S2 Biology PLANTS Learning Outcome checklist

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| Activity | -/+/\* | by the end of the unit you should know… |
| Photosynthesis – starch test |  | * **photosynthesis** is the process that plants use to make food
* in photosynthesis light energy is changed into chemical energy
* **chlorophyll** is the green pigment in plant cells that allows them to trap the energy in light
* the food plants make is **glucose** and can be stored as starch
* **iodine** is used to test for starch
* iodine turns from **brown to black** if starch is present
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| Photosynthesis – elodea bubbler |  | * **elodea** is an aquatic plant
* the rate of photosynthesis can be measured by measuring the rate of oxygen production by aquatic plants
* in **a fair test** only one variable is changed at a time
* experimental results can be made more **reliable** by repeating the experiment and finding the average of the results
* light intensity, CO2 concentration and temperature are factors which affect the rate of photosynthesis
* in a **line graph** the input variable goes on the x-axis and the output variable goes on the y-axis
* **% change = change / original x 100**
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| Plant processes |  | * plants photosynthesise **and** respire when there is light
* in the dark plants only respire
* **respiration** is the process that happens in all living cells, it uses oxygen to release the energy stored in glucose
* respiration produces water and carbon dioxide
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| Photosynthesis – limiting factors |  | * a **limiting factors** will reduce the rate of a process when in short supply
* **light intensity, CO2 concentration** and **temperature** can be limiting factors for photosynthesis
* a **high temperature** can reduce the rate of photosynthesis as it denatures the enzymes controlling it
* line graphs showing the rate of photosynthesis in different environmental conditions can be used to show the effects of a limiting factor
* by overcoming these limitations, faster growth rates can be achieved e.g. greenhouses increase the temperature
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| Photosynthesis – leaf structure |  | * leaves have a layer of cells on the top and bottom surfaces called the upper and lower **epidermis**
* the upper epidermis is transparent, allowing light through to the mesophyll layer
* the **mesophyll** layer has cells with many chloroplasts as it is the site of most photosynthesis
* cells in the **palisade mesophyll** layer are tightly packed together
* air spaces in the **spongy mesophyll** layer allow the diffusion of gases
* **guard cells** control the opening and closing of the stomata
* **stomata** are pores which allow the exchange of gases between the leaf and the atmosphere
* most stomata are found in the lower epidermis
* **veins** bring water to the leaf and take the glucose away
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| Seed germination |  | * **seeds** are the product of sexual reproduction in plants
* **germination** is the development of a seed into a new plant
* water, oxygen & warmth **(WOW)** are the three requirements for seed germination
* a **fair test** has only one input variable
* results are more **reliable** if repeated and an average calculated
* to calculate an **average** you add up the numbers to get a total then divide the total by the number of numbers added up.
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| Asexual reproduction in plants |  | * **asexual reproduction** involves one parent and produces genetically identical offspring
* **bulbs, tubers, plantlets** and **runners** are all natural methods of asexual reproduction in plants
* taking a **cutting** of a plant is an artificial method of growing new plants by asexual reproduction
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| Commercial use of plants |  | * plants are grown to provide **food, fuel, raw materials, medicines** and to make the surrounding look nicer (**aesthetics**)
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