**EGGSperimenting with Osmosis**

Due Date: Wednesday 22th February, 2017

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Score: \_\_\_\_\_\_\_\_\_\_\_\_\_\_/60

**EGGSperimenting with Osmosis**

**Background Information**

When a fluid like water moves through semi- permeable membranes that separates it from another fluid the process is called osmosis. Like most flows, the process is controlled by the difference in pressure between and concentration of the two fluids. Many people don’t know about osmosis but it is very a important scientific process. It is used to purify water, including desalination. Our kidneys use osmosis to remove excess fluid from our blood.

**Purpose:**

* To observe the way water moves through a semi- permeable membrane due to osmosis.

**Materials:**

4 de-shelled fresh eggs

250g table salt

200mL distilled water

200mL 0.1M salt (NaCl) solution

4 x 250mL beakers labelled A, B, C, D

triple beam balance or electronic balance

paper towel

digital camera

**Procedure:**

This experiment requires eggs to be treated in different ways under controlled conditions. Accurate recordings of the weight of **EACH** egg at the start of the experiment and then its weight at the end of the experiment is very important. Handle the eggs very carefully as things could get messy. Membranes are easily broken.

1. Weigh each egg and record its weight in the column headed **Starting Weight of Egg.**
2. **Egg A**- place some salt crystals in the base of Beaker A making a hollow in the middle. Place the egg into the hollow and cover it with more salt. Make sure none of the egg is showing above the salt.
3. **Egg B**- gently place the egg in Beaker B and cover with distilled water
4. **Egg C**- gently place the egg in Beaker C and cover with 0.1M salt solution.
5. **Egg D**- carefully place the egg in Beaker D and cover it with tap water.
6. Cover each beaker tightly with plastic wrap
7. Leave eggs overnight in a location where they will not be disturbed.

**Next Lesson:**

1. Remove the eggs CAREFULLY from each of the treatments. Gently wash off the excess salt and dab the eggs with paper towel to remove excess water.
2. Re- weigh each of the eggs and record its weight in the table column headed **End Weight of Egg**
3. Calculate the amount of water lost or gained by finding the weight difference between Column 1 and Column 2. Record the difference in the column 3 headed **Amount of Water Lost and Gained**
4. Calculate the percentage water loss/ gain using the following formula and write your answer in column 4 headed **Percentage Weight Change.**

Percentage change – weight column 3 x 100

weight column 1

Make and record observations of any visible changes that have occurred to the eggs. Digital photos may be useful for the collection of extra supporting data.

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| --- | --- | --- | --- | --- | --- |
| Treatment | 1. Starting Weight of Egg | 2. End Weight of Egg | 3. Amount of Water lost/ gained | 4. Percentage Weight Change | 5. Class Average Percentage Weight Change |
| **A. Egg in Salt crystals**  Observations: |  |  |  |  |  |
| **B: Egg in distilled water**  Observations: |  |  |  |  |  |
| **C. Egg in 0.1M salt solution**  Observations: |  |  |  |  |  |
| **D. Egg in tap water**  Observations: |  |  |  |  |  |

State a hypothesis for this investigation.

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(2 mark)

Name the independent variable.

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(1 mark)

Name the dependent variable.

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(1 mark)

Name two variables in this investigation that need to be controlled and describe why they need to be controlled.

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(3 marks)

Describe the purpose of a “controlled setup” in a scientific investigation.

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(1 mark)

Data Collection and Recording.

(6 marks)

Display your results in a suitable graph.

(4 marks)

Why was the starting weight of the eggs recorded?

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(1 mark)

Describe the changes that occurred to the salt that was packed around Egg A.

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(1 mark)

State which substance moved, and explain its movement in the first treatment of Egg A. What evidence do you have for your answer?

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(4 marks)

State which substance moved, and explain its movement in the first treatment of Egg B. What evidence do you have for your answer?

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(4 marks)

State which substance moved, and explain its movement in the first treatment of Egg C. What evidence do you have for your answer?

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(4 marks)

State which substance moved, and explain its movement in the first treatment of Egg D. What evidence do you have for your answer?

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(4 marks)

Which treatment showed the greatest percentage change in weight?

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(1 mark)

Why was the percentage change calculated for each egg?

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(2 marks)

How did you results compare to the class average? Explain any similarities or differences.

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(2 marks)

Predict what would happen if Egg B was placed into the salt crystals in beaker A. Explain your answer.

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(3 marks)

Use a diagram to show the movement of materials across the membrane of the egg.

You must include water molecules, salt, egg, beaker and arrows to represent net movement. (4 marks)

Did your results support your hypothesis? Explain.

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(3 marks)

Give three examples of osmosis in the body.

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(3 marks)

Describe 3 difficulties you experienced during the conducting of this investigation.

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(3 marks)

Describe 3 ways this investigation could have been improved. (accuracy, reliability etc.)

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(3 marks)