



NQF Level: 1

US No: 116199

Facilitator Guide

Primary Agriculture

Plant Physiology



My name:

Company:

Commodity: Date:

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agriculture

Department:
Agriculture
REPUBLIC OF SOUTH AFRICA



Before you get started...

Dear Facilitator,

This Facilitator Guide (together with the relevant Learner Guide) is aimed at facilitators who will be assisting learners wishing to complete the following unit standard:

| | | | |
|---------------|---|-------------------|----------|
| 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 guide contains all necessary facilitation instructions to ensure that learners will attain the expected competencies required by the above-mentioned unit standard. This guide is designed to be used during the presentation of a learning session based on this unit standard. The full unit standard is attached at the end of this guide as well as at the end of the relevant Learner Guide. Learners are advised to read the unit standard at their time. Please discuss the unit standard with the learners to ensure that they understand what is expected from them to achieve the outcomes of the unit standard.

This unit standard is one of the building blocks in the qualifications listed below. Please mark the qualification you are currently facilitating, 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 | 0 |
| National Certificate in Mixed Farming Systems | 48971 | 1 | 120 | 0 |
| National Certificate in Plant Production | 48972 | 1 | 120 | 0 |

Please mark the learning program the learners are enrolled in:

| Are you facilitating a: | Y | N |
|-------------------------|---|---|
| Learnership? | 0 | 0 |
| Skills Program? | 0 | 0 |
| Short Course? | 0 | 0 |

Note to Facilitator:

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

Please explain the above concepts to the learner.

There are four guides, namely the Learner Guide, the Learner Workbook, the Assessor Guide and the Facilitator Guide. These guides have been developed to address specific aspects of the learning experience. You therefore need to use these guides additional each other.

Make this an enjoyable learning experience!

Context of Application ...

Primary Agriculture is a diverse sector and a wide range of commodities is being produced for both national and international market. Each commodity has its own production requirements and practices. You will be facilitating the learning process within a specific context where a specific agricultural commodity is being produced. The learning material has been written in a **generic** manner, as it is aimed to be available on national level and should be suitable to be applied within a variety of commodities. It is therefore inclusive of all agricultural commodities and crop in this field. Therefore, the examples that are being used in the materials may not always be applicable to your specific community, commodity, environment or region.

This presents you, the facilitator, with the challenge to **contextualise** the learning material. It is imperative that you, the Facilitator and Assessor interpret and present activities, case studies and projects related to the material in such a way that learners can easily identify and apply their knowledge within their own context. This will require from you to add examples of crop, which are applicable to the community or farm. Learners must be guided with examples from their own communities, commodities, environment or regions. This should be done supplementary to the learning material:

- Examples relevant to the commodity,
- Including commodity specific requirements,
- Including operating procedures of the farm,
- Including agricultural practice specific requirements,
- Agricultural markets,
- Guiding learners to write these specificities down in the learning guide, etc.

The contextualization of the learning material is a very important step in preparing for and facilitating the learning experience and enough time and effort should be put into this exercise.

According to the qualifications mentioned on page 2, this module could be contextualized to fit the following groups of commodities:

| Plant Production | Animal Production | |
|--|--|--|
| <ul style="list-style-type: none"> • Organic production, • Hydroponic production, • Perma-culture production, • Agronomy, • Horticulture, Natural resources harvesting. | <ul style="list-style-type: none"> • Small stock production, • Large stock production, • Dairy production, • Pig production, • Poultry production, • Game, • Aqua / marine culture, • Commercial insects • Animal fibre harvesting, • Bee keeping. | <ul style="list-style-type: none"> • Natural resources harvesting • Organic production, • Perma-culture production, • Eco/Agri Tourism, • Agro Chemicals, • Horse Breeding, etc. |

How to use this guide ...

Throughout the guide information is given specifically aimed at you, the facilitator, to **assist** in the actual presentation of the learning material and/or facilitation of the learning process. Although this guide contains all the information required for attaining competency in this unit standard, references to additional resources, both printed and electronic, are provided for additional reference by the facilitator and further study by the learner.

Please note that the purpose of this information is merely to **guide** you, the facilitator, and is provided as a suggestion of possibilities. It remains the responsibility of every facilitator to re-assess the learner/s in each learning situation throughout the learning process in order to stay in touch with their specific learning needs. This should be the determining factor in the choice of the learning approach to follow.

Use the different boxes listed below for identification purposes:



Instructions regarding **activities**, whether group or individual activities will be described in this box.



Facilitators' Tip ...

My Notes ...

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What & How will you be Facilitating?

| | |
|--|-----------|
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My Notes ...

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The Learning Experience...

When learners have achieved this unit standard, they will be able to:

- ♥ Demonstrate an elementary understanding of the parts of a plant and their basic function.
- ♥ Gain specific knowledge and skills in plant anatomy and physiology.
- ♥ Operate in a plant production environment implementing sustainable and economically viable production principles.

Learners will specifically be able to:

- ♥ Locate and identify the different parts of a plant.
- ♥ Describe the role of the different parts of the plant.
- ♥ Describe how the plant relates to the environment.

Learners will also gain basic knowledge of:

- ♥ The names and functions of the different parts of a plant and its composition.
- ♥ The characteristics and properties of the life cycle of a plant.
- ♥ Sight and touch is utilised to identify the parts and functions of the different plants.
- ♥ Purpose of identifying parts and functions of plants in different environments.
- ♥ The procedures required when producing plants in different planting media.
- ♥ The laws of nature are understood regarding plants and their environment.
- ♥ The relationship between plants and their different environments.

My Notes ...

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Learning Program Time Frames

| | Total time allocated (hours) | Theoretical learning time allocated (hours) | Practical learning time allocated (hours) | Activities to be completed |
|---|------------------------------|---|---|----------------------------|
| Complete Program (including summative assessment) | 40 hours | 12 hours | 28 hours | 12 |
| Learner Orientation and "Ice Breaker" | 1 hour | 30 minutes | 30 minutes | N/a |
| Purpose, Introduction and Learner Directions | 1 hour | 30 minutes | 30 minutes | N/a |
| Session 1 | 4 hours | 1 hours | 3 hours | 1-3 |
| Session 2 | 4 hours | 1 hour | 3 hours | 4 |
| Session 3 | 4 hours | 1 hour | 3 hours | 5 |
| Session 4 | 6 hours | 2 hours | 4 hours | 6 - 9 |
| Session 5 | 4 hours | 1 hour | 3 hours | 10 |
| Session 6 | 4 hours | 1 hours | 3 hours | - |
| Session 7 | 4 hours | 1 hours | 3 hours | - |
| Session 8 | 4 hours | 1 hour | 3 hours | 11 - 12 |
| Preparation for Assessment & revision | 4 hours | 2 hours | 2 hours | |

Tips for level of learning



- Remember the following before you get started:
- ***This unit standard is aimed at level 1 learners.***
- A typical level 1 learner might be exposed to the world of work through this learning program for the first time.
- Explain concepts and define words in a simple, clear and concise method throughout the learning program.
- Take special care to facilitate ALL learners. Allow them opportunities to share experiences, prior knowledge, translate into their mother tongue and enjoy the learning process.
- The examples given in this resource guide might be for a different geographical area or commodity to what the learner is exposed to – please adapt your examples accordingly.
- There should always be good communication between facilitators and mentors to ensure effective learning experience.
- During practical activities facilitators should be present at all times. Should that not be possible, the mentor should be available for attendance.

Facilitator's Checklist & Training Aids

Learner support strategies

Learners are supplied with all resources and aids as required by the programme – including:

- Objects & devices such as equipment, protective clothing, safety gear, etc.
- Learner Guides and Learner Workbook
- Visual aids, etc.

Use this checklist below during your preparation to ensure that you have all the equipment, documents and training aids for a successful session.

| Preparation | Yes | No |
|--|-----|----|
| Qualification Knowledge – I have familiarized myself with the content of the applicable qualification | | |
| Unit Standard Knowledge – I have familiarized myself with the content of all aspects of the applicable unit standard | | |
| Content Knowledge – I have sufficient knowledge of the content to enable me to facilitate with ease | | |
| Application knowledge – I understand the programme matrix & have prepared for programme delivery accordingly | | |
| Contextualisation – I have included information which is specific to the commodity and practices related to the commodity | | |
| Ability to respond to learners background & experience – I have studied the learner demographics, age group, experience & circumstances & prepared for programme delivery accordingly | | |
| Enthusiasm & Commitment – I am passionate about my subject & have prepared my programme delivery to create a motivating environment with real commitment to success | | |
| Enterprise knowledge – I know & understand the values, ethics, vision & mission of the workplace & have prepared my programme delivery, reporting & administrative tasks accordingly. | | |
| Equipment check: | | |
| Learner guides x 1 per learner | | |
| Assessment guides x 1 per learner | | |
| Writing materials & stationary (facilitator & learner) | | |
| White board & pens | | |
| Flip chart paper | | |
| Proxima projector & screen | | |

| | | |
|---|--|--|
| Laptop & programme disk | | |
| Sample Hand-outs and examples of laws and other relevant documents | | |
| Safety gear as prescribed by unit standard and applicable legislation | | |
| Documentation checklist: | | |
| Attendance Register | | |
| Course Evaluation | | |
| Learner Course Evaluation | | |
| Portfolios of evidence | | |

Contextualization of Content!

Go through this module and indicate what specific **information / activities / examples** should be included in this module.

| Contextualization | |
|---|--|
| What specific information / activities / examples should I include in this module? | |
| <ul style="list-style-type: none"> Commodity specific? | |
| <ul style="list-style-type: none"> Operating procedures of the farm? | |
| <ul style="list-style-type: none"> Agricultural practices? | |
| <ul style="list-style-type: none"> Agricultural markets? | |

1 Plant Structure

Session

Learner Guide:
Page 6

After completing this session, the learner should be able to:
SO 1: Locate and identify the different parts of a plant.

| Concept (SO 1) | Time frame | Activities related to the concept |
|--|------------|-----------------------------------|
| The basic structure of a plant is illustrated. | 4 Hours | Activity 1-3 |

Tips for the Facilitator



- Physically show the structures of a plant with different examples. Spend time in confirming that learners can identify and name the plant structures. Also start exploring what the function of the structures is...
- It is important to show examples of herbaceous and woody plants. Ensure that learners have the available stationary to paste their examples.
- Explain the life cycle of plants and explore the differences between annual, biennials and perennial plants' life cycles.



Please allow learners to complete Activity 1, 2 & 3 in their workbooks

| Type of activity | Resources | Instructions to give to the learners | Conclusions |
|--|--------------------------|---|----------------------------|
| 1. Discuss with a working partner | Pen, paper | As per instructions in the learner guide. | As per assessment criteria |
| 2. Go outdoors and explore | Plant examples, Workbook | As per instructions in the learner guide. | As per assessment criteria |
| 3. Think about some plants that grow where you grew up | Pen, paper | As per instructions in the learner guide. | As per assessment criteria |

Session

2 *Locate and Identify plant parts*

**Learner
Guide:
Page 8**

After completing this session, the learner should be able to:
SO 1: Locate and identify the different parts of a plant.

| Concept (SO 2) | Time frame | Activities related to the concept |
|--|----------------|-----------------------------------|
| The roots of a plant are identified and described. | 4 hours | Activity 4 |
| The stem of a plant is identified. | | |

Tips for the Facilitator



- This is a revision exercise to ensure learners can still name the function and parts of the plant. Give learners an opportunity to complete the activity and participate in discussions about their plant.



Please allow learners to complete Activity 4 in their workbooks

| Type of activity | Resources | Instructions to give to the learners | Conclusions |
|------------------------|--------------------------------------|---|----------------------------|
| Go outside and explore | Sample of weed, pen, paper, workbook | Pull up a weed – do it gently in order to make sure that you get all its parts and that you break it off at the roots. Now paste it on a separate piece of paper and draw lines to each part as we go through all the details. | As per assessment criteria |

Session

3 Structure and function of plant roots

Learner Guide:
Page 10

After completing this session, the learner should be able to:
SO 2 Describe the role of the different parts of the plant.
SO 3 Describe how the plant relates to the environment.

| Concept (SO 3) | Time frame | Activities related to the concept |
|---|----------------|-----------------------------------|
| The role of the roots in relation to the plant and its environment is described. | 4 hours | Activity 5 |
| The root in relation to its environment is described. | | |
| How the root functions in the uptake of water and nutrients from the growing media is described very basically. | | |

Tips for the Facilitator



- This is a revision of the function of the roots. Remind learners to think beyond the obvious functions.



Please allow learners to complete Activity 5 in their workbooks

| Type of activity | Resources | Instructions to give to the learners | Conclusions |
|------------------|----------------------|--|----------------------------|
| Write Key-notes | Pen, paper, Workbook | Why do you think roots are important for a plant? Make notes to remind yourself what the functions of roots are and roots function! | As per assessment criteria |

Session

4 Structure and function of plant stems

**Learner
Guide:
Page 14**

After completing this session, the learner should be able to:

SO 2: Describe the role of the different parts of the plant.

AC 2: The role of the stem and its function is described.

SO 3: Describe how the plant relates to the environment.

AC 2: The stem in relation to its environment is described.

| Concept (SO 4) | Time frame | Activities related to the concept |
|---|----------------|-----------------------------------|
| The role of the stem and its function is described. | 6 hours | Activity 6 -9 |
| How the root functions in the uptake of water and nutrients from the growing media is described very basically. | | |

Tips for the Facilitator



- Revise why plants have stems and where the transportation vessels are located. Explain the difference between plants that expand in girth and those that don't.
- Explain the need for fruit and how fruit are formed. Ensure that learners understand that all plants do not develop fruit. Explain the economic importance of fruit formation in agriculture.
- Learners struggle with this concept. Spend extra time explaining that the bud contains all the future structures of the plant, except the fruit (the flower has to be fertilized to form the fruit). Look at examples of buds on different plants.
- Show an example of a plant with tendrils. Also discuss other plants that support in climbing but without tendrils.

Session

5 Structure and function of plant leaves

Learner Guide:
Page 19

After completing this session, the learner should be able to:
SO 1: Locate and identify the different parts of a plant.
SO 2: Describe the role of the different parts of the plant.

| Concept (SO 5) | Time frame | Activities related to the concept |
|---|------------|-----------------------------------|
| The leaves on a plant and their appearance are described and discussed. | 4 Hours | Activity 10 |
| The basic function of the leaves in relation to the plant is explained. | | |

Tips for the Facilitator



- Lead a class discussion in which each required element of plants is discussed. Encourage learners to participate and give input. Then allow learners to complete the activity.



Please allow learners to complete Activity 10 in their workbooks

| Type of activity | Resources | Instructions to give to the learners | Conclusions |
|------------------|------------|---|----------------------------|
| Worksheet | Pen, paper | Hold a class discussion and write down a list of answers next to the questions in the worksheet | As per assessment criteria |

Session

7

Structure and function of fruit

Learner
Guide:
Page 27

After completing this session, the learner should be able to:

SO 2: Describe the role of the different parts of the plant.

SO 3: Describe how the plant relates to the environment.

| Concept (SO 7) | Time frame | Activities related to the concept |
|---|----------------|-----------------------------------|
| The function of the fruit and seeds is described. | 4 Hours | No Activity |
| The importance of sunlight, water and nutrients for plant growth, fruit and seed production is described. | | |

My Notes ...

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8 Structure and function of Seed

Session

**Learner
Guide:
Page 29**

After completing this session, the learner should be able to:
SO 2: Describe the role of the different parts of the plant.

| Concept (SO 8) | Time frame | Activities related to the concept |
|---|----------------|-----------------------------------|
| The function of the fruit and seeds is described. | 4 Hours | Activity 11 - 12 |
| The importance of sunlight, water and nutrients for plant growth, fruit and seed production is described. | | |

Tips for the Facilitator



- Lead a group discussion focusing on crops that the learners are studying. Identify the type of plant (i.e. annual, biennial, and perennial) and the various parts of the plant. Identify which part/s of the plant is of economic importance in agriculture and which is important for nutritional purpose.
- Learners have to complete this activity on their own to ensure that they have gained the knowledge. After granting them time to complete this, call learners back to the classroom for a discussion and to share their experiences. If learners still have questions, this is the opportunity to ask and answer.

Please allow learners to complete Activity 11 & 12 in their workbooks



| Type of activity | Resources | Instructions to give to the learners | Conclusions |
|--|------------|--|----------------------------|
| 11. Worksheet – Let's discuss together | Pen, paper | Your Facilitator will lead a group discussion where you look at the specific parts of the crop that you will be growing and learning about on your farm... | As per assessment criteria |

| | | | |
|----------------------------------|-------------------|--|-----------------------------------|
| <p>12.Go outside and explore</p> | <p>Pen, paper</p> | <p>Go outside and look around at the area where you want to grow your crop – make some notes for yourself about the things that are good and the things that might cause a problem in terms of your crops’ needs Write down notes for yourself.</p> <ol style="list-style-type: none"> 1. What kind of environment does the roots of your crop need to grow in? 2. Name the media in which your crop’s roots is growing? 3. How do the roots of your crop function in order to take up water and nutrients from the media in which it grows? 4. Why do you think it is important for your type of crop to be exposed to sunlight, water and nutrients? 5. 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. 6. Describe in your own words and with practical examples and samples, the difference between male and female flowers and how this influences fruit production for your crop. 7. Do you think all plants have the same reproduction cycle? Motivate your answer. <p>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...</p> <p>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.</p> | <p>As per assessment criteria</p> |
|----------------------------------|-------------------|--|-----------------------------------|

What will I do differently next time?

Take some time to **reflect** on your own activities as facilitator of this Unit Standard. Then write down five of the most important lessons you have learnt and include a motivation:

| What will I do differently next time? | Motivate how or why (Give examples, reasons, etc.) |
|---------------------------------------|---|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |

As facilitator, you have hands on experience in the application of the unit standard. And you might experience difficulties with the unit standard that the developers did not anticipate. Also, the unit standard will be revised at the end of the registration period. Your comments below can be an important contribution in the revision process and should be brought to the attention of either the AgriSETA ETQA manager or the SGB chairperson.

Please take some time to reflect on your experience and list a few of the difficulties you had to address.

| Difficulties I had with the Unit Standard | Recommended Changes to Address the Difficulty |
|---|---|
| 6. | |
| 7. | |
| 8. | |
| 9. | |
| 10. | |