

Human Biology ATAR – Task 1: Science Inquiry

Osmosis Practical and Validation Test (5%)

Name:			
Time allowed: 2 Lessons			
Section	Your Mark	Marks available	Percentage of Investigation
Section 1: Practical	-	-	-
Section 2: Validation Test		39	100
		39	100%

Declaration of Authenticity

I (Student Name) _____ declare that this work is my own and I have not plagiarised from any source.

Signature:

Date:

Effect of Concentration on Osmosis

Background:

To learn more about osmosis, Human Biology students Tim and Fatima conducted an experiment using decalcified chicken eggs (eggs with the shell removed) as a model for cell membranes.

First, the students carefully weighed the eggs to find the initial mass and recorded this in the table below. Tim and Fatima then placed the eggs in beakers containing 200mL of glucose solutions of different concentrations - 15%, 20%, 25%, 30%, and 35%. They left the eggs for 24 hours to allow osmosis to occur.

The next day the eggs were removed, gently patted dry to remove moisture, and weighed again to find the final mass. Tim and Fatima's results are in the table below:

Results:

The Effect of Glucose Concentration on Osmosis

Glucose Concentration (%)	Initial Egg Mass (g)	Final Egg Mass (g)	Percentage Change in Mass (%)
15	52.0	49.8	
20	51.5	48.9	
25	53.0	49.7	
30	50.5	46.2	
35	49.0	44.1	

1. Calculate Percentage Change in Mass to complete the results table above **(1 mark)**
2. Identify the **independent** variable in this investigation. **(2 marks)**

3. Identify the **dependent** variable in this investigation. **(2 marks)**

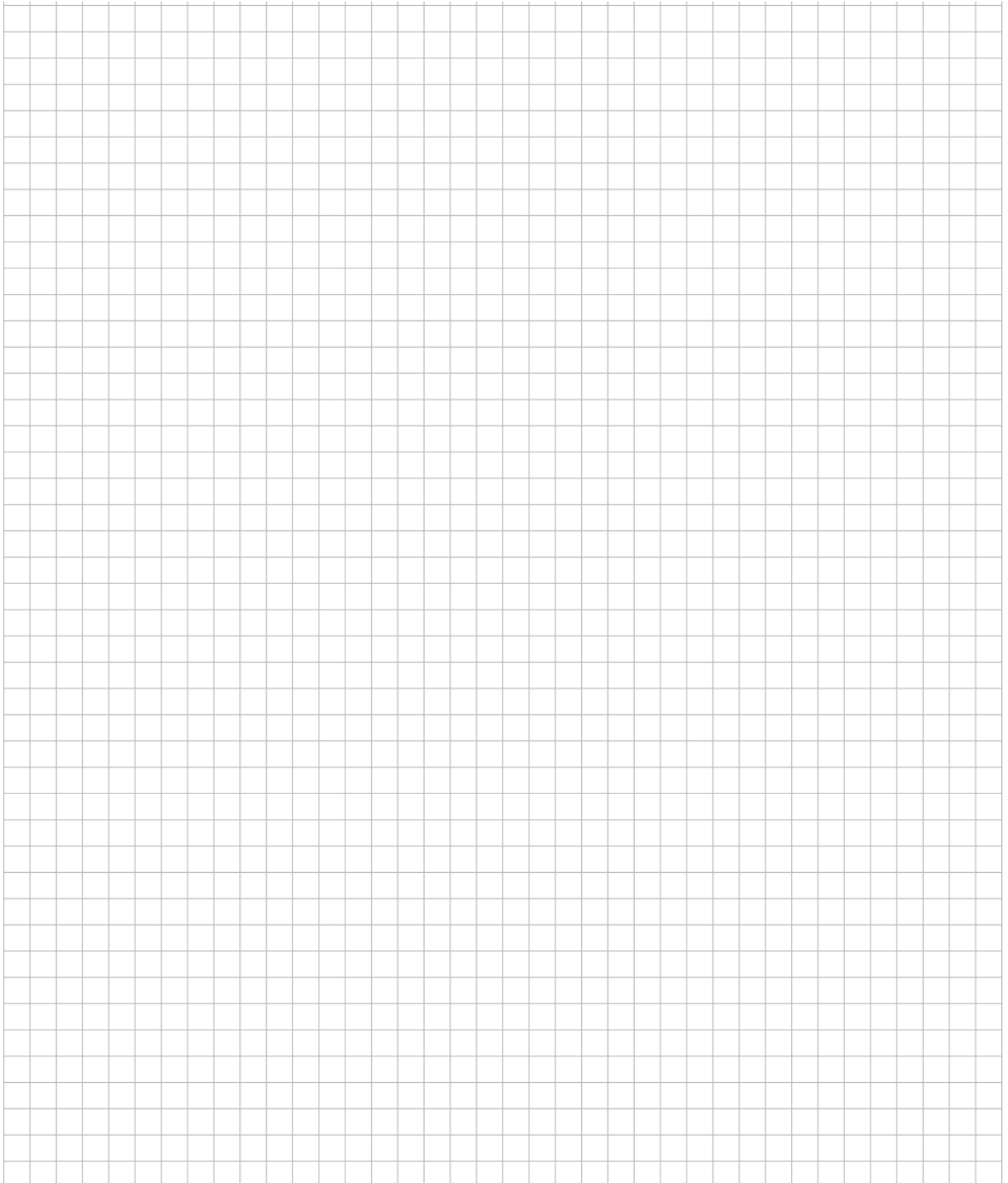
4. Identify two **controlled** variables in this investigation. **(2 marks)**

5. Write a **hypothesis** for this investigation.

(2 marks)

6. **Graph** the Percentage change in mass of potatoes.

(5 marks)



7. **Draw a labelled** diagram to show the movement of material into or out of the egg. (4 marks)



8. Explain the effect of concentration on osmosis. Use data to support your statements. (4 marks)

9. Describe one way Tim and Fatima could have improved **reliability** of their investigation. (2 marks)

10. Describe one way Tim and Fatima could have improved **validity** of their investigation. (2 marks)

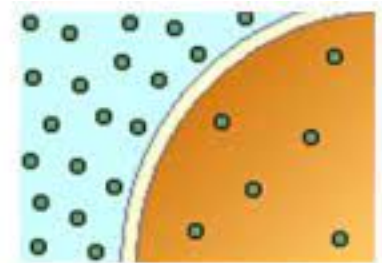
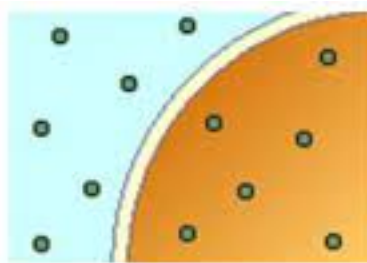
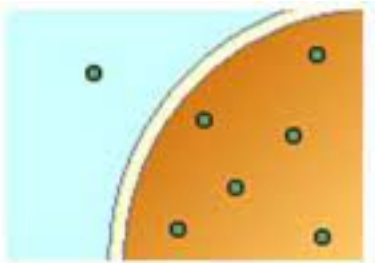
11. **Name** and **describe** two other factors that influence the **diffusion** of materials across a cell membrane. **(4 marks)**

12. Below are 3 cells in different solutions, identify each solution is isotonic, hypotonic, or hypertonic. **(3 marks)**

a. _____

b. _____

c. _____



13. Draw arrows on the diagrams above to show direction of movement of water. **(3 marks)**

14. Drinking very sweet soft drinks increases the sugar content of your blood. Explain why this would make you feel more thirsty than you were.

(3 marks)

END OF TEST

_____ / 39 marks = _____ %