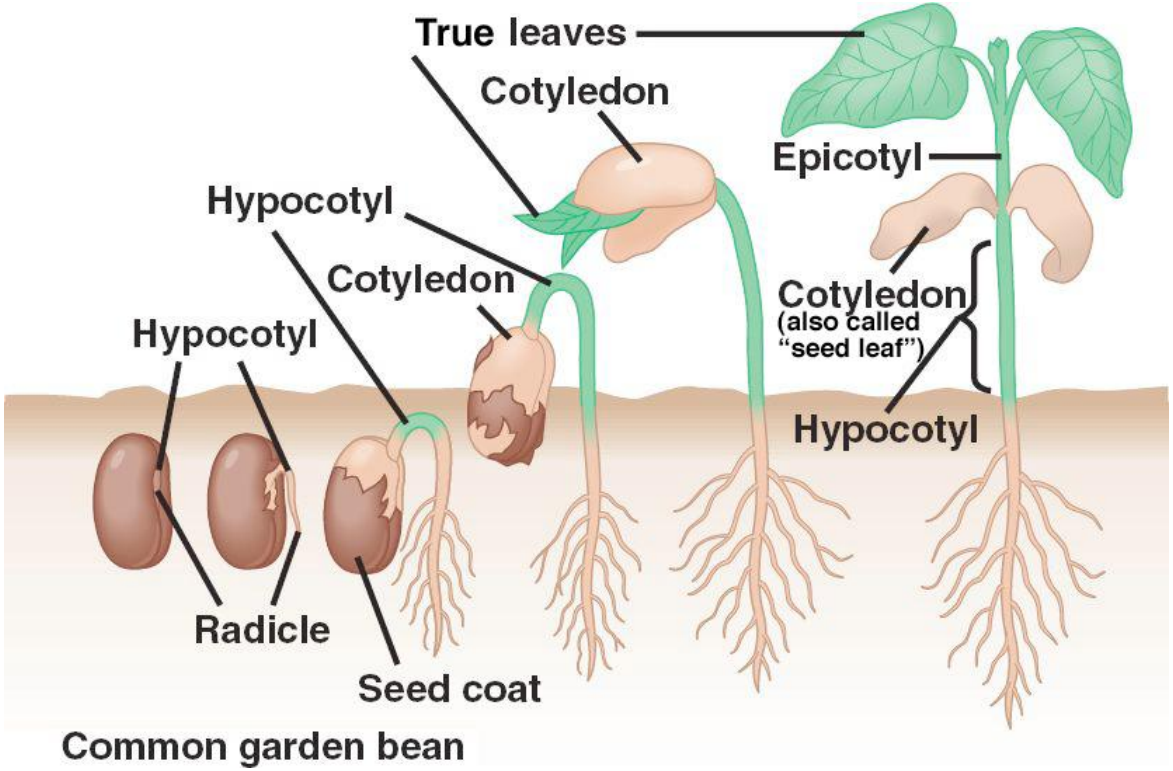
Germination of a Broad Bean

- Food reserves in seed are insoluble in water and cannot be transported in seedling. Reserves must be broken down into simple soluble compounds which dissolve in water- transported to young shoot or plumule or young root or radical.
- Water is taken up rapidly initially , causing the tissue to swell by osmosis as well as mobilising the enzymes.
- Seed coat ruptures as the radicl pushes through first
- Radicle grows downwards while the plumule will grow upwards.
- Amylase enzyme hydrolyses starch into maltose which is transported to the growing points
- During germination, the cotyledons of the broad bean remain below ground
- Plumule bent over like a hook as it pushes up against the soil, protecting the tip form soil abrasion.
- Plumule emerges it unfurls and begins to photosynthesise- by now all the food reserves in the cotyledons will have been depleted.



Germination of Maize

-Maize seed enclosed in tough pericarp, fused with testa
-This one seeded fruit called caryopsis develops with hundreds of others on a cob
-Broader sides of the fruit a light oval can be found, under which is embryo
-Radicle enclosed in hollow tube called coleorhitza
-Plumule is surrounded by a similar structure called a coleoptiles
-Small triangular cotyledon, the scutellum, to one side which the embryo is attached
-At other side the scutellum is fused to endosperm which stores starch, protein and oil

In the seed;

-Hydrolysis of starch to form maltose using amylase enzyme
-Protein to amino acids using protease
-Lipids to fatty acids and glycerol using lipase
-Soluble products are moved to growing parts using water- provide material for growth (Condensation reaction from glucose) and energy via ATP
-Glucose, fatty acids and glycerol provide respiratory substances from which energy for growth is released
-Glucose is used to form cellulose walls
-Amino acids are used for new enzymes and structural proteins
-Weight of germinating seed decreases due to germination

-Germination is onset of growth of the embryo and requires water, oxygen and a temperature within a certain range.
-Water is taken up rapidly by inbibition and later by osmosis
-Water causes seed to swell and testa then ruptures, water also activates enzymes in seed which hydrolyse insoluble storage material to easily transported substances
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