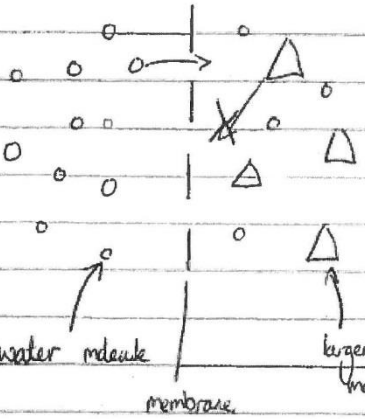
Candidate 1 evidence

Investigation into Osmosis in Potatoes

Aim - Investigate the effect of changing the concentration of salt solution on mass of the potatoes

Underlying Biology - Osmosis is the movement of water from areas of high water concentration to areas of low water concentration through the selectively permeable membrane.

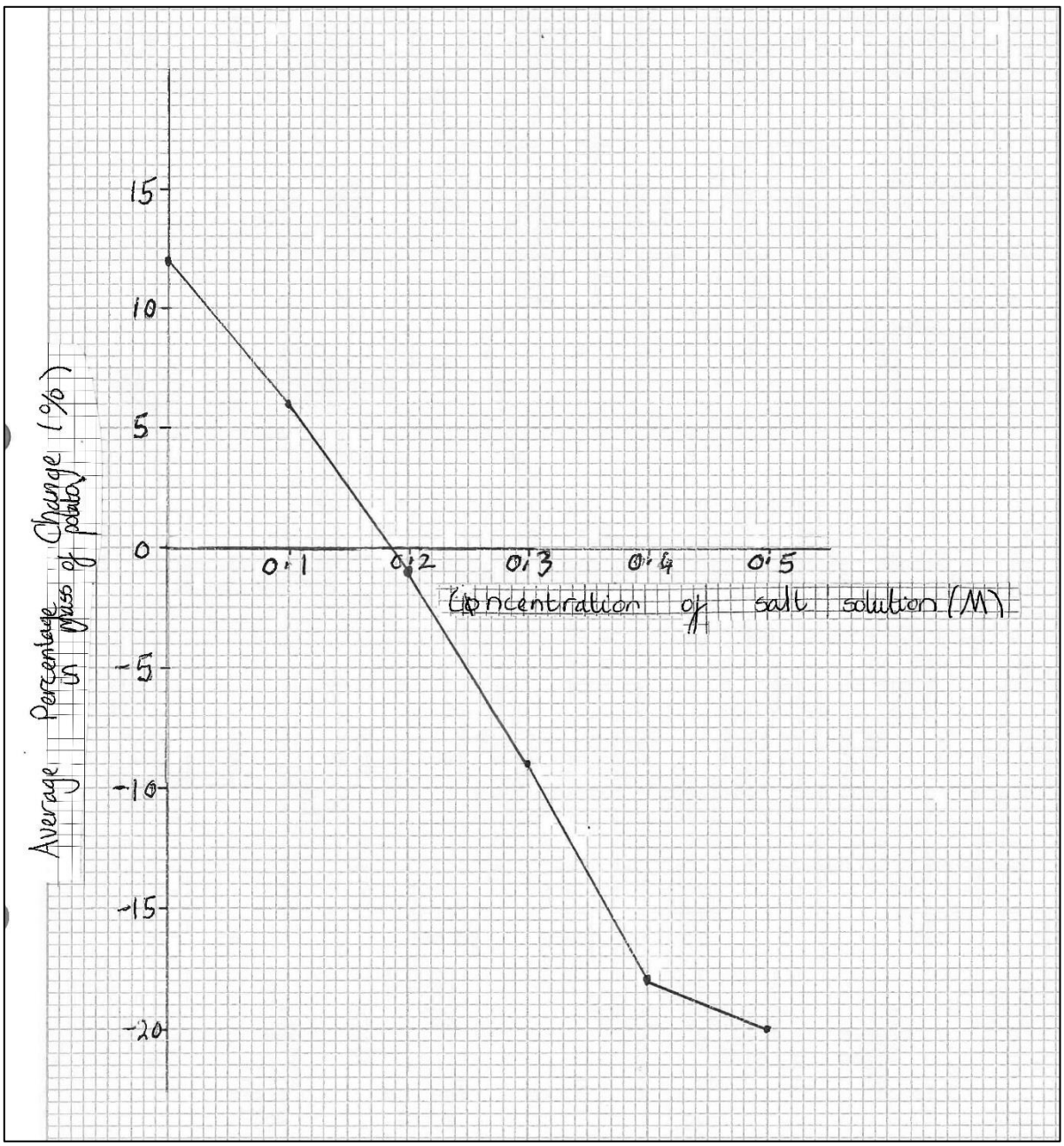


Water molecules are small enough to pass through the selectively permeable membrane to areas of lower concentration however larger molecules cannot fit through. When there is a higher water concentration outside the cell Osmosis will occur and more water will enter the cell. This causes the cell to swell and become turgid. Plant cells do not burst like animal cells as they have a cell wall. This swell causes an increase in mass When the water concentration is lower outside the cell water will move out. This causes the cell membrane to pull away from the cell wall. The cell is now plasmolysed and will see a decrease in mass. Plant cells cannot recover from this state. If the concentration is the same outside and inside the cell we will see no change in mass.

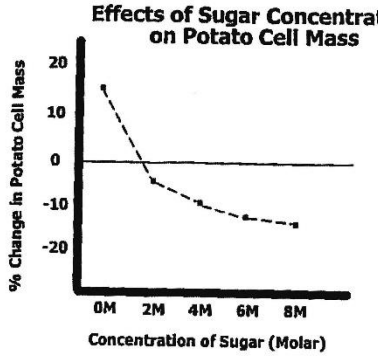
Method - I cut and weighed the potatoes then placed them in different salt solution concentrations for 2 hours then they were removed and reweighed.

Table of Results –

Concentration of Salt Solution	Experiment Number	Mass Before (g)	Mass After (g)	Percentage Change	Average Percentage Change
0M	1	1.63	1.76	7.98%	12%
	2	1.47	1.68	14.29%	
	3	1.56	1.78	14.1%	
0.1M	1	1.60	1.69	5.63%	6%
	2	1.59	1.70	6.92%	
	3	1.56	1.63	4.49%	
0.2M	1	1.52	1.52	0%	−1%
	2	1.58	1.54	-2.53%	
	3	1.59	1.59	0%	
0.3M	1	1.54	1.42	-7.79%	−9%
	2	1.63	1.47	-9.82%	
	3	1.62	1.47	-9.26%	
0.4M	1	1.61	1.27	-21.12%	−18%
	2	1.63	1.37	-15.95%	
	3	1.63	1.33	-18.4%	
0.5M	1	1.45	1.15	-20.69%	−20%
	2	1.60	1.30	-18.75%	
	3	1.60	1.28	-20%	


15
10
5
0
-5
-10
-15
-20
0·1
0·2
0·3
0·4
0·5
Concentration of salt solution (M)
Average Percentage Change (%) in Mass of potato

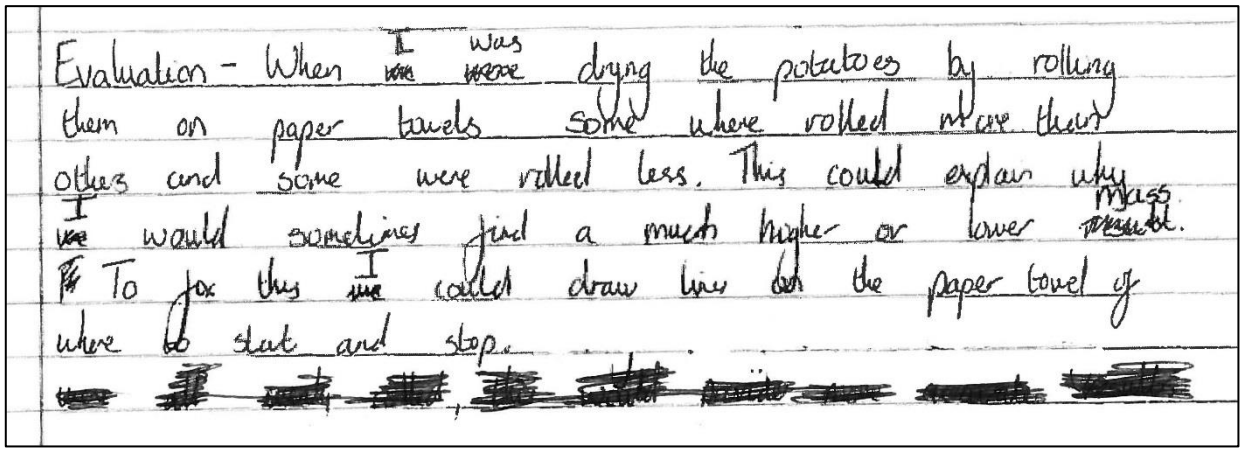
Internet Source -



https://secondaryscience4all.wordpress.com/ks3/osmosis/

In both my internet source and my graph you can see as the concentration increases the potato loses more mass and at the low concentrations it gain more On both graphs you can see it starts to level off at the bottom. You can also identify on both where the concentration of water is equal in the potato and solution

Conclusion - To conclude I found at low concentrations of salt solution we see an increase in mass and as the concentration of solution increases the potato gains less and less mass until we get equal concentrations where we find no change. After this if we continue to increase the concentration of salt solution we will start losing mass


Evaluation - When I was drying the potatoes by rolling them on paper towels some where rolled more than others and some were rolled less. This could explain why I would sometimes find a much higher or lower mass result. To fix this I could draw lines on the paper towel of where to start and stop.