Plants and Light

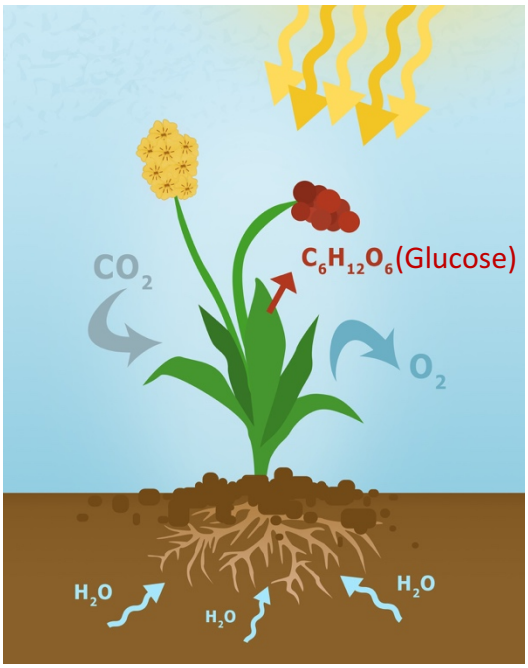
Plants are living things and, like all living things, have certain basic needs that need to be fulfilled for them to survive. Living things need air, shelter, water and food. Plants need these things too! Let's think about how a plant satisfies these needs.

Air: There is air all around us, and all around plants too! Plants can absorb oxygen and carbon dioxide, two gases that are in the air around us.

Shelter: This need varies for different plants. Some plants need a lot of sunlight, but some need more shade, and so would need to be sheltered from the sun. Smaller plants, without big sturdy roots, wouldn't be able to grow well in open spaces where there is a lot of wind - the wind would blow them over! So, some plants need shelter from the wind.

Water: Plants drink water, just like we do! Plants usually get water from the rain, but if you have a houseplant, your plant can't get water naturally, so you need to make sure to water it.

This brings us to food! Plants make their own food in a very special way – through **photosynthesis**! Plants convert energy from sunlight into food. During photosynthesis, plants combine sunlight, carbon dioxide and water in a chemical reaction to produce oxygen and glucose, or sugar. It is from this glucose that plants get their energy to keep growing and stay alive!



Our two experiments today are all about how plants use light to stay alive, and were found in "My Book of Science Experiments" written by Nicola Baxter.

Experiment 1

Plants absorb the sun's light through their leaves. Plants with big broad leaves can absorb more sunlight. Leaves are green because they have **chlorophyll** in them, a chemical that helps plants to absorb red and blue light (and reflects green light, making the leaves look green).

Photosynthesis, the chemical reaction plants do that converts light into glucose and oxygen, could not take place without the chlorophyll. But chlorophyll is also produced using sunlight! So, if a plant does not get sunlight, it will lose its green colour and eventually die. In this experiment, we will see the effects of no sunlight on the chlorophyll of a plant.

Materials:

- A potted plant with broad green leaves, such as a geranium
- A sticker

Method:

1. Stick the sticker to a leaf on the potted plant and make sure your plant is in an area where it will get plenty of sun, especially the leaf on which you have stuck your sticker. Make sure you continue to water your plant.
2. After a week, carefully peel your sticker off the leaf. You should see that the part of the leaf that was under your sticker is paler or even yellow. The cells of this part of the plant were blocked from the sun and so were not able to keep making cholophyll or take part in photosynthesis! You can see the importance of sunlight for your plant!

Experiment 2

Plants can sense where light is and will grow towards it – this is called **phototropism**. This means flowers, like sunflowers, will turn to point towards the sun. This is even true for plants that are usually deep underground. In this experiment, we will test a potato to see if it's shoot will find its way to the sun.

Materials:

- small potato
- shoebox with lid
- cardstock
- scissors
- tape

Method:

1. Cut a small hole in one end of the shoebox.
2. Use pieces of cardstock to make partitions inside the shoebox. The partitions should only stretch part of the way across the box, so that the back of the box is not completely cut off from the front where the hole is. This will look like a maze.
3. Put the potato at the opposite end from the hole and put the lid on the box. Place the box on a sunny windowsill.
4. After several weeks, a shoot from the potato will find its way through the maze and into the light! Open the box to see its twisty path. This is phototropism at its finest!