Bishop Douglass School

Experiment on osmosis

The aim of the experiment

The aim of our experiment was to investigate the effect of sucrose concentration on the potato tubes.

A tuber consists of the potato cells.

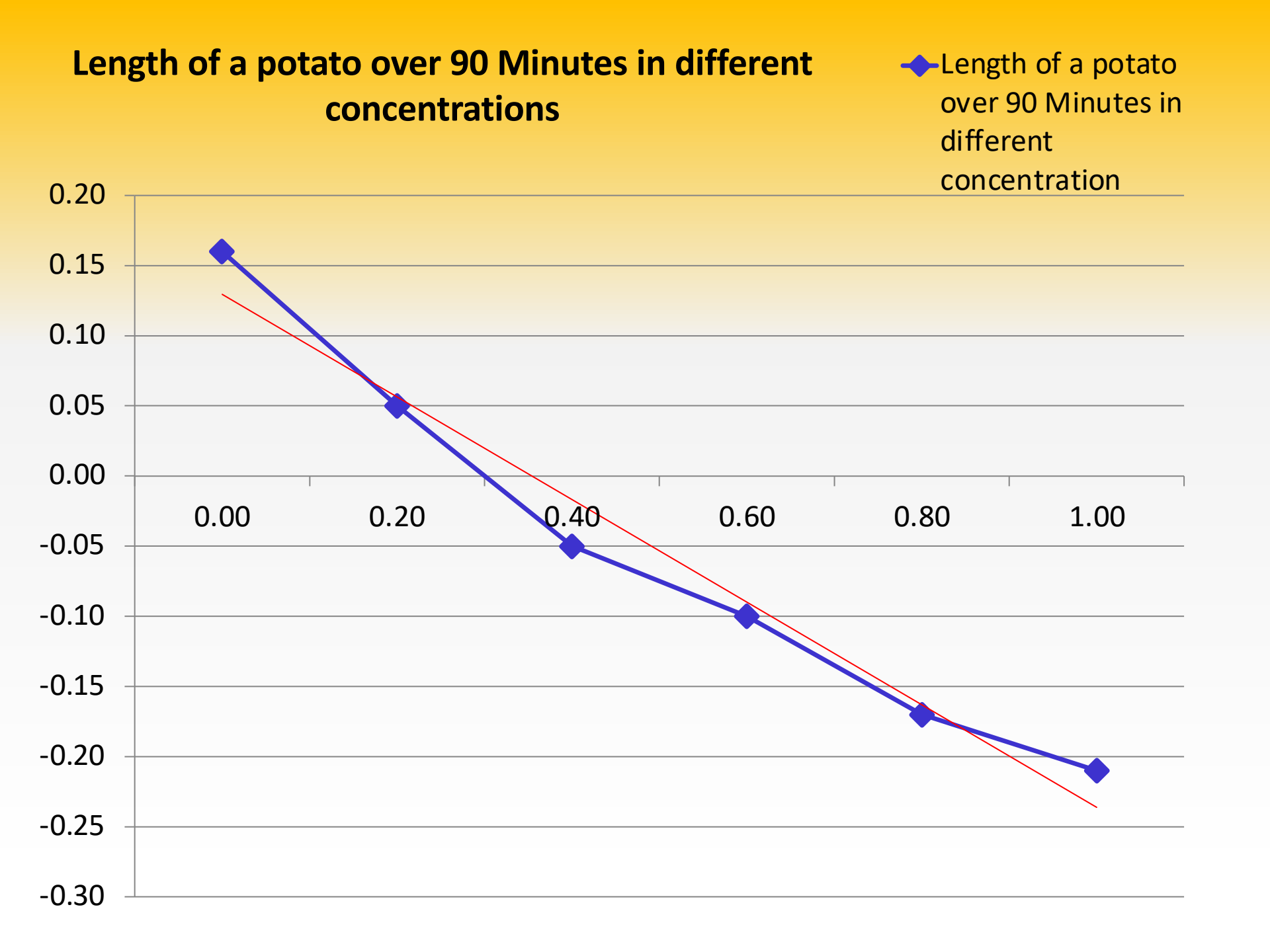
Our hypothesis

In most habitats organisms are for ever having to adapt and cope with the concentration of substances surrounding them, and taking in substances against a concentration gradient across their cell membranes etc. An amoeba uses this balance of concentration to get rid of substances that would endanger its life.

So it is with this in mind that we decide to investigate how concentration would affect plant cells.
We predicted that the higher the concentration of sucrose solution the greater the decrease in potato tubes length.

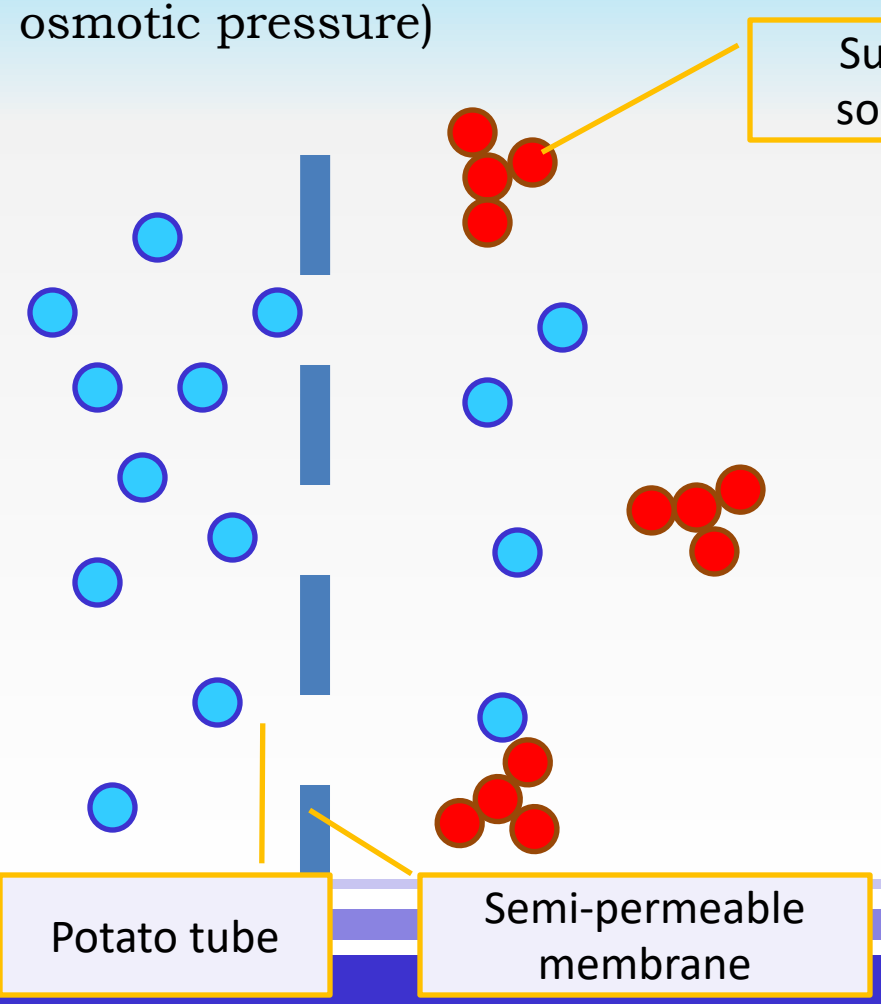
What we did

We have placed 5 potato tubes into various known concentrations of sucrose solution and distilled water. Keeping the ambient temperature the same, every 15 minutes the potatoes' lengths were measured and then re-submerged.
After 90 minutes the experiment was complete.


Length of a potato over 90 Minutes in different concentrations
Length of a potato over 90 Minutes in different concentration
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
-0.15
-0.20
-0.25
-0.30
0.00
0.20
0.40
0.60
0.80
1.00

How does osmosis work?

Osmosis is the movement of particles from a higher medium of concentration to a lower one. Osmosis will occur until both the solutions (outside the potato and inside it) will become isotonic. (have the same osmotic pressure)



Small molecules diffuse through a partially permeable membrane, whereas large ones cannot. For instance, water molecules are small enough to pass through such a membrane, whereas sugar molecules are too large.

Evaluation

Our experiment has proved the hypothesis based on osmosis. In the data collected we could clearly see correlation between the sucrose concentration and mass of the potato.
As the molarity of sucrose solution increased, the length of the potatoes decreased. Some of our ranges overlapped as an result of inaccurate weighting due to time limitations. This experiment has shown us how water flows through semi-permeable membrane as a result of osmotic pressure to reach equilibrium.

Thank you for your attention