Adult Education and Training (AET)
Site-Based Assessment
Portfolio of Evidence

Natural Sciences:	**NQF Level 1**
Total:	**50 marks**
Duration:	**One (1) week**
Task 1:	**Practical Investigation**

Learner Information

Name : _____

Surname : _____

Identity/

Passport Number : _____

Employee Number : _____

Company : _____

Centre : _____

Date : _____

Declaration

I declare that this portfolio of evidence is my own work: _____

Signature

INSTRUCTIONS

1. This task consists of **TWO ACTIVITIES.**
2. This investigation is based on a theme: **LIFE AND LIVING**.
3. The title of the investigation: **THE EFFECT OF VARYING THE CONCENTRATION OF WATER SOLUTION VERSUS OSMOTIC ACTIVITY BETWEEN POTATO SLICE AND THE SOLUTION**.
4. The task should be completed over a period of **ONE WEEK.**
5. The task is divided into **SIX PARTS (A TO F).**
    a. **Parts A – D (Activity 1)** must be done in groups/teams of TWO to FOUR learners. You can select teams or be appointed to a team.
    b. **Parts E** and **F (Activity 2)** must be completed by learners individually.
6. Write neatly and legibly.

ACTIVITY 1: GROUP WORK

Read the case study below for the purposes of this task:

Osmosis

Osmosis is the process by which water is transported into and out of cells. The movement of water into the cells is called endosmosis and cells lose water by exosmosis. Water moves from a region of low solute concentration to a region of high solute concentration through a selectively permeable membrane. Osmosis is a passive transport, which means it does not require energy to be applied.

(Adapted from sciencing.com)

PART A – HYPOTHESIS

As a team/group, formulate the investigative question and the hypothesis for your investigation based on the above case study.

Write or note this in your note pad(s).

PART B – GATHERING OF APPARATUS OR MATERIALS

INSTRUCTION: Each team/group must gather and bring in the following to proceed with the investigation. Decide amoung yourselves who will bring which item.

1. Two small cereal/porridge bowls of equal size and shape
2. Two plastic or paper cups of equal size and shape
3. Two saucers
4. One raw potato
5. Salt
6. Plastic knife
7. Plastic tablespoon
8. Water

PART C – PROCEDURE AND OBSERVATION

INSTRUCTIONS: The Facilitator will provide guidance in conducting the experiment. Learners should write down the steps they have followed to conduct the investigation in their note pads.

Steps to be followed by learners in their groups:

1. Pour equal amounts of water in each cup. In one cup, pour two full tablespoons of salt and stir until all the salt dissolves.
2. Use the knife to cut two thick equal sized slices of potato and remove the potato skin from each slice.
3. Place each slice of potato in each bowl so it leans against the side of the bowl in an upright position.
4. Separately, place the bowls on two clean A4 sized papers and label each paper as **"Bowl 1 - Pure Water"** and **"Bowl 2 - Salt Water"**.
5. Take the cup with pure water and pour the water in the bowl labelled as "Pure Water". The water should just rise halfway up the side of the potato slice.
6. Pour salt water in the bowl labelled as "Salt Water". Again, the solution should just rise halfway up the side of the potato slice.
7. Allow the slices of potato to sit for 2 hours and observe any possible change that may take place in each bowl.

PART D – ANALYSE THE RESULTS AND DRAW THE CONCLUSION.

After 2 hours, remove the slices from each bowl and place them in separate saucers. Compare the following in each slice.

- Texture of each slice
- Colour of each slice
- Mass or weight of each slice
- Structure of each slice

ACTIVITY 2: REPORT – INDIVIDUAL WORK

PART E – REPORT WRITING

Based on the activities in Activity 1, complete the report below:

1. Identify the investigative question.

(2)

2. Provide a hypothesis for the experiment.

(3)

3. List the apparatus or materials used in the experiment.

(4)

4. Outline the procedures followed to conduct the experiment.

(5)

5. Use the table below to capture the observations. Provide a title for the table, titles for each column and data in each column:

Table title:		
Column title:	**Column title:**	**Column title:**
Observations:	Observations:	Observations:

(9)

6. Compare and analyse the results in the saucers and outline the different textures, colours, weight and structures of the potato slices.

(6)

7. Discuss in your conclusion below whether the hypothesis was confirmed or not. Explain the reasons why the potato slices were different in shape, colour and texture. And provide reasons for the effects of pure water and salt water on potatoes based on the experiment.

(11)

Total marks for Part E **(40)**

PART F

1. What is meant by **"selectively permeable membrane"**?

_____

_____

(2)

2. In which bowl did endosmosis take place?

_____

(1)

3. Why did the potato slice in salt water change its colour?

_____

_____

(2)

4. Which bowl is the independent variable? Explain why this is so.

_____

_____

_____

_____

(3)

5. Identify the following as either *Active* or *Passive* Membrane.

   5.1 Cell wall

_____

(1)

   5.2 Cell membrane

_____

(1)

Total marks for Part F **(10)**

GRAND TOTAL MARKS FOR TASK 1 **[50]**

Total for Task 1: 50 Marks

Task	Parts	Maximum Mark	Learner's Mark	Moderated Mark
Task 1	**Part E**	**40**		
	Part F	**10**		
	Total: Task 1	**50**		