**Osmosis Scientific Report Write-up Guide**

**Title (one line)**

Briefly describe what the experiment is about

**Introduction (paragraph or two)**

Introduce the report, what will it be about?

**Aim (few sentences)**

What are you investigating? (Remember **not** to speak personally e.g. I did this, we did that).

**Hypothesis (one sentence)**

Statement that uses observations and that can be tested. Can be an ‘if’ and ‘then’ statement.

**Equipment (list)**

Detailed list of equipment used (include amounts) – be very specific!

**Procedure (list of detailed steps)**

Steps that were taken, in PAST TENSE (the egg **was** gently rinsed **then placed back** into the beaker)

**Results (few paragraphs, table, graph, diagram)**

Observations (no opinions as to why things happened, just what you observed)

Include your table of results, graphs or any diagrams. Explain what your data shows.

**Discussion (minimum one page)**

Discuss the results.

Controlled variables, uncontrolled variables, anomalies, what went wrong, why did it happen, what could be done to prevent this from happening.

**Conclusion (few sentences)**

Do the results match up with the hypothesis? Was the hypothesis true or false?

Write in past tense

**Osmosis through the Cell Membrane of an Egg**

The diffusion of water molecules from a high water concentration to a low water concentration through a semi-permeable membrane is known as osmosis. Water molecules move either into or out of a cell through the cell membrane to make the concentration gradient equal. This means that the number or amount of water molecules within the cell and outside of the cell should be the same, a balance which is known as homeostasis. With this in mind, it can be assumed that a cell in varying environments would affect how osmosis occurs within the membrane of the cell.

**Aim**

To conduct a three day experiment to investigate the effect of two different substances on de-shelled eggs and how this changes the process of osmosis through the cell membrane of the eggs. That is, whether the eggs will increase or decrease in mass throughout the experiment.

**Hypothesis**

If the egg is placed in water then the water molecules will move through the cell membrane into the egg, causing it to expand and increase in mass.

**Equipment**

4 x 250mL beakers

4 x chicken eggs (de-shelled and raw)

Distilled water (enough to cover the top of the egg)

Salt (enough to cover the entire egg)

Electronic balance

1x plastic scoop

**Procedure**

Day 1 of experiment

1. The beaker was weighed on the electronic balanced, re-zeroed and one egg was placed inside and weighed. This result was recorded.

2. The procedure was repeated for the other three eggs and beakers.

3. The beakers were labeled as such; ‘distilled egg 1’, ‘distilled egg 2’, ‘salt egg 1’ and ‘salt egg 2’.

4. The two beakers labeled ‘distilled egg 1’ and ‘distilled egg 2’ were filled with distilled water so that the eggs were completed immersed.

5. The two beakers labeled ‘salt egg 1’ and ‘salt egg 2’ were filled with salt so that the eggs were completely covered.

6. The beakers with the eggs were then left overnight to be recorded again the next day.

Day 2 of experiment

7. The beakers were retrieved and initial observations were recorded.

8. Gently, each of the four eggs were taken out of their beakers and weighed on a glass petri dish (the petri dish was re-zeroed before each egg was weighed).

9. These masses were recorded.

10. The beakers were cleaned and dried.

11. The eggs were then placed back in their respective beakers and topped up with distilled water (in the ‘distilled egg’ beakers) and salt (in the ‘salt egg’ beakers).

12. Again the beakers were left overnight for the next day’s results.

Day 3 of experiment

13. The beakers were retrieved and initial observations were recorded.

14. Gently, each of the four eggs were taken out of their beakers and weighed on a glass petri dish (the petri dish was re-zeroed before each egg was weighed).

15. These masses were recorded.

16. The eggs were then disposed of and the equipment put away.

**Results**

Weight changes of eggs in different substances

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mass over three days (g) | | |  |
|  | Day 1 | Day 2 | Day 3 | Total changes in mass |
| Distilled egg 1 |  |  |  |  |
| Distilled egg 2 |  |  |  |  |
| Average result for  eggs in distilled water |  |  |  |  |
| Salt egg 1 |  |  |  |  |
| Salt egg 2 |  |  |  |  |
| Average result for  eggs in salt |  |  |  |  |

Observations

Day 1 of experiment

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Day 2 of experiment

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Day 3 of experiment

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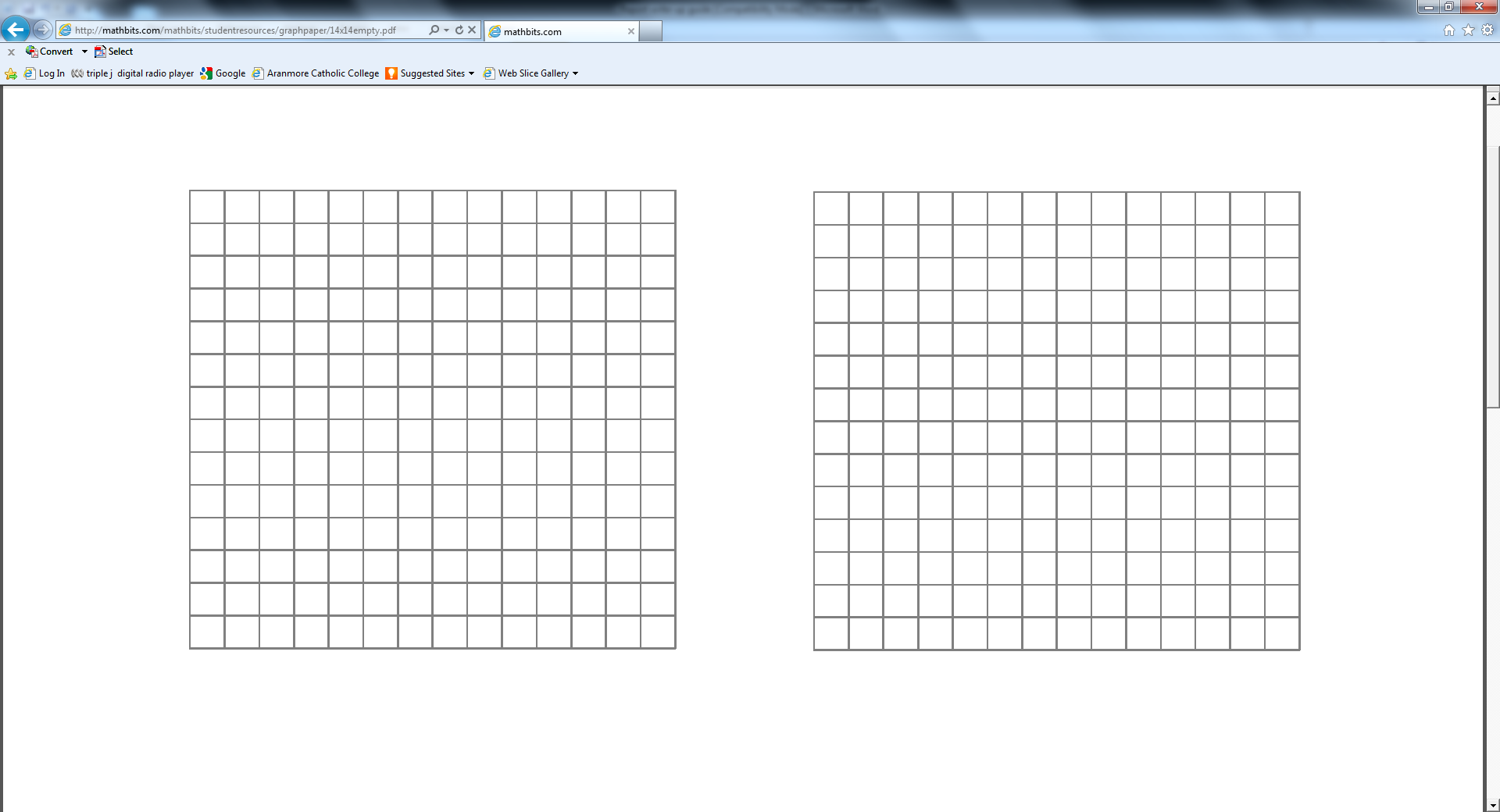
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Mass of eggs versus time



**Discussion**

In this experiment, the type of substance that the eggs were immersed in were controlled, the type of salt was controlled, the size of beakers were controlled and the type of eggs were controlled.

The amount of distilled water and salt placed in the beakers were not the same on each day, therefore this was not a completely controlled variable, also the environment that the eggs were kept in was not controlled as the temperature of the room they were placed in each night was not kept the same.

When looking at the table and graph, it is evident that the mass of the eggs in the distilled water increased over the three day period. This was due to the movement of water along the concentration gradient. The movement of water molecules from the distilled water in the beaker, via osmosis through the cell membrane of the egg and into the egg. This is because there was a greater concentration of water molecules surrounding the egg in the beaker, than in the egg.

When looking at the eggs covered in salt, the graph and table showed that there was a decrease in egg mass over the three days. This was because the water molecules inside the egg moved through the cell membrane of the egg via osmosis to the salty exterior. There was a lower concentration of water molecules in the salt surrounding the egg than in the egg so the water molecules followed the concentration gradient. The resulting effect was the decrease in egg mass.

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**Conclusion**

The eggs in distilled water increased in mass compared with the eggs covered in salt due to the movement of water molecules moving from the outside of the egg to the inside of the egg via osmosis. Therefore the hypothesis was correct.