N5 Biology  **LE3 Photosynthesis** LEARNING OUTCOMES

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|  | MC900432651[1] | By the end of the lesson you should be able to  |
| **photosynthesis** |  | * I can give the **word summary** of the process of photosynthesis.
* I can state that the **two stages** of photosynthesis are light reactions and carbon fixation.
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| **light reactions** |  | * I can state that in the light reactions, the **light energy** from the sun is trapped by **chlorophyll** in the **chloroplasts** and is converted into **chemical** **energy** which is used to generate **ATP**.
* I can state that in the light reactions, **water** is split to produce **hydrogen** and **oxygen** which diffuses out of the cell.
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| **carbon fixation** |  | * I can state that in carbon fixation, a series of **enzyme-controlled reactions** occur, which use **hydrogen** and **ATP** (produced by the light reactions) with **carbon** **dioxide** to produce **sugar (glucose)**.
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| **uses of glucose** |  | * I can state that the **chemical energy** in sugar is available for **respiration** or the sugar can be converted into other substances, such as **starch** (storage) and **cellulose** (structural).
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| **Limiting Factors** |  | * I can state that the limiting factors of photosynthesis are **carbon** **dioxide**, **light intensity** and **temperature.**
* I can explain the **impact** of carbon dioxide, light intensity and temperature on the rate of photosynthesis and so plant growth e.g.
* **increasing** the concentration of carbon dioxide will **increase** the rate of photosynthesis until another factor limits it
* **increasing** the light intensity will **increase** the rate of photosynthesis until another factor limits it
* **low temperatures** will **slow the rate** of photosynthesis as it slows the enzyme reactions controlling it
* very high temperatures will **denature** the enzymes controlling photosynthesis and so will halt the process
* I can explain how the rate of photosynthesis is investigated by measuring the rate of **oxygen production** in an aquatic plant e.g. elodea, under different conditions => the elodea bubbler experiment
* I can identify the limiting factor at different points on a **limiting factors graph.**
* I can explain how horticulturalists can adjust the environmental conditions to achieve optimum photosynthesis and therefore **optimum plant growth**
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