

Production horticulture

Introduction to Module 5

Many production horticulture settings are highly automated and resemble the production-line processes in manufacturing rather than the tasks traditionally associated with horticulture. Workers in production horticulture generally don't need a knowledge of plants and the growing process, but they do need to be familiar with the production process and its associated tasks. Many of the tasks have a direct affect on other stages of production and there is a strong requirement for accuracy and consistency.

This module supports learning for Units CU5, CU77, CU78 and CU79 of the Production Horticulture NVQ. The themes give learners the opportunity to find out more about their work setting and to develop the following skills:

- understanding the production process
- following written instructions
- checking temperature
- understanding and using codes
- assembling orders using a picking list
- using a plan for picking orders.

The skills developed in this theme mainly reflect the plant production aspect of production horticulture, although some processes will be familiar to those in crop production. Many skills for crop production, especially outdoors, are more closely aligned to agriculture. Learners may need support to apply skills to their own settings. The *Word* version of these Embedded Learning materials provides opportunities to adapt and customise materials to make them directly relevant to a range of settings.

Skills checklist

Production horticulture involves producing plants or crops on a large scale. You may be working indoors in a controlled environment, where temperature and growing conditions are critical to the production of plants or crops.

Production involves a series of tasks that follow on from each other. Each stage is important. If there are problems at any stage, it will affect the following stages or the quality of the final product.

You will need the following skills to work within a production team and to produce quality plants and crops in your workplace. Tick all the skills you have already and then look at the checklist again when you have used the materials.

Skills for production horticulture	Now	Later
Understanding the production process		
Following written instructions		
Checking temperature		
Understanding and using codes		
Assembling orders using a picking list		
Using a plan for picking orders		

The skills you learn in this module can be used to help you to achieve an NVQ in Production Horticulture.

PAGES 5:1–5:2

The production process

Many plant producers are now effectively plant factories: they require the workforce to carry out a series of established processes and procedures to 'manufacture' a product of a particular quality. Each stage of production is carefully organised to ensure maximum productivity with minimal loss of quality. Each stage will also depend on the previous stage being completed on time and to a certain standard. Some production staff may only be involved in one stage in the process, but it is important that they see the whole picture in order to understand the importance of their own role and their contribution to the end product. Many large operations now encourage staff to move from job to job and to acquire a wider bank of skills. This allows for flexibility in the workforce and enhances the work experience and progression opportunities for employees. This theme helps to support the knowledge and understanding of Unit CU2.

Note: some Latin plant names are used in this theme. This can be linked to Module 2, pages 2:7–2:8 (Plant names (2)) of these materials.

Materials

Examples of flow charts and organisation charts
Sticky notes
Flow chart – finished plants from cuttings from the Source material (0:17)

Learning outcomes

- 1 To understand and use the structure of organisation charts and flow charts (focus page, Tasks 1 and 2)
- 2 To understand own role within an organisation (focus page, Task 3)

Introduction

- Ask learners to list all the people that they know at work and to sort them into groups to show their roles in the organisation. This will be quite limited for learners who work in a small company. Show the learners (on OHT or handout) examples of organisation charts. Explain that these are used to show people's positions in an organisation and the lines of communication. If they work for a large company they may never receive direct orders or instructions from the Managing Director. *Who do they receive instruction from?* Use one of the learner's organisation as an example to show how information may get passed in many directions.
- Ask learners to think about how a similar chart can be used to show a process or series of actions – a flow chart. In pairs, ask learners to create a flow chart to show a simple process, such as making a cup of tea or a familiar job from the workplace. Encourage learners to think through the task by listing the things that need to be done on sticky notes (one stage per note) and then sorting these into order by moving them around.
- Draw a flow chart or show the process by using arrows.
- Ask learners whether it matters what order the jobs are done in. Will it make sense if some jobs are done first? Learners need to understand that most charts show order or relationships.

Focus page

- Go through the flow chart showing the production process for producing bedding plugs. Ask learners to contribute from their own knowledge by explaining what might be happening at each stage. Ask them to write in who is responsible at each stage for completing the job and for giving instructions. This may also be a good opportunity to mention the monitoring systems with which learners are familiar that track the process of production.
- Take one part of the process and ask, *What will happen if this job is not completed in time or to the correct standards. What is the knock-on effect? Who is responsible?* This may open up a range of discussion about who is at fault, for example: whose fault is it if deliveries are not on time?
- It is important that learners understand that each part of the process is important and can affect the next stage.
- Point out the difference between growing in a controlled environment such as a greenhouse and growing outside, where you have less control.

Curric. refs	NOS	Key Skills
Rt/L1.4	CU2	C1.2
Rt/L1.5		
Wt/L1.5		

Task 1

Understand a flow chart

Rt/L1.4

- Remind learners about the way flow charts work and how they represent a process in which one action depends on another.
- Tell learners they will be using the flow chart on the focus page to answer the questions.
- Answers can be discussed or recorded on paper.

If the learner has difficulty

- Identify whether there is difficulty understanding the flow chart format or a lack of vocational knowledge. In either case, it is important to relate the activity to something that the learner understands: use an everyday activity that they can describe to you. Repeat the activity used in the focus session to create and interpret the flow chart. Observe where there are any areas of difficulty.
- Be aware that language or technical terms may be a barrier to understanding. Use cards to match words with definitions and maybe also graphics, where appropriate.

Extension

List any quality controls that may be used in this scenario.

Task 2

Extract information from a flow chart

Rt/L1.5

- Make sure learners each have a copy of the Flow chart – finished plants from cuttings from the Source material.
- Remind learners of how flow charts show step-by-step processes.
- Point out that there is additional information here about quality control.
- Explain that they need to read each statement and then refer to the flow chart to decide whether the statement is true.

If the learner has difficulty

- Learners may have difficulty with the quality control system shown here. Discuss with them the concept of quality control. Ask what checks

they use in their workplace and what the outcomes may be if they find unsatisfactory products. *What do you do if you find that a plant is infested with XXX? What do you do if plants or vegetables are undersized or damaged?* Relate this to the flow chart and talk through the process.

- ESOL learners may benefit from identifying the use of the passive in this task.

Extension

Discuss the differences between growing a crop in controlled environments and outside. Think about the problems that may be encountered in the production process if growing outside. *What influences are out of your control? What do growers do to try to eliminate these problems? Can you reflect this in your flow chart?*

Task 3

Complete a process flow chart to show own work environment and contribution they make

Wt/L1.5

- Remind learners that in a production process every step is important and that every person contributes to the end product.
- Ask each learner to think about the jobs or steps that are carried out in their own workplace.
- Support learners to sort these jobs into a sequence that shows the whole process. Show how arrows are used to show movement through the process sometimes movement can be more than one direction.
- Ask learners to complete a flow chart to show their own production process.

If the learner has difficulty

Prompt the learner by asking direct questions about the products they grow. Support them to write down the steps on pieces of paper or sticky notes and sort them into order. Ask the learner to repeat the process back to you, using the flow chart as a prompt.

Extension

Ask learners to add job roles to each stage of the process and identify themselves within that process. Think about the people they rely on to do their jobs and the people that rely on them to work efficiently as well.

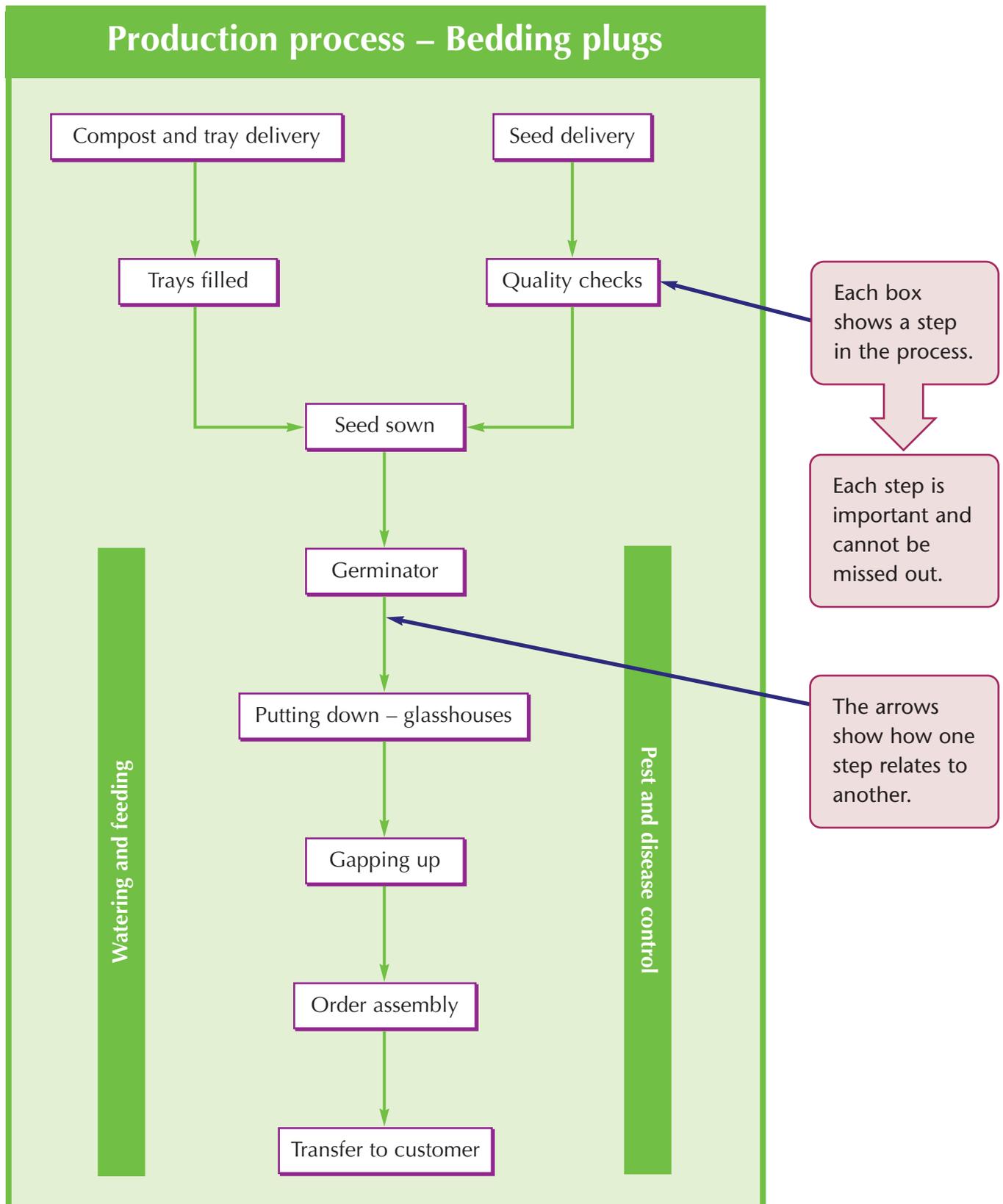
Theme assessment

Use the flow chart made in Task 3 to explain a production process to the group.

The production process

Focus

Flow charts like this are used to show a step-by-step process.



The production process

Task

Task 1

Look at the flow chart on the focus page. Think about these problems and decide what will happen in each case.

- 1 Which delivery needs to be checked for quality?
- 2 Which processes should be continued throughout the growing process?
- 3 What will happen to the process if germination is slower than expected?
- 4 What would happen if the seeds delivered were of poor quality and had to be re-ordered?
- 5 What would happen if the tray-filling machine breaks down and trays have to be filled by hand?

Look for the key words on the flow chart.

Task 2

Look at the Flow chart – finished plants from cuttings from the Source material. Decide whether each statement is true or false.

- | | |
|--|--------------|
| 1 The first step is taking cuttings. | True / False |
| 2 All cuttings are taken on the site. | True / False |
| 3 Poinsettias are the only cuttings that are potted on. | True / False |
| 4 Plants are all checked for quality before they are dispatched to the customer. | True / False |
| 5 Watering and feeding continues throughout the whole process. | True / False |
| 6 Diseased and infested plants are put in the bin. | True / False |
| 7 There are three quality checks. | True / False |

Task 3

- 1 Write down the name of one item that is produced in your workplace.
- 2 Make a list of all the steps taken to produce this item.
- 3 Write each job on a sticky note.
- 4 Sort the notes into order to show how each step fits into the whole process.
- 5 Use arrows to show the whole process from start to finish.

PAGES 5:3–5:4

Using codes in production

Production horticulture operates in the same way as many manufacturing settings. Products will be coded and tracked through the system. The process is monitored and checked throughout to ensure efficiency and quality. In order to do this, employees will use codes to identify products and processes and to record information.

Understanding the structure of these codes will contribute to accuracy when recording and handling them. Establishing some basic strategies for recognising and using codes will also be helpful. This theme contributes to units CU6 (Maintain communications and records within the organisation) and PH3 (Monitor and maintain the growth and development of crops) in Production Horticulture.

Materials

Examples from the workplace of documents using codes

List of plant names, from workplace sources

Job codes sheet from the Source material (0:18)

Learning outcomes

- 1 To understand and use codes in the workplace (focus page, Tasks 2 and 3)
- 2 To understand abbreviations used in codes (focus page, Task 1)

Introduction

Discuss learners' experiences of using codes in the workplace. It might be useful to relate this to authentic workplace documents. What are the problems with codes? Expect to hear about problems in understanding what the codes are about – codes often seem to be a meaningless jumble of numbers and letters and they can all seem to be the same.

Focus page

- Look at the example on the focus page. This shows that codes have a logical structure – all that is needed is to understand the logic. Work through the way the code is structured. Look at

other workplace examples to see if a similar logic has been used.

- The example on the page relates to a code to be entered into a computer. Discuss learners' involvement in using IT in the workplace. Give some examples of incorrectly recorded codes (e.g. AHIMP419, HIMP442-20, AHIMP412-WK20). What has gone wrong? What is the impact of incorrect recording of codes? Remind learners that databases will not accept incorrect codes.
- Run through a range of common abbreviations for plant names – this could be developed as a quiz or a game using a set of cards with abbreviations on some cards and full names on others to be matched; pictures could also be included. It would be useful for learners to record these abbreviations in a personal record book or glossary.
- Consider the issue of codes that are very similar. How can they be distinguished? It is useful to focus on the part of the code that is likely to be different. A good illustration of this is telephone numbers: the STD or area code stays the same for all numbers in your area, the next few numbers may be the same for a part of a town; it is only the last few numbers that vary.
- Confirm that codes may be listed (for example, in catalogues and product databases) in alphabetic or numerical order. The way that the code is constructed (i.e. letters or numbers first) will determine the order.
- Look at colour coding, as this may be used in the workplace. Note that different colours may be used. *Are there any problems with colour coding (e.g. colour blindness)? Would it help to keep a record of the workplace colour coding in your wallet?*

Curric. refs	NOS	Key Skills
HD1/E3.1	CU6	N1.1
Rw/E3.1	PH3	
Rw/E3.3		
Rw/E3.4		
Rt/L1.5		

Task 1

Work out abbreviations

Rw/E3.1

Rw/E3.3

- Learners may have varied experience of plant names, so it may be worth backing up this activity with a list of plant names, as contained in workplace reference material. Learners should try first to 'Name that plant' from their own experience and guesswork.
- Spellings can be difficult so this task could be done orally. However it is useful then to check spellings in a plant catalogue and record the spellings and abbreviations in a personal dictionary.

If the learner has difficulty

- Learners with little experience may need support for this activity. Make the activity one of looking up possible options in the workplace plant list, a plant dictionary or seed catalogue.
- Learners may need support with the reference skills required to look up words.
- Cards matching abbreviations to meaning could be used here.

Extension

Ask learners to make a list of the plant names and abbreviations used in their workplace and put them into alphabetical order. They could make this a permanent record.

Task 2

Use codes to check orders

HD1/E3.1

- Check that learners understand the task. You may need to model the process. Confirm that a methodical approach is needed. Look at the row and column layout.
- This is a useful opportunity to discuss picking lists and the difficulties involved in locating the correct parts of orders.

If the learner has difficulty

- Model the first item on the list. Is the bar code there? Dyslexic learners may have problems with the visual matching skills involved in this task, so it is useful to use a tracking aid (e.g.

ruler, edge of piece of paper, finger) to help. Encourage learners to match the code in 'chunks', perhaps two or three letters or numbers at a time. Cards or sticky notes could also be used as an additional aid here.

- Dyslexic learners will generally struggle with long sequences of letters and digits. Verbalising and chunking can help them to cope with this.

Extension

Using workplace documentation, ask learners to check codes for orders or other purposes. The codes should contain letters and numbers.

Task 3

Find codes in a list

HD1/E3.1

Rt/L1.5

- Use the Job codes sheet from the Source material. Do learners use similar job codes? What might be the impact of using incorrect codes?
- This task requires good scanning skills to locate key words in the text, followed by careful copying of numerical codes.

If the learner has difficulty

- Help the learner to identify the key words and confirm that the entry in the list may not be exactly the same, for example, tray washing is listed as 'Correx and tray washing'.
- Encourage a systematic line-by-line approach to scanning for the information, perhaps using a tracking aid or cards.

Extension

Give learners an example of a working day that includes the job codes used here. Ask them to record their job codes on a sample job sheet.

Theme assessment

- Set further activities involving codes using workplace material.
- It might be useful to give learners a set of codes based on letters and numbers on cards to sort into order. Picking lists involve codes and could become part of this activity.

Using codes in production

Focus

In any process you will come across codes. Codes are used for:

- tracking the growing process
- identifying individual plants or batches
- job numbers and orders.

You need to make sure you can use codes quickly and accurately.

Codes usually have some meaning, like this one. If you know how a code is structured, it is easier to remember and to be accurate. Watch out for abbreviations.



Get it right!

AHIMP439-20

A shows the year.

H shows the tray type.

IMP = Impatiens
These three letters show the plant type.

439
These three numbers show the tray size.

-20 shows the week number.

Remember to put this information in accurately. The database will not accept incorrect codes.

Codes consist of numbers or a mixture of numbers and letters. It can help to know how many digits to expect and to recognise sections of the code, such as the beginning and end.

Job codes

05680	Unknown code	Use this code to end any job
00009	Training	All training on site and off site
02394	Production engineering	Processing machine
02395	Production engineering	Seed machinery mai
02396	Production engineering	Bench transport mai
02397	Production engineering	
00200	Correx and tray washing	All Correx and tray w
00201	Tray label removing	Removing labels from
00202	Colour code labels	The sorting, washing

Stock ref codes

Stock code	Item description	Quantity
EST486100	Plug tray 100 cell	×78
EST486250	Plug tray	
EUV116635	Vermiculite Sack 25 kg	



Colour codes may be used for days of the week. It helps to have a key like this:

- = Monday
- = Tuesday
- = Wednesday
- = Thursday
- = Friday
- = Saturday
- = Sunday

Using codes in production

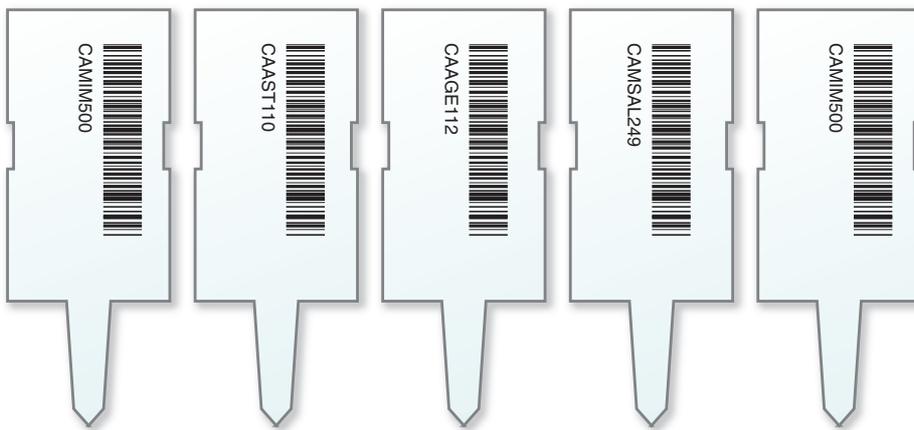
Task

Task 1

Use your knowledge of plants to work out the meanings of these abbreviations.

- 1 nem 3 cyc 5 pan 7 sal
2 rud 4 lob 6 pet

Task 2



- Using the plant labels above, check that you have all the correct items for the order below. Tick all the items that are correct.
- Write down any that are missing.

Job number	Article description	Tray size	Order quantity	Quantity dispatched
CAAGE112	Ageratum Blue Champion	J500	1	
CAANT110	Antirrhinum Liberty	J500	1	
CAIMP607	Impatiens Carnival Mixed	J500	2	
CAMIM500	Mimulus Select Mixed	J500	2	
CAMSAL249	Salvia Vanguard	J500	1	

Task 3

Use the Job codes sheet from the Source material to find the codes for these jobs.

- Tray washing
- Watering D block
- Branch transport maintenance
- Health and safety training

PAGES 5:5–5:6

Following written instructions at work

Learners may be presented with instructions at work in many forms, including written instructions. These instructions will often be framed using technical language, with which learners will need to be familiar. It is also useful to understand the typical format and language of instructions in order that they can be followed correctly. This will include understanding words for positive and negative instructions and sequencing. Following written instructions and procedures underpins the skills needed if workers are to monitor and maintain health and safety in the workplace – Unit CU2.

Materials

Examples of workplace instructions

Picking instructions – Fresh Salads Inc. from the Source material (0:19–0:20)

Week sheets from the Source material (0:21)

Learning outcomes

- 1 To understand the typical format of instructions (focus page)
- 2 To know that numbered instructions indicate sequence/order (focus page, Task 1)
- 3 To understand the use of imperatives in instructions (focus page)

Introduction

- Discuss with learners how they receive instructions at work. Do they have written instructions? Have they experienced any problems with these? What problems have they experienced?
- You might like to look at examples of written workplace instructions. Can learners identify any problems with these, e.g. language difficult to understand, not sure what order to do things in, not sure which are positive and negative instructions?

Focus page

- Look at the instructions on the page and highlight the importance of format. Demonstrate (using the example given) why it is important to follow numbered instructions in order.
- You might like also to comment on use of bold text and capitals. Why is this done? (to highlight important information)
- Look at the use of imperatives (command words) – ask learners to identify more of these in the instructions on the page. Learners could also highlight words such as ‘must’, ‘always’, ‘do’, ‘do not’, ‘avoid’. Extend this to other instructions if necessary.
- ESOL learners will benefit from comparing ‘passive’ and ‘active’ voices – ‘You must use ...’ compared with ‘... must be used.’
- Look for sentences that contain more than one instruction (use of commas, use of ‘and’; see the Planting specifications for examples) and illustrate how this contains two instructions.

Curric. refs	NOS	Key Skills
Rt/E3.1	CU2	C1.2
Rt/E3.3		
Rt/L1.3		
Rt/L1.4		
Rt/L1.5		

Task 1

Use work instructions and a completed week sheet to answer questions

Rt/E3.1

Rt/E3.3

Rt/L1.3

Rt/L1.4

Rt/L1.5

- To complete this task, learners have to read and understand the Picking instructions for Fresh Salads Inc. Week 43 and relate this to the Week sheet for the same week, both from the Source material. Learners need to understand the key on the Week sheet, so encourage them to spend some time reading before tackling the questions.

- Work with learners on the first question, to ensure they understand how to tackle the questions.

If the learner has difficulty

- The format of the instructions and the week sheet may be unfamiliar to learners – spend some time ensuring they understand these.
- The picking instructions use some technical language. Ensure learners understand this and therefore what the questions are asking.
- Ensure that learners understand the key on the week sheet.
- The third question involves counting letters – learners may not notice that there are two $\frac{1}{2}$ s to add together.
- Question 4 requires careful reading and detailed interpretation of the week sheet. Learners may need support to understand this question.

Extension

- Ask learners to set further questions based on this material.
- Use this approach to set a quiz based on workplace material.

Task 2

Use work instructions to complete a week sheet

Rt/E3.1

Rt/E3.3

Rt/L1.3

Rt/L1.4

Rt/L1.5

- To complete this task, learners will have to read and understand the Picking instructions for Fresh Salads Inc. for week 44 and the matching week sheet, both from the Source material. Learners need to understand the key on the week sheet, so encourage them to spend some time reading before tackling the task.
- Note that not all tasks allotted in the picking instructions will appear in the week sheet.
- Work with learners to complete entries for Thursday, so they understand the task. Note: leave Wednesday until last as there are no codes for the allocated tasks.

- Ensure learners check that all tasks are completed according to the REMEMBER list on the picking instructions. In particular, note the final instruction, as it impacts on the order in which tasks are completed.

If the learner has difficulty

- The format of the instructions and the week sheet may be unfamiliar to learners – spend some time ensuring they understand these.
- The picking instructions use some technical language. Ensure learners understand this and therefore what the task requires.
- Ensure that learners understand the key on the week sheet.
- Leave Wednesday until last, as there are no codes for this day's tasks.

Extension

- Set a similar task based on the Picking instructions for Week 43.
- Highlight all the command words in the Picking instructions for Week 44.

Theme assessment

- Learners should be able to complete equivalent documentation using similar written instructions from the workplace.
- Learners could develop similar written instructions for typical working days in the workplace, emphasising command words.

Following written instructions at work

Focus

Instructions and procedures are usually direct commands or orders that tell you what to do, how to do it and the order to do it in. Procedures and written instructions are usually set out in a **formal** way to show that they are official and must be followed.

Rules for seed use

1. You **must** use opened packets first.
2. Only open packets as required.
3. Unused seed goes in the last packet opened.
4. If you do not have enough seeds, please see your supervisor for extra packets. **DO NOT SOW SHORT.**
5. Opened and unopened packets **must be** banded separately.
6. **Do not** open more than one variety of seed at a time.
7. Check seed is well sieved before use.
8. **Always** return seed packets to cool box in cold store.

Think about the things that **must** be done. Look out for words such as '**must**', '**always**' and '**do**'.

Numbered instructions should be followed in order.
For example, you must use already opened packets of seeds first, before opening new ones.
Do jobs in the correct order to prevent damage or waste and to avoid making the job more difficult.

What might happen if you opened more than one variety of seed at a time?

To follow information or instructions you need to understand the **format** (how it is set out) and the words that are used.

Instructions are usually written in **short but complete sentences.**

Planting specifications

There might be **several instructions** in each point. To spot these, look out for:

- **command words** (key instruction words telling you what action to take)
- **commas**
- **new sentences**
- the words '**and**' or '**but**'.

Lobelia
Do not sow Lobelia onto pallets on a Tuesday.

Petunias
Avoid sowing Petunias on Wednesdays.
Do not mix Petunia Storms and Juniors on the same pallet.

Geraniums
Geranium 350s sown into pre-forma trays and dibbled.

Pansies
Do not sow before Thursday.
Keep Turbos on separate pallets.

Marigolds
Marigold 350s into pre-forma trays and dibbled.

Look out for words such as '**do not**' and '**avoid**' to spot things you must not do.

Following written instructions at work

Task

Task 1

Use the Picking instructions for Fresh Salads Inc., **Week 43**, Block B and the matching Week sheet from the Source material to answer the questions.

- 1 On which day is twisting and shooting two tracks the only picking job on the week sheet?

- 2 What must you leave between picking each track?

- 3 What is the total number of tracks that R. Brown picked on Monday and Tuesday? Circle your answer.

$4\frac{1}{2}$ 8 5 9

- 4 There are no numbered instructions for the picker on the Saturday, so why has he filled in the column with T and S?

Task 2

Use the Picking instructions for Fresh Salads Inc., **Week 44**, Block C and the matching Week sheet for Block C from the Source material.

Finish the uncompleted sheet for the picker on duty for Week 44 on Block C.

- Make sure you read the instructions carefully. They could be different from the week before.
- Block C has only eight tracks.
- The picker completes all his work each day.
- Use the sheet for Week 43 in Task 1 as a model.

PAGES 5:7–5:8

Checking the temperature (1)

Much of production horticulture depends on plants growing in controlled environments; this requires workers to monitor the conditions for these protected crops. Controlled temperature is an essential condition for many plants so it is important to be able to read, understand and record temperatures using thermometers. Demonstration of these skills is required for Units CU77.1 and CU72.3 of the National Occupational Standards.

Materials

Celsius thermometers

Learning outcomes

- 1 To read, measure and compare temperatures of plants grown under controlled conditions (focus page, Tasks 1 and 2)
- 2 To read scales to the nearest labelled and unlabelled division on a thermometer (focus page, Tasks 1 and 2)
- 3 To extract and record temperatures using a chart (focus page, Task 2)

Introduction

- Discuss with learners the meaning of a temperature-controlled environment. Ask learners to name plants/crops that need a temperature-controlled environment. Record suggestions on the board/flipchart.
- Ask for volunteers to tick with a red pen those plants that need to be kept at a warm temperature and to tick with a yellow/orange pen those that are kept cooler, but still require some heat. If the list includes plants that only need polytunnel protection to grow or harden off, these can be ticked with a blue pen.
- Give learners practice at reading thermometers in a practical way. Outside and inside temperature can be recorded. Temperature can be manipulated by using warm water and/or ice cubes. Support learners who have difficulty with reading the displayed temperature. Point out that each unlabelled division is 1° and that

there are 10 degrees between each labelled division. (Note: labelled divisions show a mark and a number (e.g. 10); marked divisions show a mark, but no number label. You have to work out the number from the labelled divisions.)

- Discuss the differences between the readings taken and point out that such differences could be critical in a germination room. Ask learners what they think might be the likely consequences of too high a temperature (wilted/shrivelled seedlings) or too low a temperature (arrested development/killed off seedlings).
- Establish that they all know 0°C (Celsius) is the freezing point of water.

Focus page

- Ask learners to look at the information boxes and the thermometer showing 22°C. Pose a few questions to check their understanding, for example, *The germination room door has been accidentally left open and the temperature has dropped by 7 degrees. What would the thermometer be reading? It is a very hot day and no-one has opened any ventilation windows. The thermometer reading rises by a staggering 9 degrees. What would it read?* A set of cards with different scenarios may enhance this activity.
- Ask learners which of the plants they ticked on the board are likely to be more suited to germinator room 2.
- Draw learners' attention to the range of acceptable temperatures within each germinator room. Ask why the range is so small (plants need fairly constant temperature and do not thrive in fluctuating temperatures). Ask learners to identify the room and date when the range became unacceptable (room 2, during the afternoon on 4th February). What was done about it? (ventilation closed)

Curric. refs	NOS	Key Skills
MSS1/E3.9	CU77.1	N1.1
HD1/L1.1	CU72.3	

Task 1

Read the temperature on a thermometer
MSS1/E3.9

Remind learners that each division is 1° and that they either count either on or back from the nearest labelled division, depending on which is easier.

If the learner has difficulty

- Show the learner how to use a ruler to draw a line across the top of the thermometer's liquid, identify the closest labelled division and put a mark by it. Ask the learner to count how many single divisions separate the labelled division from the top of the liquid mark and to add or take these away from the marked number.
- If there are still difficulties, use the ruler as a 'number line' or write the numbers 1–30 on a piece of paper and ask the learner to count on or back from the marked number until the temperature showing on the thermometer is reached.

Extension

- Ask the learner to write down the difference between the highest and lowest temperatures.
- Get the learner to mark in other temperatures, including some below freezing. Ask him/her to speculate on why the temperature in a room may go below freezing (faulty heating system; no plants in the room) or why a temperature rises above 30°C (faulty heating system; heat wave; tropical plants that need a high temperature).

Task 2

Record temperature
MSS1/E3.9

HD1/L1.1

Remind learners that if they record a temperature that is wildly different from the other recorded daily temperatures, then they should look again at their thermometer readings – no germinator room should have fluctuating temperatures.

If the learner has difficulty

- Help the learner by highlighting key information in different colours, so they will find it easier to match data for the chart (e.g. use one colour to highlight 'AM' on the chart and in the question). Learners can be supported by writing the information on sticky notes and sorting these physically.
- Check that the learner understands that 'AM' is morning and 'PM' is the afternoon. Highlighting may help learners to differentiate between these.
- Do one together, using a ruler to help with tracking across the grid lines of the chart.

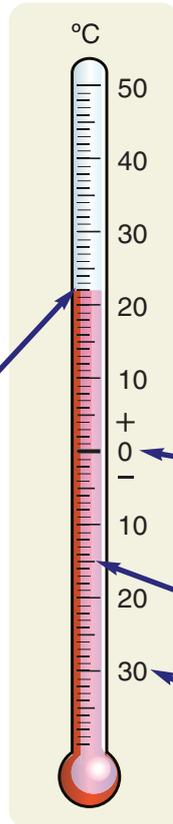
Extension

Ask the learner to establish the range of temperatures for the two rooms (18–24° for room 1; 18–21° for room 2). Would there be any cause for concern for room 1? What comments might he/she write about thermometer reading B?

Checking the temperature (1)

Focus

The temperature in the germination room is critical to the growth of the plants stored in it. This means that the temperature of the room needs to be checked and recorded twice every day.



A thermometer like this one is used to measure the temperature in the germination rooms. The temperature is measured in **degrees Celsius** or **°C**.

Every line on the scale of the thermometer represents 1°C.

0°C is the temperature at which pure water freezes and thaws.

Every 5°C is shown with a slightly longer line.

Every 10°C is shown with a long line and labelled with a number.

The level of the liquid on the thermometer scale shows the temperature of the room.

The liquid in this thermometer comes up to two small lines past the 20°C line. So the temperature in the room is 22°C.

This is a form used to record the temperature of the germination rooms. You can see there are two rooms. Note the difference in temperature of the two rooms.

Temperatures taken in the morning go in this column.

GERMINATOR TEMPERATURES				MONTH: FEBRUARY 2005	
DATE	GERMINATOR ROOM 1		GERMINATOR ROOM 2		COMMENTS
	AM	PM	AM	PM	
01/02/05	18°C	19°C	22°C	24°C	
02/02/05	19°C	20°C	23°C	23°C	
03/02/05	19°C	20°C	24°C	22°C	
04/02/05	20°C	19°C	24°C	20°C	Room 2 temperature dropped, closed ventilator

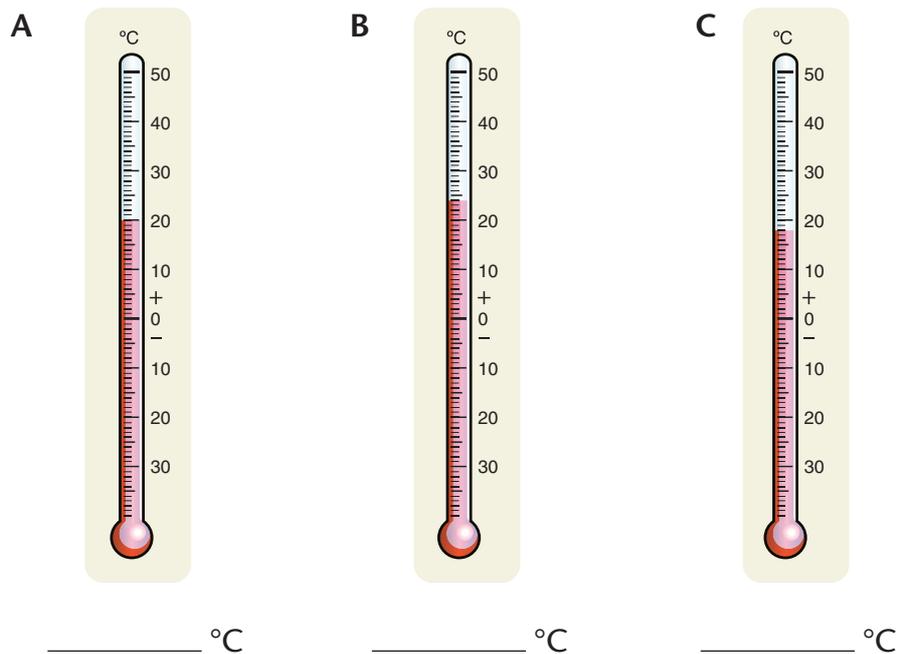
Write the date that you record the temperatures in this column.

Temperatures taken in the afternoon go in this column.

Any comments about what you find or do go in this column.

Checking the temperature (1)

Task



Every line or mark on the scale of the thermometer represents 1°C.

Task 1

What temperature does each of the thermometers A–C show?

Task 2

Thermometer A shows the temperature of germinator room 1 on 02/03/05 in the afternoon.

Thermometer B shows the temperature of germinator room 1 on 03/03/05 in the morning.

Thermometer C shows the temperature of germinator room 2 on 04/03/05 in the morning.

Use this information to complete the chart below.

GERMINATOR TEMPERATURES				MONTH: MARCH 2005	
DATE	GERMINATOR ROOM 1		GERMINATOR ROOM 2		COMMENTS
	AM	PM	AM	PM	
01/03/05	18°C	19°C	21°C	20°C	
02/03/05	18°C		19°C	21°C	
03/03/05		20°C	22°C	21°C	
04/03/05	21°C	19°C		20°C	

PAGES 5:9–5:10

Checking the temperature (2)

Checking the outside temperature or the temperature of unheated greenhouses or polytunnels is an essential part of production horticulture. Planting out, maintaining and monitoring the development of crops require close observation of the conditions that may affect their progress. The weather and ambient temperature are critical factors to be considered at all times. Workers need to understand an outside thermometer showing maximum and minimum temperatures as this information enables them to find ways to minimise environmental damage (e.g. protecting crops from frost damage; maintaining moisture levels in very hot weather). Knowledge of these skills will contribute to Unit PH3 and elements PH3.1 (Monitor and report on the growth and development of crops) and PH3.2 (Maintain moisture levels and provide nutrients to crops).

Materials

An outdoor (maximum and minimum) thermometer

OHT of an outdoor thermometer

Large-scale temperature line

Learning outcomes

- 1 To read, measure and compare temperature on an outside thermometer (focus page, Task 1)
- 2 To recognise negative numbers and understand that a negative temperature is below zero (focus page, Task 1)

Introduction

- Write the words 'maximum' and 'minimum' on the board and ask learners for examples to suit the meaning of the words. The important concept to draw from this exercise is that maximum means its limit/most/highest/warmest; minimum is its lowest/least (e.g. maximum/minimum wages; recorded yearly temperatures of a country, etc.).
- Ask learners to name some plants/crops that are grown in unheated conditions – record these on the board/flipchart.
- Question learners about the advantages and disadvantages of growing in this way (dependent on the weather; prone to frost, more difficult to control moisture and heat, etc.; but cheaper, can use vast spaces, etc.).
- Ask if anyone has seen an outside thermometer. Pass the thermometer around and discuss the features, pointing out the words 'maximum' and 'minimum'.

Focus page

- Using an OHT of an outside thermometer, cover up one half and point out the scale on that side. Ask learners what they understand about temperatures below zero – they are shown with the minus sign next to them; the larger they get the colder they are. Use a large-scale temperature line to demonstrate this.
- Negative numbers may create difficulties for many learners. It is important that they have plenty of practice in reading and recording temperatures. In some settings this can be done as a daily exercise.
- Write some temperatures on the board and ask learners to rewrite them in order on an ascending scale of cold to hot. Relate this to the side of the thermometer showing on the OHT. Check learners understand what is meant by -4°C .
- Display the other side of the thermometer, pointing out the scale and the word 'maximum' or 'minimum'.
- Reveal the whole thermometer and link the two halves. Explain how the thermometer works: the mercury expands with heat and pushes up the metal slider on the maximum side, but leaves it there when the temperature drops, pushing the mercury around the curve and towards the metal slider on the other side, which records the coldest temperature. The current temperature is shown by the level of the mercury – it is the same on both sides of the thermometer.
- The reset button is pressed every day so that the day's new maximum and minimum temperatures can be recorded.

Curric. refs	NOS	Key Skills
MSS1/L1.4 N1/L1.2	PH3.1, 2	N1.1

- Ask learners to record the maximum and minimum and daily temperatures of an outside thermometer in their workplace on at least two occasions and to compare them with each other next session.

Task 1

Use a maximum and minimum thermometer to record temperature

MSS1/L1.4

- Remind learners that they must look at the bottom edge of the sliders to read the temperatures accurately. They should look to the nearest labelled division and count up or back to where the slider mark is resting.
- Remind learners that every marked but unlabelled division is 1°.

If the learner has difficulty

- This is quite a difficult concept, so check that the learner is confident with an ordinary thermometer first. If they are then you know that it is the dual sliding scale that is probably causing the difficulty, and/or the language of maximum/minimum.
- Cover up one side of the thermometer at a time, as was done with the OHT, to reduce the visual confusion, and work together on one part at a time. Talk about the abbreviations of max. and min. and ask the learner to connect the words to something in his or her experience.
- Get the learner to draw a line across each scale with a ruler to mark max., min. and current temperature levels and to write in the temperatures.

Extension

Give the learner another temperature 'scenario' to interpret onto a blank outside thermometer.

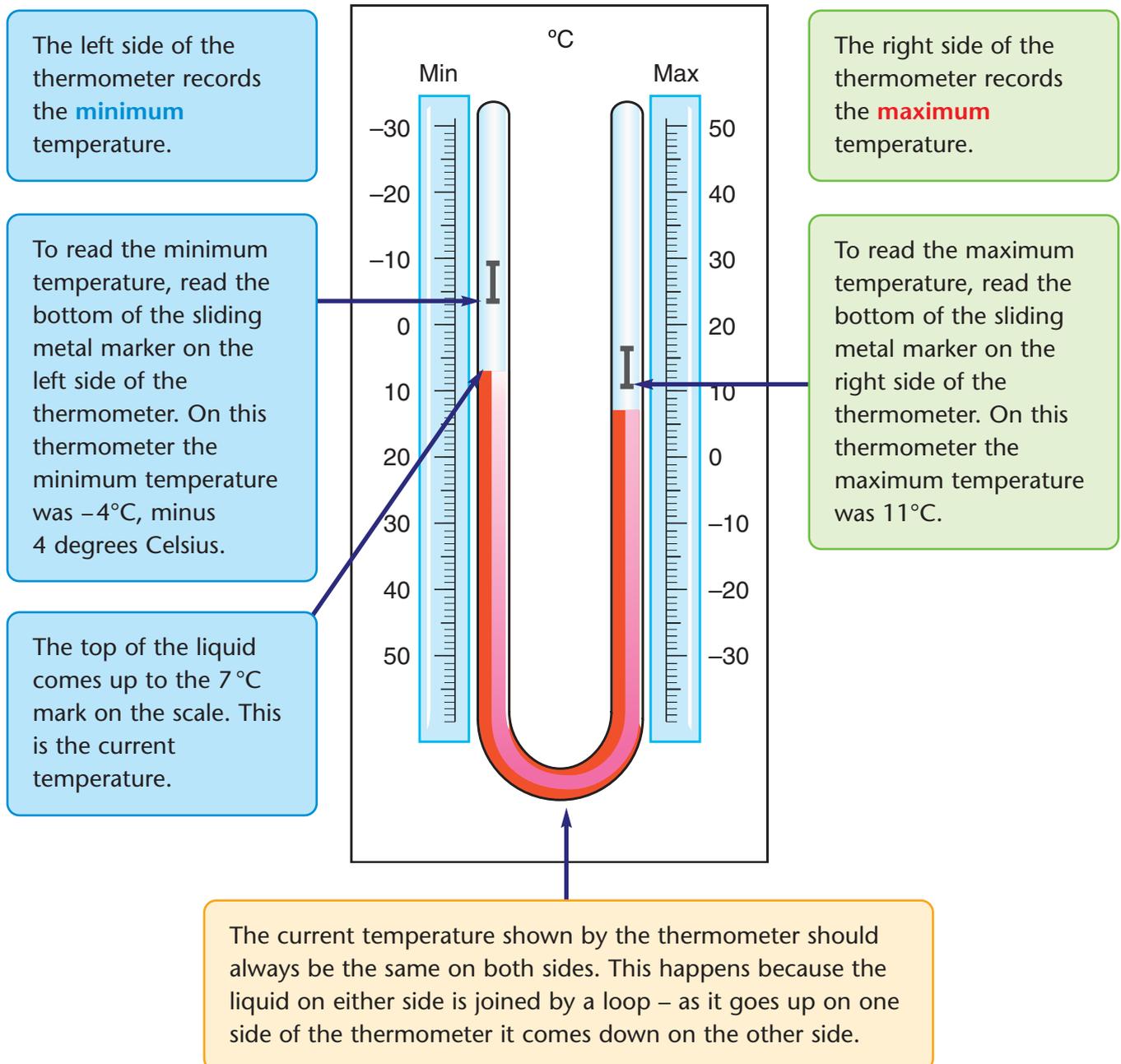
Theme assessment

- Give learners a chart similar to the one used in this theme and ask them to record the morning and afternoon temperatures of their germinator rooms/glasshouses in their workplace for one week and to write down the names (or just two if there are a lot) of the plants/crops grown in them.

Checking the temperature (2)

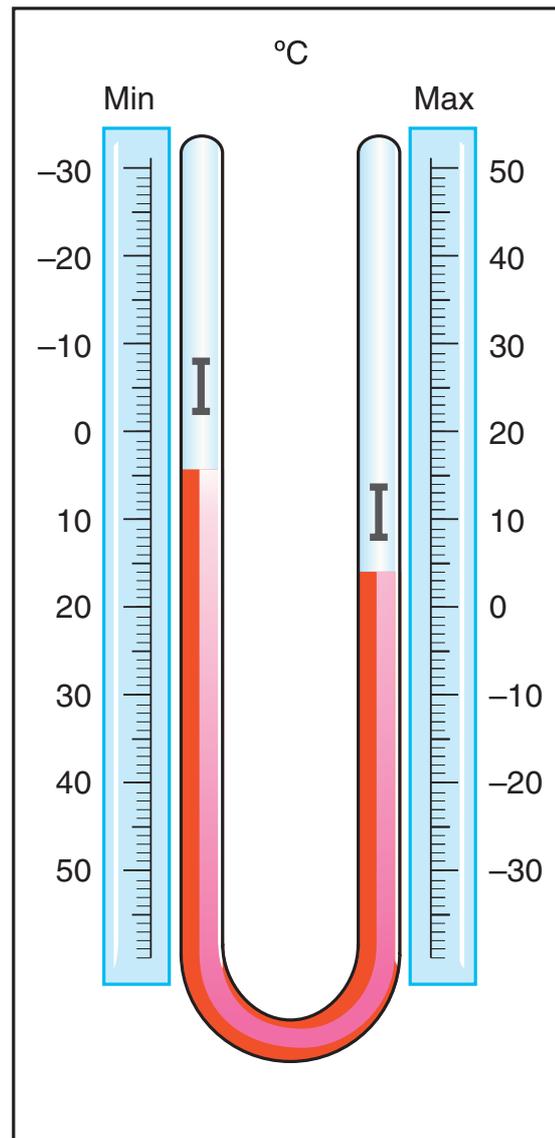
Focus

Temperatures outside are recorded using a special type of thermometer called a maximum and minimum thermometer or max. min. thermometer for short. A max. min. thermometer allows you to record the lowest (minimum) temperature and highest (maximum) temperature over a period of time.



Checking the temperature (2)

Task



Task 1

Use the readings on the max. min. thermometer above to answer the questions.

- 1 What was the maximum temperature recorded on the thermometer? _____ °C
- 2 What was the minimum temperature recorded on the thermometer? _____ °C
- 3 What is the current temperature according to the thermometer? _____ °C

To read the current temperature you read the top of the liquid.

PAGES 5:11–5:12

Pests and diseases

Employees working in a production setting will be expected to monitor plants constantly for signs of pests or disease. This may be a formal process in which they complete a check of specified beds or areas, or may be a continual process or ethic within the organisation, where everyone is vigilant all the time. Learners may also be involved in the control of pests and diseases in the workplace. They need the skills to find out about signs of pests and diseases, and appropriate products to use. This theme looks at the reading skills needed to find the right information, as well as some of the skills involved in understanding it. This theme assumes the use of biological controls rather than the chemical controls exemplified in Module 3 Pesticides. The theme develops skills that will contribute to Unit CU78 (Identify the presence of pests, diseases and disorders, and assist with their control).

Materials

Workplace information about pest and diseases, including reference books commonly used

Plant samples, graphics or photographs showing signs of pests and diseases

Workplace information about products, including relevant health and safety information

Pests and diseases product manual extract from the Source material (0:22)

Learning outcomes

- 1 To use skimming and scanning skills to locate information about pests and diseases (focus page, Task 1)
- 2 To use careful reading skills to extract information from documents (focus page, Tasks 1 and 2)

Introduction

- Discuss learners' experiences of pests and diseases at work. Where do they see these? How do they know which is which? What should they do if they see signs of pests or diseases? Discuss the impact of not reporting pest and diseases.
- If learners have to find out about pests and diseases, how do they do this? What reference sources do they use? Are these difficult to understand?
- This might be a useful opportunity to look at some typical signs of pests and diseases. Plant samples, graphics or photographs can be placed around the classroom and the learners can record observations (e.g. holes along the edge of the leaf, tops wilted, etc.).
- It is also a useful opportunity to look at pest-control products (which product to use for which pest/disease, how to use them safely, etc.). This should be part of a wider look at health and safety and may be a useful introduction to work on the spray certificate.

Focus page

- Look at the focus page, which includes information on signs of pests, pest control products and a typical product label.
- Relate the reading techniques described on the page to the information about pests and products. Look at headings and subheadings on the product label. Ask learners to find specific information, for example *Which section tells you how to use the product?*
 - **Gist:** which of these three sets of information would you use to find out about pests? (pests fact file)
 - **Understanding instructions:** look at the instructions on the product label. Ask learners to give the instructions verbally to a colleague, using their own words. Check that these versions are accurate.
- Discuss strategies for finding out the meanings of technical words: using a dictionary or glossary, asking a supervisor, trainer or colleague. *Which of these is the best method for finding out the meaning of 'biological solutions'?* (glossary) *How about 'agitate well'?* (dictionary) *'Larvae'?* (Ask your teacher.) ESOL learners may need to have the different uses of words explained.

- Finally, look at the use of graphics to aid understanding. Good graphics (as used in various commonly used manuals) are invaluable aids to understanding information, and are particularly useful for identifying pests and the effects of diseases.

Curric. refs	NOS	Key Skills
Rt/L1.4	CU78	C1.2
Rt/L1.5		
Rt/E3.9		

Task 1

Use a range of reading skills to extract information about pests

Rt/L1.4

Rt/L1.5

- Ensure learners each have a copy of the extract from the *Pests and diseases* product manual from the Source material.
- The questions in this task require the learner to use scanning skills to locate information, ideally using the headings. They will then need to read the information carefully.
- One question is about the meaning of a word. Encourage learners to use the glossary for this.

If the learner has difficulty

- This task requires the learner to hold several pieces of information in the memory and thus may be difficult for some learners. You will need to work with the learner, modelling how to build the information needed to answer the questions. For example, *question 3 is about pests. First, which section is likely to have information about pests? The question is about leaf damage. Can you spot the word 'leaf' or 'leaves'? It appears in two places. Which two pests are involved in leaf damage?*
- Check the learner understands the information. Work on any unfamiliar language. Confirm the learner knows how to use the glossary.

Extension

Using a workplace manual on pests (ideally one structured in a similar way to this extract), set further questions to test comprehension. This could be made into a competitive game in the classroom.

Task 2

Use reading skills to solve a problem about pests

Rt/L1.4

Rt/L1.5

Three symptoms are listed here. Careful reading and a process of elimination are required to identify the answer. Encourage learners to take a methodical approach, looking at the symptoms one at a time.

If the learner has difficulty

- Work through the process of elimination with the learner, modelling the decision-making process: Which pests look like caterpillars? Scan for the word 'caterpillar'. It appears under two pest headings, so it could be either of these. Now look at the next symptom (damage occurs at night).
- Check that the learner understands the relevant vocabulary and can select the appropriate key words from the question (e.g. semi-circular bites).
- ESOL learners may not be familiar with words that English people consider to be common, such as 'caterpillar'.

Extension

Using a workplace manual, devise further typical scenarios about pests, asking learners to identify what they might be. This could take the form of a timed quiz.

Theme assessment

Learners could audit a greenhouse or other growing area for signs of pests/diseases and then use the workplace manual to identify what they are and how to treat any affected areas.

Pests and diseases

Focus

As a grower you have to monitor plants and crops all the time for pests and diseases. You need to be able to recognise individual pests or the signs of disease. You also need to select and apply the correct product to control pests and diseases.

You do not need to read the whole document. Use the headings and subheadings to find the part you want to read. You can spot headings and subheadings because they stand out in some way. They may be in a different **colour**, **size** or **font**. They may be **bold** or in **CAPITAL LETTERS**.

When you read to get the **gist** or general idea of what something is about, your eyes **skim** across the page. Your eyes often pick out the things that stand out or look different. This is a bit like looking for a friend in a crowd.

Read long pieces of writing a bit at a time.

- Read each bit more than once to check that you have understood it.
- Put each bit in your own words.
- Explain what you have read to somebody else.

Pests fact file: Damage symptoms



Trialeurodes vaporariorum

- Both adult whitefly and larvae extract food from the plant, causing growth reduction.
- Viruses may also be transmitted



Chrysodeixis chalcites

- Small caterpillars mainly feed on the underside of leaves causing holes in the leaves.
- The excrement of the caterpillars soils the crops



Otiorynchus sulcatus

- Larvae cause most damage, eating on the roots, making the plant turn yellow and wither.
- Circular bits taken out of the plant can decrease the

Pictures or diagrams give you **further information**. They can help you to understand the **meaning** of words.

When you understand technical words it is easier to use them as part of your everyday language.

Every product gives advice on:

- **what** to do
- **when** to do it.

There will also be instructions about:

- **how** to do it.

Pest control products: Biological solutions

Target: Products for different types of Whitefly

Bemix	To use on female adults – all over lemon/ yellow
In-strip	To use on female adults – black head and yellow body
Mightykill	To use on larvae – cotton yellow appearance



If you can't find out about something you don't understand – ask!
You are responsible for what you do!

Pests and diseases

Task

Use the extract from the *Pests and diseases* product manual from the Source material to complete the following tasks.

Task 1

- 1 Which pest is a major problem for a particular type of crop?

- 2 Which pest has the most life stages?

- 3 Which pests damage the leaves of plants?

- 4 You have found some whitefly and caterpillars in the glasshouse. Which product can you use to get rid of both of these pests?

- 5 What does 'moulting' mean?



Remember to scan for key words

Task 2

Read these notes from a colleague about the symptoms of a pest she has spotted.

- 1 Which pest is it?

- 2 What product should you use to remove the problem?

- 3 Why is it important to stop this pest quickly?

Please can someone see if they can deal with this pest tomorrow ...

- The pests look like caterpillars.
- Most of the damage seems to be during the night.
- There are semi-circular bites from the edges of the leaves.

Thanks

Sheila

PAGES 5:13–5:14

Picking lists

Picking or order assembly occurs at the end of all production processes, whether in horticulture or more general manufacturing settings. Speed and accuracy are vital to ensure that the correct orders are dispatched to the correct customers. Picking or order assembly entails reading and understanding order sheets or picking lists. Pickers need to understand the format of the lists (information listed in rows, under column headings), the use of abbreviations and codes and have some strategies for working through these systematically so that nothing is overlooked. This theme looks at the format of a typical picking list and sets questions based on it. It relates to and underpins Unit CU79 (Identify, collect and prepare plants for dispatch) but does not directly reflect any of the performance criteria.

Materials

Picking lists from the workplace

Picking list – Avendale Nurseries from the Source material (0:23)

Learning outcomes

- 1 To use the format of lists to locate information (focus page, Task 1)
- 2 To understand common abbreviations used in picking lists (focus page, Task 1)

Introduction

- Discuss learners' experience of picking lists. Do they pick orders at work? What is the purpose of picking lists?
- Do they have any difficulties? What difficulties have they experienced? What might be the impact of incorrect items being picked?
- Look at some examples of picking lists from the learners' workplace. Do learners understand how they work?

Focus page

- This focus page uses a typical picking list. It would be useful to compare the list with one from the workplace. It might be useful to make an OHT from the picking list, to demonstrate sections to learners.
- Look at the layout and information contained in the picking list. This is a useful opportunity to discuss how orders come in and are processed and why it is important to keep accurate records – inaccurate handling can result in lost sales.
- Emphasise the need for a methodical approach, particularly with lengthy, complex orders, when both picking and checking.
- Look at the column headings. These often include abbreviations and it is important to understand what the abbreviations mean. Is there a key or will learners have to find out meanings in some other way? Discuss how they might find the information.
- Compare the column headings with those used on workplace picking lists. They probably cover similar information.
- Demonstrate how to find information using column headings and where to locate this in the rows. Emphasise the need to track accurately across rows and discuss the use of aids to tracking (e.g. a ruler, piece of paper or a finger).
- Some number skills may be needed to add quantities. Check learners have a sound method for this and can use a calculator.

Curric. refs	NOS	Key Skills
HD1/E3.1 Rt/E3.5	CU79	N1.1

Task 1

Extract information from a table

HD1/E3.1

Rt/E3.5

- Ensure learners each have a copy of the Picking list for Avendale Nurseries from the Source material.
- Introduce the scenario of using a picking list in the workplace. Learners need to understand the questions before attempting to answer them. This requires careful reading, as well as locating information in the list. Some addition and counting skills are required.
- Encourage learners to use some kind of tracking aid and to develop a checking-off system when items are located. Remind learners to check any calculations.

If the learner has difficulty

- Ensure the learner understands the questions and abbreviations used. Work through the first question, to establish if the learner understands what is expected.
- Quite careful interpretation of the data is required, so confirm that the learner is not making errors of carelessness.
- Ensure the learner is not making errors in counting or addition – support may be needed if this kind of error is the result of poor numeracy skills, rather than carelessness.
- Dyslexic learners may have difficulty with this kind of tracking activity. Encourage them to use a ruler to aid tracking, and to develop a checking-off system when items are located.
- When sorting information from tables, it can help to put information in smaller chunks on cards or sticky notes.

Extension

- Is the total quantity of plants correct? (It should be 2993.)
- Discuss how they would tackle errors in documents of this kind. Is it safe to ignore errors?

Theme assessment

Using picking lists from work, learners can develop a quiz in pairs, using similar questions to this task.

Picking lists

Focus

Picking lists give you instructions to read and follow. You need to know how to read a picking list so that you can put orders together. Look at the picking list for Avendale Nurseries in the Source material as you work through this page.

Picking lists are set out in tables. Information in tables is set out in **rows** and **columns**.

Rows run across the page from left to right. →

Columns run down the page from top to bottom. ↓

DIRECTOR OF DIRECT SERVICES
 GROUNDS MAINTENANCE
 HALVE STREET
 AVENDALE HV12 7QW
 Tel 011976 445783

Order Date :17/10/06
 Account Code :AV01128
 Customer Order Number :AV0G113
 Despatch Date :26/10/06

Description	Shape	Pot	Qty	Locat
ROSA FLOWER CARPET RED VELVET	30-40	B.R.	180	20L
EUONYMUS FORTUNEI DARTS BLANKET	30-40	2ltr	370	1L
ROSA FLOWER CARPET RED VELVET	30-40	B.R.	60	20L
ROSA FLOWER CARPET SUNSHINE	30-40	B.R.	180	12R
ROSE SHRUB FRAU DAGMAR HASTRUP	30-40	3ltr	45	4L
ROSE SHRUB MAX GRAF	45-60	B.R.	140	8L
CRATAEGUS MONOGYNA	60-80	B.R.	768	15L
CRATAEGUS MONOGYNA	45-60	B.R.	200	6L
PRUNUS SPINOSA	60-80	B.R.	200	6R
ROSA SHRUB ROSERAIE DE L'HAY	30-40	B.R.	40	10L
CRATAEGUS MONOGYNA	60-80	B.R.	60	19L
ROSA PINK FLOWER CARPET	60-80	B.R.	360	19R
ROSA SHRUB ROSERAIE DE L'HAY	30-40	B.R.	390	19L

Use your finger to **track along** the row. Look at the column headings to find what you are looking at.

The first item on this picking list is 'Rosa Flower Carpet Red Velvet', 30-40 centimetres high, bare rooted. You need to get 180 of them from location 20L.

Look **down** the 'Description' column to find out what it is you have to pick.

Then look **across** to find out the shape, the pot it comes in, the quantity and the location of what you have to pick.

Find out the meaning of any **abbreviations**.

For example, here:

B.R. = bare rooted **ltr** = litre

Always ask somebody if you are unsure about the meaning of an abbreviation.

Use the column headings to find out the information you are looking at. For example:

Description – This is the column where the **name of the plant** you are looking for is listed.

Shape – This column lists the **size or shape** of the plant in centimetres. 30-40 in this column means that the plant is 30-40 centimetres tall.

Qty – This is the **quantity** or number that you need to get.

Picking lists

Task

Task 1

Use the Picking list for Avendale Nurseries from the Source material to complete the following questions.

- 1 In which column in the picking list would you find how many items to pick? Tick your answer.
 - a Description
 - b Shape
 - c Pot
 - d Qty
 - e Locat
- 2 In which column on the picking list would you find the size of plant to pick? Tick your answer.
 - a Description
 - b Shape
 - c Pot
 - d Qty
 - e Locat
- 3 According to the picking list, how many of the 'Rosa pink flower carpet' plants do you need to pick?

- 4 What size 'Prunus spinosa' do you need to pick?

- 5 What is the total number of 'Crataegus monogyna' plants that you need to pick?

- 6 How many plant types have to be supplied bare rooted?

- 7 How many locations do you have to visit to complete this order?

The column headings tell you what is being listed in each of the columns.

Use your finger to track along the row. Look at the column headings to find what you are looking for.

Add up each of the individual quantities to work out what the total quantity is.

PAGES 5:15–5:16

Using a plan

This theme is an extension to the previous theme on picking lists and looks at understanding location plans in order to locate products for making up orders. Layout or location plans are used in many workplaces and can be quite complex, so it is important that workers can read, understand and follow them. The speed and efficiency of completing a picking list for dispatch will be reduced if plants cannot be located with ease. Additional skills are required if workers use a plan in response to spoken or written instructions. The ability to locate plants using a plan contributes to the skills required in Unit CU79.1.

Materials

Plan of Avendale Nurseries from the Source material (0:24)

Location plans (e.g. of the teaching room and another nursery)

Examples of road maps, house plans or similar

Audio equipment

Learning outcomes

- 1 To read and understand a location plan, using positional vocabulary (focus page, Task 1)
- 2 To extract information from a plan (focus page, Tasks 1 and 2)
- 3 To listen to instructions and relate them to a plan (Task 3)

Introduction

- Discuss learners' experiences of location plans at work. How do they locate particular plants at work? Is a location plan useful for this? Does it make it easier? Liken the location plan to a map, used to help people find their way about.
- What skills do you need to read a map or plan? It might be a useful idea to look at road maps, house plans, etc.
- Discuss any difficulties experienced with understanding location plans, such as use of keys.

Focus page

- Ask learners to explain what they think a plan is. Try to elicit that it is an aerial (or bird's eye) view – what you would see if you looked down on the nursery from above.
- A plan of the teaching room would be a useful way to introduce this focus page. Give learners time to look at it and think about what your plan details represent. Ask them to imagine that they are above, looking down on the room and therefore seeing just the top of everything. Ask them to give directions from one item to another within the room, using accurate, informative words such as 'left' and 'right'.
- Ask learners to draw a plan of a room at home with items labelled, and explain that everyone in the group is now able to see that room's layout.
- Explain that plans give the opportunity for reducing the size of a real room or space and drawing to scale. You may need to check that learners understand what is meant by 'scale'. This can be demonstrated using maps or a road atlas. Support materials on scale can be found in *Skills for Life* Numeracy Level 2, Unit 4. Note though that some learners may not be ready for this concept and it can be avoided as it is not critical to the tasks.
- Look at the information on the focus page. Refer to the room plans that have been worked on to demonstrate that plans can be drawn for any workplace.
- Talk through the information in the boxes, linking it to the items on the plan. Are learners able to 'see' where greenhouses, walkways, etc. are? Are they able to identify the road, where main entrance and loading facilities might be?
- The section of the picking list on the focus page should be linked to the plan. Talk through the highlighted '20L' and ask learners to find it on the plan. Do the same for '1L'. The two locations are at opposite corners of the plan. Are learners able to work out the layout system?

- Explain that although each of their workplace nurseries is likely to have a different layout, there will be a logical system to its reference/position numbers and codes. Stress the importance of becoming familiar with these. Note: point out to learners that the labels 'L' and 'R' on the plan may not actually be on the learners' left and right when they are walking around the nursery. It might be worth demonstrating this point using the room plan. It is worth spending some time on this, as many learners – particularly those who are dyslexic – find these orientation skills difficult.

Curric. refs	NOS	Key Skills
MSS2/E2.3	CU79.1	N1.1
MSS2/L2.1		
HD1/E3.1		
SL1r/E3.2		

Task 1

Read and understand a plan

MSS2/L2.1

MSS2/E2.3

HD1/E3.1

- Ensure that learners each have a copy of the Plan of Avendale Nurseries from the Source material. Read the instructions for Task 1. Draw their attention to the 'Tip'.
- Before doing the task you could try a similar exercise using the room plan and discuss the benefit of turning the plan around to match the direction you are facing.

If the learner has difficulty

- Dyslexic learners may experience difficulties in the orientation and positional skills required for this task. Check they have a strategy for discriminating left from right and that they respond to positional instructions readily (e.g. turn right, pick the tray on your left, on my right, etc.).
- Go through the room plan both physically and on paper. Encourage the learner to move around the room, turning the plan to match his/her direction.

- Provide a copy of the Avendale Nursery plan to cut into sections – preferably into the grouped greenhouses. Does the learner understand the layout system well enough to be able to put it back together?
- Take one section of the plan at a time. Ask the learner to imagine that he/she is standing in that section of the nursery. Turn the plan around several times and ask what is now in front, behind, to the left, to the right, etc. Repeat this for all the sections then ask learner to place the cut sections on the complete plan. Can he/she see how it all comes together? Do the same task using the whole plan.

Extension

Provide another plan with a different numbering system and ask similar questions to Task 1.

Task 2

Read and understand a plan

MSS2/L2.1

MSS2/E2.3

HD1/E3.1

- Remind learners that they can turn the plan as often as they like.
- Draw attention to the 'Tip'.

If the learner has difficulty

- Use similar support strategies as for Task 1.
- Ensure that the learner can identify the points X and Y and can point to the direction in which he/she is meant to be facing.
- Is the learner confident with left/right?
- If serious difficulties with plan reading persist, some additional support could be needed. Support materials on scale can be found in *Skills for Life Numeracy Level 2 Unit 4*.

Extension

- Add in similar questions to the extension task set for Task 1.
- Ask learners to develop similar questions based on another plan.

Task 3  

Listen to instructions and relate them to a plan

MSS2/L2.1

MSS2/E2.3

HD1/E3.1

SLlr/E3.2

- Play both audio clips through once for gist. Play them a second time, one at a time, and ask learners to make a note of the instructions.
- With the plans in front of them, replay the audio for learners to follow the route with their fingers or mark with a pencil. Complete the answers.
- Replay the audio clip for learners to check their answers.

If the learner has difficulty

- Replay the audio clip several times, one sentence at a time if necessary, to encourage the skill of identifying the key details. Is the learner able to write these down? If not, act as scribe and ask the learner to highlight the key words, then look at the plan. Can he/she visualise the scenario of walking along that road?
- Several skills are involved (listening to key details in instructions, understanding positional vocabulary, relating details of instructions to a plan); anxiety about one can affect the efficiency of another.
- You may need to demonstrate key phrases for ESOL learners before listening again to the audio clip.
- Remind the learner that support from colleagues in the workplace and familiarity with the geography of the workplace will help him/her to learn the way around – plan reading is not the only way to learn the layout of a place.

Extension

Develop similar verbal directions for another plan.

Theme assessment

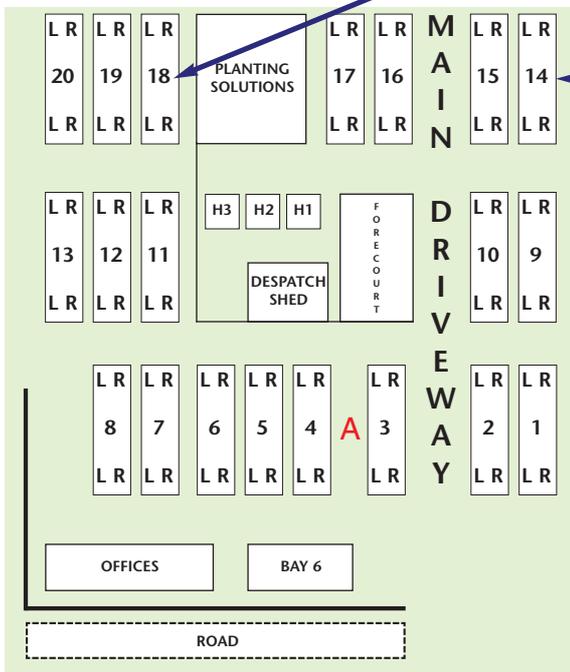
- Ask learners to bring in plans of their various workplaces. Select one or more and devise activities to reflect Tasks 1–3.
- On the Plan of Avendale Nurseries show the location of the items on the Picking list for Avendale Nurseries from the Source material.

Using a plan

Focus

The picking list gives you the location of each of the items that you need to pick. To find these locations, you need to be able to read and understand a plan.

This is a location plan for a nursery. It shows you the position of every building in the nursery. Each of the greenhouses in the nursery is labelled with a number.



This is greenhouse number 14. An item located on the right-hand side of this greenhouse would have the location number 14R in the picking list.

Where you are and the direction you are facing is very important when you are using a location plan.

- If you are at point A facing the forecourt, then greenhouse 3 will be on your right.
- If you are at point A facing Bay 6 then greenhouse 3 will be on your left.

Work out which direction you are facing and then turn the plan around to match the direction you are looking from.

This column on the picking list gives you the location of each of the items you need to pick.

Description	Shape	Pot	Qty	Locat
ROSA FLOWER CARPET RED VELVET	30-40	B.R.	180	20L
EUONYMUS FORTUNEI DARTS BLANKET	30-40	2ltr	370	1L
ROSA FLOWER CARPET RED VELVET	30-40	B.R.	180	20R

The location consists of a number followed by the letter 'L' or the letter 'R'.

20L means that the item is located on the left-hand side of greenhouse number 20.

The number corresponds to the greenhouse where the items you are picking are located.

The letter 'L' tells you that the item is located on the left-hand side of the greenhouse and the letter 'R' tells you that the item is located on the right-hand side of the greenhouse.

Using a plan

Task

Use the Plan of Avendale Nurseries from the Source material to complete the tasks.

Task 1

- 1 You are standing at point X looking at the main driveway.
 - a Which greenhouse is on your left? _____
 - b Which greenhouse is on your right? _____
- 2 You are standing at point Y looking at the main driveway.
 - a Which greenhouse is on your left? _____
 - b Which greenhouse is on your right? _____

Turn the plan around to match the direction you are looking.

Task 2

- 1 You are standing at point X facing the main driveway. You walk towards the main driveway and then turn right after greenhouse 4. Which greenhouse will be on your left?

- 2 You are standing at point Y with your back to the main driveway. You walk past greenhouse 10, turn right and then take your next left. Which greenhouse will be on your right?

Follow the instructions on the plan with your finger.



Task 3

22

Listen to the directions. Draw the route for each set of directions.

Write down where you are at the end of each set of instructions.

- 1 _____
- 2 _____

Follow the instructions on the plan with your finger.

PAGES 5:17–5:18

Choosing the best route

Employers encourage the most efficient use of their employees' time. Being able to read a plan, become familiar with it and relate it to the actual place will ensure that the minimum amount of time and energy is wasted.

The ability to locate plants using a plan contributes to the skills required in Unit CU79 (Identify, collect and prepare plants for dispatch). This theme follows on from the previous theme 'Using a plan'.

Materials

Sample picking lists

Nursery plans

Plan of Avendale Nurseries from the Source material (0:24)

Learning outcomes

- 1 To understand the need for planning routes, using a location plan (focus page, Task 1)
- 2 To find the best route for a picking list (focus page, Task 2)

Introduction

- Discuss the need for efficient use of time and energy. Planning the shortest route around the nursery can save a considerable amount of time, and having to repeat a route can be annoying – for employee and employer. Learners need to be able to look at plans and relate them to the layout of their workplace. For maximum efficiency, they need to be able to identify any nursery place or position on the plan and work out the shortest route to it.
- This theme looks at using acquired knowledge and understanding to think through the most appropriate route for a picking list.

Focus page

- Remind learners of any work done previously on picking lists and using plans. This focus page combines the skills of both to help learners select the best routes around a nursery.

- Look first at the information in the first two boxes about the starts and ends of picking lists routes. Find these two places on the plan.
- Ask learners to look at the information in the next two boxes. Discuss the value of always beginning a route at the point nearest to where the picking list is collected and to finish the route closest to the dispatch point.
- The idea is to be as logical and systematic about planning routes – find the shortest route that allows you to pick everything you need, with a starting point that is the furthest point away from dispatch, so you don't have to carry the full load too far.
- Ask learners to look at the picking list and first mark all the 'locations' that they need to go to on the plan. What are the disadvantages of following a route based on the order on the picking list?
- Ask them to plan the best route for this picking list. You could use an OHT of the plan to aid the group discussion. Suggest that learners read the guidance in the box to the right of the picking list. Ask learners to list the order in which they would pick the items.
- Read the best route for the picking list given at the bottom of the page. How did learners' routes compare?
- Reinforce the process of finding the shortest route by:
 - marking all the locations they must visit on the plan
 - working out the shortest route around the locations, marking it in pencil on the plan
 - writing a list of the order in which they will pick.
- Work through the model on the page again if necessary for learners who are finding the task difficult.

Curric. refs	NOS	Key Skills
HD1/E3.1	CU79	N1.1

Task 1

Use a plan to locate objects
HD1/E3.1

- Ensure that learners each have the Plan of Avendale Nurseries from the Source material.
- Remind learners that the planned routes should take them (and the plants) from the point furthest from the dispatch point to the point closest to it. Stress this point by referring to the Tip box.

If the learner has difficulty

- Check that learners understand the language needed for the question, in particular 'nearest' and 'furthest'. Dyslexic learners may have problems understanding the relationship between the 'locats' and the plan. Work through this with them.
- Get learner to mark each of the 'locats' on the plan. Is this a problem? Can the learner identify the furthest and nearest points to the dispatch shed? Now look at the 'locats' between these two points and discuss the order in which they appear if you are walking from the offices.
- Encourage the learner to use a finger to trace the route being discussed. When the route order has been agreed, it can be drawn on the plan. This will help the learner to 'see' the route and make it more meaningful.

Extension

Ask learners in groups to consider the format of the picking list. What are the advantages and disadvantages of putting the items in order according to their location?

Task 2

Find the best route
HD1/E3.1

- Ask learners to think about Task 1 and the details they filled in on their plans. These can now be used to help them plan the route for Task 2.
- Remind them of the information on the focus page.
- Suggest that they count how many items are on the picking list before they begin their route. These can be ticked off as they go along. Have they missed off any plants? Have they done a check?

- The answer to this question could be recorded in writing, but it might be useful to mark it on a copy of the plan.

If the learner has difficulty

- Check that learners understand 'nearest' and 'furthest' and that they can identify the locations on the plan of all the plants.
- Ensure that the plant names are written in the relevant locations on the plan. This will help to identify locations for this task.
- Encourage the learner to trace possible routes with a finger. Is this the best way? Could it be shorter? In which order should the plants be picked (i.e. which is furthest away from dispatch?)
- Encourage the learner to count the number of items on the picking list and look for any duplicated locations. Does he/she have the correct number of locations written on the proposed route?

Extension

Repeat this activity with the same plan and a different picking list.

Theme assessment

Repeat this activity with different plans and picking list from the workplace.

Choosing the best route

Focus

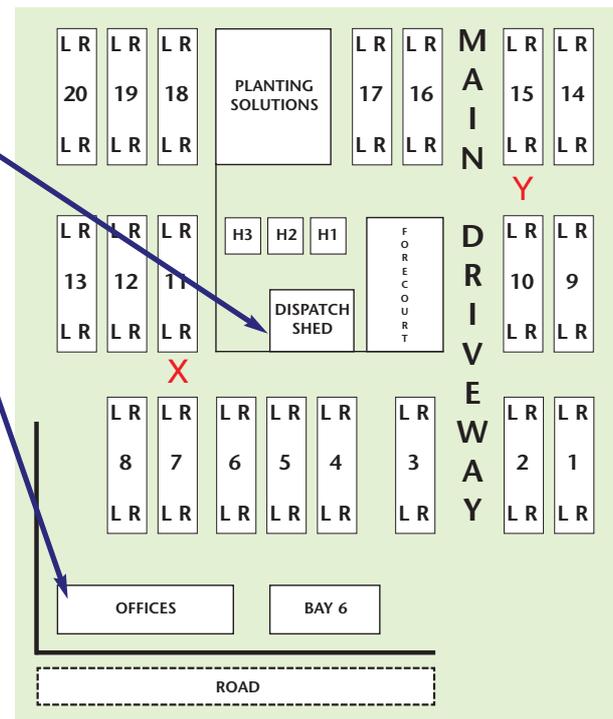
Once you have got your picking list from the offices, you need to work out the best route to take in order to pick up the plants on the list. You should try to take the shortest route, as this will be the quickest and most efficient.

All orders are dispatched from the dispatch shed, so this is where your route will finish.

You get the picking lists from the offices, so you will always start here.

It is best to visit the locations furthest away from the dispatch point first. This will ensure that you are carrying the most weight (i.e. the total load) the shortest distance.

The first item you should pick should be the furthest away from the dispatch shed, the second item you should pick should be the second furthest from the dispatch shed and so on.



Description	Shape	Pot	Qty	Locat
ROSA FLOWER CARPET RED VELVET	30-40	B.R.	120	16R
EUONYMUS FORTUNEI DARTS BLANKET	30-40	2ltr	50	7R
CRATAEGUS MONOGYNA	30-40	B.R.	30	10L
PRUNUS SPINOSA	60-80	B.R.	60	3L
ILEX AQUIFOLIUM	40-60	B.R.	70	13R
CRATAEGUS MONOGYNA	60-80	B.R.	200	10L

Check your picking list to see if any locations are the same. You don't want to visit the same location twice.

The **best route** for this picking list is:

- Come out of the offices and go to location 13R first because it is the furthest from the dispatch shed.
- Then go to 7R because it is the second furthest from the dispatch shed and then onto 3L.
- Next go to 10L, remembering that this appears twice on the picking list.
- Finally go to 16R because this is the nearest to the dispatch shed, then back to the dispatch shed.

Choosing the best route

Task

Use the Plan of Avendale Nurseries from the Source material to complete the following tasks.

Task 1

You have been given this picking list in the office.

Description	Shape	Pot	Qty	Locat
ROSA FLOWER CARPET RED VELVET	30–40	B.R.	45	20L
EUONYMUS FORTUNEI DARTS BLANKET	30–40	2ltr	200	12R
CRATAEGUS MONOGYNA	30–40	B.R.	200	6L
PRUNUS SPINOSA	60–80	B.R.	20	1R
ILEX AQUIFOLIUM	40–60	B.R.	10	15L
CRATAEGUS MONOGYNA	60–80	B.R.	50	6L

The first item you pick should be the furthest away from the dispatch shed, the second item you should pick should be the second furthest from the dispatch shed and so on.

Which of these is the best route to visit the locations on the picking list above?

- 1 15L, 1R, 6L, 12R, 20L
- 2 20L, 6L, 1R, 15L
- 3 20L, 12R, 6L, 1R, 15L
- 4 20L, 6L, 12R, 1R, 15L

Task 2

Write down the best route to take to get all of the items on this picking list.

Description	Shape	Pot	Qty	Locat
ROSA PINK FLOWER CARPET	30–40	B.R.	45	15L
ROSA SHRUB MAX GRAF	30–40	2ltr	200	5L
ROSA FLOWER CARPET RED VELVET	60–80	B.R.	200	11L
PRUNUS SPINOSA	30–40	B.R.	20	3R
ROSA SHRUB ROSERAIE DE L'HAY	40–60	B.R.	10	18L
PRUNUS SPINOSA	60–80	B.R.	50	3L

PAGES 5:19–5:20

Picking large quantities

Counting in batches is a skill used frequently in all aspects of horticulture. The background for this theme is picking large quantities of plants for dispatch. Learners need to be able to add, multiply and divide whole numbers. It is important that they develop a good feel for numbers so that they can see the relationship between numbers (e.g. four 25s in 100). Knowledge of times tables makes counting in batches easier and quicker.

The skills covered in this focus contribute to the competence needed for Unit CU79 (Identify, collect and prepare plants for dispatch).

Materials

Range of pots and trays

Learning outcomes

- 1 To understand the principle of counting in batches (focus page, Tasks 1 and 2)
- 2 To calculate the number of plants in a tray using multiplication or addition (focus page, Tasks 1 and 2)
- 3 To count, read and compare large numbers (Task 2)

Introduction

- Look at samples of planting trays. These come in a wide range of sizes from 6 to 600 cells/spaces. Give these to learners and ask them to work out the number of plants per tray.
- Discuss and record on the board/flipchart the strategies learners used (e.g. counting every single cell/space; counting one row and one column and multiplying the two; counting one row and then adding other rows one at a time – 10, 20, 30, 40 ...).
- Go through the multiplication process. Check that learners have efficient strategies for this. *Skills for Life* materials can be used to support learners having difficulty (Level 1 Unit 1).
- Highlight how strategies change depending on the size of tray. Sometimes you can just look at a small tray and just ‘know’ how many cells there are – a bit like knowing there are six eggs in a carton at a glance. This is also based on experience.

Focus page

- Although learners need to pick the correct number of plants accurately for dispatch, encourage them to develop a ‘feel’ for number by estimation or approximation (*About how many plants are on this trolley?*). Encourage learners to develop this visual estimation skill by practising with lots of different examples of trays of plants.
- Practise counting in batches. Start counting and then ask learners to supply the missing number you stop at (e.g. 20, 40, 60, _?).
- Using the trays/pots, count in 5s, 10s, 20s, 25s, 30s, etc. Some dyslexic learners (and others) may need a number line or number chart for support. Learners who have significant difficulties with these tasks should be given additional support (e.g. *Skills for Life* Numeracy Level 1 Unit 1).
- If possible, give some practice in other number skills: *Think of a number that is less than 35, is more than 25 and is made by multiplying 6 fives? (30) How many ways can you make 48? (6 × 8; 8 × 6; 4 × 12; 12 × 4; 2 × 24; 24 × 2; 3 × 16; 16 × 3; 1 × 48; 48 × 1)* Explain the relationship between counting in batches by addition and multiplication of rows and columns.
- Point out to learners that counting large batches usually involves a two-step calculation: first you count/multiply the number of plants in a single tray, and then you multiply this number by the number of trays/rows.
- A third step could be involved if you had more than one tray in any row. Encourage learners to use their ‘feel’ for number by relating what they have picked out with the original number needed (e.g. *If I have been asked to pick out 2000 plants, does what I have chosen seem to be enough? If there were 10 plants per tray I should have at least 200 trays!*)

Curric. refs	NOS	Key Skills
N1/L1.1	CU79	N1.2b
N1.E3.1		
N1/E3.4		
N1/E3.5		

Task 1

Calculate the total number of items in batches

N1/E3.4

N1/E3.5

Remind learners that working the calculation involves two steps and ask them to tell you what these steps are. Talking something through aloud helps to reinforce the learning and is a way of 'modelling' the process.

If the learner has difficulty

- Introduce 'concrete' learning tools again by using some real trays and some simple scenarios, for example, *You have to pick 30 lettuces. These trays have hold ten plugs each, so how many trays do you need? How many plants do I have in this stack? How many more trays do I need to make it up to 100?*
- Do the first part of the task together, writing down the steps to be done as you go.
- Support the second part by prompting.

Extension

Ask the learner to imagine carrying the same number of plants in a trolley but using different sized trays and number of shelves. Can he or she do this in two other ways?

Task 2

Calculate the total number of items in batches

N1/L1.1

N1/E3.4

N1/E3.5

- Point out to learners that they need to be thinking about **three** steps to find out how many plants are on one trolley. Write these on the board: 1) number of plants per tray; 2) number of trays per shelf × number in single tray; 3) number of plants per shelf × number of shelves = number on trolley.

- Remind learners that this not the end to this particular task of picking plants for dispatch. They will have to use a strategy to find out how many of these trolleys they will need to meet the order. Encourage adding on until they get to the right number. A calculator may be helpful for adding on or trying out some estimated multiplication by using a 'feel' for number. For example, *It's got to be more than two trolleys because I know that 300 and 300 is 600 and that's a long way off 1280, so I will multiply by 3 and see. That's closer but let me cancel that and try multiplying by 4 – ah that's almost it exactly!* Note: if any learner wants to divide to find the answer, applaud this as another acceptable method.

If the learner has difficulty

- Make sure that the learner is clear about the methods and strategies they can use to work out the number of trays (e.g. batch counting, adding on, multiplication).
- Draw a representation of the trays on each trolley or use sticky notes to represent each tray. Support the learner to add or multiply the trays using a times table square to help.
- Draw simple trolleys and get the learner to write the number of plants on each. Using a calculator, add each number until the quantity required is reached. (Cross off each trolley when it has been added so it will be easy to count how many trolleys make up the number needed for dispatch.)

Extension

Ask the learner to work out the trolleys needed for an uneven number of plants.

Theme assessment

- In pairs, ask learners to devise their own trolleys and number of plants to be dispatched and swop with another pair to work it out.
- Give everyone a scenario – number of plants to be picked and put on a trolley – and ask them to draw a sensibly sized trolley that will carry the number of plants you require.

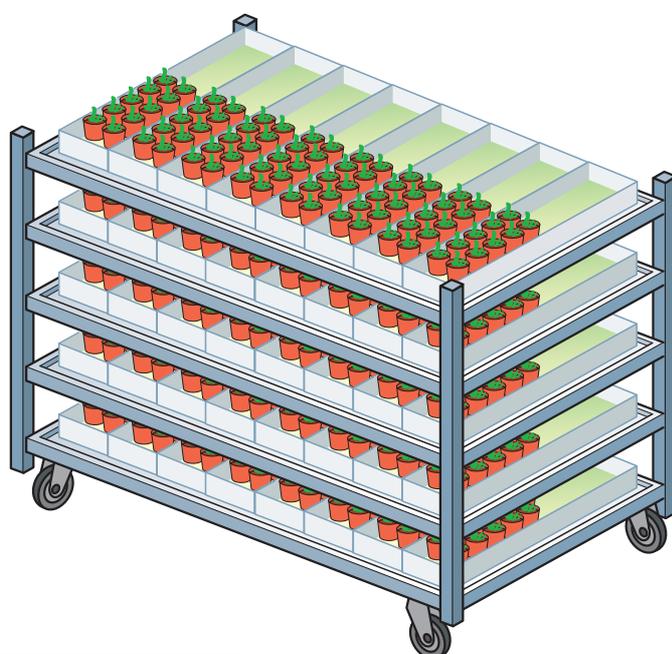
Picking large quantities

Focus

When you are picking orders you have to count large quantities of plants. You won't have time to count every single plant, so you need to be able to count large quantities quickly and accurately.

Work out how many plants are on each trolley.

To do this, multiply the number of plants in each tray by the number of trays on each shelf. Then multiply this by the number of shelves on the trolley.



Each tray contains 10 plants.
There are 8 trays on each shelf
so there are $10 \times 8 = 80$ plants
on each shelf.

There are 5 shelves on each
trolley so there are
 $80 \times 5 = 400$ plants in total.

You can find out the
total number of
plants by **counting**
in batches like this:
400 ... 800 ... 1200

Now that you know that each trolley
holds 400 plants you can count up
the total number of plants on these
trolleys. There are three ways
to do this:

- 1 Count in batches.
- 2 Add them up.
- 3 Multiply.

Use whichever method you find the
easiest.

You can find out the total
number of plants by
adding together the
number of plants on each
trolley:

$$400 + 400 + 400 = 1200$$

You can find out the total
number of plants by
multiplying the number
of plants on each trolley
by the number of trolleys:

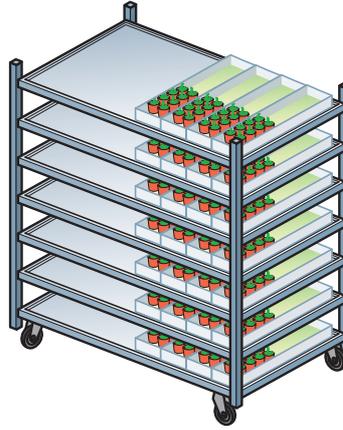
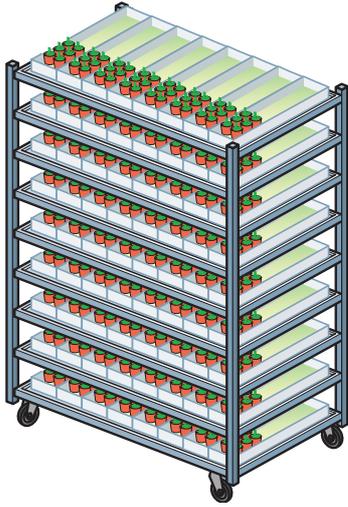
$$400 \times 3 = 1200$$

Picking large quantities

Task

Task 1

Look at these trolleys. How many plants are on each?

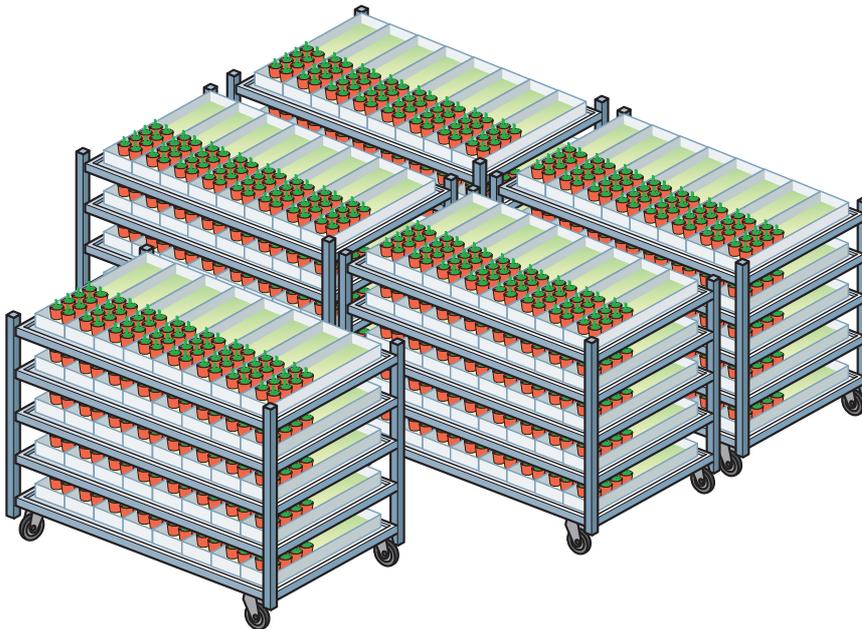


1 _____

2 _____

Multiply the number of plants in each tray by the number of trays on each shelf. Then multiply this by the number of shelves on the trolley.

Task 2



You can work out the total number of plants by counting in batches, adding or multiplying.

Your pick list says that you need to get 1280 of the plants stored on these trolleys. How many trolleys will you need to take to the dispatch shed?

_____ trolleys

Check it

1 What is the main purpose of a flow chart?

- A To show all the steps in a process and how they relate to each other
- B To show how products flow from one place to another
- C To show how many people work in a production process
- D To show who is the boss

Rt/L1.4

2 Using the 'Job codes' from the Source material, which of these is the job code for Transport Administration?

- A 00310
- B 0030
- C 00300
- D 00210

Rt/L1.5

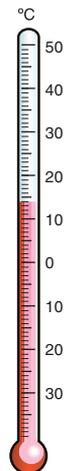
3 Using the 'Picking instructions - Fresh Salads Inc' from the Source material, on which day should any uncompleted work be finished?

- A Wednesday
- B Thursday
- C Friday
- D Saturday

Rt/L1.5

4 What temperature is the thermometer showing?

- A 15°C
- B 14°C
- C 4°C
- D 24°C



MSS1/L1.4

5 What is a max. min. thermometer used for?

- A To show the lowest temperature recorded over a period of time
- B To show the current temperature
- C To show the highest temperature recorded over a period of time
- D All of the above

MSS1/L1.4

- 6 Using the extract from 'Pests and diseases product manual' in the Source material, where does the Whitefly deposit its eggs?
- A In the soil
 - B On the stem of the plant
 - C On the underside of young leaves
 - D In the top of the plant

Rt/L1.4

- 7 Look at the 'Picking list - Avendale Nurseries' in the Source material. How many of the *Crataegus Monogyna* plants do you need to pick in total?
- A 768
 - B 200
 - C 1168
 - D 1228

HD1/E3.1

- 8 Use the 'Floor plan - Avendale Nurseries' in the Source material to answer the following question. If you are standing at point X facing greenhouse 11, which greenhouse will be directly behind you?
- A 7
 - B 13
 - C 8
 - D 13

MSS2/E2.3

- 9 Use the 'Plan of Avendale Nurseries' to decide on the best route to get all of the items on this picking list.

Description	Shape	Pot	Qty	Locat
ROSA PINK FLOWER CARPET	30–40	B.R.	45	2R
ROSE SHRUB MAX GRAF	30–40	2ltr	200	11R
ROSA FLOWER CARPET RED VELVET	60–80	B.R.	200	20L
PRUNUS SPINOSA	30–40	B.R.	20	14R
ROSA SHRUB ROSERAIE DE L'HAY	40–60	B.R.	10	9L
PRUNUS SPINOSA	60–80	B.R.	50	8R

- A 14R, 2R, 8R, 11R, 20L, 9L
- B 11R, 20L, 9L, 8R, 2R, 14R
- C 8R, 9L, 20L, 11R, 2R, 14R
- D 8R, 20L, 11R, 2R, 9L, 14R

HD1/E3.1



10 Your picking list says that you need to get 1792 of the plants stored on these trolleys. How many of these trolleys will you need to take to the dispatch shed?

- A 1
- B 2
- C 3
- D 4

N1/L2.2

Audio

PAGES 5:15–5:16

Using a plan

Task 3 22

- 1 Go along the road with the offices on your left. Turn left into the nurseries and carry on up the main driveway. It's the first greenhouse you come to on your left.
- 2 Go along the road with the offices on your left. Turn left into the nurseries. Take the first left after greenhouse number 3, then take your first right. It's immediately on your left.

Answers

PAGES 5:1–5:2

The production process

Task 1

- 1 Seeds
- 2 Watering and feeding, pest and disease control
- 3 The whole production process will be delayed.
- 4 The whole production process will be delayed or stopped.
- 5 The whole production process will be delayed – more employees will be needed.

Task 2

- 1 False
- 2 False
- 3 True
- 4 True
- 5 False
- 6 True
- 7 True

Task 3

Show your answers to your teacher.

PAGES 5:3–5:4

Using codes in production

Task 1

- 1 Nem = nemesia
- 2 Rud = rudbekia
- 3 Cyc = cyclamen
- 4 Lob = lobelia
- 5 Pan = pansy
- 6 Pet = petunia
- 7 Sal = salvia

Task 2

CAANT110 (Antirrhinum Liberty) and CAIMP607 (Impatiens Carnival Mixed) ×2 are missing.

Task 3

- 1 00200
- 2 05000
- 3 00015
- 4 Health and safety training: 00009

PAGES 5:5–5:6

Following written instructions at work

Focus page

If you opened more than one type of seed at a time then the seeds might get muddled up.

Task 1

- 1 Wednesday
- 2 You must leave a gap of at least one whole day's picking.
- 3 Total number of tracks picked on Monday and Tuesday is 9.
- 4 The column for Saturday has been filled in because the picker did not complete all the instructions for Friday. (The third item in the REMEMBER list states that any work not completed must be done on Saturday.)

Task 2

WEEK SHEET						BLOCK C
WEEK No 44						Key: P – PICKING; T – TWISTING; S – SHOOTING
TRACK NO	MON	TUES	WEDS	THURS	FRI	SAT
1	P T S				P	
2	P	T S			P	
3	P T S				P	
4	P	T S			P	
5		P		P T S		
6		P		P T S		
7		P		P T S		
8		P		P	T S	
Signature <i>P. Davies</i>						

PAGES 5:7–5:8**Checking the temperature (1)****Task 1**

- 1 20
- 2 24
- 3 18

Task 2

GERMINATOR TEMPERATURES				MONTH: MARCH 2005	
DATE	GERMINATOR ROOM 1		GERMINATOR ROOM 2		COMMENTS
	AM	PM	AM	PM	
01/03/05	18°C	19°C	21°C	20°C	
02/03/05	18°C	20°C	19°C	21°C	
03/03/05	24°C	20°C	22°C	21°C	
04/03/05	21°C	19°C	18°C	20°C	

PAGES 5:9–5:10**Checking the temperature (2)****Task 1**

- 1 8°C
- 2 -2°C
- 3 4°C

PAGES 5:11–5:12**Pests and diseases****Task 1**

- 1 Vine weevil
- 2 Whitefly
- 3 Caterpillars and beetles
- 4 Mirikill
- 5 Shedding the outer skin

Task 2

- 1 The pest is a vine weevil, a type of beetle. They can look like caterpillars because sometime they do not have any legs. However the damage to the plants happened during night and vine weevils are only active at night. They also make semi-circular bites in the plants leaves.

- 2 There is only one product to use, called Larvabust.
- 3 It is important to stop the pest quickly because one larva is enough to kill a plant all by itself.

PAGES 5:13–5:14**Picking lists****Task 1**

- 1 d
- 2 b
- 3 360
- 4 60–80 cm
- 5 $768 + 200 + 60 = 1028$
- 6 7 (Be careful: some of the bare rooted items appear on the list more than once)
- 7 10

PAGES 5:15–5:16**Using a plan****Task 1**

- 1 a Greenhouse 11
b Greenhouse 7
- 2 a Greenhouse 10
b Greenhouse 15

Task 2

- 1 Greenhouse 3
- 2 Greenhouse 1

Task 3

- 1 Greenhouse 3
- 2 Greenhouse 10

PAGES 5:17–5:18**Choosing the best route****Task 1**

3 20L, 12R, 6L, 1R, 15L

Task 2

18L, 11L, 5R, 3R, 15L

PAGES 5:19–5:20**Picking large quantities****Task 1**

1 $6 \times 8 \times 9 = 432$

2 $8 \times 4 \times 7 = 224$

Task 2

Each trolley holds $8 \times 8 \times 5 = 320$ plants, so you need 4 trolleys for 1280 plants.

Check it

- 1 A
- 2 C
- 3 D
- 4 B
- 5 D
- 6 C
- 7 D
- 8 A
- 9 D
- 10 B