

GCSE Biology (Separate AND Trilogy)

Success Criteria: Photosynthesis



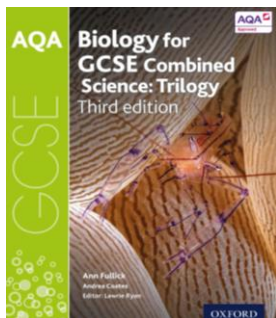
<i>I can...</i>	
Use the term producer to describe green plants (producers are organisms that make their own food using a chemical reaction called photosynthesis)	
Recognise the importance of plants to all other forms of life (start of ALL food chains, plants produce biomass)	
Recall the summary word equation for photosynthesis	
Write a balanced symbol equation for photosynthesis	
Describe photosynthesis as an endothermic reaction (takes in energy) that occurs in the chloroplasts (chlorophyll pigment absorbs light energy)	
State that photosynthesis has two main parts 1 (light dependent) = using light energy to <u>split water</u> molecules into H ⁺ ions and O ₂ gas 2 (light independent) = H ⁺ ions are added to CO ₂ to create glucose	
Explain that enzymes control ALL chemical reactions that take place inside cells, including photosynthesis (therefore temperature affects the rate)	
Describe the effects of different factors on the rate of photosynthesis: temperature, light intensity and CO ₂ conc. (including use of sketch graphs)	
Explain the effects of different factors on the rate of photosynthesis: temperature, light intensity and CO ₂ conc. using the idea of limiting factors.	
Describe how to measure the rate of photosynthesis by collecting the volume of O ₂ produced in a set time or, counting number of bubbles in a set time.	
Understand that the inverse square law can be used to calculate a numerical value for light intensity based on the distance away from the light source (as you increase the distance of a lamp from a photosynthesising plant, the light intensity decreases by the square of that distance) Light intensity = $\frac{1}{\text{distance}^2}$	
Required practical- PHOTOSYNTHESIS Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed	
Describe how to maximise the rate of photosynthesis (eg. green houses) by choosing the best values for several factors limiting the rate of photosynthesis.	
Relate limiting factors to cost effectiveness eg. increasing temperature may increase rate a little bit but cost of extra heat does not give profit.	
Describe how plants use the glucose produced in photosynthesis, including: <ul style="list-style-type: none">• Respiration (to release energy needed to drive chemical processes)• Conversion into starch (for storage)• Conversion to fat (for storage, oils, waxy cuticle on leaf-waterproofing)• Conversion to cellulose (for cell walls)• Production of amino acids/proteins (for growth)	
Explain that to produce amino acids/proteins plants need additional elements to C,H and O from glucose...need N (nitrogen). Plants obtain this by absorbing nitrates from the soil via roots (active transport)	

AQA exam specification:

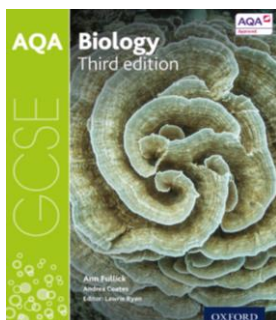
- 4.4.1.1 Photosynthetic reaction
- 4.4.1.2 Rate of photosynthesis
- 4.4.1.3 Uses of glucose from photosynthesis

Additional support:

Access the appropriate textbook on [kerboodle.com](https://www.kerboodle.com), create your own revision notes of the key points of the topic and attempt the summary questions.

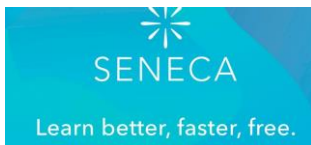


Combined science GCSE textbook
Pages 112-121



Separate Biology GCSE textbook
Pages 124-133

Utilise online revision resources to support your class notes, such as...



Attempt past paper questions using www.physicsandmathstutor.com and self-mark your answers using the official exam mark schemes.



Extension work/extra challenge:

Ask your teacher for extension task...

Pack 1 Topic 18 – The Oxygen Apocalypse! (4.4)