

# To create an isotonic solution that potatoes can be stored in essay sample

[Literature](#), [Russian Literature](#)



Aim: I will create a solution that will be perfect for storing potato chips in.

This solution must have a perfect concentration of salt to water, so creating an isotonic solution, which will stop osmosis occurring so neither causing the potatoes cells to swell up or shrivel up.

Variables: To make sure my results are valid I must take into account the variables that may affect my experiment like;

\* Temperature- changes in temperature can speed up or slow down reaction times.

\* Size/mass of potato chips- the size and mass of a potato chip can affect the experiment as the larger the potato chip is more osmosis can occur.

Simple plan: I will use four different solutions each with a different concentration of salt to water. I will put each solution into a separate beaker then I will place a potato chip in each of these solutions.

Detailed plan: First I will cut four potato chips of roughly the same length and mass (around 0.8g) using a cork borer and plunger. I will then record their weights and then a scalpel to cut it to the correct size and mass. Secondly I will select four different solutions each with a different concentration of salt to water. These concentrations will be 0% salt (pure water), 5% salt, 10% salt and 15% salt. I will then fill four beakers each with a different solution using a syringe, putting 30ml solution in each beaker, and then place one of the four potato chips in each solution using tweezers. The potato chips will be left in the solutions for 20 minutes. After the 20 minutes I will remove the potato chips from the solutions, using tweezers, and will then weigh them

recording the new weights and then I will compare them to the original weight. I will repeat this experiment two or three times to make sure my results are valid.

#### Equipment:

- \* Potato - for potato chips (x4)
- \* Scalpel - to cut potato chips to same length and mass
- \* Beakers (x4) - to hold solutions while experiment is underway
- \* Cork borer and plunger - to extract potato chips from original potato
- \* Salt - to be mixed with water to create the solutions to be tested
- \* Tweezers - to place potato chips into the solutions and extract them afterwards
- \* Electronic scales - to get an accurate measurement of the potato chips mass prior to and after the experiment
- \* Stopwatch - to record the length of time the potato chips are in the solutions so to be able to keep this time constant through out the experiment
- \* Ruler - so to be able to measure the lengths of the potato chips so to keep these similar.

#### Safety:

- \* Take care when handling sharp objects e. g. scalpel, glass etc.
  
- \* Where goggles throughout the experiment.
  
- \* Standard laboratory rules apply e. g. no running, always stand during experiments, never sit and do not bring foreign objects into the testing area.

Fair test: to make it a fair test I must keep certain factors the same throughout the experiment like:

- \* Potato - all four potato chips must come from the same potato.
  
- \* All four potato chips must be of similar length and mass.
  
- \* All the solutions will be tested at the same time to keep variables, like temperature and sun intensity, the same.

The only thing that I will change is the concentrations of salt to water in each solution from 0% salt to 15% salt.

Prediction: I predict that the more salt in the solution the lighter the potato chip will become due to osmosis removing water from the cell causing the cell to shrivel up so losing mass, so creating a turgid cell. So the more water in the solution the larger the cell will become so the cell will gain mass due to osmosis causing the cell to gain water, so creating a placid cell. So I think that a solution with a concentration of water to salt somewhere in between these two extremes will neither cause a cell to shrivel up nor swell up so keeping the cell normal and creating an isotonic solution.