

Learning Activities

Activity 1.1 – Worksheet	5
Activity 1.2 – Workplace Interview	6
Activity 1.3 – Workplace Observation and Flow Diagram	7
Activity 1.4 – Mind Map	8
Activity 1.5 – Experiential Learning	9
Activity 1.6 – Write Key Notes	10
Activity 1.7 – Workplace Research	11
Activity 1.8 – Interview an Expert	12
Activity 1.9 – Experiential Learning	13
Activity 1.10 – Worksheet	14
Activity 1.11 – Flashcards	15
Activity 1.12 – Workplace Interview	16
Activity 1.13 – Report Writing	17
Activity 1.14 – Group Discussion	18
Activity 2.1 – Draw a Poster	19
Activity 2.2 – Worksheet	20
Activity 2.3 – Logbook	21
Activity 2.4 – Workplace Interview	22
Activity 2.5 – Flow Diagram	23
Activity 2.6 – Presentation	24
Activity 3.1 – Poster	25
Activity 3.2 – Workplace Report	26
Activity 3.3 – Mind Map	27
Activity 3.4 – Logbook	28
Activity 4.1 – Poster	29
Activity 4.2 – Samples Collection	30
Activity 4.3 – Worksheet	31
Activity 5.1 – Workplace Procedures	32
Activity 5.2 – Logbook	33

Activity 5.3 – Draw a Poster	34
Activity 6.1 – Brainstorm	35
Activity 6.2 – Mind Map	36
Activity 6.3 – Workplace Interview	37
Activity 6.4 – Poster	38
Activity 6.5 – Mind Map	39
Activity 6.6 – Practical	40
Activity 6.7 – Poster Design	41
Activity 6.8 – Logbook	42
Activity 6.9 – Worksheet	43
Activity 6.10 – Practical	44
Activity 6.11 – Mind Map	45
Activity 6.12 – Practical	46
Activity 7.1 – Group Brainstorm	47
Activity 7.2 – Workplace Interview	48
Activity 7.3 – Presentation	49
Activity 7.4 – Practical	50
Activity 7.5 – Workplace Interview	51
Activity 7.6 – Mind Map	52
Activity 7.7 – Practical	53
Activity 7.8 – Workplace Report	54
Activity 7.9 – Practical	55



Activity 1.1 – Worksheet

Answer the following questions after reading the information in the learner guide, and speaking to the nursery manager or your workplace mentor or coach:

Citrus is not indigenous to Southern Africa. Where does citrus originally come from?
If citrus trees are not indigenous, why are they propagated and grown in South Africa?
In which geographical area of Southern Africa are you located?
Does citrus grow well as an agricultural crop in this area? Give reasons why.
Does each citrus farm in your geographical area propagate its own citrus trees? If not, where do the new trees come from?

Activity 1.3 – Workplace Observation and Flow Diagram

Observe the dual method of propagating citrus in the workplace, and ask mentors and coaches to explain the methods and processes to you. Draw a flow diagram showing the sequential actions that are required during the dual methods of citrus propagation. Ensure that you indicate the time periods that lapse in between different actions on your flow chart.



Activity 1.4 – Mind Map

Draw a simple mind map to explain to a new team member how you know whether propagation of a citrus tree is successful or unsuccessful.



Activity 1.5 – Experiential Learning

Go outside and find a weed. Try to keep it intact, including its roots, leaves, flowers and possibly seeds. Paste the weed below and label the plant parts.



Activity 1.6 – Write Key Notes

Use the plant that you pasted in activity 1.5, and write key notes next to each label explaining the function of that plant part. Make sure you refer to:

- ✓ **Seeds**
- ✓ **Fruit**
- ✓ **Roots**
- ✓ **Stems or trunks**
- ✓ **Leaves**
- ✓ **Flowers**



Activity 1.7 – Workplace Research

Find a small sample of the growth medium (or samples of media if more than one is used), in your nursery. Put it in a plastic bag, and paste it below.

Give it a rating out of 3 (1=poor, 2=average and 3=good) for the following properties and explain the reason for your rating.

<i>Sample</i>	<i>Property</i>	<i>Rating</i>	<i>Reason for rating</i>
	Texture		
	Structure		
	Aeration		
	Air-filled porosity		
	Texture		
	Structure		
	Aeration		
	Air-filled porosity		

Ask a workplace expert or mentor / coach to explain the different types of growth media used for citrus and other types of plants that might be propagated at your nursery. Write keynotes on their answer.

<i>Details of interviewee</i>	
Name and surname:	
Date of interview:	
Signature of interviewee:	

The image contains two logos. The top logo is for 'Citrus Academy', featuring a green circular icon with a spiral pattern above the text 'citrus academy' in a green, lowercase, sans-serif font. The bottom logo is for 'CRW', featuring a stylized circular icon with a colorful, segmented design (red, orange, yellow, green, blue) above the letters 'CRW' in a grey, uppercase, sans-serif font.

The image contains two logos. The top logo is for 'citrus academy', featuring a green circular icon with a spiral pattern above the text 'citrus academy' in a green, lowercase, sans-serif font. The bottom logo is for 'CRW', featuring a stylized 'C' that incorporates a colorful citrus slice (orange, yellow, green) with a small leaf, followed by the letters 'RW' in a grey, uppercase, sans-serif font.

Activity 1.10 – Worksheet

Answer the following questions:

What are all the structures that are found in and around the nursery where you work?
What is the purpose of each structure?
How does each structure contribute to successful citrus propagation?
What risks does each structure pose to successful citrus propagation?

Activity 1.11 – Flashcards

Design a set of flash cards that can be used to educate casual or temporary nursery workers.

- ✓ **Write one environmental requirement for successful citrus propagation on each flashcards.**
- ✓ **For each of the 'environmental requirements' flashcards, make a new flash card on which you briefly describe why and how this is of importance in citrus propagation.**

Insert your set of flashcards here.



Activity 1.12 – Workplace Interview

Interview the nursery manager where you work, and ask him / her the following questions. Record your answers below:

<i>Details of interviewee</i>	
Name and surname:	
Date of interview:	
Signature of interviewee:	

How is the nursery environment managed to ensure the best chances for successful citrus propagation?
What can go wrong in terms of environmental conditions and how is this prevented?
How are environmental conditions monitored in the nursery?
What records are kept of environmental conditions?

Activity 1.13 – Report Writing

Write a report about the nursery where you work. Draw a diagram in which you show the management structures of the nursery, i.e. show where you are as nursery employee, if there are employees that report to you, who you report to, who that person reports to, etc.



Also explain the following:

What does your immediate supervisor do?
Who does your immediate supervisor report to?
Why do you not report to the person to whom your superior reports?

Discuss the following with your co-workers and make notes on your conclusions:

What would happen if the nursery didn't have management structures?

Activity 2.1 – Draw a Poster

Explain how seeds germinate in general. Draw pictures of each stage of seed germination and label the pictures.



Activity 2.2 – Worksheet

Complete the following tasks:

- ✓ Place a sample of the growth media that is used in seedling trays in your nursery in a bank bag.
- ✓ Attach the sample here.



- ✓ Describe exactly how this medium is handled and treated in the nursery.

Activity 2.3 – Logbook

Hand in a logbook to prove that you have successfully worked with tools and equipment in the citrus nursery. Log your activities in the book for at least 10 working days, as follows:

- ✓ **Make a list of all the tools and equipment that you work with during these 10 days.**
- ✓ **Next to each tool and equipment, write how you handle it before work commences, while you work with it, and after you have worked with it.**
- ✓ **Have your supervisor confirm that the procedures that you follow are accurate by placing his / her signature next to each day.**

<i>Tools and equipment</i>		<i>Handling before, during and after task completion</i>	
<i>Day</i>	<i>Details of tasks completed</i>	<i>Time spent on tasks</i>	<i>Signature of supervisor</i>

Conduct a workplace interview with the nursery manager or your workplace mentor and answer the following.

Where do the seeds used in the nursery come from?

Are there any special requirements for the seeds that are used in the nursery?

Activity 2.5 – Flow Diagram

Draw a flow diagram of the steps required during seed tray preparation and seed germination.



Activity 2.6 – Presentation

Prepare a short presentation to educate your co-workers on the points below. Insert or attach a copy of the presentation to your workbook.

- ✓ **What are the exact environmental conditions that are required for citrus seeds to germinate successfully?**
- ✓ **How are these requirements met by the citrus nursery?**
- ✓ **How can the nursery worker assist with ensuring that these requirements are met?**



Activity 3.1 – Poster

Design a poster that can be put up in the learning area of the class to explain the following. Include the poster in your workbook.

- ✓ **What does a citrus stem looks like?**
- ✓ **What are the functions of the stem?**
- ✓ **What role does the stem play in citrus propagation?**
- ✓ **How are stems grafted in citrus propagation?**



Compile a short report from your experience in the nursery where you work, about the following:

- 

Activity 3.3 – Mind Map

Design a mind map with your group, to be presented to the rest of the learners in the class, about the following:

- ✓ **What is budding?**
- ✓ **What are the functions of scions?**
- ✓ **Why is budding important in the citrus nursery?**



Hand in a logbook, proving that you have successfully participated in budding techniques in the citrus nursery. Write all the procedures down that you participated in and have your supervisor sign off that you have completed all the tasks successfully.



Activity 4.1 – Poster

Design a poster to educate temporary and casual nursery workers. Include the poster in your workbook.

- ✓ **What do the roots of citrus plants look like?**
- ✓ **How you can tell the difference between good root development and poor root development in young citrus plants?**
- ✓ **What are the functions of citrus roots?**



Activity 4.2 – Samples Collection

- ✓ Find samples of citrus tree leaves from all the different cultivars that you work with in the nursery where you are employed.
- ✓ Dry the leaves by pressing them between tissue paper, and then paste them in your workbook.
- ✓ Identify the leaves by cultivar.

Cultivar:	Cultivar:
Cultivar:	Cultivar:

- ✓ Explain the functions of citrus leaves in terms of their role in plant growth.

Activity 4.3 – Worksheet

Sketch the process of photosynthesis and summarise your understanding of the process in your own words. Explain how the environmental conditions in a nursery promote photosynthesis.



Activity 5.1 – Workplace Procedures

Find examples of at least one granular and one liquid fertiliser in the nursery. Write down step-by-step procedures on how each of fertiliser is applied.

Trade name of fertiliser:	
Application procedures	
Trade name of fertiliser:	
Application procedures	
Trade name of fertiliser:	
Application Procedures	
Trade name of fertiliser:	
Application procedures	

Activity 5.2 – Logbook

Hand in a logbook proving that you have successfully done the following:

- ✓ Collected fertiliser from storage
- ✓ Measured / weighed fertiliser accurately according to instructions
- ✓ Prepared fertiliser according to the correct procedures
- ✓ Applied fertiliser correctly to citrus plants

Make sure that you attach all the relevant instructions to your workbook and that your supervisor signs off that you have completed these tasks successfully.

Procedures for collecting fertiliser from storage:			
Procedures for measuring / weighing fertiliser accurately according to instructions:			
Procedures for preparing fertiliser correctly:			
Procedures for applying fertiliser correctly to citrus plants:			
Day	Details of tasks completed	Time spent on tasks	Signature of supervisor

Activity 5.3 – Draw a Poster

Create a poster to explain to new and temporary nursery workers how to take leaf samples. Be sure to specifically note things that can go wrong. Include the poster in your workbook.



Brainstorm with your co-workers and find answers to the following questions:

[illegible]

Activity 6.2 – Mind Map

Design an educational mind map for nursery workers that explains the following:

- ✓ What is the difference between a beneficial organism and a pest organism?
- ✓ How will you know whether you are dealing with a pest organism in the citrus nursery?



Interview your superior in the nursery to find answers to the following:

<i>Details of interviewee</i>	
Name and surname:	
Date of interview:	
Signature of interviewee:	

[illegible]

Activity 6.4 – Poster

Make a poster to educate your co-workers on the following. Include a copy of your poster in your workbook.

- ✓ **Give a detailed pictorial description of the ten most common weeds in the nursery.**
- ✓ **Explain in detail how each weed affects the citrus plants or environment.**
- ✓ **Explain how to prevent the spread of the weeds in the nursery.**
- ✓ **Explain how to deal with the weeds in the nursery if you find them there.**



Activity 6.5 – Mind Map

Draw a mind-map that includes the following:

- ✓ Different weed control methods used in citrus nurseries in South Africa.
- ✓ Detailed information of when which method would be appropriate to use in your nursery.
- ✓ Detailed information of how each method is applied in the nursery.



Complete the following practical tasks.

- ✓ **Attach copies of the procedures that are followed when herbicides are mixed and applied in your nursery.**
- ✓ **Attach a copy of the procedure that is followed when the herbicide application has been completed.**
- ✓ **Attach proof from your supervisor that you have applied herbicide correctly and that you followed the correct post-application procedures.**

Procedures for when herbicide application has been completed:

[illegible]

Activity 6.7 – Poster Design

Design an educational poster for your co-workers in the nursery. Include a copy of your poster in your workbook.

- ✓ **Show the five most important pests and the three most important diseases that affect the citrus nursery, and include pictures to identify these pests and diseases.**
- ✓ **Show how these pests and diseases can be prevented, and how they can be controlled.**



- ✓ **Attach a copy of the procedure for scouting in the nursery where you work.**
- ✓ **Complete at least eight scouting sessions in the nursery and hand in a logbook proving that you have successfully completed this task.**



Activity 6.9 – Worksheet

Obtain a label from a plant protection product used in your nursery. Paste the label below.



Get the following information for this product from the label:

Name and manufacturer:	
Expiry date:	
PHI:	
Registration information:	
Level of toxicity:	
Information indicated by pictograms:	
Protective gear and clothing required:	
Procedures in case of poisoning:	

Activity 6.10 – Practical

Prove that you have applied plant protection product in the nursery.

- ✓ **Attach a copy of the procedure for mixing spray material in your nursery.**
- ✓ **Attach confirmation from your supervisor that you have mixed the product correctly.**
- ✓ **Attach a copy of the procedure for applying a plant protection product in your nursery.**
- ✓ **Attach confirmation from your supervisor that you have applied the product correctly.**
- ✓ **Attach confirmation from your supervisor that you have worn and used all appropriate safety gear and equipment while applying plant protection product.**

Procedures for mixing spray material in your nursery:		
Procedures for applying a plant protection product in your nursery:		
	<i>Date</i>	<i>Signature of supervisor</i>
Confirmation of product mixed correctly		
Confirmation of product applied correctly		
Confirmation that appropriate safety gear and equipment were worn and used while applying plant protection product		

Activity 6.11 – Mind Map

Draw a mind map that shows the following:

- ✓ Explain what would be considered an out of the ordinary incident in your nursery while plant protection products are being used, mixed, or applied.
- ✓ Explain what you would report and to whom you would report it.



Activity 7.1 – Group Brainstorm

Brainstorm with your group and find answers to the following:

What does water quality mean in the citrus nursery?
How can the quality of water impact on the success or failure of propagation?

Activity 7.3 – Presentation

Give an educational presentation while walking your co-workers through the nursery on the following. Attach a copy of your presentation to your workbook.

- ✓ **Explain how water quality is measured in the nursery.**
- ✓ **Explain how water quality is improved in the nursery.**
- ✓ **Explain the effect of improved water quality on the propagation process.**



- ✓ **Attach a copy of the procedure that is followed in your nursery for using water spore traps.**
- ✓ **Attach confirmation from your supervisor that you have successfully sampled water for pathogen analysis.**

Procedures to be followed for using water spore traps:

[illegible]

Activity 7.5 – Workplace Interview

Interview your superior in the nursery and explain the following in your own words:

<i>Details of interviewee</i>	
Name and surname:	
Date of interview:	
Signature of interviewee:	

How does the nursery ensure that it maintains water quality?
Why is it important for the nursery to maintain water quality?
What are the possible consequences of not maintaining water quality in the nursery?

Activity 7.6 – Mind Map

Draw a mind map that indicates the following:

- ✓ What type of irrigation system is used by the nursery where you work?
- ✓ Why was this irrigation system chosen?
- ✓ Briefly explain how the irrigation system works.
- ✓ What is the delivery rate of the irrigation system?



Activity 7.7 – Practical

Prove your practical ability by performing the following tasks:

- ✓ Study the pre-start-up checklist provided in the learner workbook.
- ✓ Hand in a similar checklist, signed by your supervisor, proving that you have completed the start-up inspection for the irrigation system correctly.

Pre-Start-Up Checklist			
Pump Station:			Date:
Item	Checked	Comments	
Water Level			
Pump			
Excessive Water			
Oil Levels			
Flanges			
Gland Packaging			
Couplings			
Mountings			
Free Rotation			
Motor/Starter Panel Dry			
Other Comments			
Filters			
Valves			
Lids			
Seals			
Flanges			
Inline Filter (Hydraulic Valves)			
Other Comments			
Valves (Manual)			
Manual Open/Close			
Spindle			
Leaks			
Other Comments			
Valves (Hydraulic)			
Settings			
Other Damage			
Other Comments			
Checked By:		Signed:	

Confirmation of correct completion of pre-start-up inspection for the irrigation system	<i>Date</i>	<i>Signature of supervisor</i>

Seek assistance from your superiors and co-workers and compile a report about the following:

- The image contains two logos. The top logo is for 'Citrus Academy', featuring a green spiral icon above the text 'citrus academy' in a green, lowercase, sans-serif font. The bottom logo is for 'CRW', featuring a stylized circular icon with segments of red, orange, yellow, and green, followed by the letters 'CRW' in a grey, uppercase, sans-serif font.

Activity 7.9 – Practical

Prove your practical abilities by completing the tasks below. For each of the tasks, attach the workplace procedure that you have to follow and confirmation from your supervisor that you have completed the task successfully.

- ✓ **Priming a pump**
- ✓ **Starting up the irrigation system**
- ✓ **Irrigating nursery plants**
- ✓ **Shutting down the irrigation system**

Procedures for priming a pump:

Procedures for starting up the irrigation system:

Procedures for irrigating nursery plants:

Procedures for shutting down the irrigation system:

Activity 7.9 – Practical (continued)

<i>Day</i>	<i>Details of tasks completed</i>	<i>Time spent on tasks</i>	<i>Signature of supervisor</i>


citrus
academy

 CRW