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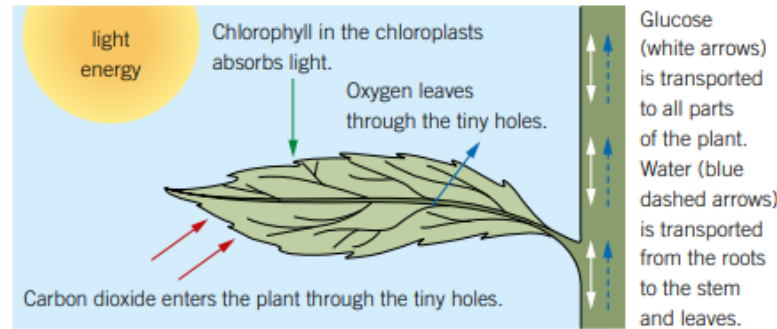
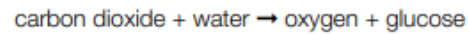
# Photosynthesis

1	I can describe the role of leaf stomata in gas exchange in plants
2	I can state that plants make carbohydrates in their leaves by photosynthesis and gain mineral nutrients and water from the soil via their roots
3	I can list the reactants and products of photosynthesis and summarise these in a word equation
4	I can explain how some structural adaptations of plants' leaves aid photosynthesis
5	I can list some ways in which the rate of photosynthesis can be increased
6	I can list some minerals that are needed for health plant growth

	Keyword	Definition
1	algae	Green uni-cellular or multi-cellular organisms that perform photosynthesis and live underwater.
2	chlorophyll	Green pigment in plants and algae which absorbs light energy.
3	fertiliser	Chemicals containing minerals that plants need to build new tissues.
4	photosynthesis	The process plants and algae use to make their own food, glucose. In photosynthesis, carbon dioxide and water react together to make glucose and oxygen.
5	producer	Organism that makes its own food using photosynthesis.
6	stomata	Pores in the bottom of a leaf which open and close to let gases in and out.

# Photosynthesis

**Photosynthesis** is a chemical reaction that takes place in the **chloroplasts** to produce **glucose**.



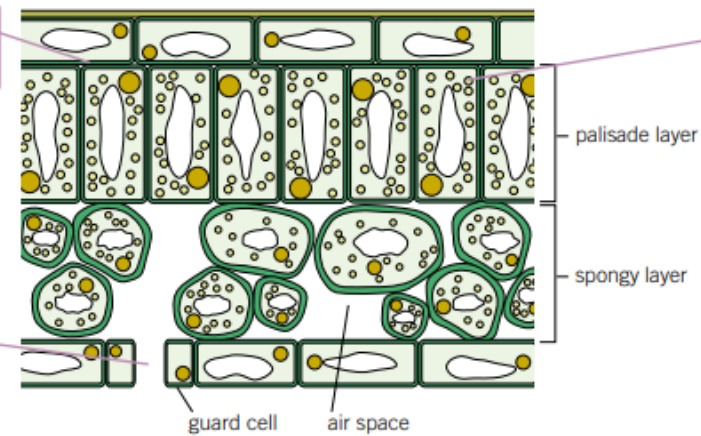
The minerals plants need are:

- 1 **nitrates** for growth
- 2 **phosphates** for healthy roots
- 3 potassium for healthy leaves and flowers
- 4 magnesium for making chlorophyll

If a plant does not have enough of a mineral, it may suffer from a mineral **deficiency**. Farmers can use **fertilisers** to add missing minerals to the soil.

waxy layer – to reduce water loss by evaporation

stomata – on the lower surface to reduce water loss by evaporation



chloroplasts – mainly located on the upper side of the leaf where the most sunlight reaches

Leaves are specially adapted for photosynthesis:

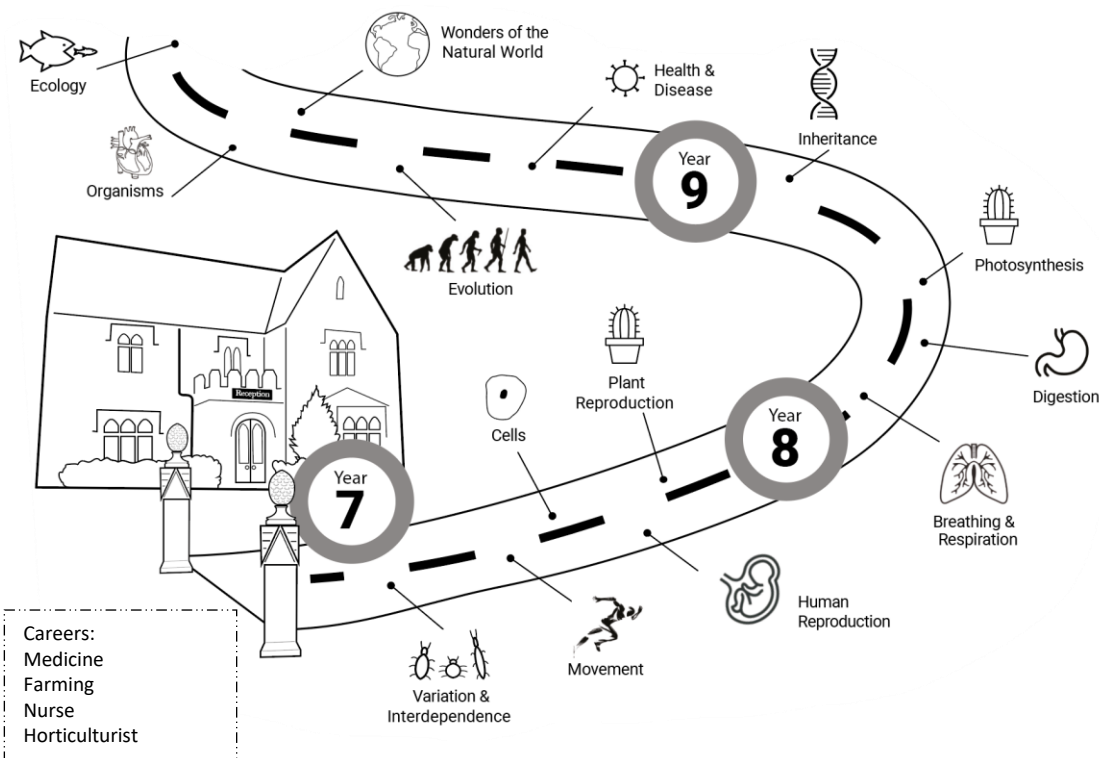
- have lots of green **chlorophyll** – absorb sunlight for photosynthesis
- are thin – allow gases to diffuse in and out of the leaf
- have a large surface area – absorb as much light as possible
- have veins – xylem transports water and phloem transports glucose

Prior Knowledge From KS2: you will have covered the following:

Identify and describe the functions of different parts of flowering plants – roots, stem/trunk, leaves and flowers  
Explored the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant, and investigated the way in which water is transported within plants

**Future:** At GCSE you learn in more detail about the differences between aerobic and anaerobic respiration. You will learn about the process of photosynthesis, the factors that affect it and how this links to plant growth.

Why? Respiration and photosynthesis are methods to transfer energy in living things, it is vital for life processes



## Homework Menu Grid

Topic	1 Point	2 Points	4 Points	6 Points	10 Points
<b>What is photosynthesis</b> 	What does the word 'photosynthesis' mean?	Can you write the word equation for photosynthesis?	Where do plants get all of the reactants for photosynthesis from?	Describe what would happen to a plant if: a) It did not have any chloroplasts. b) It was placed in a room without light.	Create a short song to help you memorise the photosynthesis equation.
<b>Leaf adaptations</b> 	Print off a labelled picture of 'cross section of a leaf'	Describe the structure of a leaf.	Create a flashcard summarising the adaptations of a leaf.	Research why a cactus does not have leaves, produce a short summary of your findings.	Create an A4 poster on how leaves are well adapted for efficient photosynthesis.
<b>Plant minerals</b> 	What minerals do plants need to stay healthy?	Make up a wordsearch using keywords from the topic. Make up a sentence about each key word, as a clue.	Describe the appearance of a plant that is deficient in Nitrogen, potassium, and phosphorus.	You have designed the perfect fertiliser; you must create a sales pitch to sell your fertiliser to a local farmer. This could be as a PowerPoint presentation, or as a poster.	Go onto BBC Bitesize Key Stage 3 Science. Do the Revise, Activity and Test for the topic. Print Screen the page with your test score and the answers then print it or send it to your teacher.
<b>Investigating photosynthesis</b> 	List three safety precautions you must take when doing a practical.	What gas would you expect to find in the bubbles produced in this practical?	Predict what you think will happen to the rate of photosynthesis as the light is moved closer to the plant.	Draw some scientific diagrams of the key pieces of scientific apparatus you used in this practical.	Write a method for the practical you completed in class. A method must be detailed enough for a complete stranger to be able to follow it.
<b>Artificial photosynthesis</b> 	Why are greenhouses made of glass?	Why do we need to use greenhouses to grow plants in the UK?	Research some fruit and vegetables that are grown here in the UK in greenhouses.	Go onto YouTube and watch a video on 'industrial greenhouses' describe how the farmers in the video create the perfect environment for photosynthesis.	Design the perfect greenhouse. How is your greenhouse designed to maximise the rate of photosynthesis?