Interdependence and adaptation
Adapted from QCA Science Unit 6A

ABOUT THE UNIT

In this unit children extend their knowledge of the way in which plants and animals in different habitats depend upon each other and are suited to their environment. They relate feeding relationships to knowledge of plant nutrition.

Experimental and investigative work focuses on:

- making careful observations and measurements
- using results to draw conclusions and suggesting explanations for these using scientific knowledge and understanding.

Work in this unit also offers children opportunities to explain feeding relationships in a habitat in terms of scientific knowledge and understanding and to consider ways in which the living things and the environment need protection.

This unit takes approximately 12 hours.

VOCABULARY

In this unit children will have opportunities to use:

- words relating to plant growth *eg fertiliser, nutrients*
- words and phrases relating to feeding relationships *eg consumer, producer, predator, prey, food chain*
- words which have different meanings in other contexts *eg fertiliser, consumer, producer, key, suited, plant food*
- expressions for summarising and generalising.

EXPECTATIONS

at the end of this unit

most children will:	recognise that a green plant needs light and water to grow well and that it produces new material from air and water; describe how animals in two habitats are suited to the conditions; represent feeding relationships in food chains beginning with a green plant and use keys to identify animals and plants
some children will not have made so much progress and will:	recognise that a green plant needs light and water to grow well, that different animals and plants live in different habitats, and that some animals feed on other animals and some on plants; use keys to identify some animals and plants
some children will have progressed further and will also:	recognise that green plants are the source of food for all animals and that they produce material for new growth from air and water in the presence of light

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN
	Review what children remember about what plants need in order to grow well. It may be helpful to stimulate their thoughts by showing them a green plant that has been kept in the dark for several weeks and a healthy plant as contrast. Question children about the plant, if necessary prompting them to identify light, water and warmth and healthy stems, roots and leaves as necessary for plants to grow well.	
• that green plants need light in order to grow well • to make careful observations of plant growth and to explain these using simple scientific knowledge and understanding • that green plants make new plant material using air, water in the presence of light • that for this to take place the green plant requires leaves	♦ Ask children to suggest what will happen to the plant kept in the dark if it is placed on the window sill for a few days. Ask children to observe the plant to see whether it grows better *eg becomes more sturdy, develops more leaves*. Discuss with children what they have seen and explain that plants grow by making new materials using the air around them and the water they take in through their roots, and that they need leaves to do this.	• recognise that the plant will grow healthily once it is returned to the light by making a prediction *eg its leaves will turn green and it will begin to grow stronger after a few days* • make relevant observations which provide information about how the plant is growing
• that fertilisers are often added to soils to provide plants with the nutrients they need	♦ Show children some packaging from fertilisers or 'plant food' or labels from house or garden plants and ask them to suggest why fertilisers are needed. Explain that plants take in nutrients as well as water through their roots but that very small quantities of these are needed. Ask children to think about how animals obtain food for growth and discuss the differences between this life process in plants and animals.	• state that plants and animals obtain food for growth in different ways
• to use keys to identify animals and plants in a local habitat	♦ Ask children what they remember of the local habitats studied in Year 4 and revisit one specific habitat. Observe animals and plants found in these and help children to use keys to identify unfamiliar animals and plants from living things, or from pictures.	• use a suitable key to identify a number of plants and animals found in a local habitat
• that animals and plants in a local habitat are interdependent • how animals and plants in a local habitat are suited to their environment	♦ Ask children what they remember from previous work about the feeding of animals and plants and ask them to suggest other reasons why animals need the plants and why plants might need the animals. Help children to use their own knowledge and observations and secondary sources to make an information card about an animal or plant in the local habitat.	• identify ways in which the animals depend on plants *eg for food, shelter, shade* and ways in which the plants need animals *eg provide fertiliser for the soil, help to disperse seeds*

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN
• that food chains can be used to represent feeding relationships in a habitat • that food chains begin with a plant (the producer)	♦ Remind children of earlier work on food chains and present children with information *eg from their information cards* about the animals and plants in a local habitat, or in another habitat, together with information about what the animals eat. Ask children to construct food chains and to explain to each other what they mean. Elicit children's understanding of the terms 'producer' and 'consumer'. (Refer to everyday uses of the words 'producer' and 'consumer' and use these as analogies. Plants 'produce' food for animals which 'consume' etc. That there are some insect-eating plants, however, few plants feed in this way.) ♦ The interdependence of living things in a food chain (i.e. if one thing is affected then all the other organisms will be too.	• construct a food chain *eg rosebush → greenfly → ladybird* and explain it *eg this means the greenflies feed on the rosebush and the ladybirds feed on the greenflies* • explain why plants are essential to food chains *eg plants grow using air and water, they don't eat other things*
• that different plants grow in different soil conditions • that water and nutrients are taken in through the root • that roots anchor the plant in the soil	Show children a collection of labels from garden and house plants which illustrate the needs of the plants in terms of *eg light, shade, soil type, water etc.* Ask children to suggest why soil type is important. Show children some plants with different shaped roots, pictures of different roots. Ask them to suggest how roots ensure the plant gets water and nutrients. Ask children to draw and annotate a diagram showing the importance of a root to a plant and ask them why fertilisers are often added to soil. (Dandelion and carrot roots can be used as examples of long tap roots. Pictures (or a visit to a site) to show a tree fallen in a storm help to reinforce the idea of roots anchoring a plant.)	• recognise that different plants grow well in different conditions • produce a drawing showing nutrients and water being taken in by the root and the root anchoring the plant in the soil
• to make careful, relevant observations of soils • to draw conclusions from observations and to explain these using scientific knowledge and understanding	♦ Present children with two soil samples and ask them to observe them closely *eg with hand lenses or microscopes* and to record differences between the two soils *eg size of pieces of rock, colour, dryness, animal/plant material.* Challenge children to explain which could provide a good habitat for a soil-living animal and which would allow plants to anchor themselves most effectively. Remind them of earlier work on soils and drainage. Ask them to present their ideas in drawing and writing.	• describe observed differences between the soils • identify characteristics that would suit a soil-living animal *eg air spaces, dampness, plant material* and explain why these are important

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN
• that different animals and plants are found in different habitats • how animals and plants in a second habitat are suited to their environment	♦ Extend children's understanding of habitats to a contrasting habitat which may not be in the locality *eg seashore, river, woodland* and using secondary sources *eg video, CD-ROM, reference books or a visit* illustrate the range of animals and plants living there. Ask children to use secondary sources *eg reference books, CD-ROMs, photographs* to find out about a specific animal and a specific plant *eg a wading bird, seaweed or a woodland plant (bluebell)* and how it is suited to the habitat in which it lives. Ask children to make an information card about the organism and make a class display to illustrate the animals or plants in this habitat. Talk with children about differences between the habitats and the animals and plants found in each.	• name some animals and plants found in the habitat • identify features of animals and plants which make them suited to their habitat *eg long legs for wading birds, bladders to make seaweed float*
• to construct food chains in a particular habitat	♦ Using the information gathered in the previous activity help children to construct food chains relating to the habitat. Challenge children to trace the food chains back to the producer. Ask children to compare the food chains from the two habitats and talk with them about similarities and differences. (Children may begin to see how food chains interconnect. If so, the idea of food webs could be mentioned.)	• sequence food chains within a habitat including a plant as a producer and using the arrow convention correctly
	Thorough revision of QCA Unit 5B • structure of flowering plant (esp. flower) • reproduction in flowering plants: processes of pollination and fertilisation Revision of human (and other animal) life processes human growth and reproduction incorporating sex education	