

B8 Photosynthesis

Lessons TBAT	Key Knowledge	Practical	Assessment
<p>Describe the process of photosynthesis using an equation</p> <p>Explain how factors affect the rate of photosynthesis</p> <p>Describe how plants use glucose</p>	<p>Photosynthesis is represented by the equation: $\text{carbon dioxide} + \text{water} \xrightarrow{\text{light}} \text{glucose} + \text{oxygen}$ Students should recognise the chemical symbols: CO₂, H₂O, O₂ and C₆H₁₂O₆.</p> <p>Students should be able to describe photosynthesis as an endothermic reaction in which energy is transferred from the environment to the chloroplasts by light.</p> <p>Students should be able to explain the effects of temperature, light intensity, carbon dioxide concentration, and the amount of chlorophyll on the rate of photosynthesis.</p> <p>(HT only) These factors interact and any one of them may be the factor that limits photosynthesis.</p> <p>(HT only) Students should be able to explain graphs of photosynthesis rate involving two or three factors and decide which the limiting factor is.</p> <p>(HT only) Students should understand and use inverse proportion – the inverse square law and light intensity in the context of photosynthesis.</p> <p>(HT only) Limiting factors are important in the economics of enhancing the conditions in greenhouses to gain the maximum rate of photosynthesis while still maintaining profit.</p>	<p>Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.</p>	<p>Plotting a graph using class data and explaining the effect of the limiting factor</p> <hr/> <p>Maths Skills Solve simple algebraic equations</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> • measure and calculate rates of photosynthesis • extract and interpret graphs of photosynthesis rate involving one limiting factor • plot and draw appropriate graphs selecting appropriate scale for axes • translate information between graphical and numeric form.

	<p>The glucose produced in photosynthesis may be:</p> <ul style="list-style-type: none">• used for respiration• converted into insoluble starch for storage• used to produce fat or oil for storage• used to produce cellulose, which strengthens the cell wall• used to produce amino acids for protein synthesis. To produce proteins, plants also use nitrate ions that are absorbed from the soil.	<p>Key stage 3</p> <p>Photosynthesis</p> <ul style="list-style-type: none">• The reactants in, and products of, photosynthesis, and a word summary for photosynthesis• The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere• The adaptations of leaves for photosynthesis. <p>Cells and organisation</p> <ul style="list-style-type: none">• Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope• The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts• The similarities and differences between plant and animal cells• The role of diffusion in the movement of materials in and between cells
--	--	--

B8 Photosynthesis