



Photosynthesis

1 What is photosynthesis and why do plants do it?

- Photosynthesis is an endothermic reaction that used the sun's energy to make glucose from carbon dioxide and water
- Plants do it to produce glucose which has many functions in the plant, such as form of energy and a building block

[2 marks]

2 Write the word equation and chemical equation for photosynthesis

- Water + Carbon Dioxide \longrightarrow Glucose + Oxygen
- $6\text{H}_2\text{O} + 6\text{CO}_2 \longrightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

[4 marks]

3 Name the organ, cell and subcellular structure where most photosynthesis takes place

- Leaf, palisade cell, chloroplast

[3 marks]

4 To carry out photosynthesis the plant requires water and carbon dioxide. Where does it get these from?

- 1) Water - Taken up from the soil by the roots (by osmosis), transport up the xylem (in transpiration stream by transpiration) to the leaf
- 2) Carbon dioxide - Diffuses in from the outside air, through the stomata

[4 marks]

5 The aim of photosynthesis is to make glucose. Two uses of glucose are making starch and cellulose. How are they similar and how are they used?

- Both are polysaccharides (carbohydrates)
- Starch is used as an energy storage molecule, so that plants can use it for energy later
 - Because it is more compact than glucose and does not draw water into the cell by osmosis
- Cellulose is used to provide strength/rigidity to the plant cell walls

[4 marks]

6 Name two other uses of glucose

- Directly used for energy; make amino acids; make lipids (fats and oils)

[2 marks]

7 Photosynthesis is an endothermic reaction. Explain what this means

- The reaction requires energy from the surroundings to work

[1 mark]

8 Name the pigment that absorbs the light for photosynthesis

- Chlorophyll

[1 mark]

9 How are leaves adapted to carry out photosynthesis?

- They have a large surface area, so that they capture a lot of light
- They have stomata to let in carbon dioxide
- Their upper epidermis is transparent to let light in
- They have a waxy cuticle so less water evaporates
- Etc

[3 marks]

[Total 24 marks]