Ecosystems

4. Photosynthesis

CONCEPT 1

LESSON GUIDE

PHOTOSYNTHESIS

PRECISE LEARNING POINTS

KNOW

I know what a food chain in and can use scientific vocabulary to label is components (same as 9.1.1).

APPLY

I can apply my knowledge to explain photosynthesis and can write the word equation for it.

EXTEND

I can extend my knowledge to predict the limiting factors of photosynthesis.

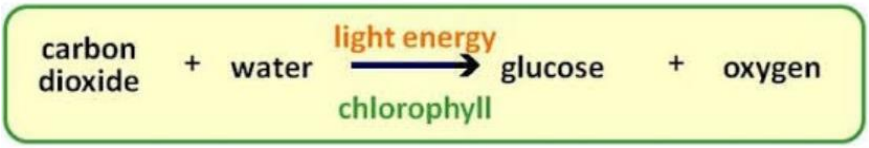
NOTES

Plants do not need to eat other organisms. They make their own food using materials from the air and soil. This is why they appear at the start of all food chains as all other organisms rely on them for their own food source. They are called **Producers**

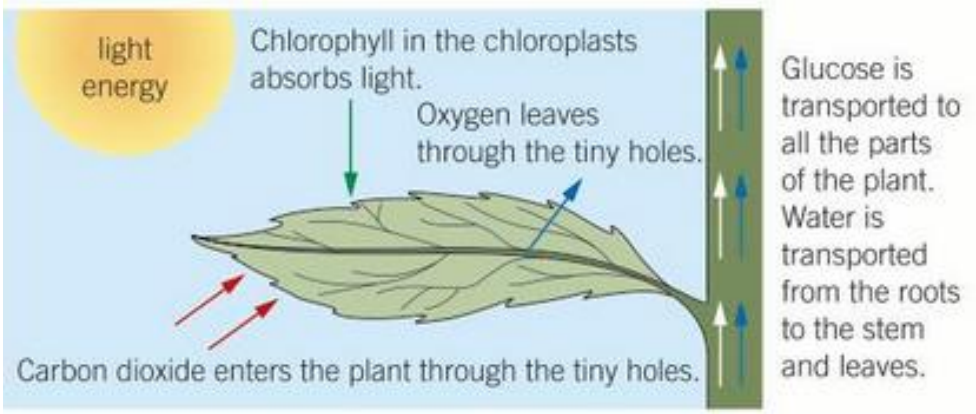
Green plants make food using water from the soil and carbon dioxide from the air. Light from the Sun provides the energy needed to make the reaction happen. This process is called **PHOTOSYNTHESIS**.

This vital reaction produces oxygen and glucose. We breathe in the oxygen and the plant uses the glucose for growth and respiration. Plants also store glucose as starch. We use glucose and starch as a source of energy for ourselves.

Here is the equation

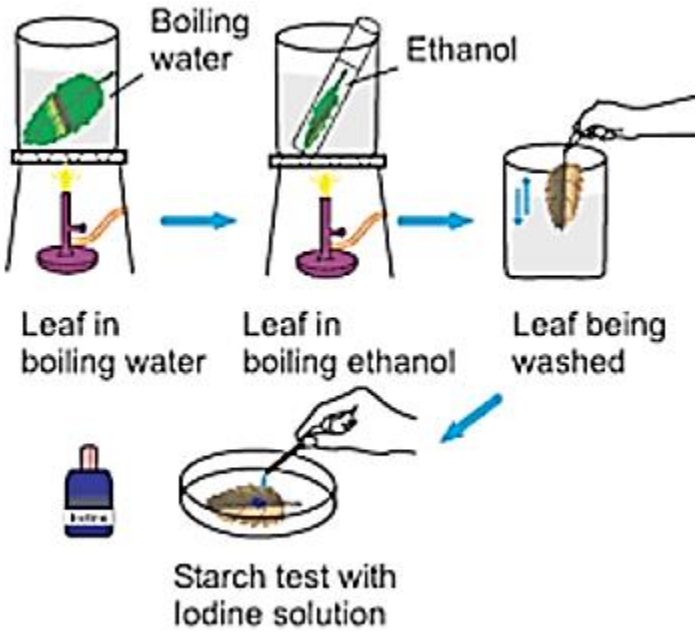


Water gets into the plant via the root hair cells. They provide a large surface area for diffusion. The water travels up the xylem to the leaves. Carbon dioxide gets into the plant via tiny holes in the leaf called stomata. Again, there is a large surface area for diffusion.



You can show that a plant has carried out photosynthesis by testing its leaves for starch. The test for starch uses a chemical called Iodine. It is orange but turns blue-black when added to starch.
First the leaf needs to be boiled in ethanol and then rinsed in warm water. This kills the cells and removes the green colour. Iodine is then added. If it turns blue-black then starch is present, showing that photosynthesis has taken place.

Here is the method:



There are some **risks** with this experiment. The **hazards** of the chemicals, apparatus and method must be considered before deciding to conduct any experiment.
Control measures must be put in place to minimise the risks as much as possible, for example wearing goggles, using chemicals with a low concentration and ensuring that the Bunsen burner is off before using ethanol.