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 |
| 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** |
| 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 |
| 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 |
| 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 |
| 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. |
| 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 |
| Commercial use of plants |  | * plants are grown to provide **food, fuel, raw materials, medicines** and to make the surrounding look nicer (**aesthetics**) |