

**TIMING**

30 min

MATERIAL

Board or flipchart
Markers

SKILLS

Forming own opinion

KEYWORDS

Oxygen (air)
Breathe
Food
Plants
Humans
Photosynthesis

GETTING STARTED!

Can we live in a world without plants?

Overview

This unit serves as an introduction to photosynthesis. Photosynthesis is the process through which plants use carbon dioxide, water and energy from the sun to produce carbohydrates, which the plant uses to grow. As a by-product of this process, plants also produce oxygen. To introduce the topic, children will consider what it would be like to live in a world without plants.

Aims

To understand that we cannot live in a world without plants.

To understand that plants provide us with oxygen, food and useful materials (wood, fibres for textiles, medicine etc).

Teaching sequence

1. Enlarge figure 1 (below) and display on a whiteboard or flipchart.
2. Discuss with the children why plants are important for animals and humans and note down their ideas on the illustration. If children do not mention that plants produce oxygen (which we need to breathe), add it to the list. If they mention 'air', explain that plants produce oxygen, which is only one of the gases that make up air.
3. The children will probably mention that plants provide us with food. Discuss what would happen if we didn't have plants - would there be enough food? We could eat meat, couldn't we? But what does a cow eat to grow? Plants!
4. Explain that all animals and humans need to eat other living organisms to live. Plants are different. They use energy from the sun to produce food in the form of sugars (starch) and as a by-product make oxygen.
5. Ask children if they know what this process is called. Explain that the process is called photosynthesis and that they will study this topic in more detail in the following modules.
6. Explain that the word 'photosynthesis' comes from the Greek meaning 'putting together with light'. Plants produced all the things that the children have written down (e.g. oxygen, food, wood) using energy from the sun. Add a sun to the illustration.
7. Define the learning objectives of the module. Summarise with the children what you expect them to have learnt by the end of the project. They should have an understanding of
 - a. the process of photosynthesis; what plants need to grow and how they produce oxygen.
 - b. how a plant produces and stores food, which it uses to grow and reproduce but which we can eat.
 - c. how scientists work when they plan, carry out and evaluate experiments.
8. Assessment. Children draw their own cartoon to show how plants grow and what they need to grow in their science notebook. These drawings can be revisited and added to or changed at the end of the project. In doing so teachers will become aware of how children's concepts on the topic have changed during the course of the project.



Teachers' notes

Every living organism, including green plants, needs food (carbohydrate, fat and protein) to live. However, animals (including humans) must consume other living organisms. They are therefore consumers (heterotrophic). Plants survive without needing to feed on other organisms and are therefore called producers (autotrophic).

Plants make their 'food' using carbon dioxide (CO_2), and water (H_2O) to produce sugars and oxygen (O_2), using energy from the sun. This process is called photosynthesis. Photosynthesis is carried out in green leaves. The leaves contain a green substance called 'chlorophyll' which collects energy from the sun. The word photosynthesis comes from the Greek meaning 'to put together with light'.

Photosynthesis is the most important biochemical process on earth because:

1. Photosynthesis is responsible for producing oxygen, without which humans and animals cannot survive.
2. Photosynthesis converts the sun's energy into accessible energy that humans and animals consume as food. All animals depend directly (i.e. herbivores) or indirectly (i.e. carnivores) on this process.

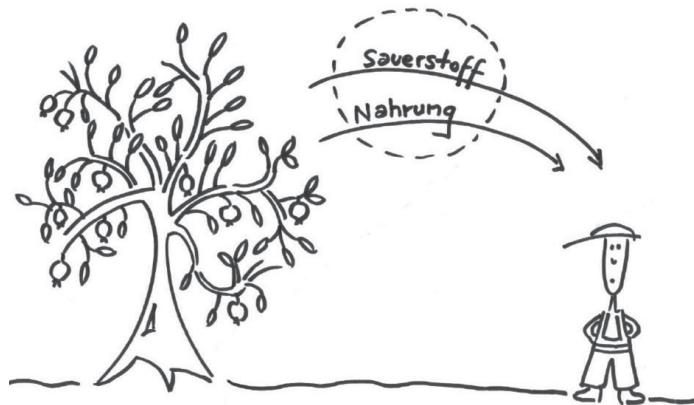


Figure 1:
The process of photosynthesis

Extension activity

Instead of a drawing, children use the concept mapping cards in module 10. They prepare a concept map using the cards (for an explanation see module 10). Unknown cards are put aside.

Children can find ideas about how plants can be used as materials, food and the role they play in the ecosystem in the other topics: Plants in Art, Food and Conservation.