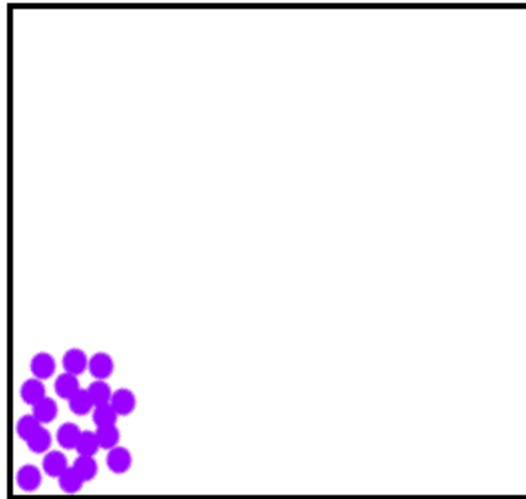


Diffusion





Learning Outcomes

1. Diffusion is the movement of molecules from a high concentration to a low concentration down a concentration gradient until evenly spread.
2. Diffusion takes place through the cell membrane because it is selectively permeable.
3. Diffusion does not require energy to take place.

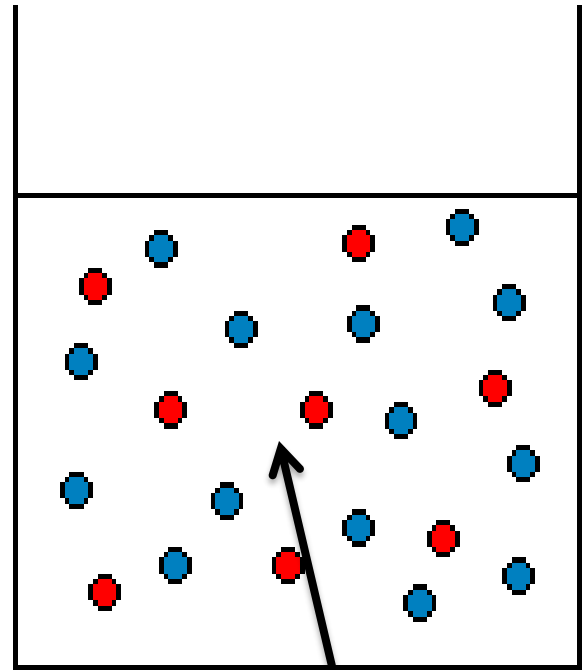
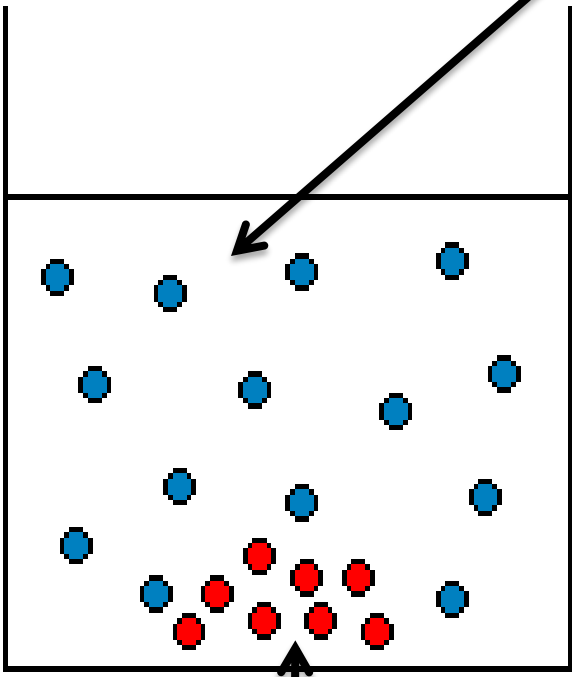
Watch the demonstration

Diffusion

Low crystal concentration

Before

After



Red molecules move along the concentration gradient until they are evenly spread out

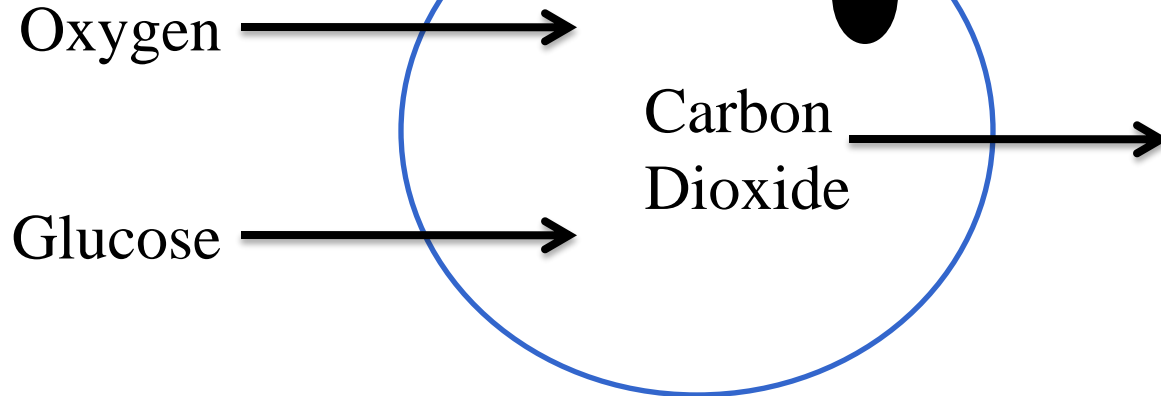


Importance of Diffusion

- Diffusion of molecules takes place in plant cells, animal cells and in unicellular organisms.
- Substances a cell needs diffuse into the cell
- Substances a cell doesn't want diffuse out of the cell

Diffusion

Copy



Molecules that diffuse Into a cell

- Oxygen
- Glucose

Molecules that diffuse Out of a cell

- Carbon Dioxide

Importance of Diffusion

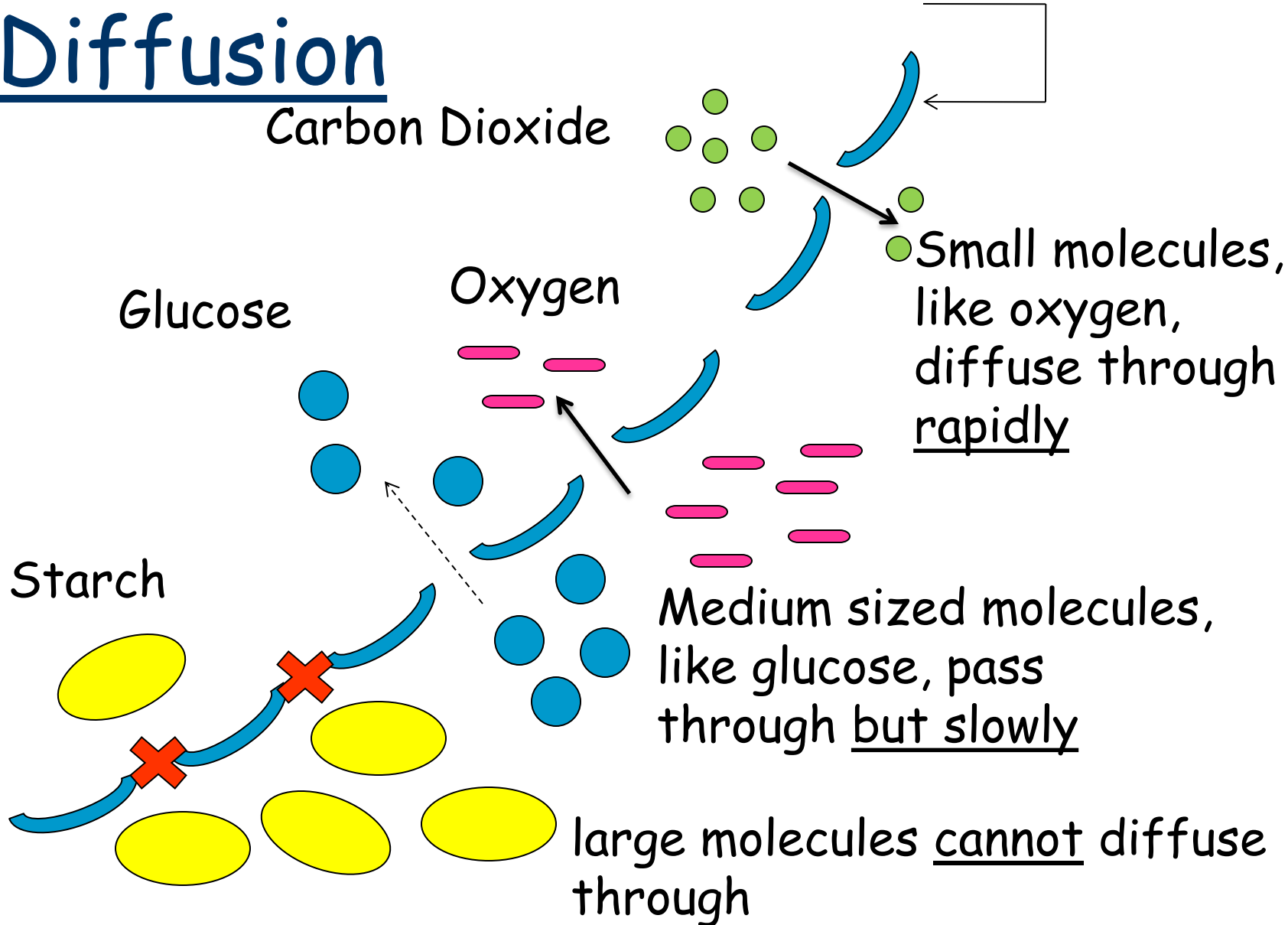
In multicellular organisms

- Animals:
Dissolved food and oxygen moves from the bloodstream into respiring cells. Waste products move from the cells into the Bloodstream
- Plants:
Carbon Dioxide needed for Photosynthesis diffuses into the plant

In Unicellular organism

- Useful substances like Oxygen and dissolved food can enter it
- Waste substances like Carbon Dioxide can leave it

Roll of cell membrane in Diffusion



Movement through Membranes

Title: Making a "Model Cell" using Visking Tubing to Investigate the Diffusion of Molecules

Aim: To investigate the movement of starch and glucose across a selectively permeable cell membrane

Collect

- Boiling Tube and a test tube
- Boiling Tube Rack
- 20 ml Starch/glucose Solution
- 20 ml Water
- Syringe
- Dropper
- 1 length (20cm) of visking tubing
- Iodine to test for starch
- Benedicts solution to test for glucose



Now watch Mrs Wrightson...

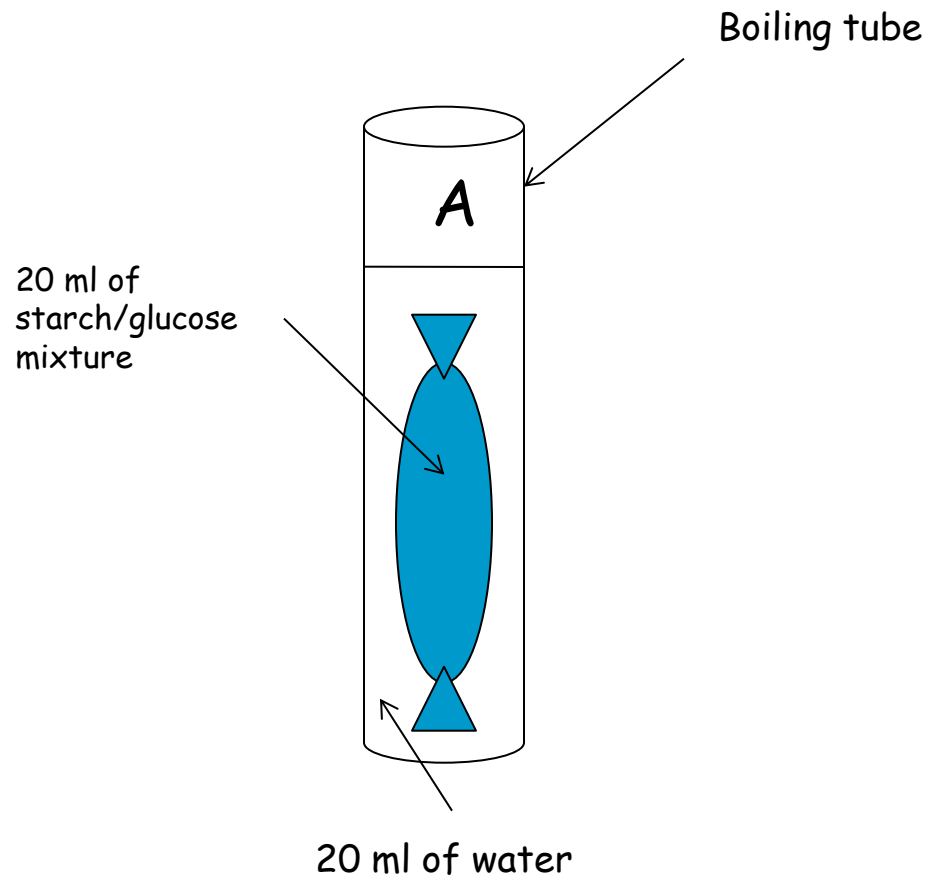


First – leave half a page for your method write up

Copy - Results

Substance	Present in surrounding water at start	Present in surrounding water after 30 mins
Starch		
Glucose		

Method





Important things to remember !!!!

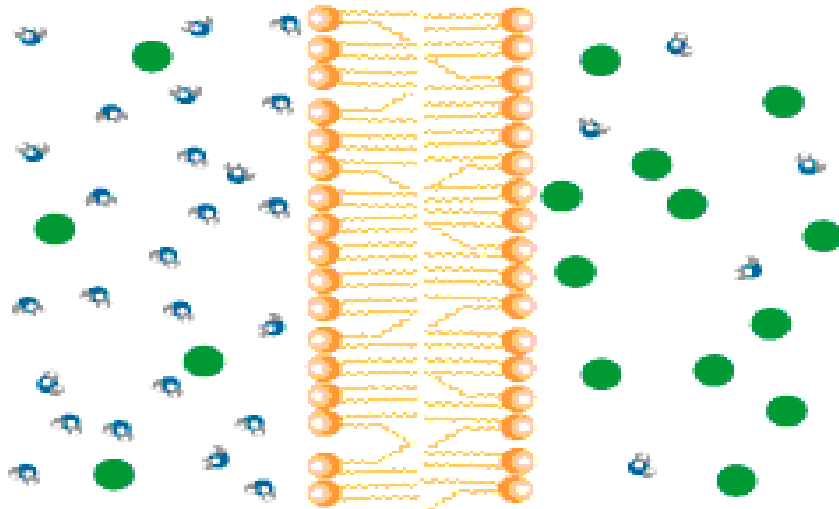
- Rinse the bags under running water and dry with a paper towel before you weigh them
- Test surrounding water for starch and glucose first



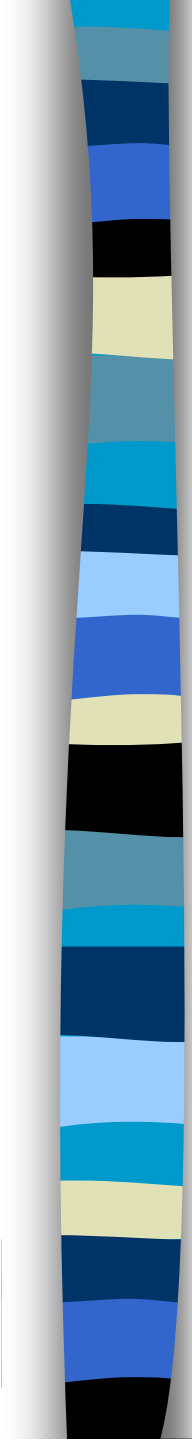
Variables kept constant for a valid set of results

- Time (30mins)
- Temperature (room temp)
- Volume of solutions in each bag
- Concentration of sucrose solution
- Volume of solutions in boiling tubes
- Length of visking tubing

OSMOSIS



WATER

- 
- Osmosis is the movement of _____ molecules from a _____ water concentration to a _____ water concentration, through a s_____ p_____ m_____ until evenly s_____.



Solutions of Different Concentrations

- Solutions can have different concentrations. The concentration inside a cell may not be equal to the liquid surrounding it. When we compare the differing solutions we use the following words;
1. **Hypotonic** – This describes solutions that have the higher water concentration.
 2. **Isotonic** – This describes solutions that are of equal concentration.
 3. **Hypertonic** – This describes solutions that have the lower water concentration.

Relative Water Concentrations-

Definitions:



= Sugar or salt

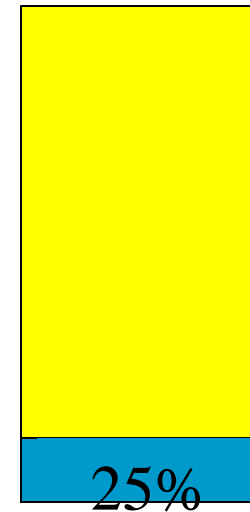
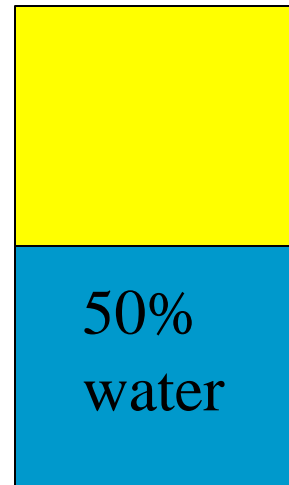
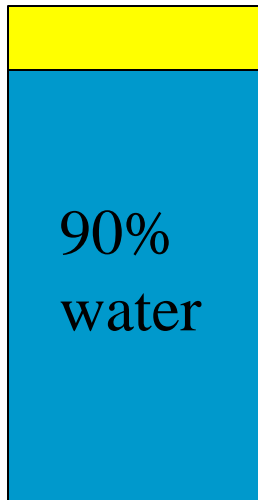


= Water

10% salt soln

50% salt soln

75% salt soln



HWC

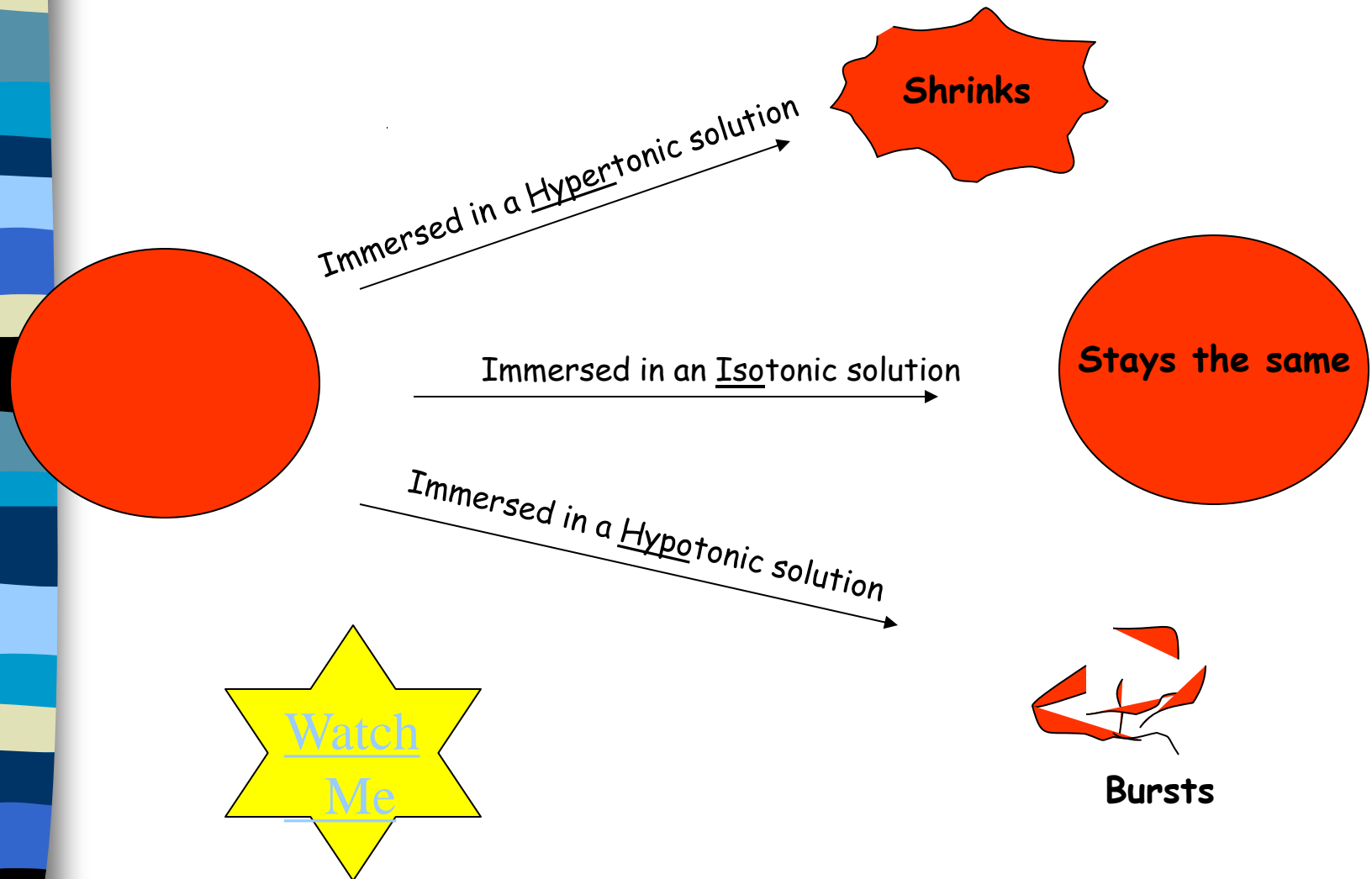
LWC

HYPOTONIC

ISOTONIC

HYPERTONIC

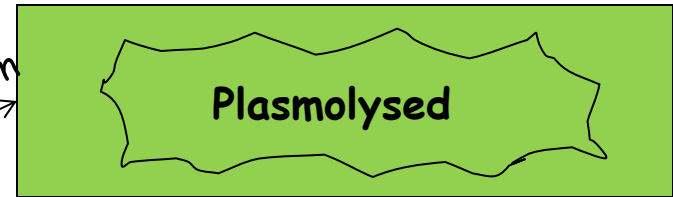
RED BLOOD CELLS (animal)



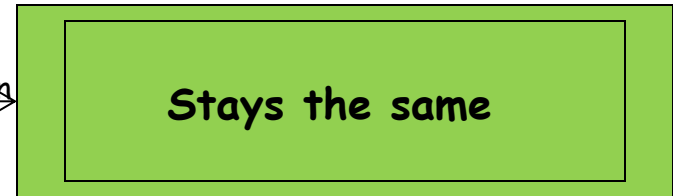
Plant Cells



Immersed in a Hypertonic solution



Immersed in an Isotonic solution



Immersed in a Hypotonic solution





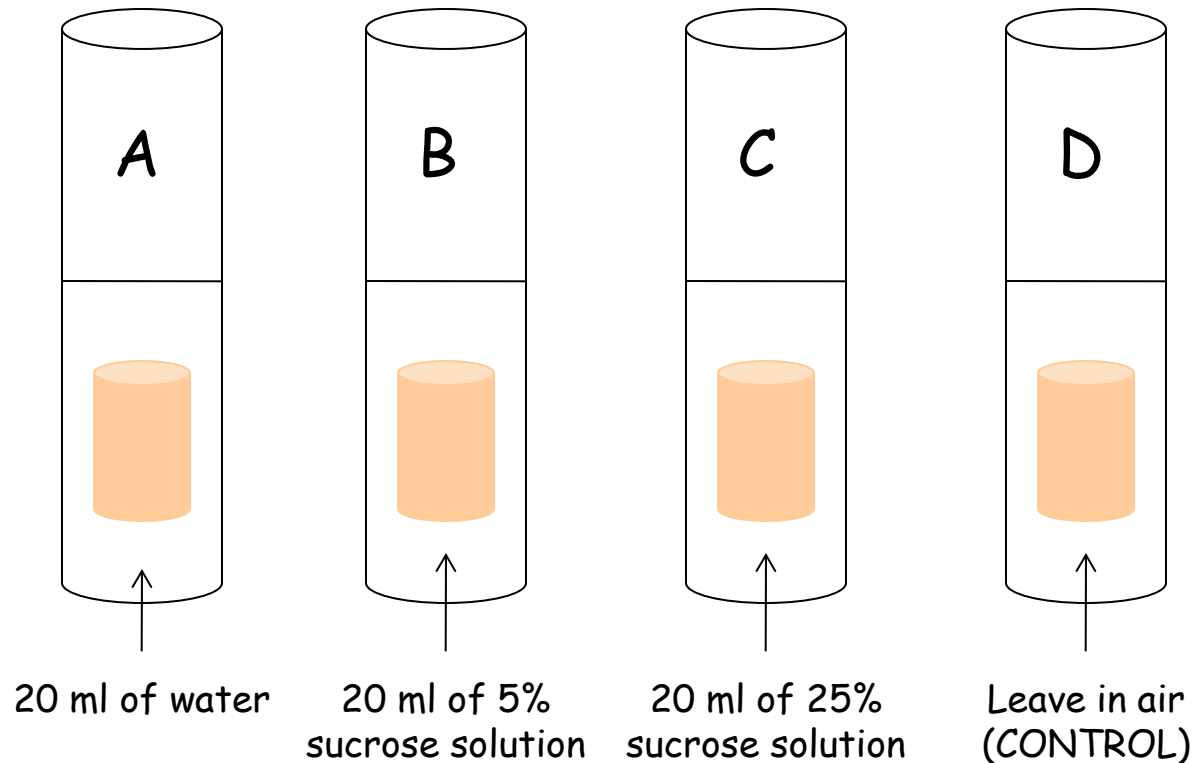
Activity

- Collect 'Osmosis in animal cells' and Osmosis in plant cells' sheet
- TYK, page 33
- TYK, page 37

Title: Osmosis through living tissue

Aim: To investigate the movement of water through potato tissue in different concentrations of solutions

Method:



Results:

Conditions	Initial Weight (g)	Final Weight (g)	Change in Weight (g)	Percentage change in Weight (%)
A: Water				
B: 5% S.Solution				
C: 25% S.Solution				
D: Air				

Analysis of results:

- In experiment A there was a percentage (increase/decrease/stayed the same) in the weight of potato.
- In experiment B there was a percentage (increase/decrease/stayed the same) in the weight of potato.
- In experiment C there was a percentage (increase/decrease/stayed the same) in the weight of potato.
- In experiment D there was a percentage (increase/decrease/stayed the same) in the weight of potato.



Conclusion:

- This experiment concludes that water does move from an area of high water concentration to an area of low water concentration through a selectively permeable membrane.
- In experiment A, the water moved from a ____ outside the potato to a ____ inside the potato by osmosis. The potato tissue is said to be turgid.
- In experiment B, ...
- In experiment C, ...
- In experiment D, ...



Osmosis Experiment

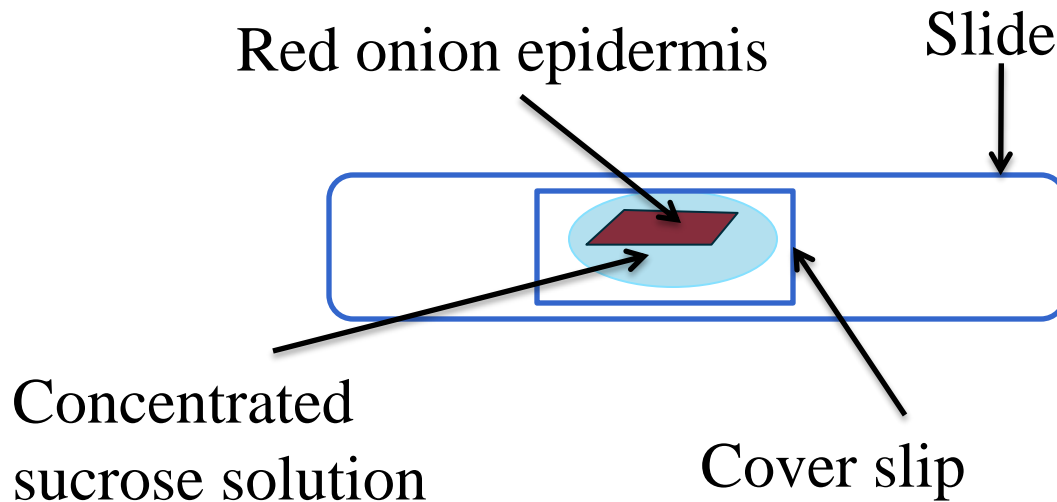
To determine the Isotonic point in
potato tissue

Template

Viewing Plasmolysis in Plant tissue

Aim: To prepare a slide containing red onion epidermis bathed in a concentrated sucrose solution.

Method:



Results: Draw what you see

Conclusion:

When placed in a hypertonic solution, plant cells lose water by osmosis and become plasmolysed