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: Conducting 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 Temperature on Osmosis

TASK: Investigating the Effect of Temperature on Osmosis in a Potato

You are to investigate the effect of temperature on osmosis in potato tubers by placing cylinders of potato in salt solution at different temperatures. You will need to record the change in mass of the potato cylinders. All the equipment you need will be provided and water baths placed on the side benches. This task will test your ability to follow instructions, measure accurately and draw conclusions.

It is your responsibility to work safely and organise your time efficiently. You have:

- 5 mins reading time
- 55 mins working time

Each group will require:

Materials:

- 3 cylinders of potato tuber tissue from a large potato
- 100mL 5% salt solution in a suitably labelled container

Equipment:

- Safety glasses
- 3 test tubes in a test tube rack
- Permanent marker or labels
- 20mL measuring cylinder
- Sharp scalpel
- Cutting board
- 30cm ruler
- Paper towels
- Stopwatch
- Blunt nose forceps

Access to:

- Electronic balance (0.1g)
- Water baths set at 30^{o}C, 40^{o}C and 50^{o}C with test tube racks

Procedure:

1) Label 5 test tubes with **your group initials** and 30^{o}C, 40^{o}C, and 50^{o}C.

2) Using the most suitable measuring instrument place **15mL of salt solution** into each test tube.

3) Place each of the test tubes containing the salt solution into the correct water bath **and leave for at least 5 minutes** to reach the correct temperature.

4) Trim any skin of the potato cylinders. Use a ruler and sharp scalpel to cut the cylinders so they are **exactly 5cm** long.

5) Place the potato cylinders on a piece of paper towel and blot off any surplus moisture.

6) Measure the mass of the potato cylinders to the **nearest 0.1g** and **immediately** place in labelled test tube.

7) Record the weight of the potato cylinder and the temperature of test tube. Take note of the time it is placed into the salt solution.

8) Repeat for remaining potato cylinders.

9) Leave each potato cylinder in salt solution at correct temperature for **exactly 25 mins**.

10) **After 25 mins** use the forceps to carefully remove the potato cylinders from the salt solution.

11) Using a paper towel gently blot of the surface moisture. Measure the mass of each potato cylinder and record.

While waiting for the 25 mins:

- ***Start completing your investigation template***
- ***Prepare a suitable results table for recording the initial mass, final mass and percentage change in mass of the potato cylinders***

$$\boldsymbol{Percentage\ Change\ in\ Mass} = \left(\frac{\boldsymbol{Final\ Mass - Initial\ Mass}}{\boldsymbol{Initial\ Mass}}\right) \times \mathbf{100}$$