

HUMAN IMPACT

INTRODUCTION

In this module children will learn about some of the positive and negative ways that humans change the environment, locally and globally, with a particular focus on how this affects other living things. They will begin to understand that actions can have both positive and negative consequences, that situations are not black and white, and that decisions involve compromises. They will consider how industry, housing and thoughtless behaviour can damage local habitats and also how humans can increase biodiversity by developing environments such as country parks and nature reserves.

This will be related to a developing understanding of food chains (building on what children learned in Year 2) and what happens if food chains are broken by habitat disruption or the removal of a species from an ecosystem. In this module children consider both habitats (where something lives) and ecosystems (the inter-relationships between organisms and their interaction with the habitat/environment). As an example of a local issue that they can influence, children will plan and carry out litter surveys and, through considering the effect of litter on animals, will understand that its negative impact goes beyond its appearance. This will support work towards an Eco-Schools award.

Children will also be introduced to some global issues by researching the impact of deforestation, ocean pollution (oil spill) and global warming on ecosystems. In the enrichment lessons children will consider and debate positive and negative aspects of keeping animals in zoos.

When working scientifically children will plan and carry out a litter survey, using a tally chart to record data. They will group items into categories to make survey data manageable and present their findings by constructing and labelling pictograms and bar charts. They will also present information as oral and written reports, posters and food chains. When working with information from secondary sources they will weigh and present evidence, recognise statements that do and do not support an argument, and participate in a debate.

Key vocabulary:

environment, impact, positive, negative, litter, pollution, waste, biodiversity, habitat, derelict, graffiti, traffic, destroy, create, location, food chain, producer, consumer, human impact, global issue, destruction, deforestation, rainforest, climate, climate change, zoo, endangered, breed, wild, natural, predator, prey, conservation, categories, tally chart, pictogram, bar chart, axes, scale, opinion, point of view, argument, viewpoint, debate

FACT FILE:

Humans can have a negative impact on the local environment through different types of **pollution** (e.g. litter, chemical, air, noise) and through destruction of habitats through building housing, roads etc.

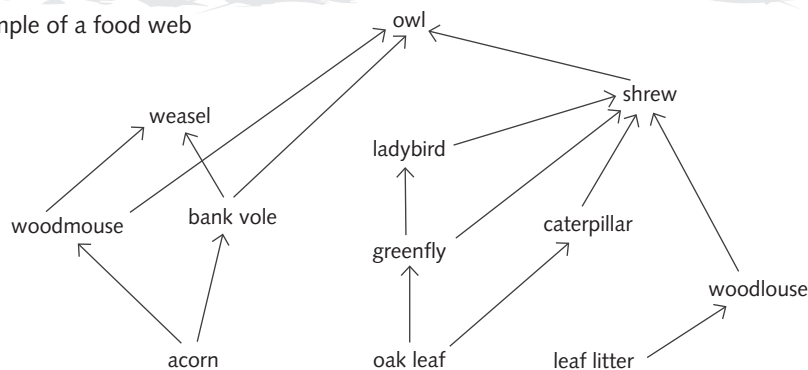
Humans can also have a positive impact when developments are designed to be **environmentally friendly**, when they improve **brownfield sites** and where **parks, nature reserves** and other green spaces are deliberately created or actively maintained to increase **biodiversity**.

Global issues affecting biodiversity include habitat destruction through **deforestation** (for intensive agriculture, building or use of the trees as a resource), **pollution** (for example from oil spills) and **global warming**, which can be explored through its impact on polar habitats. These are representative of negative human impact, but other similar issues taken from topical news stories could also be used to examine the same concepts and skills.

Discussion of global warming is a useful introduction to the idea that there are scientific issues for which evidence is still being collected, and that for some issues scientists may disagree about what the evidence shows. Debating the pros and cons of keeping animals in zoos shows children that scientific facts can be used to support different and opposing points of view.

A **food chain** is used to describe feeding relationships. These relationships are complex and, for the whole ecosystem, are shown as an interconnected food web, with any one organism being food for or a feeder on one or more other species. A food chain isolates one linear relationship from within the web.

Example of a food web



From the above illustration, for example, the food chain below can be extracted:

Leaf litter → woodlouse → shrew → owl

The arrows represent energy transfer through the food chain, but at this level they can be understood to show either the direction of food (which provides the energy) or represent the phrase 'is eaten by'.

The food chain starts with a species that eats no other species (known as a producer, and usually a green plant). All other species in the chain are known as **consumers** and the food chain ends with a species that is eaten by no other species in the web (**top consumer**). If one species from the food chain is removed from the habitat or the habitat is destroyed, scattering the species, this has an impact on other species in the chain or web. Animals higher up the chain may reduce in number or survive by competing for other foods, affecting the numbers of those species and of others that are in feeding relationships with them. Organisms earlier in the chain may increase in number, changing the balance in the ecosystem, but it is equally likely that other species that also feed on them will increase in number as competition reduces. This can happen naturally, but in this module the focus is on it happening as a consequence of human actions.

Common misconceptions:

- Children may not recognise that natural-looking environments can be highly managed and may have been entirely created by humans – not all development is malign. Even the wildest places have been affected by human activity of some kind in the past and to varying degrees now.
- Children may also not connect housing developments that look like pleasant places to live with the destruction of habitats that may have been involved in their creation, and they may also not realise that apparently derelict sites can harbour great biodiversity.
- It is also important for children to understand that natural events can destroy habitats and that food chains can be disrupted by naturally occurring events affecting either the whole habitat or an individual species (for example disease).
- Children often have difficulty with the scientific convention for recording food chains, using the arrow to represent 'eats' rather than 'is eaten by'. This may be because they associate the arrow with an action so they believe it points from the animal acting (eating) to the one being acted upon.
- Children may also misunderstand the consequences of the removal of one species from a habitat, because they consider only an individual food chain rather than the more complex relationships of the food web. Although these inter-relationships are beyond the scope of this module, care must be taken not to over simplify and as a result introduce misconceptions.

Big Cat Book links

Living with Climate Change Alison Sage 978-0-00-723118-8 Band 12 Copper	Explore the issue of climate change through the experiences of children.
Fragile Earth Claire Llewellyn 978-0-00-723110-2 Band 17 Diamond	Is the world's climate changing? We all know the theory, but here is the evidence.
What If We Run Out of Oil? Nick Hunter 978-0-00-742834-2 Band 18 Pearl	What impact is our use of oil having on the environment?