



NQF Level: **1** US No: **116199**

Assessment Guide

Primary Agriculture

Plant Physiology



Assessor:

Workplace / Company:

Commodity: Date:

Before we start...

This assessment guide contains all necessary activities and instructions that will enable the assessor and learner to gather evidence of the learner's competence as required by the unit standard. This guide was designed to be used by a trained and accredited assessor whom is registered to assess this specific unit standard as per the requirements of the AgriSETA ETQA.

Prior to the delivery of the program the facilitator and assessor must familiarise themselves with content of this guide, as well as the content of the relevant Learner Workbook.

The assessor, facilitator and learner must plan the assessment process together, in order to offer the learner the maximum support, and the opportunity to reflect competence.

The policies and procedures that are required during the application of this assessment are available on the website of the AgriSET and should be strictly adhered to. The assessor must familiarise him/herself with this document before proceeding.

This guide provides step-by-step instructions for the assessment process of:

Title:	Demonstrate a basic understanding of the structure and function of a plant in relation to its environment		
US No:	116199	NQF Level:	1
		Credits:	4

This unit standard is one of the building blocks in the qualification listed below. Please mark the qualification you are currently assessing, because that will be determined by the context of application:

Title	ID Number	NQF Level	Credits	Mark
National Certificate in Animal Production	48970	1	120	<input type="checkbox"/>
National Certificate in Mixed Farming Systems	48971	1	120	<input type="checkbox"/>
National Certificate in Plant Production	48972	1	120	<input type="checkbox"/>

Please mark the learning program you are enrolled in:

Are you enrolled in a:	Y	N
Learnership?	<input type="checkbox"/>	<input type="checkbox"/>
Skills Program?	<input type="checkbox"/>	<input type="checkbox"/>
Short Course?	<input type="checkbox"/>	<input type="checkbox"/>

Note to Assessor:

If you are assessing this module as part of a full qualification or learnership, please ensure that you have familiarized yourself with the content of the qualification.



1

SO 1, AC 1

Instructions to learner:

Discuss with a working partner...

Learner Workbook: Page 3 Facilitator Guide: Page 12

What do you think the words "Plant structure" means?

Model Answer(s):

Plants consist of different plant organs like stems, roots and leaves as well as flowers that are actually modified shoots (stem and leaves) Plant structure refers to the external as well as the internal formation (structure) and relationship of these organs.



2

SO 1, AC 1

Instructions to learner:

Go outdoors and explore...

Learner Workbook: Page 4 Facilitator Guide: Page 12

Can you find an example of one type of herbaceous plant and one type of woody plant? Pick a small piece of stem of each and paste it here in your workbook to remind yourself...

Herbaceous	Woody
<i>Plants with stems that is usually soft. These stems die back to the ground every year.</i>	<i>Stems that is hard and stiff. These stems usually don't die back to the ground during the winter. Some of these stems can be used to make furniture and houses.</i>

3

SO 1,AC 2

Instructions to learner:

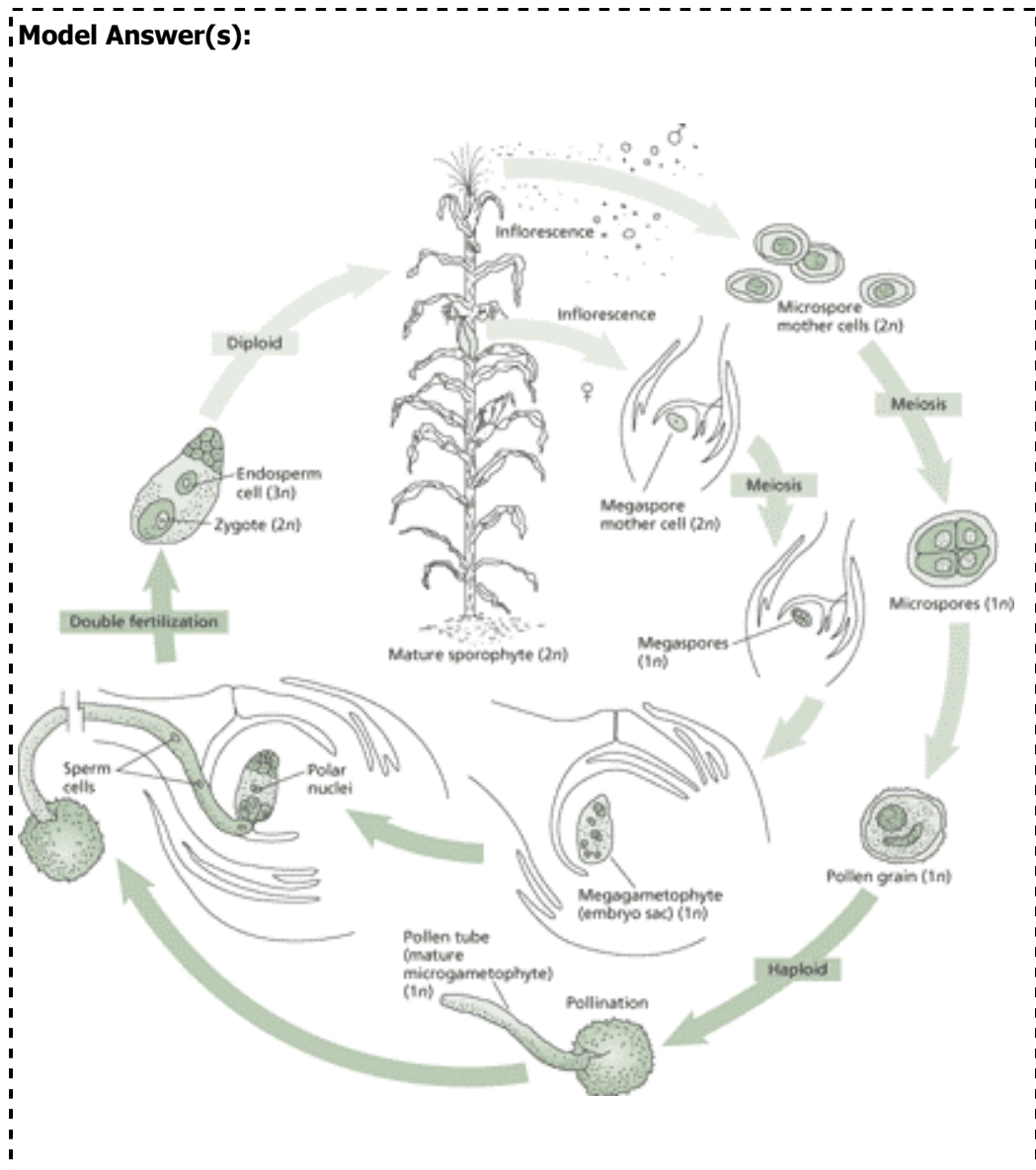
Think about some plants that grew where you grew up...

Learner Workbook: Page 5 Facilitator Guide: Page 12

Think about some plants that grew where you grew up...

Can you remember the cycle in which they grew? They were not constantly the same, were they? Now write down what you remember to remind yourself...

Model Answer(s):



4

SO 1,AC 2&3

Instructions to learner:

Go outside and explore...

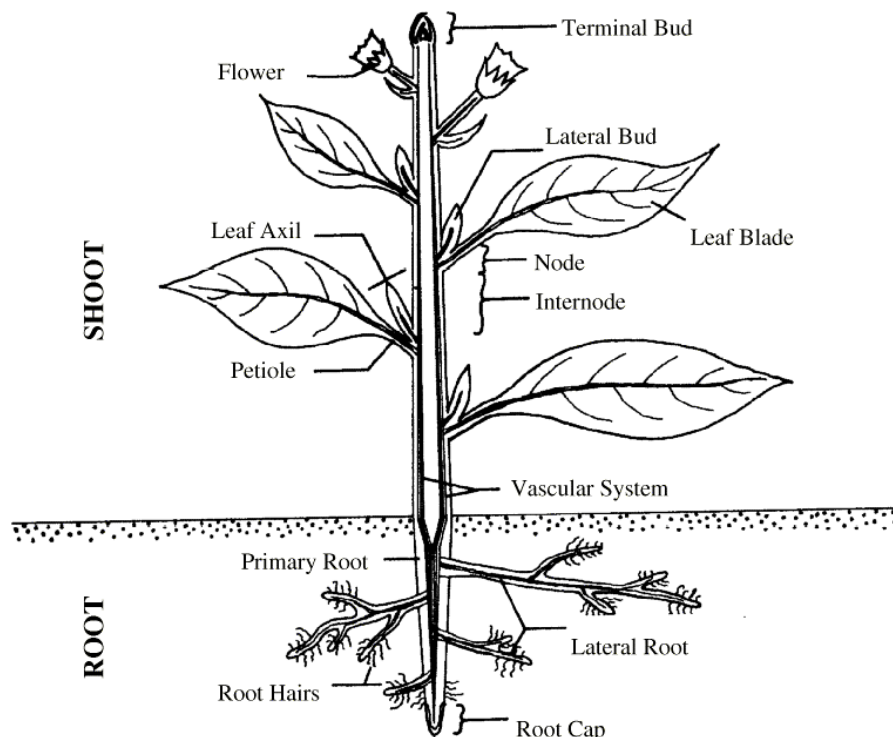
Learner Workbook: Page 6 Facilitator Guide: Page 14

Pull up a weed – do it gently in order to make sure that you get all its parts and don't break it off at the roots (it might mean that you have to loosen the soil a little bit first!)

Now paste it on a separate piece of paper and draw lines to each part as we go through all the details.

Model Answer(s):

Principal Parts of a Vascular Plant



5

SO 2&3, AC 5

Instructions to learner:

Write key-notes

Learner Workbook: Page 7 Facilitator Guide: Page 16

Why do you think roots are important for a plant?

Write notes to remind yourself what roots do & how they work.

Model Answer(s):

The roots help provide support by anchoring the plant and absorbing water and nutrients needed for growth. They can also store food (carbohydrates) that the plant uses to carry out other functions. Plants can have either a taproot system (such as carrots) or an adventitious root system (such as onions and turf grass). In both cases, the roots are tools that the plant uses to absorb the water and nutrients needed for plant growth.

Often, a part of a plant is forgotten because it is underground and not seen. Roots are important because they anchor the plant and absorb food and water.

Where on the plant can it be found?

At the base and normally underground

What is its function?

- ◆ *To anchor the plant*
- ◆ *To absorb water and nutrients*
- ◆ *To store Carbohydrates*

My Notes ...

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Instructions to learner:

Brainstorm in your group...

Learner Workbook: Page 8 Facilitator Guide: Page 18

Why do you think stems are important for a plant?

Write notes to remind yourself what this part does & how it works

Model Answer(s):

*The main body of a plant that holds up the limbs, leaves and flowers
Stems carry water and nutrients taken up by the roots to the leaves, and then the food produced by the leaves moves to other parts of the plant. The cells that do this work are called the xylem cells (move water) and phloem cells (move food). Stems also provide support for the plant allowing the leaves to reach the sunlight they need to produce food.*

Where on the plant can it be found?

Above the roots and attached to the leaves – normally above ground

What is its function?

It is the link between the roots and the above soil growth and its main function is to keep the plant upright, transport and store water and food.

My Notes ...

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SO 3,4,AC 7

Instructions to learner:

Make a list as a group...

Learner Workbook: Page 9 Facilitator Guide: Page 18

Make a list of plants that are bearing their flowers and fruit in the leaf axils on the shoot. Make another list of plants that are bearing their flowers and fruit at the shoot tips.

Model Answer(s):

Plants bearing flowers and fruit in leaf axils:

- ◆ *Maize (female flowers – ears), Cotton,*
- ◆ *Citrus, Papaya (on main trunk), Coffee, Palms, Peaches*
- ◆ *Cucumbers, Pumpkins, Watermelons*

Plants bearing flowers and fruit on shoot tips:

- ◆ *Maize (male flowers – the tassel), Wheat, Sorghum, Sunflower*
- ◆ *Mangoes, Avocadoes and Litchis*
- ◆ *Carrots, Beetroot, Cabbage, Lettuce*

My Notes ...

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SO 3,4,AC 8

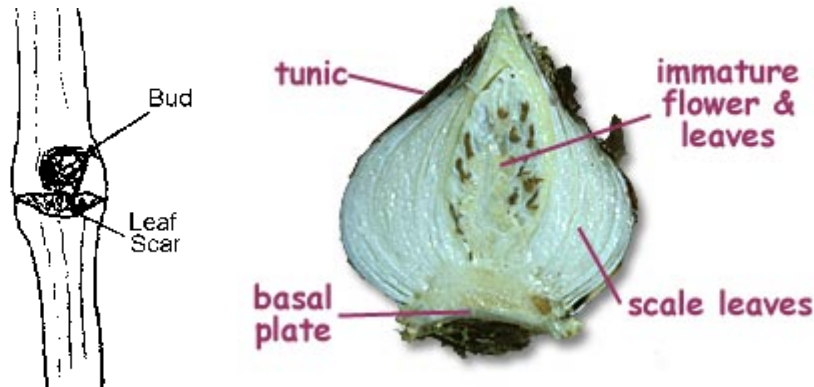
Instructions to learner:
Research and discover

Learner Workbook: Page 10 Facilitator Guide: Page 18

Go outside and look for 3 types of plants that have buds attached. Think of what part of the plant you think this bud might develop into.

Write notes for yourself.

Model Answer(s):



A microscopic view of a cut through a bud will reveal these structures: either an apical meristem and bracts (scale leaves) or flower buds covered by bracts

What does it look like?

A bud is an embryonic shoot. In other words, a bud is a shoot that develops into the future plant structures such as the stems, leaves, tendrils, and flowers

We say it contains all the future structures of the plant.

So, it can form a leaf, or shoots with leaves, buds, tendrils, growth points and flowers

Where on the plant can it be found?

On stems.

What is its function?

- Buds are where the future growth occurs.
- Buds may form shoots, and all structures found on shoots, such as nodes, internodes, future buds, leaves, lateral shoots, flowers and growth points.

Can we use it to manipulate the plant and how?

Yes –

Buds are the most important factor to consider during pruning.

By minimizing buds to a certain number or certain positions, you can manipulate the plant form, the quantity and quality of fruit.

Buds can develop into: shoots, leaves, flowers, tendrils, growth points.

Instructions to learner:
Worksheet

Learner Workbook: Page 13 Facilitator Guide: Page 19

Hold a class discussion and write down a list of answers next to the questions in the worksheet.

Say why you think the following factors would be important in the environment of a plant in terms of growth, survival and to reproduce a crop:

Roots and soil for water-uptake

- ◆ Roots absorb water and nutrients from the soil or substrate where the plant grows. Root hairs enlarge the contact area between the root and the substrate.

Water

- ◆ Water serves as a solvent for the nutrients and is also essential for live processes in the plant.

Sunlight

Air

- ◆ The chlorophyll in the leaf absorbs light energy, and the energy is used for combining carbon dioxide and water to form carbohydrates. Oxygen is released during the process.

Model Answer(s):

Light

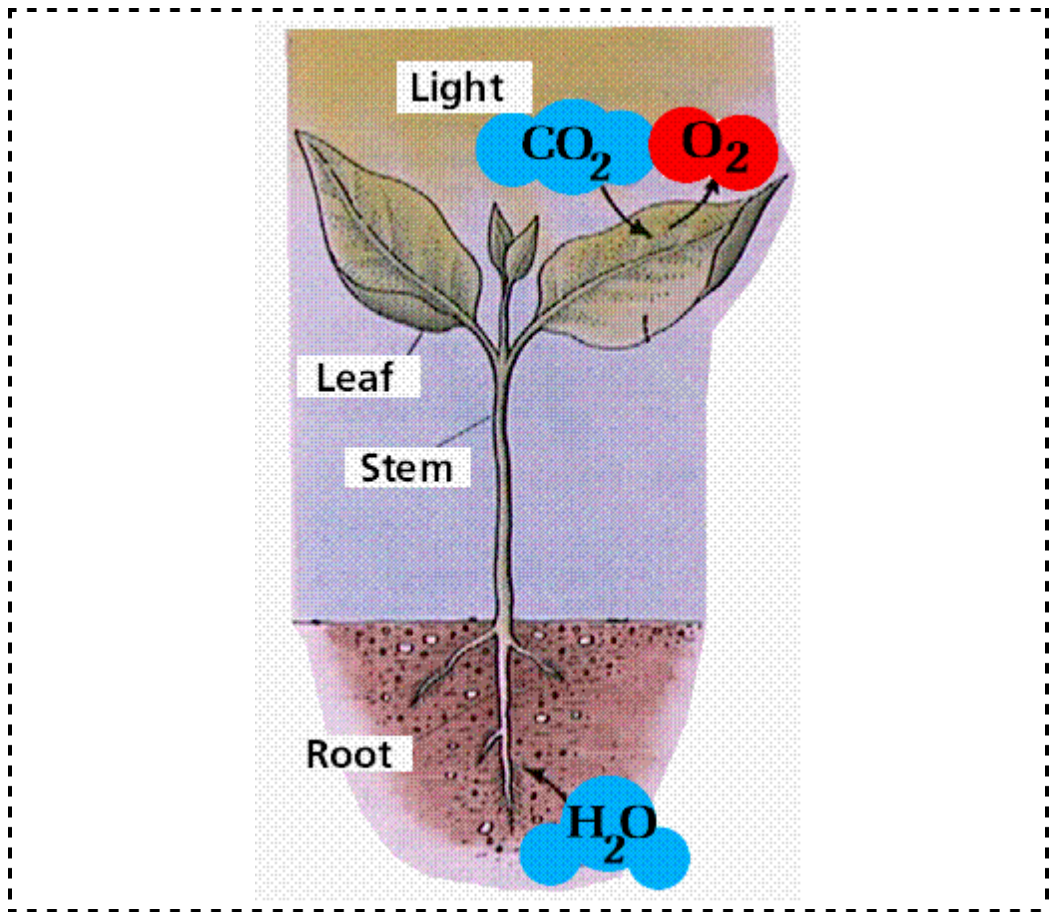
- *Plants need light for growth. Slopes or rows facing the north & east get more light. A plant will show when it isn't getting enough light, because its stems will be thin and it will lean toward the light.*

Water

- *Water is important in the plant's ability to make and move nutrients. Without water or with too much water, a plant dies. For this reason, watering is an important part of plant care. Most plants like to be watered when the soil is slightly dry to the touch. When irrigating, it is important to ensure that the right type of irrigation system for the right types of crop is applied for the right length of time. This is a specialised field and we will spend much more time on it later in the course.*
- *Drainage is also an important factor to consider when talking about water – if plants are not in a place with good drainage, they will stand with their roots in water and may become diseased and rot.*

Air

Nutrients



My Notes ...

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SO 2, AC 3

Instructions to learner:
Worksheet

Learner Workbook: Page 14 Facilitator Guide: Page 23

Your Facilitator will lead a group discussion where you look at the specific parts and stages of the crop that you will be growing and learning about on your farm...

Model Answer(s):

As per context of crop studied – a SME should present this.

My Notes ...

A large rectangular area with a dotted grid pattern for taking notes.

12

**SO 1, AC 4
SO 2, AC 3**

Instructions to learner:
Go outside and explore...

Learner Workbook: Page 15 Facilitator Guide: Page 23

Go outside and look around at the area where you want to grow your crop – make some notes for yourself about factors that are good and the things that might cause a problem in terms of your crops’ needs

Write down notes for yourself.

What kind of environment does the roots of your crop need to grow in?

Model Answer(s):

As per context of crop studied – a SME should present this.

Name the media in which your crop’s roots are growing?

Model Answer(s):

As per context of crop studied – a SME should present this.

How do the roots of your crop function in order to take up water and nutrients from the media in which it grows?

Model Answer(s):

As per context of crop studied – a SME should present this.

Do you think that your type of crop would grow and produce high quality fruit and seed, without sunlight, water and nutrients? Motivate your answer.

Model Answer(s):

No – no plants can photosynthesize without these conditions.

Do you think all plants have the same reproduction cycle? Motivate your answer.

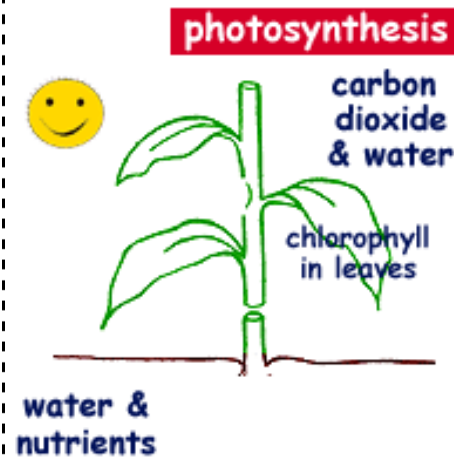
Hint: Think of your crop and how it reproduces. Then go to the library and read how some different type of crop that grows in another part of the country reproduces...

Model Answer(s):

No – compare crop of specific context to another type of crop – As I should present this.

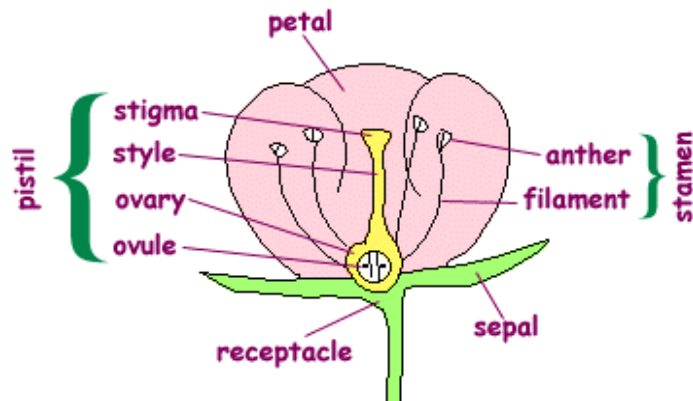
Why do you think it is important for your type of crop to be exposed to sunlight, water and nutrients?

Model Answer(s):



Study your own crop and find out whether the plants have bisexual (complete) flowers or separate male and female flowers. Discuss the implication on pollination and production.

Model Answer(s):



As per context of crop studied – a SME should present this.

Summative Test and Attitude & Attribute Evaluation

Before the knowledge test is undertaken, the learner must be reminded of what is expected from him / her in terms of summative and reflexive competence. Read and explain to the learner, the **Preparation for Your Final Assessment** section in the learner workbook. Learners and assessor should sign off this section to acknowledge that this step was completed.

Please set up a knowledge test from the questions given as a guideline to learners and supply each learner with a test sheet.

Supply each report with the following heading:

Unit Standard:	116199	NQF Level:	1
Learner Name:			

Questions	Model Answers
1. What kind of environment does the roots of your crop need to grow in?	No specific model answer, will differ from crop to crop.
2. Name the media in which your crop's roots are growing?	No specific model answer, will differ from crop to crop.
3. How do the roots of your crop function in order to take up water and nutrients from the media in which it grows?	No specific model answer, will differ from crop to crop.
4. Why do you think it is important for your type of crop to be exposed to sunlight, water and nutrients?	No specific model answer, will differ from crop to crop.
5. Study your own crop and find out whether the plants have bisexual (complete) flowers or separate male and female flowers. Discuss the implication on pollination and production.	No specific model answer, will differ from crop to crop.
6. Do you think all plants have the same reproduction cycle? Motivate your answer. Hint: Think of your crop and how it reproduces.	No specific model answer, will differ from crop to crop.
7. Find out and write down what the best possible environment might look like for your type of crop to be pollinated. Hint: Your type of crop might need help from specific types of insects or birds	No specific model answer, will differ from crop to crop.

Assessment Feedback Form

Comments / Remarks	
<p>Feedback to learner on assessment and / or overall recommendations and action plan for competence:</p> 	
<p>Feedback from learner to assessor:</p> 	
<p>Assessment Judgement You have been found:</p> <p><input type="radio"/> Competent</p> <p><input type="radio"/> Not yet competent in this unit standard</p>	<p>Actions to follow:</p> <p><input type="radio"/> Assessor report to ETQA</p> <p><input type="radio"/> Learner results and attendance certification issued</p>
Learner's Signature:	Date:
Assessor's Signature:	Date:
Moderator's Signature:	Date: