

Effect of sugar solution concentration on plant tissue mass:

Method:

1. Measure the mass of 3 identical potato cylinders
2. Put each in a beaker, one with pure water, one with a slightly concentrated sugar solution & one with a very concentrated sugar solution
3. Leave to soak for 20 hours
4. Take cylinders out, dry them & measure their mass

Increase in mass = water is drawn in via osmosis

Decrease in mass = water has been drawn out via osmosis

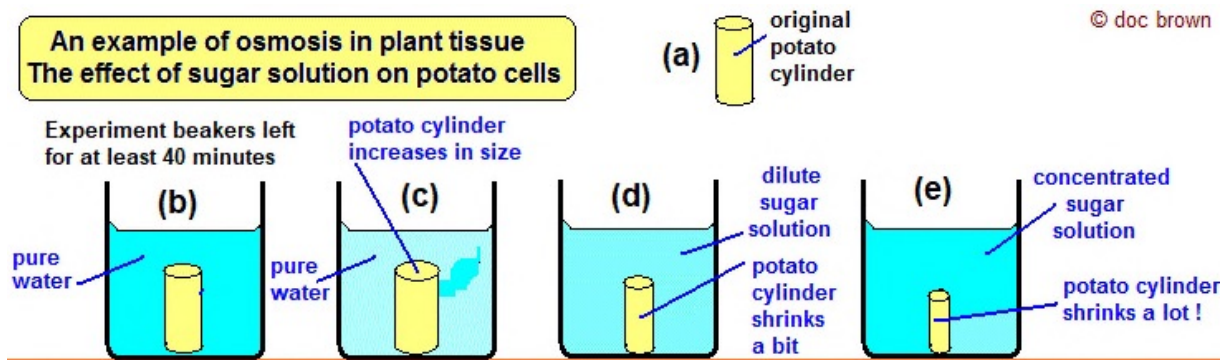
Independent variable: concentration of sugar solution

Dependent: affect of sugar concentration on mass

Control: volume of solution, time, sugar type ect

Errors: potato isn't dry so extra mass/ water evaporates from beaker = sugar concentration changes

Calculating mean percentage change reduces errors



Food tests:

Food sample prep:

Break up food in pestle & mortar

Transfer 2 beaker with water

Stir with glass rod 2 dissolve food

Filter solution through funnel

Reducing sugars via Benedicts:

1. Prep food sample
 2. Add to test tube
 3. Heat water bath to 75 degrees cel
 4. Add benedict's solution with pipette
 5. Leave test tube in bath for 5 mins
- Presence of sugars= brick-red solution

Starch via Iodine:

1. Transfer food sample to test tube
 2. Add iodine & shake gently
- Presence of starch = orange -> blue-black

Proteins via Biuret:

Transfer food sample to test tube

Gently shake after adding biuret solution

Presence of protein= blue -> purple

Lipids via Sudan III:

1. Prep sample (don't filter it) & add to test tube,
2. Add Sudan solution & shake

Presence of lipids= mixture separates into 2 layers (top is bright red)

Plant growth responses:

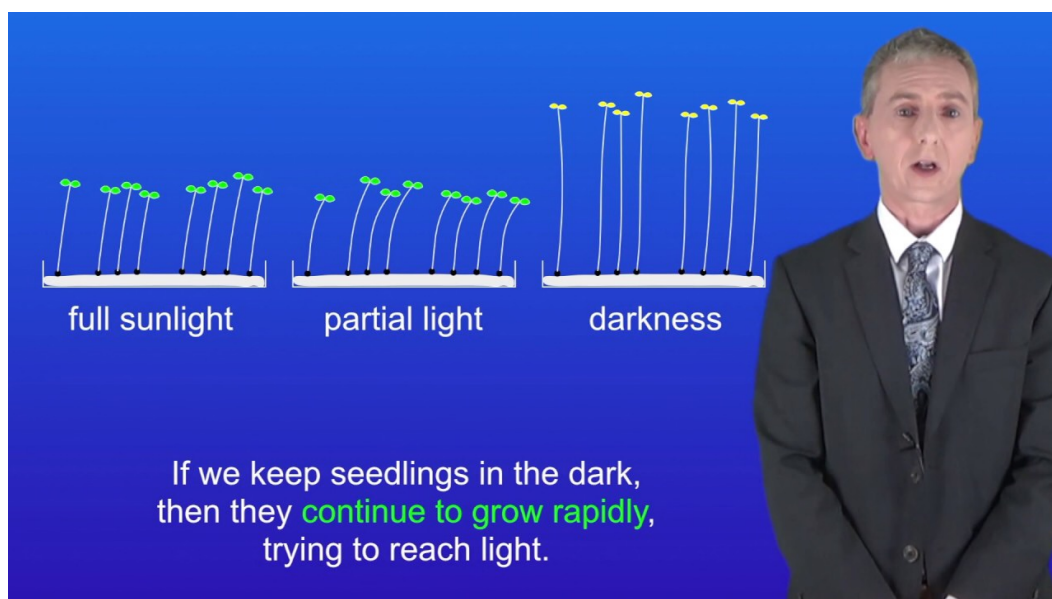
Method:

1. Put 10 crest seeds in 3 Petri dishes, lined with moist filter paper
2. Allow seedlings to germinate, measure their height
4. Place 1 dish in direct sunlight, one in partial & one in none
3. Leave for a week, measuring their height daily

=Seedlings in full & partial light will grow to the same height (chloroplasts are efficient at absorbing light) & the seedlings in total darkness will be the tallest with yellow leaves (energy source has ran out) = they are searching for light!

Seedlings grow towards the light = phototropism (auxin is on the side of the seedling with the least light = rapid growth)

Control variables: seed type & distance between bulb & dish (light intensity)



Quadrats:

1. Place 1m quadrat on a field randomly
2. Count organisms within the quadrat
3. Repeat
4. Work out the

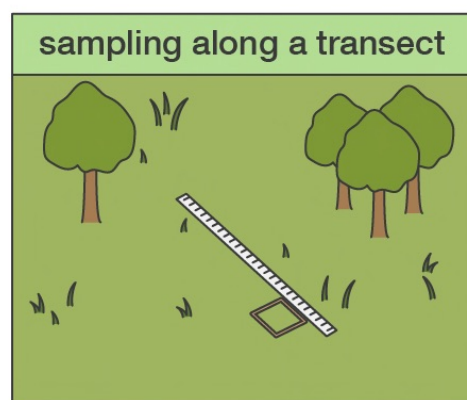
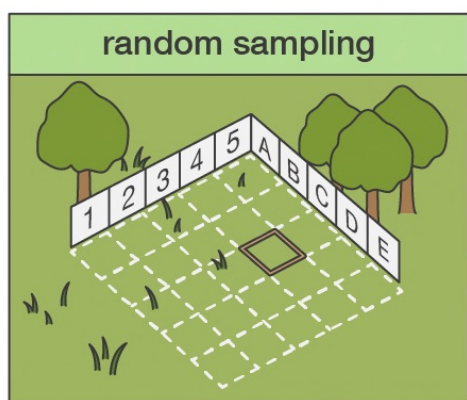
$\text{MEAN} = \text{total number of organisms} / \text{number of quadrats}$

Distribution can depend on light intensity

Quadrats & transects = quantitative methods

Transects:

1. Mark out a line (with a tape measure) of an area
2. Count organisms touching the line
= measures distribution from the hedge -> middle of a field of organisms



Microscopy:

Preparing slide:

1. Add water to clean slide
2. Separate an onion's layers & peel the epidermal tissue off
3. Place the tissue on the water slide
4. Add iodine to stain the tissue
5. Place cover slip over the specimen

Light microscope:

1. Clip slide onto stage
2. Select lowest objective lens
3. Move the stage upwards with the coarse objective knob
4. Focus the object with the fine adjustment knob

If higher magnification needed, use higher objective lens

Draw cells with a pencil & label features

Magnification = image size / real size

There's 1000000 nano meters in 1 mm

