



TEACHER'S NOTES

Science – Interdependence and adaptation (based on QCA Unit 6a)

Learning Intentions

In this unit pupils will 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 will relate feeding relationships to knowledge of plant nutrition. Pupils will explain feeding relationships in a habitat in terms of scientific knowledge and understanding and learn how living things and the environment need protection.

Pupils will be asked to:

- make careful observations and measurements;
- use results to draw conclusions and suggest explanations for these using scientific knowledge and understanding.

Resources for further work

Dictionaries; range of information sources about common plants and animals; plant kept in the dark for a few weeks; labels from house and garden plants; soil samples; packaging from fertilizers and plant food; examples of plants with different types of roots; video showing a different, possibly non-local habitat.

Glossary / Vocabulary

adapted	The state of being suited to a particular environment.
carnivore	An animal that eats meat.
consumer	An animal which eats another living thing for food.
fertilizer	Chemical or natural substance which adds nutrients to soil.
food chain	A series of organisms, each dependent on the next for food.
food web	System of interlocking food chains within a habitat.
habitat	The natural home of an animal, plant or other organism.
herbivore	An animal which feeds only on plants.
interdependent	Two or more things being reliant on each other.
nutrients	Substances needed for plant and animal growth.
omnivore	An animal that eats plants and other animals.
photosynthesis	The process by which green plants use sunlight to make food out of carbon dioxide and water.
producer	Term to describe food-making green plants.



Lesson notes (sections 1 – 4)

1. What does a plant need?

Learning Objectives

Pupils will learn:

- that green plants need light in order to grow well;
 - to make careful observations of plant growth and to explain these using 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;
 - that fertilizers are often added to soils to provide plants with the nutrients they need;
 - 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;
 - to make careful, relevant observations of soils;
 - to draw conclusions from observations and to explain these using scientific knowledge and understanding.
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- Ask pupils to predict what will happen to the plant once it is moved into the light. Pupils could note down the differences between the healthy plant and the plant kept in the dark.
 - Following the animation about roots, pupils could draw their own diagrams showing the importance of roots to a plant.
 - Loamy soil (containing the most nutrients) would be the ideal soil for a worm. You might also point out how worms could live in sandy soil because of its air spaces.
 - Explain that loamy soil is also the best soil for plants to grow in because it contains lots of humus (dead animal and plant material) which makes it nutritious.
 - Pupils can use information sources to list other plants that require full sun/shade to grow well. They could produce similar lists for damp/dry conditions.
 - Following the multiple choice quiz, pupils could make up more questions to test each other.
 - In reference to question four, a fig tree from the Transvaal of South Africa was recorded as having the deepest roots of 120 metres.
 - Refer to <http://www.bookrags.com/sciences/biology/record-holding-plants-plsc-04.html> for more information.
NB: You will need to investigate the site in advance and use your professional judgement concerning the suitability of the content on this site. While all care is taken to ensure web links contain useful information, Boardworks does not take responsibility for the content or accuracy of external websites.



Everything a plant needs

Green plants need **light** in order to grow. They make food for new leaves, stems and roots using **air** and **water**. This food can only be made when there is light.

With the help of the Sun, this plant...

to make food in its leaves.
This process is called
photosynthesis.

uses water from
the soil...

and carbon
dioxide from
the air...
CO₂

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Notes



2. It all depends

Learning Objectives

Pupils will learn:

- that animals and plants in a local habitat are interdependent;
 - that food chains can be used to represent feeding relationships in a habitat;
 - that food chains begin with a plant (the producer);
 - to construct food chains in a particular habitat.
- Pupils can think about what they eat and how they fit into a food chain. Ask pupils “Are humans herbivores, omnivores or carnivores?” You may like to also refer to the different levels of consumer along the food chain as primary, secondary and tertiary consumers. Other food chains which illustrate the relationship between producer, herbivore, omnivore and carnivore are:
Grass – cow – person – shark
Grass – grasshopper – squirrel - fox
 - During the rabbit animation you might like to point out to pupils how food chains feed back into themselves. Animal waste and also animal and plant remains provide green plants with the nutrients they need in order to make food. Ask pupils “What other ways do plants depend on animals?” (Plants rely on insects for pollination and animals for seed dispersal).
 - As pupils complete the garden food web activity, ask them “Can you see a food chain that does *not* start with a green plant?” (dung – fly – blackbird...). Pupils can use information sources to find other animals that could be added to the food web.
 - Pupils could do research to develop a food web for a different habitat such as the forest or pond.
 - They can use the garden food web and other food webs to play the ‘Missing Link’ game. A pupil chooses a plant or animal in the food web. Other pupils can ask a number of questions to try and identify the missing link e.g “Is it a consumer?” Only ‘yes’ or ‘no’ answers are allowed.
 - Pupils can write speech bubbles for some of the other garden creatures to show how the change in the aphid population might affect them.





3. Suits me!

Learning Objectives

Pupils will learn:

- to use keys to identify animals and plants;
 - how animals and plants in a local habitat are suited to their environment;
 - that different animals and plants are found in different habitats;
 - how animals and plants in a second habitat are suited to their environment;
 - to construct food chains in a particular habitat.
- Ask pupils: “Why do we find different animals in different habitats?” The first activity in this section should help them understand how animals have certain features that are designed to suit their particular environment and conditions. After they have dragged the animals to their correct habitats, pupils could suggest ways the animals are adapted. You might like to refer to the following features of the animals: goldfish (gills to enable it to breathe underwater and a streamlined body and tail so it can move easily through water); squirrel (big hind legs to help it leap between trees and big strong teeth to break nuts); polar bear (thick layer of fat to help it stay warm, large paws so it can walk in the snow and white fur so it blends in with its environment); lizard (able to go without water for long periods of time, nocturnal so avoids heat during the day, tough skin to survive harsh conditions and wearing from sand).
 - Pupils should identify the following adaptations of the hummingbird: long thin beak to reach the nectar inside flowers; wings which flap very fast, allowing it to hover beside the flowers.
 - Encourage pupils to describe how each bird’s special body parts might help it to live and feed in its habitat. Pupils could find other examples of birds to add to the key. They could also use information sources to design keys to sort other animals (e.g a selection of mammals) according to adaptations (e.g gnawing teeth in rodents) to help them find food.
 - Pupils could gather information on how other garden animals are adapted to their environment. They can then use the information to produce their own matching games in line with the activity.
 - Before pressing on each sea creature to reveal its adaptations, ask pupils: “What features does each sea creature have that help it to survive in this habitat?” Pupils might like to find out about other sea plants and animals and use the information to construct more food chains/webs.

Suits me!

Where do these animals live?
Drag each animal to the habitat you think it belongs to!

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4. Review

The multiple choice quiz is designed to be played as a team quiz but would also work well as a general unit review for the whole-class.

Extension task / homework

Pupils could draw up a food web with themselves at the centre. Can they trace their foodstuffs back to the original producers?

Based on the plenary activity of section 3 - 'Suits me!', pupils could produce an imaginative piece of writing about features of adaptation they would need to survive in one of these different environments.

Interdependence and Adaptation

Team B: Which of these things do plants depend on animals for?

- For seed dispersal
- For shelter
- For food
- For friendship

Team A Team B

Review

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