaptation

Colour Bingo!

Children act as 'detectives', searching their surroundings for different colours, which they check off one-by-one on a bingo-style sheet. This is a very versatile activity as it can be carried out in any setting and is easily adapted to different abilities.

Materials needed Printed copies of the colour bingo sheet (see below) and pencils.

Instructions

1. Before the activity, ensure you have printed enough colour bingo sheets and pencils for each child. You can photocopy our examples below, or you may create your own to suit the children and the setting.

2. Children use the sheet to see if they can find all the listed colours in their surroundings. This may be carried out individually, in small groups, or as a whole class. It can even be made into a competition where the winner is the first to find them all.

3. Make sure to clarify that they should simply tick off each colour when they find it, and should not pick plants or bring things back.

4. Before they begin, ask the children to predict which colours they expect to be most common, and which will be the hardest to find. Briefly discuss the reasons for these predictions.

5. Upon their return, go through each colour discussing what they found and where they found it.

Simplify
Design a colour sheet with fewer colours, and try to focus on those more commonly found at the location.

Stretch
Create a sheet with more colours to be found. Or ask the children to find light and dark examples of each colour.

Brown	Green	Yellow
Red	Blue	Grey
Orange	White	Pink

Your name .....

Brown	Green	Yellow
Red	Blue	Grey
Orange	White	Pink

Your name .....

6 Hibernation

One of the ways animals adapt to the changing seasons is to curl up nice and warm with a stash of food and sleep for the winter when it is cold and food is hard to find. Some animals, like snails, hibernate at other times: when there's not enough food or water, or if it's too warm.

Which of these animals hibernate in winter in Ireland?

❑ Bat

❑ Ant

❑ Robin

❑ Otter

❑ Hedgehog

❑ Salmon

❑ Pygmy Shrew

❑ Bee

❑ Snail

Answers are at the bottom of the next page

7 Migration

Many types of animals make long journeys, usually during winter or summer. It is not fully understood why some travel as far as they do but we do know that they travel to find food or to the place where they will have their young.

Lots of different types of animals travel, from little insects to big mammals. Did you know… the Painted Lady butterfly travels all the way from North Africa to spend the summer in Ireland? That's a long way for a little lady!

Some animals migrate here during the summer because it's a lot cooler here (in temperature of course!) than where they've come from, but others migrate here during winter. Can you guess why?

Tick the ones you think are true

- ❑ They love rain, and it rains more in Ireland
- ❑ They come here to do their Christmas shopping
- ❑ Where they come from, food is hard to find in winter
- ❑ Hotel prices are cheaper in Ireland in winter
- ❑ Ireland never gets as much snow and ice as the place they have come from

A. Which of these animals migrate to Ireland?

Michael Finn

❑ Swallow

S.Rae, Wiki Commons

❑ Woodlouse

M.O'Clery

❑ Sanderling

M.O'Clery

❑ Sedge Warbler

Ita Martin

❑ Rabbit

Dick Coombes

❑ Swift

M.O'Clery

❑ Robin

Oran O'Sullivan

❑ Painted Lady

B. All but one of these migrants are spring or summer visitors. Can you guess or find out which one is the winter visitor to Ireland?

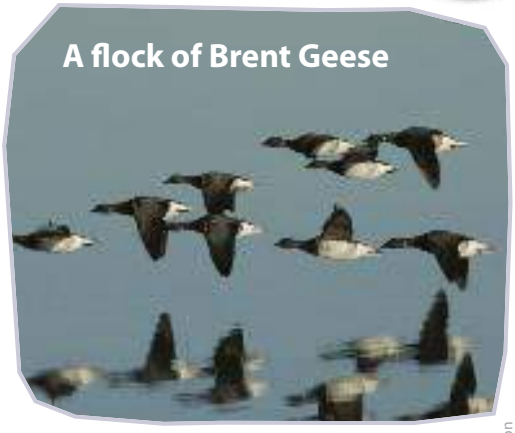
Your answer.....

Answers are at the are bottom of the next page

Answers to Activity no. 5. Bats, Snails, Bees and Hedgehogs all hibernate during winter in Ireland.

Teacher's section

The migrating flock



David Dillon

Children pretend to be a migrating herd or flock and must trust their navigator (you can think of the navigator as their natural instinct) to guide them.

Materials needed None.

Instructions

1. Groups of four or five stand in a line behind each other facing the same direction. The person at the back is the leader with their eyes open. Everyone else has their eyes closed.

2. The person at the back must guide the group to a certain place using shoulder taps to turn the group and shoulder presses to get the group to duck under something – the message should be passed up the line without anyone speaking.

This is a good exercise in communication and trust.

FACT FILE

How do we know where they go?

People used to think that Swallows hibernated during winter at the bottom of ponds.

Years ago, one man wanted to tell his garden birds apart from each other so he caught them and put unique rings on their legs. Then in 1912 an amazing discovery was made... he got a letter to say a Swallow that he'd put a ring on was found all the way down in South Africa!

Dick Coombes

This is how we found out that Swallows migrate to Africa.

Ringing is now commonly used by scientists to track where birds and other animals go.

Answers to 7A. Swallow, Sanderling, Sedge Warbler, Swift and Painted Lady Butterfly migrate to Ireland.
Answers to 7B. Sanderling are commonly seen along our coastline during winter.

10 Shape

Living things come in all kinds of shapes and sizes. There are lots of different ways that the shape of a living thing can help it survive in the wild. It could be that it helps it find a mate, hide or defend itself from predators, or even to help it eat its favourite type of food.

When you take a good look, you'll see plants are not just flowers and trees, they are all sorts of different shapes. We saw different leaf shapes back in Activity 4 of the 'Biodiversity' section, these are all adapted to suit their lifestyle. One of the most common reasons things are the shape they are is for protection against predators. Let's take a look at plants with spikes as an example.

Some plants like the Thistle (right) have spikey leaves.

A. How do you think this helps them to survive?

B. See how many spikey plants you can find outside and write the number in the box.

11 Insect Survey

Flowers are also shaped in such a way that they attract the right kind of insects (or other kinds of pollinators), that will help to carry their pollen to other plants.

In much the same way, different types of insects have adapted unique ways of feeding so they can all eat from different flowers, as well as the other kinds of food insects eat.

In an area where there are different kinds of flowers, record details of the flowers and the insects that visit them below. This is best carried out on a dry and sunny spring/summer day.

Flower	Colour	Smell	Shape (eg, deep, flat, bell-shaped)	Insects visiting

Do some insects prefer one special type of flower? ❑ Yes ❑ No

FACT FILE

Most flies and honey bees have short tongues and gather nectar. Moths and butterflies have longer tongues to reach nectar in deep flowers. Many bumblebees have long tongues to help lap nectar in deep

flowers too, but some of the bumblebees with short tongues cheat by biting the bottom of these flowers.

Adaptation

12

Teacher's section

The Short Straw

This activity shows how insects have adapted different mouthparts which help them to feed on a range of flowers so they don't all have to fight over the same food source. This is a common example of adaptation.

Materials needed Plastic cups, straws, squash and water.

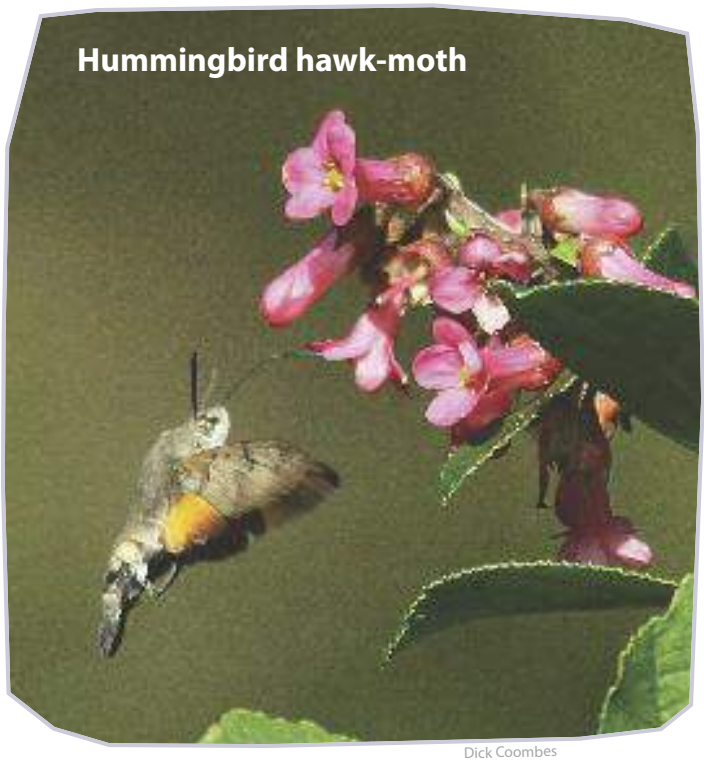
Instructions

1. Cut some plastic cups to a few centimetres (flat, shallow flowers) and some straws so they are about the same length as the cups (short-tongues).
2. The rest of the cups represent deep flowers and remain un-cut. Put the same amount of diluted squash into each cup. Long straws represent long tongues (like butterflies).
3. Participants take long or short straws and assume the roles of either short or long-tongued bees. How successful are they at taking nectar from the different flowers? Can this explain some of the observations from the insect surveys?

Stretch

Start off with enough short straws for everyone but only enough short cups for half the class. Let children observe how difficult it is for everyone to get a drink of the 'nectar'. Then give half of the class long straws instead of short ones and introduce the long cups.

Now everyone can feed in the same space because they have adapted to the environment. This also demonstrates competition for resources.



Hummingbird hawk-moth

Dick Coombes

13

Best beaks for the job

Adaptation

It's not just insects, Lots of animals have mouth parts that are adapted to help them eat their favourite foods. These are some of the different mouth types Irish birds have.

Sand Martin - insect-catching

Teal - filtering

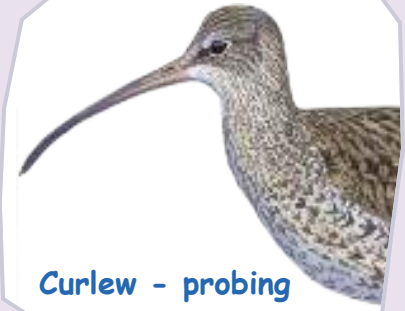
Crossbill - extracting seeds

Oystercatcher - chiselling

Grey Heron - stabbing

Reed Bunting - cracking

Curlew - probing



Wren - pecking/ probing

Sparrowhawk - tearing

Look at the beaks below. Which one do you think would be best for cracking seeds?

Answers is at the are bottom of the next page

❑ Tunstone

❑ Bullfinch

❑ Kingfisher

Feeding Frenzy

Students adopt a mock-beak and investigate how different beaks work for eating different kinds of food. Using everyday objects, they will try to collect food and lift it into their 'stomachs'. This is a great opportunity to tie in the lessons learned above.

Materials needed Suggested foods: uncooked shell pasta, cooked spaghetti/noodles, jelly worms, raisins, fruit, sunflower seeds, nuts (provided no-one is allergic), sprinkles, mini marshmallows. There are lots of options so use your imagination.

Suggested beaks: Give one set per group – toothpick, clothes peg, small plastic scoop, straw, spoon, tweezers/small scissors or tongs.

Other: small cup as the stomach (1 per student), paper plate for feeding dish (1 per group), whistle/bell.

Instructions

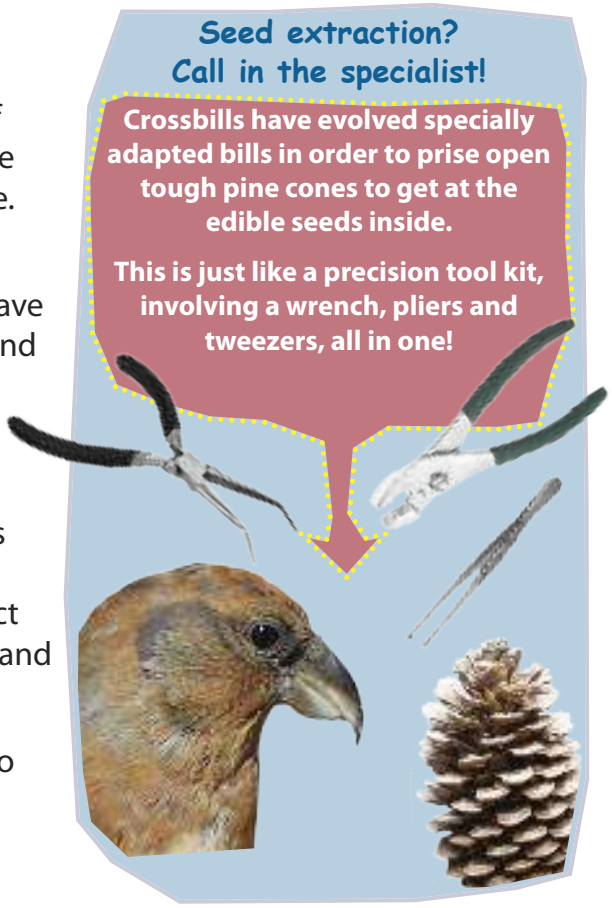
1. Before playing the game, discuss what kind of bird's beak the utensils represent and what the various kinds of food might represent in real life.

2. Put children in groups of 4-6 and within each group give each child a different beak type. Have them hold the beak in one hand and the other hand behind their back. This can be played at a table or around a mat on the floor, inside or outside.

3. Give a plate to each group and place one and of the food types in it. Give each child a cup as their 'stomach'. When you blow the whistle, they must compete for as much food as they can collect with their beaks. They must take it from the plate and into their cups. It has to get into the cup to count.

4. Allow 5-10 second to 'feed' then signal them to stop. Ask students which beak was the most efficient at collecting that food type.

Repeat for each of the food types.



Stretch

Evolve it into an arts and crafts activity – make masks of the different beak types, make papier-mâché models of the birds and their food, give each child/group a mouth type write up posters about it. Discuss the different feeding strategies and associated adaptations in other animal groups.

Answers to Activity no. 13. Bullfinch

15 Teacher's section

Adaptation

Bat and Moth

A game to introduce the concept of echolocation

Sound is an important adaptation in many animal groups. Humans are the only animals that use complicated language to talk to each other but other animals do communicate, just in a different way. From insects like grasshoppers rubbing their legs and wings together to birds singing, there are lots of way animals make sounds. Animals use sound to tell each other where they are – like a mother that's left her baby – so they recognise one another, to attract mates, to scare other animals away or call for help, and more. Some use a special type of sound called echolocation to hunt.

Materials needed A blindfold.

Instructions

1. Form a circle and discuss what food bats eat, and how they find their food if they are nocturnal. Introduce the concept of echolocation.
2. Choose one volunteer to blindfold to be the bat and one or more moths. (Moths don't have to be blindfolded but they can be to add to the challenge).
3. To demonstrate echolocation the bat finds its food (the moth) by repeating "bat, bat, bat", every time that the bat says "bat" the moth should respond by saying "moth". The more frequently the bat says "bat", the more frequent the response should be. Bats use this technique with echolocation making very quick noises when they are near their prey to build a clearer picture.
4. The rest of the participants in the circle are the trees and they have to stand still but they can wave their arms. It is important that trees are as quiet as possible so the bat and moth can hear. If a blindfolded child moves too close to the tree circle the children can quietly say "tree" to let them know.

Once the moth(s) are caught, repeat with different people.

Stretch

Brown long-eared bats are quite common in Ireland and love to eat moths. Get children to make a pair of long bat ears and wear them during the game when they're on.

FACT FILE

There are nine types of bat in Ireland. They can all see but use echolocation to hunt.

- **Fruit bats don't need echolocation to hunt because they've got big eyes and a very good sense of smell to help them find the fruit they eat at night.**
- **There are no fruit bats in Ireland; in fact there's only one type in all of Europe.**
- **Some whales and dolphins use echolocation to communicate, navigate and hunt.**

Bottlenose Dolphin

16 Teacher's section

Adaptation

Noah's Ark

This game demonstrates how animals use their individual sounds to find their own kind.

Materials needed Card, pens.

Instructions

1. Create cards with pictures of animals (an even number of cards, with two cards for each of a variety of animal). Shuffle the cards and give each child a card.
2. Alternatively, just whisper the name of animals to the children or write them on pieces of paper and hand these to them.
3. The group should all spread out in the area that you have and then each child has to assume the sound of the animal on the card and find their partner.

Make sure the animals you choose are 'doable' and that no two pairs are likely to be acted in the same way (e.g. tiger and lion). Possible pairs include: wolf, elephant, monkey, gorilla, birds, snake, horse, sheep, pig, chicken, duck, woodpecker, wild cat, donkey, deer, frog, bee.

Simplify Don't just focus on sound, allow children to find each other through actions instead of or as well as animals noises. You can now include more silent animals, e.g. butterfly, deer, bee, giraffe.

Stretch Find your Flock - Similar to but with 'flocks' of birds with distinctive songs/ calls, e.g: Great Tit ('tea-cher, tea-cher'), Cuckoo,Jackdaw ('jack'), Corncrake ('crex'), Woodpigeon. You could use this as an opportunity to tie in with Activity 18.

17 Teacher's section

Bird feeding game

This game is a relay race with each team collecting cards with pictures of the food that birds eat from the teacher. It is a good opportunity to discuss how different species are adapted for different food sources and how they can be limited by availability of this food.

Materials needed cards (laminated images will do) of each food type: worms, seeds and beetles.

Stretch
Use different animal species: E.g. Rabbit, Squirrel, Hedgehog. Tie-in with activities 10 - 13 of this section.

Instructions
Create three teams – Blackbirds, Greenfinches and Great-spotted Woodpeckers. Blackbirds eat worms, Greenfinches eat seeds and Great-spotted Woodpeckers eat beetles. Teams race against each other to get to the teacher and pick a card. If the card they pick is their food item, they take it back to their team. If it isn't, the card goes back in the pack and the player returns to their team empty handed. The first team to collect all of their food items (the same number for each team) wins.

18 Teacher's section

Adaptation

Counting Sounds

Open children's ears and minds to the natural world around them.

Materials needed None.

Instructions

1. This simple activity gives children a chance to stop and listen to what's going on around them.
2. Arrange the group in a circle and ask everyone to raise both hands in a fist shape.
3. Everyone closes their eyes for a timed minute or two.

When their eyes are closed, in silence, children raise a finger for each different bird sound they hear (or you can change it to be any natural noise, or first natural then un-natural noises).

4. At the end of the minute ask each child how many different sounds they heard.

There is no right answer – as well as hearing different things participants will count the same noises in different ways. This is a good activity for calming a group down, and helping people focus on birds (or other) sounds.

Singing Chaffinch

Stretch
Listen for unnatural noises to tie in with the 'Human Impact' section.

19

Drawing Bird Sounds

Introduce children to bird song.

Birds are found in most habitats but are so fast that they can often be hard to get a good look at. A great way to spark children's interest in the nature that surrounds them and bird identification is to introduce them to bird song. Identification through sound allows us to 'see' that there is in fact many living things around us, even in urban environments.

Materials needed Paper/card, pencils.

Instructions
Give everyone a small piece of paper/card and a pencil. Participants make marks on the paper to represent how they hear a particular bird noise. This is another good focussing activity that encourages children to really listen to bird song.

If you don't have clear bird song in the area you're doing the activity you can play bird songs – there are lots of good applications for this.

Singing Wren

Shay Connolly

20 Teacher's section

Adaptation

Sound Map

Create a sound map of from bird song and other sounds, both natural and man-made.

Materials needed Paper, pens.

Instructions

1. Get each person to draw an 'X' in the middle of their paper to represent their geographical position.
2. They then use symbols/marks to represent all the noises they can hear around them – both natural and man-made – in relation to where they are sitting.

Everyone should move away from each other and find their own space for this activity.

21

What's that bird?

Open children's ears and minds to the natural world around them.

Materials needed Bird sounds (on app or video).

Instructions

Choose four common garden birds to teach the children about, and play tracks or videos of their bird song for the class.

1. Then place laminated pictures of the four birds a distance apart from each other, either on the walls or the ground outside.
2. Play one of the bird's songs and have children move or run to the picture they believe it belongs to. Then reveal the correct answer.

Repeat as often as you want.

Michael Finn

Singing Blackbird

Stretch

Repeat several times throughout the year with a different selections of birds. If you are planning on taking part in the Schools Garden Bird Survey (see the 'Wild Detectives' section) choose familiar species, this is a good way to familiarise yourself and the children with the birds using your school grounds.

Human Impact

Sharing the world

The environment we live in doesn't just belong to us, we share with all the living things around us. The Earth is their home just as much as it is ours. Sometimes humans forget this and we don't think about how the things we do might be bad for nature.

Think about it this way... nature is home to lots of living things, and although you can't see many of them, they're still there. Imagine you were walking through a stranger's house; would you leave your litter on the floor? Trample all over the furniture and damage it? Take pieces of it home with you?

It's not very likely, but sometimes when we are out in nature we forget we are walking through the homes of many other living things.

1 Grumpy or happy?

As you walk around in the outdoors, imagine which actions would make the plants and animals that live there Grumpy or Happy. Put the right emoji in box beside the action.

- ☐ Walking along the path
- ☐ Creating lots of noise
- ☐ Catching butterflies
- ☐ Keepng our voices low
- ☐ Picking flowers
- ☐ Littering
- ☐ Taking photos

Wiki Commons

Did you know?

Midges help make chocolate!

The living things we share the planet with do a lot of good things for us. You may have heard that trees help us breathe and clean our air. We also rely on them for food, and without pollinators like bees we wouldn't a lot of have fruit or vegetables. You may not think that's such a bad thing but did you know a type of small midge pollinates the cacao plant that gives us chocolate, so without it there would be no Dairy Milk!

2

Teacher's section

Why do we need trees?

An activity to demonstrate the importance of trees in the ecosystem.

Materials needed None.

Instructions

1. Choose three or more people to be trees. Everyone else becomes an animal that lives in or on a tree and moves to one of the trees.
2. Discuss oxygen-carbon dioxide cycle.
3. Animals can only breathe when they are next to a tree and must hold their breath to move between trees when you say 'move'.
4. After a while introduce a 'chainsaw' by making the noise and pretending to hold a chainsaw or using a prop and start chopping down the trees.

Woodland

M.O'Clery

This activity demonstrates the importance of trees in the ecosystem. If we lose our trees the living things that depend on them lose their homes and it has a negative impact on our atmosphere. Chopping down trees also means that we lose the 'lungs' of the planet, and remember this doesn't just affect wildlife; humans need trees for oxygen as well.

In Ireland, the air is polluted mainly by cars and other vehicles, power stations and agriculture. This pollution makes the air and water 'dirty'. However, trees are here to help. Trees can clean the air and water through respiration (that's just the fancy name for the way they breathe) and through their roots. Just one tree can remove 4.5kg of pollutants each year. This is one of the reasons we need more trees!

3

How much air do trees clean?

Count how many trees there are in the area around your school and do the simple sum below on your calculator.

multiplied by

❑ Number of trees **X** 4.5 kg of pollution per year **=** ?

This shows how much pollution is removed by the trees just in your immediate area!

4 Lichens

Have you ever heard of Lichens? They are living things that you will have seen but probably not noticed. They are mostly seen growing on rocks and tree trunks. Most lichens cannot survive in places with polluted air so if you see an area with lots of lichens the air is probably nice and clean there.

Here are some of the lichens we find in Ireland. Take a look outside at the tree trunks, rocks and walls around your school to see if you can spot any lichens.

Did you know?

Lichens are not made of one living thing but two. They are fungi (like mushrooms and mould) and algae (like seaweed – these make food from the sun like plants do). The two help each other survive. This is known as **Symbiosis**.

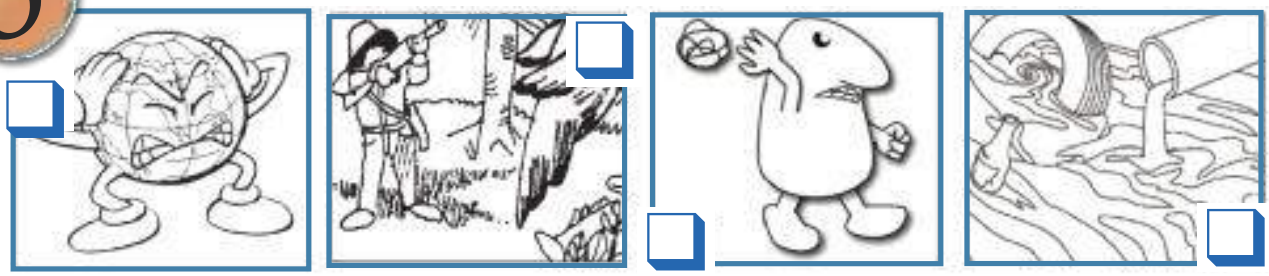
M.O'Clery

Did you find any lichen at your school? ❑ Yes ❑ No

Was it growing on rocks, walls or trees? ❑ Rocks ❑ Walls ❑ Trees

So, do you think the air around your school is clean? ❑ Yes ❑ No

5



In what way do these probelms affect nature?

Noise pollution .....

Illegal hunting .....

Littering .....

Water pollution .....

Stretch

Play activities 16 & 18 of the 'Adaptations' section. Concentrate only on unnatural sounds.

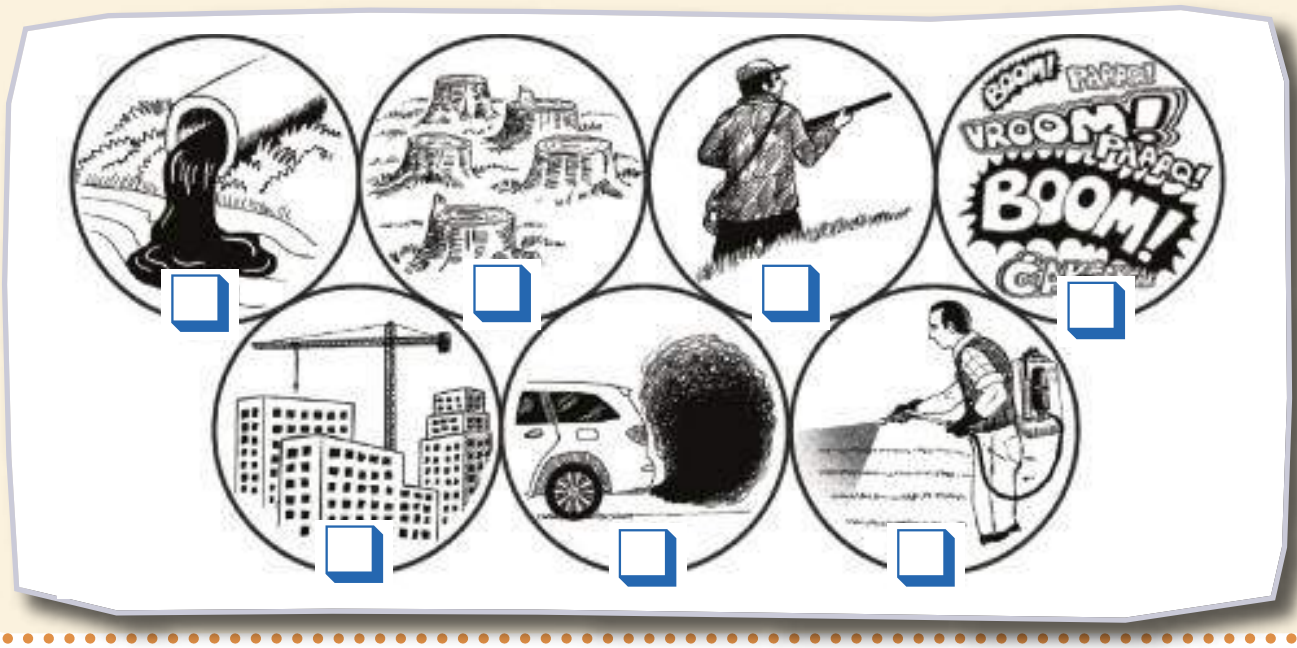
Waterbirds like ducks, Moorhens and Coots like quiet places with clean water and lots of food. Tick the box or boxes where you think the dangers can harm the water birds...

Noise pollution ❑ Illegal hunting ❑

Littering ❑ Water pollution ❑

6 The list goes on...

These are some of the common problems affecting nature around the world. Number them in order of which problems you think are causing the most harm to nature in Ireland. **1 – Most harm, 7 – Least harm.**



Did you know?

Not all plants and animals are good news

One of the problems that affects nature is **Introduced** and **Invasive** plants and animals. Introduced species have several other names: exotic, alien, non-indigenous, non-native. Simply put, they are plants and animals that do not originate in Ireland but have now been brought into Ireland by human activity, either accidentally or on purpose.

Given that we said the more biodiversity the better, you would think that more species would be a good thing, but this is not the case. In fact, after habitat destruction, invasive non-native species are the second biggest threat to biodiversity worldwide. When foreign plants and animals spread outside of the range where they were introduced and start to cause problems their status is upgraded to **invasive species**.

As these species have no natural predators to keep them at bay and/or have the ability to out-compete the native species, they can transform whole habitats and pose a threat to entire ecosystems. They have a serious effect on the environment and our economy. Some of the most commonly known examples are the Grey Squirrel, Japanese Knotweed, Rhododendron and the Zebra Mussel.

So, try to keep it native! Don't release any animals into the wild, especially aquatic species, and always plant native.

7 Problems

Sometimes the problems humans create are not good for nature but are not that harmful to them either. Tick the boxes of problems that are definitely harmful to nature.

❑ Dog poo

❑ Littering

❑ Invasive plants & animals

❑ Traffic

❑ Construction

❑ Illegal hunting

Stretch

Carry out a walking debate on statements relating to the above. For example, say 'Hunting should be banned completely', or 'Hunting helps to control populations of animals that are too abundant, so it is not always a bad thing' then get children to decide if they agree or disagree.

Designate a different place outside or in the classroom for each of the responses; agree, disagree and undecided if you like. Have children walk to the one they believe to be true.

Discuss why they think this to be the right choice. Encourage light debate on the topic for a few minutes then ask anyone who has changed their mind to move. Ask those who moved why they changed their mind. Repeat with another statement.

8

Which of these changes do you think wildlife would not like? Put a sad face beside the changes they wouldn't like and a smiley face beside those they would.

❑ An area is cleared of litter.

❑ A rocky area is covered over with soil.

❑ Part of a woodland is turned into a picnic site.

❑ Goats start grazing a hillside.

❑ Loud music is played in a forest.

❑ Invasive plants are removed from a hedgerow.

Stretch

Play Activity 4. of the 'Habitats' section to demonstrate changing habitats.

Activities 8 - 11 of the same section can also be tied in with this topic.

9 Sustainability

Let's Talk Positive!

Not all habitat change is bad. As we talked about in earlier sections, biodiversity is a really good thing for humans and for wildlife. There are things you can do to create habitats for wildlife and help increase biodiversity. But it doesn't stop there! There are also lots of things you can do to reduce waste and pollution too.

To live sustainably means to live without harming the environment. Many of us waste a lot and cause a lot of pollution but we also do things to reduce waste and to help nature and its habitats.

List some things that people do at home and in your school to reduce waste and help nature.

.....

.....

.....

.....

.....

Now make a list of things you can do in your school to help make it even more sustainable.

.....

.....

.....

.....

.....

Some examples might include:
walking or cycling to school, sharing lifts with others, recycling, not using pesticides in the farm garden, building bug or bird houses.

See '**Biodiversity Boosters**' for ideas on how to help nature and its habitats.

Cycling

Eleanor Bentall - rspb-images.com

Wild Detectives with Shelduck Holmes

Children are naturally curious. Why not encourage this curiosity by getting outdoors and investigating the wildlife that surrounds them?

Grab your magnifying glasses and let's go…

Sense the mystery

About this activity Children use their senses to work out what the mystery object is. A blindfolded child is presented with natural items found in the environment by their peers. They must then use their other senses to assess its qualities and guess what it is. This activity may be carried out in the school ground if you gather a selection of natural resources beforehand.

Rough bark

Materials needed Scarves, handkerchiefs, or any scrap fabric that could be used as blindfolds.

This activity may be done in pairs or as a group, where each child takes it in turn to be blindfolded. Whilst a child is blindfolded, the other children gather natural objects from their surrounding environment. These may include, for example; sticks, stones, pinecones, leaves or shells. They then present these, one by one, to the blindfolded child who must try to figure out what it is by answering the following questions.

- Is it big or small?
- Is it light or heavy?
- What is its texture like (e.g. rough, smooth, bumpy, scratchy)?
- What shape is it (e.g. long, round, pointy)?
- Is it hard or soft?
- What does it smell like?

Simplify
Present the child with two items at a time and tell them what they are. They must then determine which is which.

Stretch
Challenge the children further by limiting the amount of time they have to identify the object.

Tricks for Trees – How to age a tree

For an approximate figure, every 2.5 cm of trunk circumference at chest height = one year of age for a tree that has a full crown. You can measure the tree with string (which you could calibrate in advance) or by hugging the tree and then estimating. The formula works for most tree species in the temperate parts of the world.

Tricks for Trees – Estimating the height of a tree

Walk away from the tree until, when you bend over and look back through your legs, with your head as near to the ground as possible, you can see the top of the tree. The height of the tree is the same as your distance from it. You can use a measuring tape to work out the distance.

Tricks for Trees – Identify the tree

Collect leaves from trees easily found in the surround area. Give out leaves and ask the children to find the tree that matches the leaf they have been given. Using identification guides, they can work out what species the tree is.

Forensic investigation

Animals are not always easy to see, but they often leave signs of their presence or activity. As you walk, look out for signs of animal presence or activity. List your observations and try to guess which animal could have left that sign.

Observation	Animals

Animals tracks and traces – Make a footprint trap

Sometimes, signs of an animal's presence are hard to find. Here's how to make it easier.
Materials needed wet mud or soil and a shallow tray, such as a baking tray. Also: plaster of Paris, a mixing pot and stick, water, a ring of stiff cardboard held with paperclips – or a ring of plastic cut from a bottle (this should be higher than the depth of the tray), petroleum jelly – like Vaseline

- Put the mud into the tray and smooth it down. Fill it to the top.
- Place the tray in an area that you know or is likely to be used by an animal. Somewhere out of direct sunlight would be best to avoid it drying out. It is probably best to leave the tray out just before the end of the school day and check it again the next morning.
- When you have got a print, try to identify what animal has made it. A good way to keep the print is by making a plaster cast of it.
- To do this, smear the cardboard or plastic with Vaseline (to help the mould lift out easier) then to make the mould, surround the animal print with the card or plastic.
- Pour a little less water than would be needed to fill the mould into the pot, then slowly add the plaster and stir until it's a creamy paste.
- Pour the paste into the mould and smooth it on top. Leave it to harden for at least 70 minutes then remove it carefully from the mould.
- Gently wash off any of the remaining mud with cold water and clean with a paintbrush. If it is completely dry and clean it can be painted.

Hair tubes

Materials needed Plastic tubes (from about 3cm wide and 10-15 cm long), double sided tape, bait (grain or fruit), tent pegs or sticks.

- Put a strip of sticky tape along the top of the inside of the tube.
- On one end of the tube put a few pieces of tape to restrict access but do not seal it completely.
- Put some (just a little bit) of bait inside the tube.
- Place it on the ground under cover, if possible near known animal holes. To avoid it rolling, cross two pegs or sticks over the top of it or place stops, such as large stones, on either side of it.
- Look for hairs left on the strip of tape and signs of the bait being eaten.
- Investigate who it belongs to by the colour of the hair. With a steady hand, the hairs can be removed from the tape, placed on a slide and covered with clear nail varnish to look at it under the microscope (after the nail varnish has dried of course).

These will make a great addition to the nature table!

Anybody home?

Another way to get an idea of what animals are around without having to see them is by spotting their homes.

Take a look around and see if you can spot any homes that animals have made? Be careful not to damage them or the animals might be very upset!

Home	Animal
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

Bug hunting ideas – Who do you think you are?

Write the name of an obscure minibeast on a sticker and put it on a willing volunteer's forehead. The volunteer has 20 questions to work out what they are, and will probably fail. Then give them a key to work through, and they should succeed. This demonstrates how easy and useful it is to use a key.

Try it out in conjunction with some of the bug-hunting activities below.

Vegetable trap

Materials needed large potatoes or similar vegetables, cork-borer or something that can make a hole, toothpicks or used matches, a sharp knife (for adults' use only)

- Bore a hole from the top to the bottom of the potato and a second hole from one side to the other. Both holes should meet in the middle.
- Cut the potato in half (longitudinally) and hollow out some more from the centre of the potato.
- Put the potato back together and hold it in place with the toothpicks.
- Place the trap in leaf litter and mark where it is you can find it again.
- Open it and inspect what minibeasts you find inside. This can be repeated several times with the same potato.

Stretch keep a log of the minibeasts you find and divide them into the different groups (See Activity 10. of 'Biodiversity').

Make a simple pitfall trap

Materials needed jars or used plastic coffee cups (a good chance to recycle), trowel, small stones, small pieces of flat wood

- Dig a hole large enough to take the cup in the grass or under the trees. Backfill around the cup so that the soil is flush with the top of it.
- If using a coffee cup, place another inside it so that this can be removed while leaving the trap intact.
- Put the small stones around the edge to keep up the wooden lid off the ground but still keep out the rain.
- You can make several traps per class group but be sure to check them regularly as shrews and other small mammals may be caught. Due to their fast metabolism, they need to eat regularly and so may die if trapped for too long.
- Minibeasts such as spiders, beetles and centipedes are likely to get caught.

Pitfall trap

Eleanor Bentall - rspb-images.com

Centipede

'Darkone': Wiki Commons

Other mini-beasts traps and tricks

• Sweep a fine net through the long grass to catch minibeasts. Don't do this in wet grass as they'll stick to the net. Use a net with a fine mesh or a simple bag on a coat hanger.

• Use an umbrella to investigate what bugs are living in the trees. It must be an umbrella with a hook handle. Turn it upside-down, hook the end around a branch and pull, shaking the bugs from the tree into the brolly. Makes sure to put all bugs back where you found them.

• Magnifying glasses and magnified insect boxes are great for looking at bugs up close but you can also use a simple handheld mirror to look at the minibeasts and their eggs on the underside of leaves.

Gail Hampshire: Wiki Commons

• Get the kids to think about how the minibeasts you find are just a small group of a much bigger population. Taking this group as representative of the population, how many bugs would be in that whole tree or patch of grass, and how many would be in the whole school?

Make it yourself

• Make a simple **Pooter** by drilling or boring two holes in the top of a jar with no labels. Insert a plastic straw or tubes upside down into each hole in the lid. The bend in the straw should be just above the lid. Seal them to the lid with Blu-tack. Cut one straw a couple of inches shorter than the other and then tie a square of muslin around the end of it (the end in the jar) with an elastic band. Pop the lid on and you're good to go.

• Make a simple **Magnifier** with a small clear plastic lid or petri dish, a crayon and a drop of water. Using the crayon, draw a small (not too small) circle in the centre on the lid or dish, then carefully add a drop of water inside the circle. The wax of the crayon should restrict the drop from moving too much but be sure to hold the magnifier flat when using it.

Who's flitting around our garden?

Put out **Butterfly feeders** to investigate what kind of butterflies come to your school.

• Dissolve sugar in boiling water.
Use a ratio of 8:1, Water: Sugar.

• When it has cooled soak it up on a brightly coloured sponge then place this on a plate near some flowers.

• Watch for which butterflies come to the plate and how often.

Or

• Another way is to put mushy fruit that is going off on a hanging plate. A waxy paper plate or plastic plate will suffice. Mushy bananas work especially well.

• Why not try both feeders?

"Who am I?" hunt

Materials needed Printed media or online access to images.

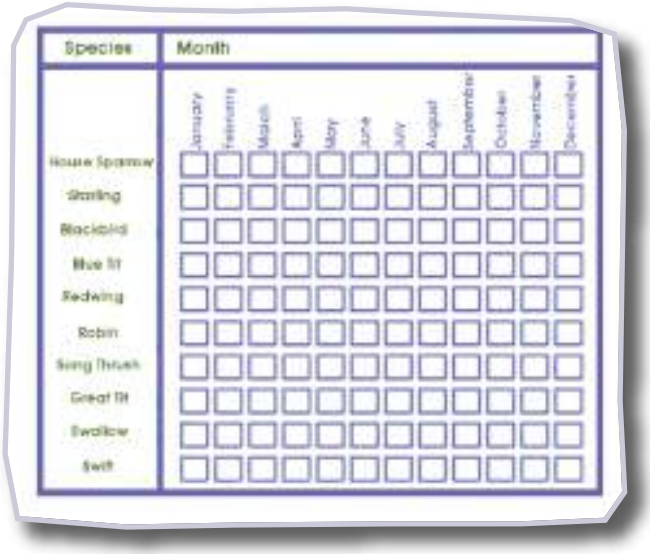
- Make a collection of images like the ones shown here. Select images of living things that it is realistic for the children to find in the school grounds (or area where you're running the activity).
- The images don't have to be originals, i.e. can be copied from the internet or other sources, once they are the correct species that are found in your area. It is useful to do a recce of the grounds beforehand to find out what's there.
- Divide the class into groups. Give each group a sheet of images.
- Their aim is twofold: figure out what species is in the picture and then go spot it.
- Only allow a certain amount of time for the hunt.

Simplify Make images less cryptic.

Stretch Use more cryptic images, have children take their own photos of the living things in the pictures, race groups against each other for who find them all the fastest.

Join the Schools Garden Bird Survey

See 'Biodiversity Boosters' for into and ideas about attracting birds to your school, including the do's and don'ts of feeding birds.



The **Schools Garden Bird Survey** may only take place between December and February but there's no reason why you shouldn't record what birds are in your school throughout the year. Especially seeing as some are seasonal so will be there part of the year and gone the rest. This kind of information is really interesting to collect.


Starling

Here's an example of a table you could use to record what you see.

The Schools Garden Bird Survey

The birds you actually see will depend on where your school is. Some of the questions you can try and answer are:

- Which birds are seen all year round?
- What attracts them to the school?
- Why are some birds seen only in the winter?
- Where are they in summer?
- Other birds may be seen only in the summer. Why?
- Where are they in winter?

Robin

Clive Timmons

Sample of the Schools Garden Bird Survey form.

School Garden details

Tell us some information about your school

The school grounds, are they... (tick 'yes' or 'no'.)

Urban (in a town or city centre)? yes no

Suburban (on the outskirts of a town or city)? yes no

Rural (in or beside open country or farm land)? yes no

What size are they?

Half the size of a tennis court, or smaller yes no

Approx. tennis court size yes no

Larger than a tennis court yes no

An acre or larger yes no

Food available for birds...

Are berry bushes present? yes no

Do you provide...

Peanuts in feeders? yes no

Seeds in feeders? yes no

Scraps? yes no

Fruit? yes no

Fat / bird cake? yes no

Why not take part in the Schools Garden Bird Survey this year?

You can, simply by setting up a feeding station for birds at your school. Choose a place in the school grounds that is clearly visible from a window in the school building.

Try and pick a safe space for birds where feeders can be hung from a branch of a tree and where birds have a safe area to approach and to retreat to. Then watch, and record what you see. Easy!

Recording your bird, biodiversity and general wildlife sightings and engaging in national citizen science efforts at your school will prove to be massively rewarding and can fit well into lesson plans such as science, geography, maths and IT, to list just a few examples.

Outside of the Schools Garden Bird Survey, there are a couple of other ways you can record your findings and put the data to real use:

Spring Alive Spring Alive is an international project to encourage children's interest in nature and the conservation of migratory birds and to get them to take action for birds and other wildlife as well as to participate in events organized by birdlife partners (www.springalive.net).

I-Spy Nature aimed at getting primary school children recording and mapping wildlife and biodiversity online on a great, easy to use website.

Biodiversity Boosters

Every school, no matter how big or small, urban or rural, has the potential to be of some benefit to biodiversity.

Bringing more biodiversity to your school by improving the habitats and conditions on campus can help flora and fauna and lead to serious rewards for staff and pupils alike.

Biodiversity projects fit well with the Green Schools awards and slot excellently into many lesson plans from the obvious biology/nature lessons, to maths, geography and IT.

Biodiversity Booster Project Ideas Table

Projects (set up)	Cost	Effort	Suitable For Areas With: little/no green space	some green space	plenty of green space
Project Committee	Free	Low	√	√	√
Biodiversity Action Plan	Free	High	√	√	√
Projects (outdoors)					
Wildlife Survey	Free	Medium	√	√	√
Plant Survey	Free	Medium	√	√	√
Wildlife Zone/Wilderness Area	Low	High		√	√
Log Pile	Free	Low		√	√
Bug Hotel - Large	Free/Low	Low		√	√
Bird Table/Feeders	Low/Medium	Low	√	√	√
Bird Nest Boxes	Low	Low	√	√	√
Bird Nest Box Camera - classroom stream	Medium	Medium	√	√	√
Bat Boxes	Low	Low	√	√	√
Insect Boxes	Low	Low	√	√	√
Plant native trees	Free/Low	Low		√	√
Bee Friendly Flowerbeds	Low	Low		√	√
Bee Friendly window boxes/baskets/planters	Low	Low	√	√	√
Wildlife Corridors/Wild Patch	Low	Low		√	√
Wildflower Meadow	Medium	High	√	√	√
Wildlife Pond	High	High			√
Wildlife interpretative panel	High	High	√	√	√
Projects (indoors)					
Nature Display	Free	Low	√	√	√
Nature in the Library	Low/Medium	Low	√	√	√
School Twinning - Migration	Free	Medium	√	√	√

The key to success is undertaking projects and actions to add value to your campus. These projects can be small or large scale and cost a lot of money or nothing at all. Here is a table of project ideas laid out by their potential cost, effort and space requirements.

The list is not exhaustive but it's a very good start!

Project summaries

Each of the ideas in the table above is described here and a link to further information provided.

- **Project committee** – be it the Green Schools Committee or a special biodiversity sub-committee, it is vital a structure is in place to coordinate activities. This group can have student and staff members and ask for expert input when required.
- **Biodiversity action plan** – the first task of the committee will be to set out the aims and objectives of the group for the academic year or term. Once the group has agreed actions a rough schedule or roadmap can be compiled. Some projects will take successive terms and years to realise and can be actioned early on to get the ball rolling.


Bird feeder

Project ideas that may be included in your action plan are described below;

Wildlife has three main needs; **shelter** for nesting etc, **food** to survive and **protection** from disturbance and predators. By providing one or all of these things you will increase biodiversity on your campus.

1. Wildlife Survey

It is important that you monitor the base level of wildlife found at your school. This will not only inform you on what projects you might undertake but will later give you a measure of how well the projects have succeeded in increasing biodiversity. A basic "look see" approach can be taken here. Map the potential habitats for example, grassland, hedgerow, mature trees, etc. It doesn't have to be complicated. After the habitats are listed have a go at listing some of the wildlife using the campus, are their birds feeding or nesting, have bats been seen at dusk, are there areas that insects use?

2. Plant Survey

The same can be said for plants as for wildlife, and your habitat map will be useful here. Plants can be difficult to identify if you are not experienced, but one advantage is they cannot run or fly away! Start with listing the common tree varieties. Each list for plants and or animals does not have to be completed in a day; it can be added to each time a new species is identified. Keep a central list with species name, date found and recorder name, etc. Keys to common plants are easily found online or you could invite a local expert in for help.

Plant identification fits well with the curriculums of science and geography and is tested later in life at Junior Cert. and Leaving Cert. level ecology.

M.O'Clery

3. Wildlife Zone/Wilderness Area

Now the fun begins and the real action starts! During the wildlife and plant surveys you will have recorded a patchwork of habitats or land types at your school. Not all habitats have to be green spaces, for example, buildings are often inhabited by externally nesting birds and species such as Pied Wagtails (a common little bird) often feed on surfaced areas such as car parks. Your wildlife zone would be best placed somewhere quiet and rarely used. It can be an unused corner where plants and animals are allowed thrive. This little overgrown patch will provide cover for birds, invertebrates and small mammals and act as a 'micro nature reserve'. To communicate that this wild corner is not just a forgotten spot it can be fenced or signposted as a "Wildlife Patch".

M.O'Clery

Some of the following features can used to increase biodiversity on campus or in your wild patch.

4. Log Pile

A log pile is a cheap way of providing good habitat and cover for a range of wildlife. Small mammals and frogs will take shelter between the logs. A huge range of invertebrates from beetles, spiders, worms and slugs will make it their home and attract birds and other wildlife looking for a meal.

5. Bug hotels

Bug/insect hotels are a fun way of demonstrating the importance of providing safe homes and places for wildlife but also a really good way to get students involved.

- Make an open-fronted housing and fill it with materials for bugs to hide and hibernate in. Bug hotels can be as big as a stack of wooden pallets or as small as a recycled pea tin stuffed with garden bamboo canes cut to size (just a bit longer than the length of the can).
- If you are making a big hotel, use pallets or a wooden box to provide the structure and fill the shelves with all sorts of materials. You can collect pine cones, straw, logs (even better if you drill holes in the flat end of the log), leaves, sticks, stones, broken tiles, bricks with holes or anything that might provide layers and cover for all the creepy crawlies.
- There are lots of design ideas online.
- Make sure to do a "bug hunt" (use some of the 'Wild Detective' tricks) and collect guests for your new 5 Star bug accommodation.

6. Insect boxes

Insect boxes are, in basic terms, mini bug hotels and are great addition to a campus where space is limited. They can be wall mounted, attached to a tree or any structure at all. They are widely available commercially but are also easy to make out of recycled materials such as old wooden wine boxes, food tins and materials gathered from the outdoors such as leaves and pine cones.

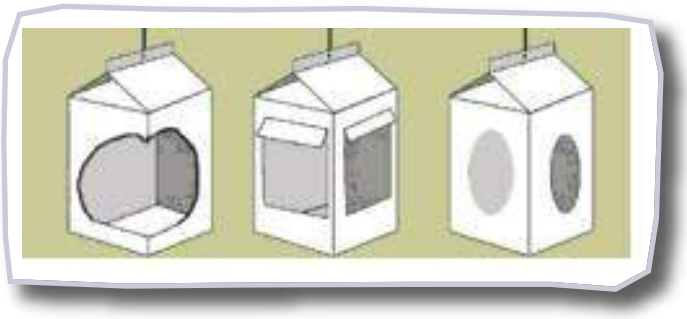
- Start with an open-fronted housing (a can or box). Fill it with natural materials bugs would like to snuggle up in, such as leaves, pine cones, sticks from the ground, dry grass.
- There is lots of design possibilities - information is widely available online

7. Bird tables and bird feeders

Providing food for birds is a great way to attract a huge range of birds to your school. Not only is this beneficial to the birds but it can attract them close enough where they can be easily observed by students. This is great when investigating what birds are around your school (see the 'Wild Detectives' section). Bird feeders can be filled with a range of food types such as peanuts, sunflower seeds and nijer seed which will help in attracting various species. It's a great way to build the bird life into the curriculum such as science, maths and geography lessons. Check out the Kids' Zone on the BirdWatch Ireland website for more ideas on bird-related projects.

Bird Feeders

- Bird feeders can be made from simple drinks cartons or plastic bottles. Experiment with different designs



Food for Birds: Some do's and don'ts

- Peanuts, sunflowers and mixed seed in mesh and plastic feeders are ideal for many small birds.
- Over-ripe or slightly spoilt fruit is ideal for Blackcaps and thrushes, either left on the ground or speared onto a branch.
- Some crumbs and stale cake will be mopped up by sparrows and larger birds; bird cake recipe is available from the BirdWatch Ireland website.

• Don't put out too much at a time, as you may encourage some less-than-welcome furry visitors. Loose food shouldn't be left out overnight.

• Try and provide some clean water. An upturned bin lid will do, as will any shallow container.

• Make sure the birds have a regular food supply. Fill the feeders on Fridays and top up during the following week as they empty.

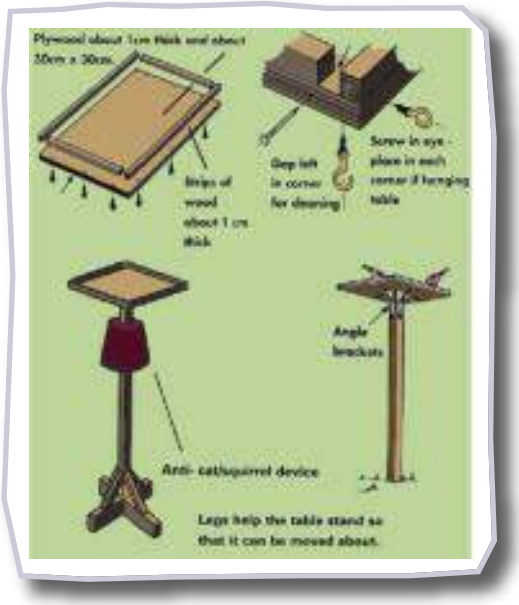
• Try and continue feeding and watching birds right through the winter season, especially when it is cold.

Bird Tables

• Anything flat, about 30cm x 30cm or larger, will make a bird table. Solid wood (maybe old floorboards) or 'exterior grade' plywood would be best. Plastic or metal is okay too but any other materials are not likely to last long. Use weather-proof glue, screws or nails.

• Decide where to put the table. Preferably somewhere quiet, near bushes and trees and protected from the worst of the weather. It is best to raise it off the ground, to protect birds from enemies such as cats. If you make it moveable, you can gradually bring it closer to your window.

• Fix your table to a post, a window sill, a wall (by brackets) or hang it from a tree. Make sure it is firm and steady, especially if you are going to move the table about.



Some handy tips

• Bird tables should protect food from the wind, should not collect water and should be easy to clean.

• Clean the bird table and ground around the table regularly to prevent the birds from spreading infection.

• Put a little food on the table daily and replenish it regularly, rather than a lot at once. This will help prevent vermin.

• A roof is useful in snow or rain but is not important at other times.

• Including a scale (in centimetres) along the side of the table is a good idea so that you can compare the sizes of birds.

• Warning: Bird tables that include nest boxes are not a good idea. Birds that try to nest would be disturbed by others coming to feed. Don't combine tables and nest boxes

8. Bird nest boxes

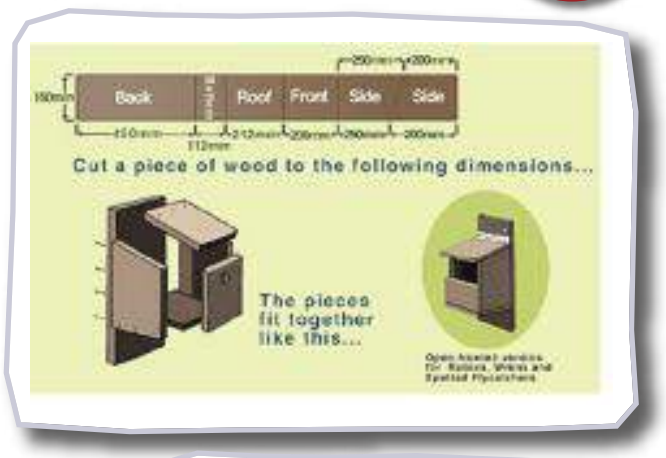
Many schools' grounds are suitable for nesting birds and natural nest sites will exist but bird nest boxes can be added to increase nesting opportunities for birds. It demonstrates again that it is important to look after the environment and all the wildlife that we share our space with. A range of bird box types can be considered and this should be guided by your wildlife survey which will have included a look at what birds are found at your school. Bird species such as Robins, Blue Tits and Great Tits will readily nest in manmade bird boxes of the right design. Bird boxes are easy to find and purchase but are also an easy DIY projects.

• Birds are different sizes, but will use 'standard' boxes, if you change the size of the entrance hole to suit them. Blue Tits and Great Tits are most likely to use these.

• With a large front opening, this box is used by birds that nest in cracks and among creepers, such as Robins, Wrens and Spotted Flycatchers.

Making a box

• Use solid wood or exterior-grade plywood, about 1.5cm thick. Thin wood is not weather-proof and most other materials will not last long outdoors. Nails, screws or weather-proof glue can be used to join the pieces together.



• Decide the size of the entrance hole. Use a brace and bit, a holesaw or a fretsaw to make the hole.

• A new box will be quite obvious to predators and vandals. Paint it with a modern preservative stain which is non-toxic.
Warning Do not use creosote!

Where to put it

There is no hard and fast rule about the best place to put a nest box and there is no guarantee that it will be used right away but there are some tips to help make it a success.

• Shade the box from the sun, especially if it is on a wall. The box should face north or east in order to face the entrance away from the worst of the wind and rain.

• Tilt the box slightly forward to keep water away from the hole.

• Nest boxes near bird tables are not a good idea. Birds trying to nest are disturbed by those that come to feed. In fact, it is best not to feed birds during the nesting season. Natural food is better for them and their young. Also, don't put nest boxes too close to each other.

• For tits, the box must be no more than 30 metres away from trees where they can collect insects for their young.

• Warning Keep boxes away from places where cats can reach!

• Put the box out at the end of winter, before birds start prospecting sites in mid- to late February.

Using the Box

• Be careful not to disturb birds using the box. A frightened bird may desert and leave its eggs or young to die. Watch from a place that does not worry the birds.

• In autumn, when nesting has finished, the old nest material can be cleared out. This stops parasites such as fleas from living in the box until next year.

9. Bird nest box camera

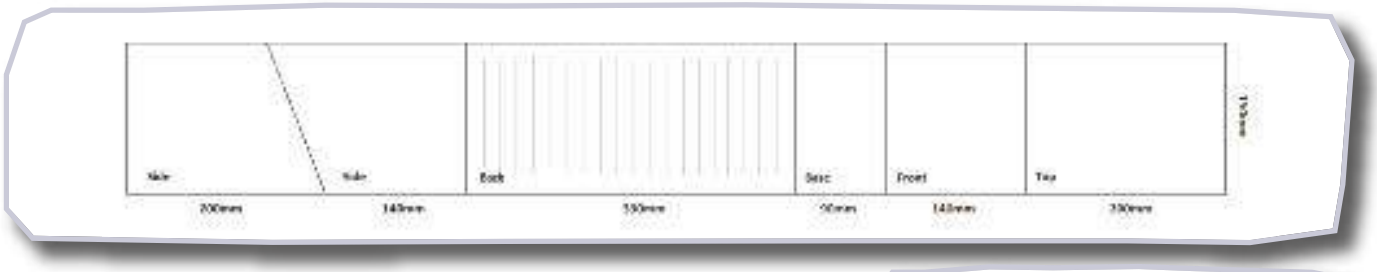
These are a fantastic way to observe the day to day activities of nesting birds. The technology allows for a live stream of all the action within the nest box. It causes no disturbance to the birds and is a super way to introduce school children to the entire avian life cycle and the trials and tribulations that our garden birds face.

These nest box cameras are supplied with suitable boxes and can be easily installed to be streamed to an interactive whiteboard, TV or laptop. There is a modest cost and the equipment can be used year after year.

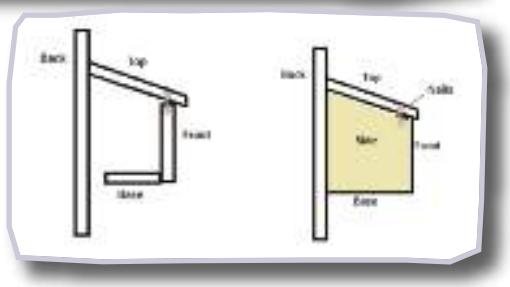
10. Bat boxes

Bat boxes are an easy and cheap way to provide safe places for bats to roost during the day. Bats are very interesting and an important part to any ecosystem. They evoke great interest and sometimes fear in people but rest assured all Irish bat species are tiny, nocturnal and pose no threat whatsoever to humans. Bat boxes can be erected on trees or buildings and require little to no maintenance. Instructions and designs for these can be found online. There is also a simple template below.

- Cut a piece of untreated wood to the dimensions shown below.



- Saw several lines in the back piece as shown. These don't have to be neat, they are there to provide a surface for the bats to cling to as they climb into the box.



- Fix the base of the box to the front and side panels but leave a gap between it and the back panel to allow bats space to climb up.
- It is best to make closed bat boxes that you cannot open but if you decide you'd like to be able to open it, screw/nail roofing felt to the back and top of the box to make a hinge. To stop the top being opened by wind or nosey predators hammer a nail into each side panel, just below the lid and either side of the lid. Wrap a piece of wire between the two nails on either side to keep it closed.
- Place the box high, sheltered from wind but exposed to the sun for part of the day. You can put up to three boxes per tree.

11. Plant native trees

Environmentalists often make the case for keeping plants be they flowers, shrubs or trees, native. The reason for this is that our native animals have evolved over thousands of years alongside our native plants. This means that our native flora and fauna complement each other's needs naturally and where you find native plants you will find native animals. Native trees will benefit everything from the insects right up to the mammals and birds. Trees can take up a lot of space but provide, food, shelter and cover for lots of animals so if there is space on campus definitely consider planting some native species. Ask your local supplier which varieties are native.

12. Bee-friendly flowerbeds

Bee friendly flowerbeds are just that, and by planting flowers and other plants that are rich in pollen and nectar in your flowerbeds you can make them more bee-friendly.

Globally, pollinating insects are in trouble for a variety of reasons, not least modern farming practices and their dependence on pesticide sprays which harm many insect types. There are international efforts in affect across the globe to help mitigate against the harm being done by pesticides and other harmful effects to our pollinators such as bees. In Ireland, the National

Biodiversity Data Centre based in Waterford has produced a national pollinator plan to suggest simple ways that anyone can help pollinators. They have produced 3 similar manuals aimed at home owners, schools/children and organisations such as county councils. The *Junior Pollinator Plan* is best for school reference. This document - *The All Ireland Pollinator Plan* - is the most up to date and best document to help you help bees.


Window box

Nick Bristol: Wiki Commons

13. Bee-friendly window boxes, baskets and planters

If you are tight for space and still want to help bees and other insects try planting bee-friendly flower baskets. As mentioned above all the information your school requires can be found in the *Junior Pollinator Plan*.

14. Wildlife corridors and wild patch

A wildlife corridor makes provisions for critters to come and go freely along fence boundaries or wherever vegetation is allowed to grow a little. This is much the same as a wild patch. By leaving a margin of un-cut grass at the end of a football pitch or along a boundary line you create a small wildlife refuge where bugs, small mammals and even birds can go about their business undisturbed. Corridors can allow passage of wildlife between two properties. effectively maximising the amount of safe habitat they can access. For example, a Hedgehog may not be able to find enough food in one garden but by allowing it to roam between there and the school grounds next door it may well have a much better chance of finding enough food. thus making that area its home. It saves a bit of mowing for the caretaker and is completely free to do! The key is just to leave it be.

- Only cut at the end of the summer since by then the flowers have provided pollen for insects, the seeds have set and the birds have been able to find bugs and insects to feed hungry chicks over the nesting season.

15. Wildflower meadow

A wildlife meadow is one of the single most beneficial projects you could do for biodiversity. Plants and animals alike will benefit by creating a meadow. The key feature of a species rich meadow is that it is not as dominated by grass as a traditional lawn or agricultural field. It is has a huge variety of flowering plants that will blossom at different times from early spring right through to the autumn. Meadows can be any size but for maximum benefit, bigger is better!

rspb-images.com

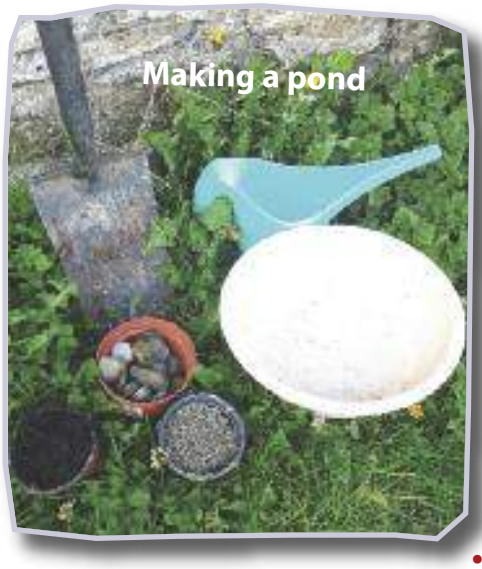

Wildflower meadow

Meadows can be space heavy, are only cut at the end of the flowering season (autumn) and like the wild patch has pollen for insects and seed for a variety of wildlife within the growing season. At the end of the season the vegetation is cut and removed (added to compost perhaps). Meadows take work and planning but there is good information out there and the rewards are massive.

16. Wildlife pond

Biodiversity Boosters

A wildlife pond introduces a wetland habitat to your space. In schools these can be seen as too high a risk but if the space is safe they can add a massive biodiversity hot spot to your campus. Ponds introduce a whole new habitat by allowing species of plants and animals that depend on water into your space. Frogs, newts, water beetle, water skaters, dragonflies and all sorts of other aquatic invertebrates will colonise the pond over time. Ponds are a great place to teach about eco systems, food webs and ecology fieldwork skills.



- Things like old baths or basins can be used to make wildlife ponds. If you're not sure about the idea, start out with a mini wildlife pond and see how that goes.
- Materials needed: spade, old basin/waterproof tub, stones, gravel/sand and water (of course!)
- Choose a quiet location where animals won't be disturbed often.
- Trace around the basin with the spade and dig out this area.

- Dig it to the shape of the basin and ensure the basin will sit level with the ground. Make sure the basin is level or the water will pour out.

BirdWatch Ireland

- Use stones and gravel to partially fill the bottom of the basin. Fill it to the edge with water (preferably rain water). Allow it a day or two to settle and become less murky.
- Place a stick or piece of slate at the side as a ramp for animals to climb in and out – and an escape route for anything that falls in.
- Fish should not be introduced as they will eat the eggs and larvae of the species you want to attract.
- Make sure your pond is always topped up with water (rain water is best). Now sit back and enjoy!

Other ideas

17. Wildlife interpretive panels

Make pupils, staff, parents and visitors aware of the wonderful wildlife that calls your campus a home. An interpretive panel could be a laminated sheet on a wall or noticeboard right up to tailor-made permanent signage made by professionals.

18. Nature display

A nature display is a lovely way to bring nature to the classroom or indoors. Set aside a table where students can display their nature projects and bits and pieces they have found outside in nature.

19. Nature in the library

Does your school library have many books on the subject? Children love the topic of wildlife and are amazed by the natural world. Try source and stock books about Irish wildlife and plants in an effort to encourage the pupils to learn more about them and in turn want to protect their local plants and wildlife.

20. School twinning project

Modern schools have the ability to speak live to anyone anywhere in the world. Why not try to identify a school doing similar work in Ireland, the UK or anywhere for that matter. It can be very interesting to link up with countries, such as Iceland, that we share migrating species with. You can use programs such as Skype to chat to the other schools, trade ideas and plans and learn more about each other's respective projects and local wildlife. The **Spring Alive** site is an all-round great resource and starting point for getting in touch with schools internationally.

21. BT Young Scientists

Every school with new or established biodiversity projects should think about entering the Irish Young Scientists Awards to showcase their work. Biodiversity projects have a good track record in the competition.

Links and resources

BirdWatch Ireland – Birds and Your school resources
www.birdwatchireland.ie

Recording Wildlife on Campus
http://ispynature.com/
http://www.springalive.net

Increasing Biodiversity
http://bit.ly/2xgXtuz
http://shop.birdwatchireland.ie/birdwatchireland/
http://www.biodiversityireland.ie/projects/irish-pollinator-initiative/all-ireland-pollinator-plan/
http://www.rspb.org.uk/makeahomeforwildlife/advice/gardening/insects/building_homes.aspx
http://www.bats.org.uk/pages/bat_boxes.html
http://www.batconservationireland.org/irish-bats/bat-roosts/775-2

Keeping it Native
http://invasivespeciesireland.com/what-can-i-do/
http://www.wildflowers.ie/growers-manual/index.htm

Other resources
http://www.askaboutireland.ie/
https://outdoorclassroomday.com/
http://unesdoc.unesco.org/images/0009/000963/096345eo.pdf