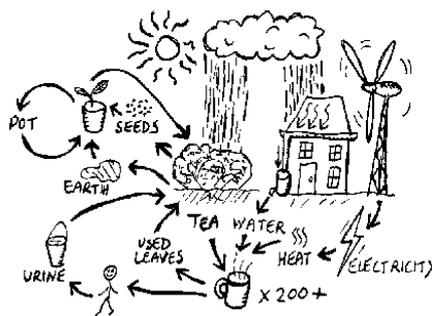




HLUMELELISA
A NEW SPIRIT

INTERPRET AND ILLUSTRATE PERMACULTURE PRINCIPLES



NQF Level 2 | 5 Credits
SAQA Unit Standard 116109

Facilitator Memo

Knowledge & Theory Component

Activity 1: Knowledge

ASSESSOR INSTRUCTIONS: ACTIVITY 1		
Location		Assessed By
Assessment Centre		Constituently Registered Assessor
Method	Instrument	Tool
Questioning	Knowledge Test	Answer Sheet
BLOOMBERG'S TAXONOMY LEVEL ¹		
COMPREHENSION <i>(Knowledge Component)</i>	<p>The ability to grasp the meaning of material</p> <ul style="list-style-type: none"> • Site components are correctly identified and described, and their outputs linked with the needs of at least two other site components in a specific context. • The needs of specific site components are linked to the outputs of at least two other site components in a specific context. • The living site resources in a specific context are identified and their characteristics identified. • The non-living resources in a specific context, and their characteristics, are identified. • The role of micro-organisms in soil health is explained. • At least three species, one of which should be earthworms, are identified in soil and their role in soil health explained. 	
KNOWLEDGE <i>(Knowledge Component)</i>	<p>The ability to recall memorized information.</p> <ul style="list-style-type: none"> • The purpose of the Permaculture design is identified and explained. • The principle functions of the Permaculture design are identified. • Two or more ways to support each principle function are identified. 	
Mark Allocation:		
75% Pass Rate		
Total:/60 = x 100 =%		
MODEL ANSWERS:		

Question 1. Analyse the inputs and outputs of one of the following elements. (10 points)

1. Bees

2. Windbreaks
3. Herb and vegetable gardens
4. Nurseries
5. School building with learners and teachers in it

Bees: Inputs – garden flowers, hives. Outputs – honey, pollination.

Windbreaks: Inputs – plants, water, pests and disease control, care. Outputs – wind protection, shade, fruit, timber, wildlife habitats, nectar for bees.

Herb and vegetable gardens: Inputs – plants, soil fertility improvement, water, pest and disease control, care. Outputs – food, medicine, dyes, material for soil fertility.

Nurseries: Inputs – plants, water, structures, good soil, pest and disease control, labelling. Outputs – plants for school and sale.

School building with learners and teachers in it: Inputs – electricity, water, cleaning.

Outputs – sewerage, waste, dirty water.

Question 2. What are the outputs of a vegetable garden? (1 point)

Vegetable clippings

Question 3. How can the outputs of a vegetable garden be put to good use in a permaculture farm? (1 point)

The outputs can be linked to a worm farm and a compost heap. (AC1.1)

Question 4. Explain the different site components of a nursery garden. (4 points)

Inputs	Outputs

Inputs: For example, a nursery requires an adequate supply of water, potting sleeves and shelter. Outputs: For example, a nursery provides seedlings, water run-off and characteristically it is a relatively warm, humid environment.

Question 5. Link the needs of a chicken to the outputs of a worm farm. (2 points)

For example, chickens need food and additional protein, and the worm farm and the clippings from vegetable beds could meet these needs. (AC1.2)

Question 6. What are the factors to consider when we speak about “the geographic placement of a site”? (4 points)

Geographic placement refers to climate, latitude, altitude, slope, wind and distance from large bodies of water. (AC4.6)

Question 7. Give two examples of how a family’s water needs could be met in a permaculture design? (2 points)

For example, the family's water needs could be met by harvesting water into a tank as well as through the municipal supply. (AC2.3)

Question 8. Give two examples of how a family's ENERGY needs could be met in a permaculture design? (2 points)

Harvesting wood from a woodlot as well as using solar energy could meet the family's energy needs. (AC2.3)

Question 9. Explain the difference between inputs and outputs of a site component (2 points)

Inputs refer to the needs of a component. The outputs of a component refer to the products or characteristics of a component.

Question 10. Identify and explain the principle purpose of the Permaculture design of a community food garden. (2 points)

The principle purpose of a community food garden could be to generate income, which means that the species selected for cultivation should generate as high an income as possible. (AC2.1)

Question 11. Identify and explain the important functions of the Permaculture design in a domestic environment. (2 points)

The important functions in a domestic environment could be to provide food for the table as well as a modest income, as well as to provide energy to cook food and heat water, and to provide water to meet the needs of the household and the food/animal production areas. (AC2.2)

Question 12. The Permaculture Ethics are... (3 points)

Earth Care

People Care

Fair Share

Question 13. Explain the inter-relationship between different site components and resources in a Permaculture design so it reflects Permaculture ethics. (5 points)

Site resources refer to the specific living and non-living, as well as tangible and intangible parts of a landscape that can be used. These include, but are not restricted to, (earth care) sun, wind, soil, water, human energy, time, climate, animals, information (people care) and plants. (fair share)

Question 14. You've recently started implementing a small Permaculture design in a dry arid climate.

You have a small budget and want to get an appropriate example of Permaculture ideas up and running quickly, do you . . . (1 point)

B. Build a chicken dome

Question 15. Which principle is exemplified by composting? (1 point)

C. Produce no waste

Question 16. Which of the following is NOT a permaculture principle (1 point)

A. Set limits to consumption and population growth

Question 17. How do earthworms (soil decomposers) improve soil fertility? Give at least three examples. (3 points)

They help water flow through the soil

As they move through the soil, they turn the soil, i.e. they bring down organic matter from the top of the soil, and mix it with the soil below.

They increase the amount of air that gets into the soil

They break down organic matter, like leaves and grass into things that plants can use, i.e. humus which is rich in nutrients. (AC4.2)

Question 18. Name at least two other soil decomposers that have similar functions in soil. (2 points)

Ants, millipede, woodlouse

Question 19. The relationship between altitude and climate. (1 point)

The gradient of latitude that alters the temperature and season length variables is mirrored in altitude. As one moves from low elevation to high altitude the environment changes from tropical (or perhaps temperate depending on which mountain you consider) to arctic. So the same gradient of organisms that exists from equator to poles is expected to be reflected from base to mountain top.

Question 20. Explain the role of legumes in the nitrogen cycle. (1 point)

Legumes fix atmospheric nitrogen (N₂) through nodules on their roots.

Question 21. Name the three primary nutrients in soil, and describe the benefit(s) of each. (6 points)

The three main nutrients are nitrogen (N), phosphorus (P) and potassium (K).

Phosphorus is involved in the metabolic processes responsible for transferring energy from one point to another in the plant. It's also critical in root development and flowering. Because phosphorus moves slowly through the soil, it's important to work it into the soil, where it's needed by the roots.

Potassium helps regulate plant metabolism and affects water pressure regulation inside and outside of plant cells. It is important for good root development. For these reasons, potassium is critical to plant stress tolerance.

Question 22. Read each statement. Decide whether the statement is true or false. Write your answer below each statement. (4 points)

- a. Micro-organisms are divided into seven types: bacteria, archaea, protozoa, algae, fungi, viruses, and multicellular animal parasites (helminths).

True (AC4.1)

- b. Micro-organisms are beneficial in producing oxygen, decomposing organic material, providing nutrients for plants, and maintaining human health

True (AC4.1)

- c. Micro-organisms are also decomposers.

True (AC4.1)

- d. Large bodies of water such as oceans, seas, and large lakes affect the climate of an area. Water heats and cools more slowly than land. Therefore, in the summer, the coastal regions will stay cooler and in winter warmer.

True (EEK)

Practical Skills

Activity 2(a): Poster Project

ASSESSOR INSTRUCTIONS: Project		
Location		Assessed By
Portfolio Submission		Constituently Registered Assessor
Method	Instrument	Tool
Evaluation	Poster ⁱⁱ Project ⁱⁱⁱ	Checklist
BLOOMBERG'S TAXONOMY LEVEL^{iv}		
APPLICATION <i>(Practical Component)</i>	The ability to use learned material in new/existing situations <ul style="list-style-type: none"> Demonstrate the role of plants in soil fertility Demonstrate the role of animals in soil fertility 	
COMPREHENSION <i>(Knowledge Component)</i>	The ability to grasp the meaning of material <ul style="list-style-type: none"> Explain the role of plants in soil fertility Explain the role of animals in soil fertility 	
SYNTHESIS <i>(Practical Component)</i>	The ability to put parts together to form a new whole. <ul style="list-style-type: none"> Create a poster on the role of plants in soil fertility through the establishment of a guild by selecting the appropriate species. Create a poster on the making of compost and the application thereof. Create a poster on the role of ducks in soil fertility by means of preparing and applying liquid manure. 	
Competency Rating:		
<ul style="list-style-type: none"> Competent (C); or Not Yet Competent (NYC) 		
<p>MODEL ANSWERS: As per the Evaluation Checklist within the learner portfolio. The candidate must be able to demonstrate / answer all of the criteria in the checklist. <u>If the candidate is incapable of any one of the criteria, the candidate must be found 'not yet competent'</u>.</p> <p>Posters are becoming part of business practice, and can be displayed in poster sessions as part of the post-learning value to the candidate's employer.</p> <p>The poster project must be representative of candidate research, writing, and presentation skills as well as visual thinking, knowledge and comprehension.</p>		

Activity 2(b): Practical Demonstration

ASSESSOR INSTRUCTIONS: Demonstration		
Location		Assessed By
Permaculture site		Line Manager, Peer, or Constituently Registered Assessor
Method	Instrument	Tool
Evaluation	Demonstration	Checklist; Company Policies & Procedures
BLOOMBERG'S TAXONOMY LEVEL'		
ANALYSIS <i>(Practical Component)</i>	The ability to break down material into its component parts. <ul style="list-style-type: none"> Analyse the wind direction 	
APPLICATION <i>(Practical Component)</i>	The ability to use learned material in new/existing situations <ul style="list-style-type: none"> Organic waste is recycled appropriately for the specific context. This can include a worm farm, compost heap or as food for domestic animals or fowls. Trees are planted correctly. Sources of mulch are harvested and applied. Bare soil is mulched with available and appropriate material. 	
COMPREHENSION <i>(Knowledge Component)</i>	The ability to grasp the meaning of material <ul style="list-style-type: none"> Two or more ways to support each principle function are identified. Wind direction and the areas vulnerable to wind damage are identified. The geographic placement of a site is explained. Sources of mulch are identified Bare soil is identified 	
EVALUATION <i>(Practical Component)</i>	The ability to appraise, assess, critique on a basis of specific standards and criteria <ul style="list-style-type: none"> Evaluate and explain biotic and abiotic resources 	
KNOWLEDGE <i>(Knowledge Component)</i>	The ability to recall memorized information. <ul style="list-style-type: none"> Know methods and procedures pertaining to mulching and recycling of waste 	
Competency Rating:		
<ul style="list-style-type: none"> Competent (C); or Not Yet Competent (NYC) 		
MODEL ANSWERS:		

ASSESSOR INSTRUCTIONS: Demonstration

As per the Evaluation Checklist within the learner portfolio. The candidate must be able to demonstrate / answer all of the criteria in the checklist. If the candidate is incapable of any one of the criteria, the candidate must be found 'not yet competent'.

MODEL ANSWER GUIDE: The SAQA unit standard requires demonstrated ability – refer assessment criteria as per the Checklist in the Learner Portfolio.

ⁱ <http://www.fresnostate.edu/academics/oie/documents/assessments/Blooms%20Level.pdf>

ⁱⁱ <https://gra617.expressions.syr.edu/wp-content/uploads/2012/07/Poster-Assignment-%E2%80%93-93-GRA617.pdf>

ⁱⁱⁱ <http://ii.library.jhu.edu/2014/01/28/creative-student-assignments-poster-projects/>

^{iv} <http://www.fresnostate.edu/academics/oie/documents/assessments/Blooms%20Level.pdf>

^v <http://www.fresnostate.edu/academics/oie/documents/assessments/Blooms%20Level.pdf>