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**Year 11 ATAR HUMAN BIOLOGY**

**TASK 1 – SCIENCE INQUIRY**

NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DUE DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 4 %

TEACHER: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK: \_\_\_\_\_\_\_ / = \_\_\_\_\_\_\_\_ %

### Assessment Activity: Cooking French Fries

You have just opened your first business called “Just French Fries” in Kalgoorlie and you want to develop the perfect tasting French Fries …. crispy on the outside and soft and fluffy on the inside. You hope to sell more French Fries than all the fast food outlets in Kalgoorlie, but to achieve this goal, you need to cut up lots of potatoes and store them correctly so they can be deep fried and ready for your customers when they place their order. Fast food outlets soak their French Fries in sugar solution to keep them fresh before cooking. The solution has a concentration that ensures that the water content of the potato remains the same, if water enters the potato they cannot be fried.

**Your task**: To determine the optimum concentration of this sugar solution. You will be given 5 sugar solutions of varying concentrations that you can use to help determine what sugar concentration is being used so no water enters the potato.

**Equipment Provided:** Potatoes

100% Water

Solutions available are 5% sugar, 10% sugar, 15% sugar and 20% sugar solution.

Knife, weighing balance, containers, lids/ glad wrap and elastic bands, paper towels, glassware

Safety equipment : lab coats, goggles, gloves

**Part A:** Developing a Plan. (1 lesson) *Individual activity*

Develop your own plan by:

1. Stating the aim of your investigation**.**
2. Writing an introduction, including the definition of osmosis.
3. Stating your hypothesis, independent, dependent and controlled variables for the investigation (must include at least 3 controlled variables).
4. Write a step by step method.

You will need to consider the following:

* the independent variable and its range.
* the dependent variable and how this will be measured and calculations that will be used.
* controlled variables and how they will need to be managed to minimise sources of error and why they need to be controlled.
* how you will ensure that your results are accurate and reliable.
* how you are going to record and process your data.
* how your experiment is going to be conducted in a safe and ethical manner.

*Each student will hand in their own piece of work*

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**Part B:** Carrying out the experiment and collect results (1 lesson) *Group activity*

**Task 2:** Analysing trials, developing the final method and setting up the experiment. (50 minutes)

1. In groups of 4, set up experiment according to the method below.

*Note: the piece of potato have already been cut for you using the same cutter; they are all identical in shape and have come from the same type of potato, bought at the same time*

* 1. Collect a lab coat and gloves
  2. Collect fifteen pieces of potato
  3. Record the mass of each piece of potato to one decimal point.
  4. Collect five identical plastic cups.
  5. In each cup, place 80mls of the different solutions and label accordingly.
  6. Place three pieces of potato in each cup, identifying the mass of each potato in each cup.
  7. Seal the top of the cup with plastic and leave overnight.
  8. The next lesson, remove the potato pieces from the different solutions, one at a time, dry the piece on a paper towel and then reweigh.
  9. Record the new mass of each potato.
  10. At the end of the practical, dispose of all used potato appropriately and rinse out the cups.

*Each student will hand in their own piece of work*

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**Part C:** Process, evaluate and communicate findings. (1 lesson) *Individual Activity*

Part C is divided into three sections.

1. Use Task sheet C to record your results in an appropriate format and plot a graph.
2. Use the lined paper you have been supplied with to write your analysis and evaluation. You will need to address each of the points below in your written answer.
3. At the end of your analysis and evaluation, you must write a conclusion linking back to your hypothesis.

**Analysis and evaluation**

- describe the trends and patterns in your data,

- identify any outliers,

* use your science knowledge and understanding to explain your results,
* comment on the reliability and validity of the data collected and the experiment,
* state any sources of error
* State how you could minimise your identified sources of error in a repeat experiment.

**Conclusion** - summarise your findings and link to your hypothesis,

**Task sheet C :**

1. In the space below record your *raw results and processed results* in an appropriate format. If any formulas are used show the formula and explain how it was used.
2. Use the grid below to present your processed results.

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