

## Foreword

The British countryside offers a haven to a huge variety of wild plants, animals, birds and insects. This biological diversity is a national resource of immeasurable value. The natural environment is part of our rich national heritage.

Farmers across the country are increasingly adapting and developing their farming practice to protect and encourage greater biodiversity. Their actions are helping to ensure a sustainable future for ourselves and for future generations. Working in partnership with schools, many farmers are creating opportunities for young people to discover our native biodiversity in woodlands and field margins, hedgerows and ponds.

***Biodiversity: c/o British Farming*** has been produced to help teachers lead creative and stimulating field trips for primary school pupils. We hope the simple and accessible activities will stimulate greater understanding and appreciation of the countryside, and encourage pupils and teachers to value the wide variety of species all around us.

Most of the activities focus on quantifying the number of species in a particular habitat rather than identifying particular examples. However, children are naturally curious and the identification sheets at the back of the file will help them put names to the species they discover.

If you would like to share your discoveries with other schools, visit our website [www.cobritishfarming.org.uk](http://www.cobritishfarming.org.uk) and complete a field-study report.

Farming and Countryside Education, September 2004



# Introduction

This file offers ideas for activities to use with school pupils during farm and countryside visits. Through participating in the activities the children will be able to develop:

- awareness of the many different animals and plants that exist
- understanding of the contribution that farmers make towards conserving and enhancing biodiversity
- scientific and geographical skills useful for investigating the natural environment.

This file is organised into four sections. Section 1 provides some background information about biodiversity. It also explains how farming practices help to maintain and increase biodiversity. Section 2 offers safety advice on activities taking place in the natural world. Section 3 gives ideas for activities to carry out with pupils. Section 4 provides simple charts to help pupils identify common species. Where appropriate, Copy Masters for use with the children are provided. These can be downloaded from the c/o British Farming website [www.cobritishfarming.org.uk](http://www.cobritishfarming.org.uk)

Visits to farms, woods, ponds and environmental centres are invaluable for the development of many scientific and geographical skills, as well as increasing children's knowledge of PSHE, Citizenship and Education for Sustainable Development (ESD) issues. All the activities are referenced to the National Curriculum (QCA 1999).

# SECTION 1: Background information

## What is biodiversity?

The word 'biodiversity' is formed by combining 'biological' and 'diversity'. Biodiversity refers to the existence of a wide range of animal and plant species in their natural environment. This means many different plants and animals living in numerous different habitats.

## Why does biodiversity matter?

Over recent years there has been a reduction in biodiversity. Habitats have been destroyed to make way for farming, housing and industrial development. Species have been driven to extinction by trading, pollution and the loss of natural habitats. Loss of biodiversity in our immediate environment and beyond has serious consequences for our economic, social and spiritual well-being now and in the future.

## Why is it important to learn about biodiversity?

We have all played a part in the reduction of biodiversity and we all have a responsibility, and an opportunity, to help protect and restore it for the future. By understanding how to conserve and create habitats as well as recognising the value of plants and animals, we can all make a difference.

Britain's farmers are already working to improve biodiversity in the countryside. Farm visits can help us explore our own national biodiversity and discover just how much we have to save.

## How do farmers encourage biodiversity?

In recent years many farmers have changed the way they manage their land to create and protect a variety of habitats. Special initiatives such as the

Countryside Stewardship Scheme encourage farmers to balance their commercial and environmental interests, ensuring that farms and wildlife can flourish together. Common farming practices include:

### ● Maintaining field margins

Gaps around fields are valuable for wildlife. Matted grass and thick vegetation give essential cover for many hibernating invertebrates and mammals. Many animals would die if they did not have this cover.

### ● Managing land not used for crops

Many farms have fields or other areas that are not used for cultivation. These are managed to encourage wild flowers, which in turn offer food and shelter to insects, birds and mammals. These fields join up with ditches, paths and hedgerows to form wildlife corridors covering many miles of countryside.

### ● Making beetle banks

Uncultivated areas running the length of fields can be used as refuges for crop pest predators. Ladybird larvae, for example, are extremely useful for eating aphids. Beetle banks also create useful habitats for birds, mammals and wild plants.

### ● Conserving and creating woodlands and hedges

Woodlands and hedgerows offer food and shelter to a wide range of insects, birds and small mammals. As they mature, they are colonised by wild flowers and shrubs. Woods and hedges can be hundreds of years old and contain mature trees. New woods and hedges are created every year and will survive as a resource for wildlife for generations to come.

### ● Maintaining and creating ponds and ditches

Ponds and ditches are a valuable habitat for a variety of water life and insects. Carefully designed ponds encourage frogs, toads and newts to spawn. Sensitively managed ditches provide a habitat for a variety of aquatic species, and birds such as reed warblers.

### ● Leaving dead wood

Dead wood provides an ideal habitat for creatures such as woodlice, millipedes and centipedes as well as fungi. Standing dead tree trunks can be useful for birds such as woodpeckers to break down when searching for food. Dead wood on living trees can be a good habitat for insects. In turn, the insects can be eaten by birds and bats. Dead wood can also be used for nesting animals such as small mammals and birds.

## SECTION 2: SAFETY

When planning a farm visit it is vital to carry out a preliminary visit to complete a risk assessment. School and local authority safety policies should be consulted, and teachers can familiarise themselves with the Health and Safety Executive Guidelines “Avoiding ill health at open farms – Advice to farmers (with teachers’ supplement)” (HSE sheet AS1S23). In addition the following points may be of use. More information on health and safety can be found on the FACE website ([www.face-online.org.uk](http://www.face-online.org.uk))

### Working with plants:

In Great Britain it is illegal to dig up wild plants or to pick some wild flower species. In general it is acceptable to allow children to pick safe, common weeds.

Some plants contain toxic chemicals. Poisonous plants include black nightshade, holly, laburnum, privet, ragwort, white bryony, woody nightshade and yew. Plants can also irritate the skin or cause dermatitis. Examples of these are stinging nettles, giant hogweed and some bulbs of the lily family. It is best to consider all plants and fungi as hazards until it is known that they are safe.

When working with plants, children should be taught to:

- avoid touching eyes
- never taste any part unless it is certain that it is safe to do so
- wash hands after touching plants or seeds.

### Working with minibeasts

When studying minibeasts, children should be encouraged to be ‘gentle giants’. They should realise that it is important to return minibeasts to their natural environments as soon as possible. For collecting creatures, either small paintbrushes or pooters (with separate mouthpiece tubes that can be sterilised before and after use) should be used.

## Pond dipping

When pond dipping, take care to avoid areas with difficult or steep access.

Weill's disease is a rare bacterial disease that can cause influenza-like symptoms.

It can be caught from water polluted by rats, thus pond dipping should not take place from ponds or streams where rats might be present.

When pond dipping, children should be taught to:

- cover cuts and abrasions with waterproof plasters
- avoid splashes that cause water to enter the eyes, nose or throat
- wash hands and other areas that have come into contact with the water (e.g. knees).

# Section 3: Activities

## Working in woodlands (W)

1. Investigate where minibeasts live. Complete a table to show whether they are found in the air; on flowers; in hedges; in the grass; under stones; under logs; on trees; in other places. Are there any minibeasts not present that might have been expected? If so, what might need to be placed in the habitat to encourage their presence? (Sheet 1)
2. Use an identification sheet to identify a range of minibeasts.
3. Compare the number and type of minibeasts that live in six samples of leaf litter. (Sheet 2)
4. Make bark rubbings of different kinds of trees using thin paper and thick wax crayons. Compare the patterns from different species of trees. (Sheet 3)
5. Estimate tree ages. Measure the distance around the middle of the tree trunk (the girth) in centimetres. Each 2.5 cm corresponds to about one year of a tree's life. (Sheet 4) The measurement should be taken about 1.5m above the ground.
6. Walk along a boundary or around a field where there are trees. Note the number of trees growing. Sort them according to the shape of their leaves. (Sheet 5)
7. Look for clues to birds' presence such as nests, feathers, pecked wood, eggshell, etc. Try to identify the birds.

More information available from [www.teachingtrees.org](http://www.teachingtrees.org)

**Sheet 1** Name of minibeasts spotted: .....

**WHERE DO MINIBEASTS LIVE?**

	Beetles	Butterflies	Snails	Spiders	Worms	Other minibeasts
In the air						
on flowers						
In hedges						
In the grass						
under stones						
under logs						
on trees						
In other places						

**Sheet 2** Name: .....

**WHAT LIVES WHERE?**

Use a tablespoon or small plastic pot to select six equal-sized samples of pond water, soil or leaf litter.

- How many minibeasts can you find in each sample?
- How many different species can you find?
- Are similar minibeasts in each sample?

Sample 1	Sample 2
Sample 3	Sample 4
Sample 5	Sample 6

**Sheet 3** Name: .....

**TREE FACT FILE**

- Identify two different kinds of trees.
- Make a rubbing of the bark.
- Make sketches of the leaves.
- Identify the trees using the sheet provided.
- Make a list of the similarities and the differences.

Name of tree		
Leaf shape		
Special features		

**Sheet 4** Name: .....

**AGE A TREE**

Type of tree	Girth of the tree measured in centimetres	Age of the tree in years - girth measured in centimetres ÷ 2.5

**Sheet 5** Name: .....

**LEAF SHAPES**

Walk around a field or along a line of trees. Spot how many different kinds of trees there are. Put a tick in a leaf when a tree is spotted with that shape.


## Working in field margins and hedgerows (FM)

- Go on an ant's nature trail. Ask the children to lay a 2 m length of string on the ground in the shape of the letter 'S'. Encourage them to follow the string from an ant's point of view, examining the trail in detail. What is the ant walking on? What plants does the ant see? Does the ant meet any other creatures? Keep a record of all the different plants and insects the ant encounters. (Sheet 6)
- Use an identification sheet to identify a range of minibeasts.
- Keep a record of all the minibeasts discovered. If you don't know what they are called, draw them or photograph them so you can identify them back at school.
- Lay four one-metre sticks on the ground in a square. Note the variety of plants within the square. Are all the leaves and grasses the same green? Are there any coloured flowers? Which plants are insects most attracted to? Choose four of the plants. Make a square of 20 cm by 20 cm. Make a detailed count of the number of each plant species within the 20 cm square. Use this count to estimate the total number of plants within the metre square.
- Find as many different kinds of seeds as possible. Consider how the seeds are dispersed, by wind (e.g. dandelion), animals, or exploding mechanisms within the fruit (e.g. conkers). Keep a record of all the different seeds discovered. (Sheet 7)
- Calculate the age of a wild hedgerow by counting up the number of species of trees and shrubs in 30 yards/27metres. It is estimated that each species represents 100 years. Some farmers have planted mixed hedgerows that might appear older than they really are. See if the children can find other clues to the age of the hedgerow.
- The BBC website [www.bbc.co.uk/gardening](http://www.bbc.co.uk/gardening) states that an average hedgerow contains 20 species of mammals, 65 species of birds and 1500 species of insects. As a class, investigate whether this is true.
- Identify flowers growing in a hedgerow. Make a flower fact file. (Sheet 8)
- Investigate which flowers attract the most insects.
- Sit or lie down with eyes closed. Listen for birds. How many different bird calls can be heard within a fixed period of time?
- Make a bird fact file. (Sheet 9)

**Sheet 6** Name: .....

**MAP OF AN ANT'S TRAIL**

Plants found along the ant's trail

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Other insects found along the ant's trail

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Sheet 7** Name: .....

**SEED HUNT**

In order to have enough warmth, light and water, seeds need to move away from their parent plants. Look at the plants around. How do their seeds disperse? Collect as many different kinds of seeds as possible. Draw each one in the table below. Guess how each seed is dispersed.

By animal/seed explosion/wind?	By animal/seed explosion/wind?
By animal/seed explosion/wind?	By animal/seed explosion/wind?
By animal/seed explosion/wind?	By animal/seed explosion/wind?

**Sheet 8** Name: .....

**FLOWER FACT FILE**

Name of plant		
Colour		
Number of petals		
Number of leaves		
Stalk texture		
Special features		

--	--

--	--

**Sheet 9** Name: .....

**BIRD SPOTTING**

Date	Time
Habitat	
Weather	
Description of the bird (e.g. colour, size, notable markings, voice, flying style, nest, nearby eggshells, similar to a...)	
Sketch of the bird	
Conclusion This bird may have been a...	



















## Working with ponds, streams and ditches (PSD)

1. Take a sample of pond life. Identify any creatures within it. Make a tally chart of the types. Older children could also estimate the total numbers within a pond. (They would, though, need to bear in mind that numbers are approximate given that different creatures will prefer to live in different areas of a pond.)
2. Take samples from defined zones such as the pond edge, water surface, submerged weed, emergent weed, at different depths. Encourage the children to compare the samples. Which zones contain the most species? How does the habitat offered by each zone differ from the others?

**NB: Return all species carefully to the places you found them.**
















## Section 4: Identifying common species

### IDENTIFYING POND CREATURES
















		
bloodworm	flatworm	freshwater shrimp
		
great diving beetle	leech	mosquito larva
		
mosquito pupa	pond skater	pond snail
		
ram's-horn snail	sludgeworm	water beetle
		
water-boatman	water flea	water louse
		
water mite	water spider	whirligig beetle


















## IDENTIFYING MINIBEASTS

		
ant	beetle	caterpillar
		
centipede	crane-fly	earthworm
		
earwig	fly	ladybird
		
millipede	moth	slug
		
snail	spider	woodlouse







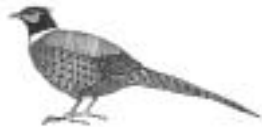








## IDENTIFYING TREES

		
ash	beech	common lime
		
fir	hawthorn	holly
		
horse chestnut	oak	pine
		
plane	silver birch	sweet chestnut
		
sycamore	wild cherry	yew

## IDENTIFYING PLANTS

		
campion (red/white)	chickweed	common St John's wort
		
creeping buttercup	dead nettle	dog violet
		
forget-me-not	golden rod	greater bindweed
		
heather	hedge parsley	lesser celandine
		
poppy	primrose	wood sorrel






## IDENTIFYING BIRDS

		
blackbird	blue tit	chaffinch
		
crow	great spotted woodpecker	great tit
		
pheasant	robin	song thrush
		
sparrow	starling	swallow
		
swift	wood pigeon	wren


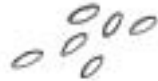

## IDENTIFYING MAMMALS (CLUES)

It can be difficult to see wild animals in their natural habitats because they are often wary of humans. Also, some wild animals are nocturnal. Clues, however, can show that an animal has been present. Find how many clues you can discover for different kinds of animals.

### Footprints

 badger	 deer	 fox
 hedgehog	 rabbit	

### Droppings

 fox	 mouse	 rabbit
--	--	---

### Food remains

 Hazelnut split by a squirrel	 Hazelnut gnawed by a dormouse
---	--

### Other clues to look for:

Fur or hair (note the colour and where it is found – this gives clues to the height of the animal and what it might be).

Gnawed wood (rodents gnaw wood even when they are not hungry).