

Chapter 1: Introduction to Energy

Aims

The aim of this chapter is for children to learn how our sun acts as a source of energy.

Overview of Chapter



The lessons in this chapter introduce the sun's role as a source of energy for all life on the planet. The children discuss the factors involved in plant growth and learn how simple food chains and food webs are formed.

Teacher note: Before starting this chapter the strand unit, Plant and Animal Life, should be covered. This will enable the child to:

- Observe, identify and investigate plants and animals that live in their local environment.
- Appreciate that animals depend on plants and indirectly on the sun for food.
- Discuss simple food chains.

Working Scientifically Skills

Through discussing, engaging with and reflecting on the investigations in this chapter the children will be applying and developing the following scientific skills:

- Observing
- Predicting
- Investigating and experimenting
- Estimating and measuring
- Analysing (Recording patterns)
- Recording and communicating

Primary Science Curriculum link

Strand unit: Plants and animals

Lesson 1 – What does a plant need to grow?

Resources

IWB 1 / PowerPoint 1: Our environment

IWB 2 / PowerPoint 2: What does a plant need to grow?

Activity type: Discussion

Use **IWB 1 activities** to discuss different environments and which environment is most suitable for growing plants. If you do not have access to an IWB use **PowerPoint 1** to aid discussion.

Use **IWB 2 activities** to hold a whole class discussion on the factors that influence plant growth. If you do not have access to an IWB use **PowerPoint 2** to aid discussion.

After the whole class discussion divide the class into groups. Ask them to select four factors that they perceive to be the most important for the growth of plants. Illustrations on **IWB 2 / PowerPoint 2** can be used. Each group reports back to the whole class giving reasons for their choices. Record the children's choices.

Lesson 2 – The sun as a source of energy: food chains and food webs

Resources

IWB 3 / PowerPoint 3: Energy transfer in the environment

PCM 1-9: Food chains and food webs: pictures of animals and plants

Ball of wool, Tape to attach pictures to clothing, Space for the class to form a large circle

Activity type: Discussion

Teacher note: In this lesson children will learn how energy is transferred from the sun to all life on the planet using a game that explores food webs and food chains.

Children will

- 1 Construct a food chain (using one producer and three consumers) and explain how energy flows through the chain.
- 2 Explain how all living things depend directly or indirectly on green plants for food.
- 3 Use pictures and arrows to create a food web that includes: the sun, green plants, herbivores, omnivores, and carnivores.

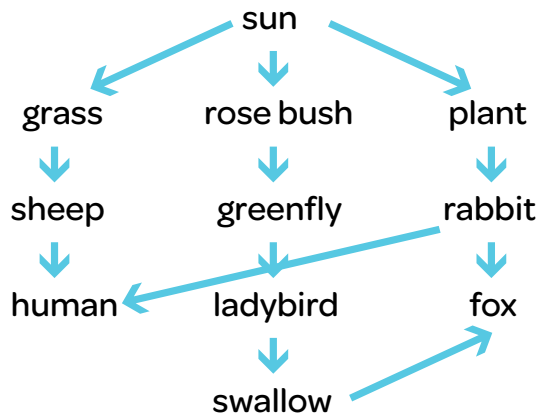
Example of food chains:

Chain 1 sun → grass → sheep → human

Chain 2 sun → rose bush → greenfly → ladybird → bird

Chain 3 sun → grass → rabbit → fox

Example of a food web:



How to run the game

- 1 The children tape a picture to each of their chests.
- 2 Tell the children that they will now make a food web. Have them stand in a circle and introduce themselves as the plant (*producer*) or animal (*consumer*) they represent. Only one child should have the picture of the sun; that child should stand in the centre.
- 3 Before beginning the game using the instructions below, ask your class the following question:
 - Where would your animal or plant get their energy from?

Introduce a ball of wool and explain that it represents sunbeams or energy from the sun. Ask the child with the picture of the sun to hold the end of the wool tightly and throw the ball to someone who can use that energy (*a green plant*). When a child with a picture of a green plant catches the ball of wool, he or she should hold the wool, so that they are connected to the sun, and throw the ball to someone who could use their energy, for example, a sheep. Once the wool reaches a carnivore (*an animal that only eats meat e.g. falcon*) or an omnivore (*an animal that eats both plants and animals e.g. fox, badger, human*) cut the wool and start again at the sun. This will represent one food chain. Repeat the process again until everyone in the class has been included in more than one food chain. Ask the class to gently put the wool on the ground, take a step back and observe the pattern the wool has made. The chains should be interconnected making the pattern of a web.

Questions to promote discussion

- 1 Who is part of most chains? (*Sun and green plants*)
- 2 What would happen if all the green plants died? (*Nothing else in the food web could survive*)

Extension

The children identify food chains from other ecosystems (e.g. forest, wetland, marine, etc.) and design pictures of the plants and animals from that ecosystem, using arrows to indicate the flow of energy. They could use the internet to help them with this activity.

Children could conduct some research on the plant or animal they represented in the food web activity. They could write a report, tell a story, or make an illustration about the plant or animal to share with the class.

Investigations from the book, **The Energy File: Make a Wormery (page 16) and Composting (page 19)** to see part of a food web in action.

