

HOW PLANTS USE GLUCOSE

FOR RESPIRATION

- Plants manufacture glucose in their leaves
- Glucose is a small, simple, soluble sugar made during photosynthesis
- They use some of the glucose for respiration
- This releases energy which enables them to convert the rest of the glucose into various other useful substances, which they can use to build new cells and grow.
- Plants respire just like us to releases energy
- $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
- To produce some of these substances they also need to gather a few minerals from the soil

MAKING CELL WALLS

- Glucose is converted into cellulose for making strong cell walls, especially in rapid growing plant
- Cellulose: a complex carbohydrate made from glucose to strengthen cell walls

MAKING PROTEINS

- Glucose is combined with nitrate ions (absorbed from the soil) to make amino acids, which are then made into proteins
- Amino acids: the building block of proteins made by combining glucose with nitrate ions from the soil

FATS AND OILS

- Made from glucose, used to strengthen cell walls and as an energy store
- Glucose is turned into lipids (fats and oils) for storing in seeds
- Sunflower seeds, for example, contain a lot of oil – we get cooking oil and margarine from them

STARCH

- Starch is a polymer of glucose (long chain of glucose)
- Glucose is turned into starch and stored in roots, stems, and leaves, ready for use when photosynthesis isn't happening, like in winter
- Starch is insoluble which makes it much better for storing than glucose – a cell with lots of glucose in would draw in loads of water and swell up.
- Potato and parsnip plants stored a lot of starch underground over the winter so a new plant can grow from it the following spring
- We eat the swollen storage organs

GROWTH AND REPAIR

- Energy is needed to make larger molecules such as amino acid and protein – this is called the synthesis
- Plants also make glucose into complex carbohydrates like cellulose to strengthen the cell walls.