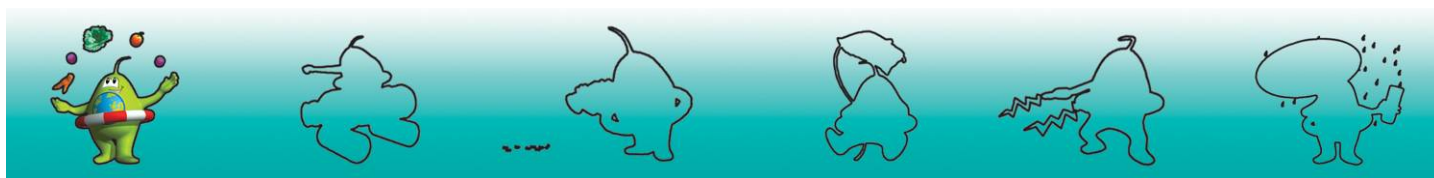


## 9. TOPIC: FOOD

Out the ground into the pot  
 Meat in the oven so very very hot  
 Out comes a meal beautifully cooked  
 And at the cans in the supermarket we never even looked



Activity	Learning points	Curriculum Links
<p><b>Food Miles</b></p> <p>The students are first asked to predict how far away food travels before ending up on our plates</p> <p>A range of empty food wrappers (<i>these could include examples brought in by students</i>) are inspected. Labels are read to discover where each food item came from. Using a globe and a piece of calibrated string, the students are shown how to calculate the distance in miles the food items have travelled to be eaten. This includes understanding the relationship between degrees of latitude/ longitude and distance. A flip chart is used to record the results and the total miles for a hypothetical meal calculated. The packaging is also examined with respect to necessity and waste.</p> <p>A discussion is then facilitated about transport related problems of pollution and fossil fuel depletion. What then are the solutions? - Buying local and growing your own food is then discussed.</p>	<ul style="list-style-type: none"> <li>A. Use of simple equipment to make measurements (globe and string)</li> <li>A. Use of conclusions to understand wider issues of food miles (transport pollution &amp; fossil fuel depletion).</li> <li>B. The conflicting interests of food choice and impact on the environment - Eating local food seasonally reduces environmental impact -even better if self-grown due to reduced packaging</li> <li>C. Use of a globe and scale to calculate miles</li> <li>D. Breaking down a complex problem (distance between places) into simpler steps (scales and conversion factors)</li> <li>E. Use a measuring scale to approximate distances</li> <li>F. Estimating numbers in a practical context</li> <li>G. Contribute and listen to views in a group discussion before coming to conclusions                         <ul style="list-style-type: none"> <li>• Choices are often about 'wants' rather than 'needs'.</li> <li>• Waste in packaging (see also WASTE topic)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>A. Science/Sc1 Scientific Enquiry, 2b,2e,2g,2i,2j,2l (Investigative skills)</li> <li>B. Geography/ Knowledge, skills and understanding, 5a, (Knowledge and understanding of environmental change and sustainable development)</li> <li>C. Geography/ Knowledge, skills and understanding, 2c, (Geographical enquiry and skills)</li> <li>D. Mathematics/ Ma2 Number, 1b (Problem solving)</li> <li>E. Mathematics/ Ma3 Shape, space and measures, 4b (Understanding measures)</li> <li>F. Mathematics/ Breadth of study, 1b,1d,1e</li> <li>G. English/EN1 Speaking &amp; Listening, 3a, 3b, 10b,10c (Group discussion &amp; interaction)</li> </ul>



<p><b>Planting Beans</b></p> <p>Each student fills a pot with 'HHP' compost and plants a bean (variety will vary according to time of year). After watering and labelling a digital photo of all pots is taken which will then be emailed to the school. Subsequent photos can be taken over the year so students can see the progress of the beans</p>	<p>A. Life processes common to plants include growth and nutrition</p> <p>B. Requirements for germination: water, light, warmth</p> <ul style="list-style-type: none"> <li>• How to grow your own food</li> <li>• Use of technology to communicate information-digital photo via email</li> </ul>	<p>A. Science/Sc2 Life processes and living things, 1b (Life processes)</p> <p>B. Science/Sc2 Life processes and living things, 3a (Green plants)</p>
<p><b>Making Fertiliser (seasonal)</b></p> <p>Nettles or comfrey leaves are collected and put into a container and covered with water.</p> <p><i>These are left for three months before use by HHP on particular crops such as beans or tomatoes.</i></p>	<p>A &amp; B. Use of nutrients to improve plant growth.</p> <ul style="list-style-type: none"> <li>• Safety with nettles/comfrey by using gloves</li> <li>• Use of chemical-free fertiliser</li> <li>• Home-made and local production of a plant feed</li> </ul>	<p>A. Science/Sc2 Life processes and living things, 1b (Life processes)</p> <p>B. Science/Sc2 Life processes and living things, 3a (Green plants)</p>
<p><b>What can we eat?</b></p> <p>The students split into two or three supervised groups. Each group, walk around the site collecting evidence of five edible plants and five inedible plants. (Examples of the latter include: leaf of apple tree and dockleaf). After these have been collected, the students return to the activity site to share and discuss findings. The adults do not interfere during collecting.</p>	<p>A. Identifying food we can eat - some we might expect -and some unusual ones e.g. nettles and bulrushes</p> <p>B. How different plants are found in different habitats</p> <ul style="list-style-type: none"> <li>• Safety with nettles and other potentially 'harmful' plants</li> <li>• 'Food for free'</li> </ul>	<p>A. Science/Sc2 Life processes and living things, 4b(Variation and classification)</p> <p>B. Science/Sc2 Life processes and living things, 5b(Living things in their environment)</p>
<p><b>Can you taste the difference?</b></p> <p>The taste of a fresh carrot is compared to one from a can. Any differences are noted between the processed and fresh alternative. There is then a discussion around concept of freshness, nutrition, packaging etc.</p>	<p>A. Understanding what processed and organic means and implications for nutritional value</p> <p>B. The conflicting interests of food choice and impact on the environment - Eating local food seasonally reduces environmental impact -even better if self-grown due to reduced packaging</p> <ul style="list-style-type: none"> <li>• Safety re clean hands ; Wash hands prior to this activity</li> <li>• Sensations of taste and describing them</li> </ul>	<p>A. Science/ Sc2 Life processes and living things, 2b (Humans and other animals - Nutrition)</p> <p>B. Geography/ Knowledge, skills and understanding, 5a, (Knowledge and understanding of environmental change and sustainable development)</p>

## 9. TOPIC: FOOD (PREPARATION)

**Session length:** 1 hour 15 min

**Staff:** One facilitator plus helper.

**Location:** Polytunnel/Greenhouse or other shelter in/near food growing area.



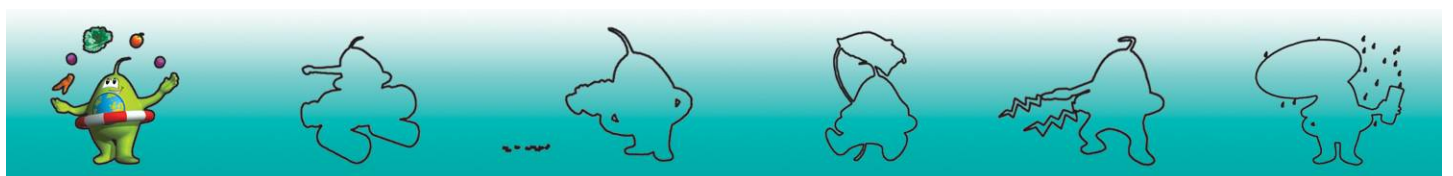
**Specific Health and Safety issues:** All to wear gloves. Ensure hands are washed thoroughly at end of activity. Supervision by guide. Use gloves to pick nettles. Treat stings with docks and reassurance. Safety instructions - nothing to be eaten without adult permission. Check if any food allergies with specific children.

**Preparation:** Assemble materials before start.

**Post activity actions:** Wash hands at finish

### Method

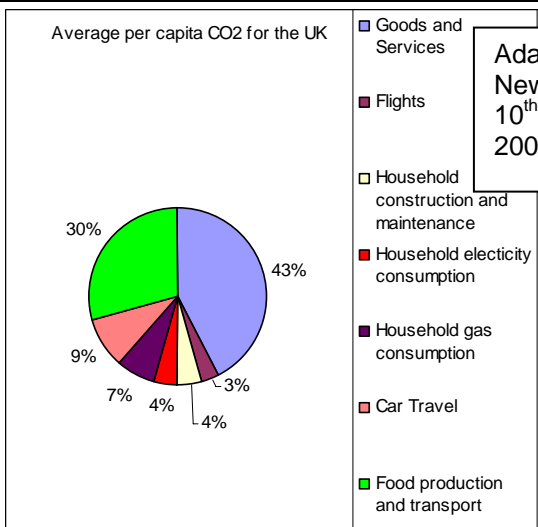
Timing	Activity	Materials	Sources of materials/notes
5 min (5)	<b>Introduction</b>	<ul style="list-style-type: none"> <li>Briefing sheets including "Needs and Problems"</li> </ul>	Resource Pack
10 (15)	<b>Food Miles</b>	<ul style="list-style-type: none"> <li>Matting</li> <li>Food wrappers</li> <li>Globe with scale string</li> <li>Flipchart and pens</li> </ul>	Encourage children to bring food wrappers. See prediction sheet below.
15 (30)	<b>Planting Beans</b>	<ul style="list-style-type: none"> <li>Plant pots</li> <li>Labels and pens</li> <li>Compost</li> <li>Watering cans and water</li> <li>Gloves</li> <li>Trowels</li> <li>Beans</li> </ul>	Bean variety will vary according to time of year.
15 (45)	<b>Making Fertiliser (seasonal)</b>	<ul style="list-style-type: none"> <li>Comfrey or nettles</li> <li>Gloves</li> <li>Buckets of water</li> <li>Water butt / buckets</li> </ul>	
15 (1hr)	<b>What can we eat?</b>	<ul style="list-style-type: none"> <li>6 Plastic containers</li> </ul>	Locate a local food growing area e.g. allotments, local resident's garden who grows food.
10 (1hr 10)	<b>Can you taste the difference?</b>	<ul style="list-style-type: none"> <li>Carrots growing in plot/ bought organic carrots</li> <li>Can of carrots</li> <li>Knife/peeler</li> <li>Washing facilities Soap, towel, bowl of water</li> </ul>	
5 (1hr 15)	<b>Recap</b>		Recap activities and sum up learning points



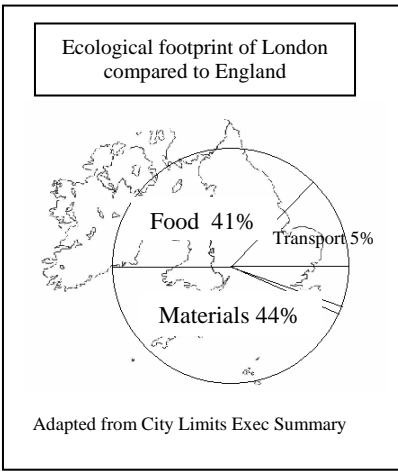
# 9.TOPIC : FOOD

## Prediction Sheet

Food miles travelled	PREDICTION	<b>ACTUAL</b>			
		Main Ingredient In UK	Impor	Other Ingredients	Total
Crisps					
Can of beans					
Can of fruit					
Other					



Adapted from  
New Scientist  
10<sup>th</sup> March  
2007



Different people's analysis of the situation

## 9. TOPIC: FOOD



### Problem Solvers Actions

#### What can you do?

- Encourage frogs into your garden to eat slugs with a rock pile or a small pond
- Grow your own cress - to make it fun why not plant in different shapes or words and see them grow!
- Eat more healthily with more fruit and vegetables to get those essential minerals and vitamins for growing up (check out [www.sustainweb.org/grab5\\_index.asp](http://www.sustainweb.org/grab5_index.asp))
- Cook your own biscuits, reduce packing and perhaps a little bit of that sugar!

#### What can you do with your parents or teacher at home and school?

- Grow as much food as you can at home or in an allotment. Why not help start a garden at school? (for ideas see kids section of <http://aggie-horticulture.tamu.edu>)
- Don't use chemical fertilisers
- Make your own comfrey or nettle fertiliser. Don't use chemical pesticides
- Make your own slug trap
- Pick off caterpillars by hand
- Use companion planting to deter pests - e.g. plant marigolds near carrots
- Encourage parents and school to use locally grown food, (supermarkets are more likely to import products). Organic box schemes provide good quality local produce (try [www.simplyorganic.net](http://www.simplyorganic.net) or [www.organicshop.co.uk](http://www.organicshop.co.uk))
- Eat fruit and vegetables seasonally (i.e. when they are harvested locally) to save on food miles (check out [www.thefooddoctor.com](http://www.thefooddoctor.com))
- Reduce the amount of meat you eat. It takes far more energy and resources to produce meat products
- Encourage ladybirds by providing them with a home - they will save you using chemicals to get rid of greenfly - a house of 100 ladybirds will eat up to 8,000 greenfly a day! (see [www.naturalcollection.org](http://www.naturalcollection.org) to purchase house)

### Problem solvers Further Resources

- **Banana Link** ([www.bananalink.org.uk](http://www.bananalink.org.uk))- find out more about how bananas can be produced more sustainably
- **Henry Doubleday Research Association** - lots of information about organic gardening ([www.hdra.org.uk](http://www.hdra.org.uk))
- **The Kids Organic Club** ([www.kids.organic.org](http://www.kids.organic.org)) has an interactive organic farm, it gives you facts about organic farming and you can debate on-line between organic and intensive farming.
- **The Vegetarian Society** ([www.vegsoc.org/youth](http://www.vegsoc.org/youth)) have a youth section



## GLOBAL RELEVANCE OF FOOD TOPIC

The food we eat has important implications on both the environment and our own health. It has been estimated that a typical food product in a supermarket has travelled over 1,000 miles increasing the amount of polluting carbon dioxide. Many of these products are also heavily packaged creating the additional problem of waste.

Modern farming makes a lot of use of chemical fertilisers and pesticides. Regulations are not always so strictly adhered to in other countries. It has been estimated that around 40% of vegetables and fruit contain pesticide residues, often in concentrations higher than is thought to be safe. In many cases additional chemicals are added to foodstuffs to produce packaged and processed products for the supermarket shelves. For example:

**A BAG OF CRISPS =** A simple potato sliced and deep-fried with artificial flavours before being added to a laminated foil and plastic packet.

The more food is processed, the lower its nutritional value is likely to be and the more likely cheap fat and sugar has been added, making them less healthy. It has been argued that this has led at least in part to the increase in the number of people being over-weight (obesity). In the UK 9% of boys and 13.5% of girls have been estimated as being over-weight and the trend is for this to increase. It is generally best to eat a balanced diet that includes as wide a variety of foods as possible but with a focus on low-fat, high fibre foods. Many health problems in later life could be avoided by establishing a healthy diet in childhood.

Many people are now demanding food with less chemicals that are grown using organic farming methods. Supermarkets have responded by stocking more and more organic foods. However UK farmers have struggled to keep up with this demand, so that in many cases the food has to be imported from other parts of the world, adding to pollution from transport emissions.

The best possible approach is therefore to think global but to act local i.e. try and grow at least some of your own food or buy seasonal local organically-grown food.

### Food growing area at HHP



# 10. TOPIC: BIODIVERSITY

## Life Energy

Twinkle, flash  
Swish, swoop  
Watching it loop the loop  
Is it a fairy, is it a fly  
No, it's a dragonfly



Activity	Learning points	Curriculum Links
<p><b>Lilliput</b></p> <p>Lay cloth squares on the ground. Set the scene by suggesting every one is getting smaller; so small in fact we'll all soon be able to get in a leaf! But first you start to see small things in a new way. Remove cloth squares and look very carefully underneath them through the tubes. Lilliput people are out but their homes are still there.</p>	<p>A. Appreciation of the beauty found in small things</p>	
<p><b>Leaf food</b></p> <p>A role play is set up with particular emphasis on needs. All take part in constructing the set; a giant leaf in the woods. Then six children are cast as the "Chlorophylls"; each is given a mould and then takes up residence in the leaf structure. They shout out their needs. The remaining children, the "Molecules" supply things requested eg water, carbon dioxide and sun energy via the correct entrance holes in the leaf. These are reassembled in the moulds - producing sugars. Oxygen is expelled. The shape of the mould determines the formation of the product. So in this case carbon attaches to the energy stick then to the oxygen, then to the hydrogen ball. This represents the shape of a very simple sugar. Six molecules are made similar in shape to represent a "real" sugar, starch.</p>	<p>B. The elements necessary to meet the needs of plants.</p> <p>C. The useful products a plant makes.</p> <p>D. Energy is stored in a plant.</p> <p>E. The importance of the energy stored in plants.</p>	<p>Science/ Sc2 Life processes and living things: Green plants 3a, 3b, 3c (Living things in their environment)</p> <p>Key stage 3, 3a Nutrition and Growth</p>



# 10. TOPIC: BIODIVERSITY

## Life Energy



<p><b>Jump</b></p> <p>An experiment on ourselves. Everyone jumps up and down for one minute and the effects are assessed - heat, perspiration, gas inhaled and expelled etc. A segment of an orange is then offered to each child to eat (Animal food).</p>	<p>A. Human activity generates needs for fuel (food and air)</p> <p>B. Our by-products are used by plants as their fuel. The linked nature of nature.</p>	<p>A. Science/ Sc2 2b</p>
<p><b>The World Wide Web (of life)</b></p> <p>This fun game powerfully demonstrates the interrelationships of plants and animals. Using string to represent food chain links, the children acting as different plants or animals in a food chain become connected to each other to form a small eco-system. They all start out from a "leaf". Dependency on each other is demonstrated as one part of chain dies (representing extinction or destruction) and in turn everyone feels the impact of the loss.</p>	<p>A. The complex interrelationships between animals and plants</p> <p>B. All animals and plants are part of a food chain and so connected and dependent on each other.</p> <p>C. Most food chains start with a green plant.</p>	<p>A. Science/ Sc2 Life processes and living things: 5a, 5d, 5e (Living things in their environment)</p>
<p><b>Fire</b></p> <p>Students collect firewood from a designated pile, the sticks are "tickets to the show". Then they build a fire in a fire-place. The sun's energy is released quickly, along with CO<sub>2</sub> and soot. This is also demonstrated with the molecules. <i>(Only the supervisor lights the fire and feeds the fire.)</i></p>	<p>A. Stored sun energy can be released quickly.</p> <p>B. Pollution, heat and Carbon Dioxide are released by fires.</p> <p>C. Recognise the hazards of fires and that action can be taken to reduce risks to themselves and others.</p>	<p>A. Science/ Breadth of study, 2b (health &amp; safety)</p>
<p><b>Warming</b></p> <p>Children move to a poly-tunnel to experience the effects of the sun's energy being trapped by a layer of carbon based material. The analogy with the global warming is drawn. Plants are seen growing and the internal temperature is hot!</p>	<p>A. The release of carbon dioxide although vital for plant growth can also cause problems if released in excess.</p>	<p>A. Science/ Sc2 Life processes and living things: 3a</p>



# 10.TOPIC: BIODIVERSITY-Life Energy (Preparation)

**Session length:** 1 hr 15 min

**Staff Resources:** One facilitator plus helper

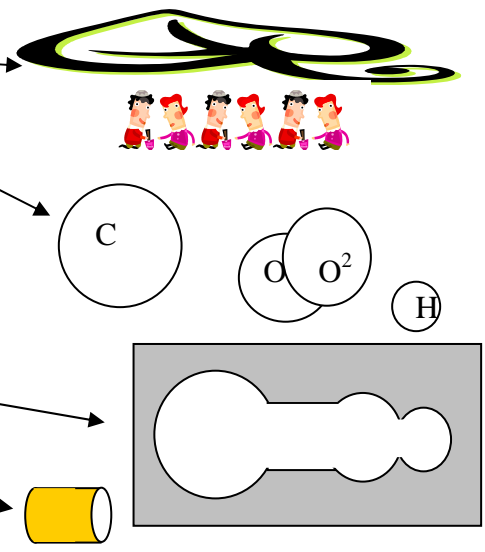
**Locations:** Aim is to spend as much time outside as possible experiencing nature. Ideally, locate beneath trees.

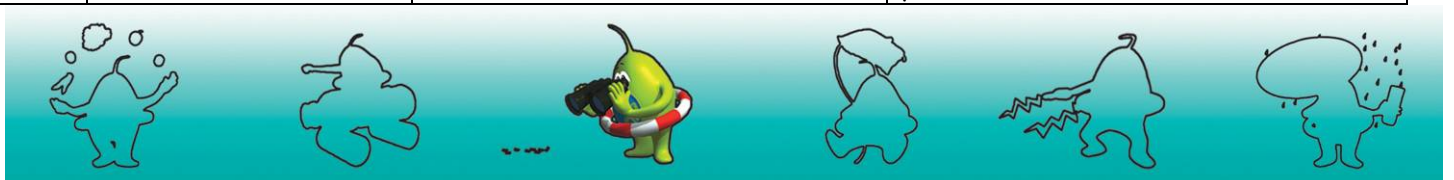
**Specific Health & Safety issues:** Nothing should be eaten from the land without adult permission. Children may be offered a taste of an orange - it should be clear that this is optional. Nettles are common. Children need to be made aware that they sting, but balance this with how wonderful a plant it is! Treatment can be with dock leaves and sympathy. Risk from stinging insects should be assessed. Fire precautions and safe working practice.

**Preparation:** Assemble materials before start, including gloves. Ensure all children have suitable footwear (spare boots may be available) and rainwear (if wet).

**Post activity actions:** All wash hands.

## Method

Timing	Activity	Materials	Sources of materials/Notes
5 (5)	<b>Introduction</b>	<ul style="list-style-type: none"> <li>Briefing sheets including "Needs and Problems"</li> </ul>	Resource Pack
10 (15)	<b>Lilliput</b>	<ul style="list-style-type: none"> <li>6 Card tubes and 6 squares of material 30 x 30cm</li> </ul>	Toilet rolls
15 (30)	<b>Leaf food</b>	<ul style="list-style-type: none"> <li>Large green leaf big enough to cover 6 children. (Ply wood)</li> <li>Three small bags marked carbon dioxide, Water &amp; Sun.</li> <li>Atom balls (Polystyrene craft balls) marked C, O, O<sup>2</sup> and H<sup>2</sup> (6 Carbon, 6 Oxygen, 6 Oxygen-2 and 6 Hydrogen-2). These should stick together with Velcro forming "molecules".</li> <li>Three moulds to suit balls, forming a sugar "shape"</li> <li>Six sun energy sticks; small yellow cylinders with Velcro on; sticks carbon to oxygen atoms.</li> </ul>	
5 (35)	<b>Jump</b>	<ul style="list-style-type: none"> <li>Orange</li> </ul>	
10 (45)	<b>The World Wide Web (of life)</b>	<ul style="list-style-type: none"> <li>String</li> </ul>	
15 (1 hr)	<b>Fire</b>	<ul style="list-style-type: none"> <li>Fire box &amp; Matches</li> <li>Dry kindling; Fire wood</li> <li>Sand in bucket</li> </ul>	
10 (1hr 10)	<b>Warming</b>	Green house or other well lit space behind or under glass or plastic.	
5 (1hr15)	<b>Recap</b>		Recap activities and sum up learning points





## 10. TOPIC: BIODIVERSITY - Life Energy



### Problem Solvers Actions

#### What can you do?

- Put up wildlife and bird boxes (see [www.yptenc.org.uk](http://www.yptenc.org.uk) for more information)
- Set up a habitat pile in a quiet spot - logs and stones make wonderful homes for small creatures.
- Don't buy souvenirs that threaten wildlife e.g. objects made from unmanaged hardwoods, tortoise shells, or coral.
- Make your own or improve a green space for wildlife (check out British Trust for Conservation Volunteers at [www.btcv.org/ppawards/ppawardsintro.html](http://www.btcv.org/ppawards/ppawardsintro.html), or The Young Person's Trust for the Environment for lots of ideas at [www.yptenc.org.uk](http://www.yptenc.org.uk)). There are a number of local schemes including 'Sherwood Forest Community Rangers' & 'Greenwood' (tel: 01623 758 231), 'Bestwood Country Park Rangers' (0115 927 3674) and 'St Anns Community Orchard' (07816 209 108)
- Find out more about wildlife in your area (see [www.biodiversityday.org](http://www.biodiversityday.org)) or visit a local 'wild place' (see [www.foe.co.uk/wildplaces](http://www.foe.co.uk/wildplaces))
- Adopt an animal as a present (see [www.wildlifetrusts.org.uk](http://www.wildlifetrusts.org.uk) or [www.barnowltrust.org.uk](http://www.barnowltrust.org.uk))
- Leave wood to rot and become a mini wildlife paradise

#### What can you do with your parents or teacher at home and school?

- Fit cats with bell collars to scare the birds they are trying to catch (this can cut down predation by about a third)
- Use peat free composts, to protect important ancient peatbog habitats (for more information try The Royal Botanic Gardens at [www.rbgekew.org.uk](http://www.rbgekew.org.uk) or Friends of the Earth at [www.foe.org.uk](http://www.foe.org.uk))
- Build a wildlife garden including a small pond (see [www.beautifulbritain.co.uk/pond\\_pages.htm](http://www.beautifulbritain.co.uk/pond_pages.htm))
- Use and support local products from sustainable managed woodlands
- Install a bat box - as well giving a home to these endangered species they will pay you back by eating many unwelcome insects (up to 3,000 a night!) (see [www.naturalcollection.org](http://www.naturalcollection.org) to purchase a box and [www.nrw.co.uk/bats](http://www.nrw.co.uk/bats) to find out how to encourage bats.)
- Check for hibernating hedgehogs before you start a bonfire and don't feed them milk -they can't digest it! (check out British Hedgehog Preservation Society at [www.hedgehogs.org.uk](http://www.hedgehogs.org.uk))
- Plant (or leave) a small nettle patch as a good source of food for many caterpillars before they turn into butterflies



## Problem solvers Further Resources

### For problem solvers:

- **Naturegrid** ([www.naturegrid.org.uk](http://www.naturegrid.org.uk)) - Explore woodlands, rivers, woods and the wildlife of the UK. It has links to places all over the UK where you can go to study nature. If you have a very small brother or sister it is suitable for them as well.
- **Over the Garden Gate** ([www.overthegardengate](http://www.overthegardengate)) - Visit the wildlife section - includes ten ways to make your garden an attractive place for wildlife.
- **Royal Society for the Protection of Birds (RSPB)** ([www.rspb.org.uk](http://www.rspb.org.uk)) Tel: 01273 775333 - They have a separate young person's club.

### Mainly for adults and teachers:

- **English Nature** ([www.english-nature.org.uk](http://www.english-nature.org.uk))
- **Hawk & Owl Trust** ([www.hawkandowl.org](http://www.hawkandowl.org)) - They can help you to encourage owls in your area by installing an owl box.
- **Nottinghamshire Biodiversity Action Group** ([www.nottsbaq.org.uk](http://www.nottsbaq.org.uk)) - It provides advice, training and financial support for individuals and community groups taking action for local wildlife. They also have free leaflets on wildlife gardening.
- **Nottinghamshire Biological and Geological Record Centre** - Holds information about the county's wildlife, which is used for a variety of purposes, including land use planning, land management and education. Tel: 0115 915 3902
- **Nottinghamshire Wildlife Trust** - Find out more via the **Wildlife Trusts** ([www.wildlifetrust.org.uk](http://www.wildlifetrust.org.uk))
- **Wild Things** ([www.wildthings.org.uk](http://www.wildthings.org.uk)) - This is an ecological educational collective working with children and young people.
- **World Wildlife Fund** ([www.wwf.org.uk](http://www.wwf.org.uk)) - WWF just for kids has a guide to wild places and the animals that live in them. There is also software to download about Whales and Dolphins

## GLOBAL RELEVANCE OF BIODIVERSITY TOPIC

Biodiversity refers to the wonderful variety of wild animals and plants, and the habitats which support them. It is not just about the rare and special. We experience it at first hand when birds visit our gardens and the open spaces near our homes. The loss of the house sparrow from many towns is a sad example, having declined by 95% since 1990.

Caring for biodiversity is important not just for its attractiveness but because it is part of the natural world on which we depend. It gives us many of the basics of life; our oxygen, water, food, clothing, health and relaxation. It gives us new sources of food or medicines.

The state of our wildlife tells us a lot about the state of the environment as a whole. Man's activities have increased natural extinction rates by many thousands, and it is happening in all parts of the world. By 2050 orang-utans could be extinct. Maybe one day the only way to see an elephant is on a video, or in a zoo. Closer to home, Nottinghamshire is no exception, where habitat losses include:

- 50% less ancient woodland than in 1920,
- 90% less heathland than in 1922, and
- 97-99% less wildflower grassland than in 1930.