Practice Aptitude Quiz

Horticulture
It is vital for young people to build their career management skills so they can make informed choices regarding their study and training options and navigate a pathway towards their occupation and career of choice.

This career development resource combines labour market information with a practical industry specific activity to help develop awareness about the skills needed to pursue a career pathway in the Horticulture Industry.

PART 1: About the Horticulture Industry

1. The Horticulture Industry in a nutshell

Key sectors:

- Horticulture
- Arboriculture
- Floriculture
- Landscaping
- Landscaping Construction
- Production Nursery
- Parks and Gardens
- Sports Turf Management

Horticulture is one of Australia’s fastest-growing industries, closely linked to urban development and lifestyle. It includes maintaining parks, gardens, golf courses, as well as plant nurseries and landscaping. Climate change is increasingly becoming a significant topic for this sector.

The Horticulture Industry employs approximately 30 per cent of all workers in the broader Agriculture, Horticulture and Conservation Industry.

Sectors in the industry:

Horticulture (amenity) involves growing plants for some amenity purposes, including decorative (ornamental or recreational) and functional (e.g., environmental management, modification). Amenity horticulture is sometimes described as ‘gardening and landscaping’, ‘ornamental horticulture’ or ‘recreational horticulture’.

Arboriculture covers the maintenance, management, removal, protection and assessment of trees in private and public gardens, parks and streetscapes.

Floriculture includes the growing and harvesting of commercial flowers, flower seed, foliage and essential oil crops, as well as wild harvesting and processing of commercial flowers, flower seed, foliage and essential oil crops.

Landscaping covers a wide range of operations across the sector with a key division between those who focus on hardscape construction, which is often linked to the construction industry, and softscape development involving approaches to plant use, landscape development and the provision of technical advice.
Nursery work covers production, wholesale and retail nurseries. Work includes: propagation, production and maintenance of plants for sales or hire; wholesaling and retailing of plants and associated products; giving advice on plant selection and garden design and; marketing and promoting plant products and services.

Parks and Gardens work comprises: the management and maintenance of public and private parks, reserves and gardens as well as natural bushland and community recreation areas; the management and maintenance of historic, cultural and special use areas such as botanic gardens, cemeteries, recreation parks and institutional lands; and the design and implementation of special plant displays.

Sports Turf Management covers both the growing and sale of turf and the care and management of sports turf for golf courses, bowling greens, wicket and pitch preparation, racing clubs and institutional and recreational playing fields. Work includes: establishing and maintaining commercial and recreational turf; designing and preparing sports turf playing surfaces; mowing and turf maintenance operations; commercial growing and supply of turf; and managing recreational and sports turf facilities.


**Weekly average earnings for major occupations:**

- Landscape Gardener - $800
- Gardener - $800
- Nursery Worker - $850
- Horticultural Assistant - $730
- Greenkeeper - $800
- Parks and Gardens Tradesperson - $800
- Arborist - $830
- Garden Centre Assistant - $850
- Production Nursery Assistant - $850
- Flower Grower - $830
- Landscape Designer - $1150
**Jobs and demand information**

**Horticultural Workers** assist Gardeners with plant nursery work including tending to and potting up plants as well as advising customers on products and services and applying point-of-sale handling procedures. They may also assist Landscape Gardeners with construction and planting work or help with tree pruning and care.

- Job prospects - Average
- Weekly earnings - $730
- Occupation size - 29,600

Potential entry level qualifications:

- Certificate II in Horticulture
- Certificate III in Horticulture
- Certificate IV in Horticulture
- Also Diploma and Advanced Diploma in Horticulture

**Landscape Gardeners** carry out landscaping operations in a variety of residential, commercial and public settings. The focus is on hard landscaping such as designing and constructing features such as pathways, retaining walls, water features and other outdoor structures. They also plant and maintain plants, trees, garden ornaments and lawns. Work may also include trimming hedges, recommending plants, products and treatments, sourcing information, supervising staff and sourcing supplies.

- Job prospects - Above average
- Weekly earnings - $800
- Occupation size - 60,400

Potential entry level qualifications:

- Certificate II in Landscaping
- Certificate III in Landscape Construction
- Also Diploma of Landscape Design.

**Parks and Gardens Workers** prepare garden beds or lawn areas by cultivating soil and adding fertilisers and compost, plant and transplant flowers, shrubs, trees and lawns, maintain gardens by weeding, watering, fertilising and trimming, prune trees and hedges, and maintain lawn and grass areas. They may construct rockeries, paths or ponds, operate and install irrigation and drainage systems, use chemicals and be involved in the planning of revegetation works, tree planting programs or turf establishment.

- Job prospects - Above average
- Weekly earnings - $800
- Occupation size - 60,400
Potential entry level qualifications:

- Certificate II in Parks and Gardens
- Certificate III in Parks and Gardens
- Certificate IV in Parks and Gardens
- Also Diploma of Parks and Gardens Management

**Sports Turf Managers** are responsible for recreational facilities such as golf courses, parks and athletic fields. They plan and organise the establishment and maintenance of turf areas, schedule maintenance activities to accommodate customer activities and events, identify and control insect, disease and weed problems, determine the type and quantity of grass varieties to grow, order supplies, oversee the maintenance, servicing and replacement of turf machinery and repair irrigation systems.

- Job prospects - Average
- Weekly earnings - $800
- Occupation size - 11,100

Potential entry level qualifications:

- Certificate II in Sports Turf Management
- Certificate III in Sports Turf Management
- Certificate IV in Sports Turf Management
- Also Diploma of Sports Turf Management

**Retail Nursery Workers** may work in retail nurseries, local government nurseries or garden centres. Work involves planting and cultivating all plant types in plant nurseries, assisting in general maintenance, supervising sales, nursery plant production, supplies and services, recommending plants, products and treatments and implementing a propagation plan.

- Job prospects - Average
- Weekly earnings - $850
- Occupation size - 4,900

Potential entry level qualifications:

- Certificate II in Retail Nursery
- Certificate III in Retail Nursery
- Certificate IV in Retail Nursery
- Also Diploma of Retail Nursery Management
Production Nursery Workers undertake propagation activities, treat weeds and diseases, apply chemicals, maintain drainage and irrigation systems and package trees and plants for sale to growers or retail nurseries.

- Job prospects - Average
- Weekly earnings - $850
- Occupation size - 4,900

Potential entry level qualifications:
- Certificate II in Production Nursery
- Certificate III in Production Nursery
- Certificate IV in Production Nursery
- Also Diploma of Production Nursery Management.

Arborists (also known as Tree Surgeons) cultivate, establish, maintain and care for trees and shrubs in public and private gardens, public parks and reserves. They provide information about trees and their culture, implement tree pruning programs, sample soils and analyse the results, improve plant nutrition, implement tree care and maintenance programs as well as operate chainsaws, undertake complex tree climbing and aerial rescues, remove dead, damaged, dangerous or unsound trees or tree limbs and fell smaller trees.

- Job prospects - Above average
- Weekly earnings - $830
- Occupation size - Information unavailable

Potential entry level qualifications:
- Certificate II in Arboriculture
- Certificate III in Arboriculture
- Also Diploma of Arboriculture

Flower Growers coordinate work site activities, prepare commercial flower garden beds, grow plants from seeds, seedlings and bulbs, in addition to maintaining and harvesting flowers.

- Job prospects - Information unavailable
- Weekly earnings - Information unavailable
- Occupation size - Information unavailable

Potential entry level qualifications:
- Certificate II in Floriculture
- Certificate III in Floriculture
About the Qualifications

Qualifications provide the core skills and knowledge (competencies) required for effective performance on the job plus the option of choosing a range of elective competencies that meet the needs of the employer and the individual.

Every qualification includes an emphasis on “Employability Skills” or the skills that employers identify as playing a significant part in contributing to an individual's effective and successful participation in the workplace.

Employability skills are non-technical skills. They are also sometimes referred to as generic skills, capabilities, enabling skills or key competencies.

Employability Skills are:

› **Communication skills** that contribute to productive listening and understanding, speaking clearly and directly and harmonious relations across employees and customers;
› **Teamwork skills** that contribute to productive working relationships and outcomes;
› **Problem-solving skills** that contribute to productive outcomes;
› **Initiative and enterprise skills** that contribute to innovative outcomes;
› **Planning and organising skills** that contribute to long and short-term strategic planning;
› **Self-management skills** that contribute to employee satisfaction and growth;
› **Learning skills** that contribute to ongoing improvement and expansion in employee and company operations and outcomes;
› **Technology skills** that contribute to the effective performance of tasks.

3. Career Pathways Websites

Select ‘Agriculture, Horticulture and Conservation and Land Management’ from the list of Industries and then hit ‘Submit’

Other useful careers sites are:

› My Future - [www.myfuture.edu.au](http://www.myfuture.edu.au)
4. **Job Hunting**

**Job vacancy website:**

  The Australian Government’s job site. Input your postcode, select the Occupation Category “Gardening, Farming and Fishing” scroll down to the “Additional Search Criteria” section and click on “Apprenticeships/Traineeships”, then click on the “Find Jobs” button.

**Job hunting hints and labour market information:**

  Click on “Search” to find potential Australian Apprenticeships occupation ideas. You can also find Job Hunting hints in the “Self Help” menu item.

  Click on the map or use the drop down menu to find general labour market information for your region including top occupations and incomes. Data is based on the most recently available census.

5. **Useful Contacts**

Here are some links to a range of support services, organisations and government agencies that may help with careers research and job hunting:

**Support services:**


- Job Services Australia providers work with eligible job seekers to develop an individually tailored Employment Pathway Plan. The plan maps out the training, work experience and additional assistance needed to find job seekers sustainable employment - [www.jobsearch.gov.au/provider/ProviderLocation.aspx?ProviderType=JNS&](http://www.jobsearch.gov.au/provider/ProviderLocation.aspx?ProviderType=JNS&)

**Industry Organisations:**

- AgriFood Skills Australia - [www.agrifoodskills.net.au](http://www.agrifoodskills.net.au)


- Australian Native Plants Society (Australia) - [anpsa.org.au](http://anpsa.org.au)


- National Arborists Association of Australia - [www.naaa.net.au](http://www.naaa.net.au)
Australian Landscape Industry Association - www.landscapingaustralia.com.au
Horticulture Australia - www.horticulture.com.au
Australian Institute of Horticulture - www.aih.org.au
Australian Council of National Trusts - www.nationaltrust.org.au
Plant Health Australia - www.planthealthaustralia.com.au

Government Agencies:
Department of Agriculture, Fisheries and Forestry - Biosecurity Program - www.daff.gov.au/ba
Part 2: About this Resource

Guidance

This Practice Aptitude Quiz is intended to be a general illustration of some of the key learning standards required of people commencing an Australian Apprenticeships entry level qualification below Diploma level in the Horticulture Industry.

This Practice Aptitude Quiz is neither a formal assessment tool nor a direct pre-requisite for any job application.

This assessment tool has been developed to provide you with an understanding of the literacy, numeracy and problem solving knowledge and skills you will need when undertaking entry level training in the Horticulture Industry. The literacy and numeracy questions in this quiz are specifically designed for the Horticulture Industry.

The level of reading, writing and mathematical skills assessed by this Quiz is equivalent to that of the Year 11 or School Certificate level in Australia.

The important thing to remember is that these skills and knowledge are vitally important for you to succeed and be safe in the Horticulture Industry.

The Quiz can be used by a number of different organisations and people such as careers practitioners with young people, and Group Training Organisations and Job Services Australia organisations with job seekers.

Please note that rates quoted in this assessment for various items, including pay rates, are not meant to reflect today’s values, but are used purely for mathematical purposes.

The Quiz provides you with an indication of your skill level in these areas relative to industry expectations.

It is not a formal test and so there is no pass or fail mark.

This Quiz has been developed with the assistance of industry, training providers and the secondary school sector as a careers resource.

The assessment should be able to be completed in approximately 60 to 90 minutes.

After the Quiz

There are a range of support services available to help you find out about courses that may help you improve your literacy and numeracy skills and also your readiness for work.

If you are still at school you should discuss any concerns you may have with your career adviser. Further information may also be provided by a Job Services Australia provider, an Australian Apprenticeships Centre, a Group Training Organisation or a training provider.
Useful Contacts

Here are some links to job seeker support services:

› Job Services Australia providers work with eligible job seekers to develop an individually tailored Employment Pathway Plan. The plan maps out the training, work experience and additional assistance needed to find job seekers sustainable employment - [www.jobsearch.gov.au/provider/ProviderLocation.aspx?ProviderType=JNS&](http://www.jobsearch.gov.au/provider/ProviderLocation.aspx?ProviderType=JNS&)

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Part 3:  The quiz

Section 1 - Literacy, Reading and Comprehension

Spelling

1. The following text has 10 spelling errors in it. Identify the errors and list them with the correct spelling in the order you find them in the text.

Horticulture is a great career choice if you like to work outdoors and there are many different industry sectors that offer varied types of jobs and career paths. Some of the main sectors to choose from within horticulture consist of turf maintenance (sporting ovals), parks and gardens maintenance (public open space), landscaping (building gardens), nursery (growing plants), arboriculture (trees) and conservation and land management (bush landscapes). There are many career pathways and opportunities available to prospective employees willing to apply themselves.

1. __________________________  6. __________________________
2. __________________________  7. __________________________
3. __________________________  8. __________________________
4. __________________________  9. __________________________
5. __________________________ 10. __________________________

2. Write the correct spelling for the following words.

a. Wateerinng
   __________________________

b. Chemcials
   __________________________

c. Hazasrrd
   __________________________

d. Certifikate
   __________________________

e. Sprinklar
   __________________________

f. Equiepmant
   __________________________

g. Vocationl
   __________________________

h. Gardan
   __________________________

i. Careera
   __________________________

j. Partisipate
   __________________________
3. Circle the 8 incorrectly spelt words from the group below.

Shovel  Spade  Wheelbarrow  Irrigation
Trench  Deciduous  Evergreen  Flower
Leaflet  Disease  Chemicals  Knapsack
Valve  Nursery  Sunblock  Secateurs
Fertilizer  Fungi  Nutrition  Pruning
Excavate  Chainsaw  Virus  Groundcover

Comprehension

4. Read the following passage and answer the questions that follow.

The Horticulture Industry is an industry which seeks to design, develop and maintain a variety of different living landscapes to suit the desired focus.

A horticultural project begins with an idea and ends with the completion of the final living landscape. From the start to end there are a number of stages and each stage has its own series of steps. In order for each stage of the project to be completed successfully, effective communication is vital.

Communication can only be considered successful when the receiver of the information understands exactly what the sender of the information intended. Feedback from the receiver of the information to the sender of the information can determine if the communication was successful.

Workplace communication is how we convey or share information in the workplace. People use a wide variety of ways to communicate with each other. Sometimes these are used alone or combined together to make a message or information clearer. Methods of communication include verbal, written, electronic and non-verbal. When communicating you must be accurate, clear, concise, comprehensive and logical.

Questions

a. What is the main purpose of the Horticultural Industry?

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
b. What is the most important skill that is used in the Horticultural Industry to ensure a project is completed successfully?

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

c. Explain how you would know if someone had understood an instruction you gave them.

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

d. List three different examples used to exchange information.

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

Personal Protective Equipment

5. Personal Protective Equipment (PPE) consists of items of clothing or equipment, which are used to help protect your body from hazards in the workplace that cannot be controlled by other means.

In the Horticulture Industry, major hazards include: use of chemicals in spray and solid form; managing heavy loads; working outdoors with exposure to heat and rain; and use of power tools and machinery such as lawn mowers and tractors.

Match the PPE items below to the workplace protection issues they address in the table on following page.

<table>
<thead>
<tr>
<th>Ear protection/ear muffs</th>
<th>Steel cap boots</th>
<th>Safety harness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective eye wear</td>
<td>Full body spray suit</td>
<td>PVC apron</td>
</tr>
<tr>
<td>Gloves</td>
<td>Respirator mask</td>
<td></td>
</tr>
</tbody>
</table>
6. *Zoe is employed at the Smithton Golf Course. She has been asked to mow the practice fairway using a ride-on mower.*

   **What items of PPE could she use to protect herself? Circle the 5 most appropriate options below.**
   
a. Gloves  
b. Steel cap boots  
c. Safety glasses  
d. Ear muffs or ear plugs  
e. PVC apron  
f. Wide brimmed hat  
g. Half face respirator mask

7. *Joe and Sally started weeding a large garden bed in a public park when they noticed a break in an irrigation line that had eroded a large hole in the ground beside a footpath. The large hole had the potential to cause an injury to someone should they step into it.*

   **What course of action do you think they should have taken? Circle the 2 correct options.**
   
a. Inform work colleagues immediately that there is a hazard that will need to be fixed  
b. Just keep weeding and attend to the irrigation break at a later time  
c. Organise for someone to fence off the area (barricade), until it can be fixed
8. Pruning tools need to be kept sharp and clean, free of any plant sap or debris. The reasons for this are to ensure that only the necessary required force is used to cut plant materials, and also to restrict plant diseases being transferred from plant to plant.

To maintain pruning tools you can use a wire brush with warm soapy water to soften and remove sap and sharpening stones or wheels to create a new working edge that is sharp.

When sharpening pruning tools, which personal protection items should be used? Circle the correct responses.

a. Gloves
b. Steel cap boots
c. Safety glasses
d. Ear muffs

Tools & Equipment

9. The following tools are used in the Horticulture Industry. Match the tool names to the pictures of the tools.

<table>
<thead>
<tr>
<th>Name of Tool</th>
<th>Write in the letter associated with the correct picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long handled square mouth shovel</td>
<td>A</td>
</tr>
<tr>
<td>Fork</td>
<td>B</td>
</tr>
<tr>
<td>Outdoor broom</td>
<td>C</td>
</tr>
<tr>
<td>Leaf rake</td>
<td>D</td>
</tr>
<tr>
<td>Pruning saw</td>
<td>E</td>
</tr>
<tr>
<td>Secateurs</td>
<td>F</td>
</tr>
</tbody>
</table>
10. All engines require fuel mixtures to operate such as 2-stroke, unleaded petrol or diesel. Being able to tell the difference between each configured engine, as to their required fuel is very important as using an incorrect fuel type can result in serious damage to the engine.

2-stroke fuel mixture has 2-stroke oil added to the petrol fuel to provide lubrication to the engine. Other engines have oil lubrication found in a reservoir at the base of the engine and is not mixed with the fuel.

Tracey works at the local golf course. She has two different push mowers available for her use. Both mowers require refuelling.

Mower (A) has an oil cap, oil dipstick and oil sump; whereas Mower (B) does not. One of the mowers requires 2-stroke fuel and the other unleaded fuel only.

Which mower should Tracey fill with the 2-stroke fuel mixture? Mower (A) or (B)?
Section 2 - Mathematics

The Horticulture Industry often uses mathematics when undertaking everyday tasks. Please show all working’s out in your answers to the following questions.

Scenarios

1. You have been asked to lay instant turf for a client’s front lawn. The area measures 6 metres x 9 metres. How many square metres (m\(^2\)) of turf will you need to cover the area?

2. A garden design for a client's garden has been drafted. The plan has been drawn to a scale of 1:100. The plan requires you to plant 5 trees along a fence at 3 metres (3,000 millimetres) apart. How many millimetres would 3 metres be at 1:100 scale?

3. There is a need to spray some herbicide on a very weedy garden bed using a backpack pump and spray hose. The garden bed measures 10 x 9 metres. The chemical you are using is to be diluted in water at a rate of 10mls per litre of water with an application rate of 1 litre per 10m\(^2\).
   a. How many litres of diluted chemical solution would be required to cover the area?
   b. How much concentrated chemical is required to make up this amount of solution?

4. A garden bed has been excavated and requires new soil to be added. The bed measurements are 4 metres long x 3 metres wide x 0.3 metres deep. Calculate the volume of soil required to refill the bed using the following formula.

5. Ramos has been asked to calculate how many pavers will be required for a new pathway that is to be paved. The new pathway is 15 metres long and 1.5 metres wide. The number of pavers required for 1m\(^2\) is approximately calculated at 38 pavers, which includes an allowance for a few damaged pavers. How many pavers does Ramos require for the job?
6. Chris has been asked to plant out a garden bed that is 5 metres x 3 metres, using a native groundcover *Myoporum parvifolium* or Creeping boobialla. This prostrate plant typically grows to 0.1m high x 1.5m wide and will be planted out in mass for a quick carpet like effect. Planting density will be 3 plants per m\(^2\). How many plants will Chris need to complete the job?

7. Nang is installing a new trellis system for growing grape vines and needs to determine how much trellis wire to purchase. The vine rows are 25m long. Each row has 3 lines and there are 45 rows. How much length of wire will Nang require?

8. When pruning a tree, support lines are often used to control the fall of large limbs. If support line rope costs $8.00 a metre, how many complete metres of rope could be bought for $250.00?

Numbering

9. Match the numbers to their descriptions. Write your answers in the table below.

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3\slash8</td>
<td>percentage</td>
</tr>
<tr>
<td>35°</td>
<td>decimal number</td>
</tr>
<tr>
<td>25%</td>
<td>fraction</td>
</tr>
<tr>
<td>5\slash4</td>
<td>mixed number</td>
</tr>
<tr>
<td>16.37</td>
<td>ratio</td>
</tr>
<tr>
<td>2\frac{1}{3}</td>
<td>angle</td>
</tr>
</tbody>
</table>

10. Solve the following equations:

a. \(2 + 6 \times 7\) = 

b. \(4 - 11 \div 2\) = 

c. \(50 + 26\) = 

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d. \[2 \times 57 = \] \\
\[e. \ (12 - 4) \times 3 = \] \\
\[f. \ (35 ÷ 5) ÷ (14 ÷ 4) = \] \\
\[g. \ 9^2 = \] \\
\[h. \ \sqrt{25} = \]

11. Solve the following subtraction, addition, multiplication and division questions:

a. Subtract:
   i. 1,784 from 5,218
   ii. 29.461 from 43.18

b. Find the total of:
   i. $2.00, $21.45 and $8.23
   ii. 18.32, 471.019 and 315
   iii. 2.63m and 50cm

c. Multiply:
   i. 6.87 by 10
   ii. 13.8 by 3
   iii. 46.2 by 8.5

d. Divide:
   i. 3.45 by 10
   ii. 3024 by 14
   iii. 56.2 by 0.2
12. Michael purchased a whipper-snipper for $250 which he later sold for $375.
   a. How much profit did he make?  
       ____________________________
   b. What was the profit as a percentage of the cost price?  
       ____________________________

13. Tom is a landscaper who buys the following items from a hardware store: Plants $450; Post hole shovel $55; Tire wire $5 and a bag of fertiliser $14. Tom gets 10% trade discount.
   a. How much would Tom pay without discount?  
       ____________________________
   b. How much will he pay with the discount?  
       ____________________________
   c. How much has Tom saved?  
       ____________________________

14. Tina scored 80% in her horticulture exam. There were 25 questions.
   a. How many questions did Tina get right?  
       ____________________________
   b. How many questions did Tina get wrong?  
       ____________________________

15. Select the best estimate for each of the following. Circle the correct answer.
   a. $4249 \times 71 = 280000$  
       150000  
       2800  
   b. $80000 \div 38 = 200$  
       2000  
       20000  

16. How much money would be required if you need to purchase the following items: Chainsaw $650.00, Wheelbarrow $120.00, Plants $680.00, Fertiliser $250.00?  
       ____________________________

17. Todd is a landscaper and earns $28.00 an hour for a normal 40 hour week. For any overtime, that is hours worked over the standard 40 hour week, he receives a pay rate of ‘time-and-a-half’ or one and a half times the normal pay rate.

   What is Todd’s total pay if he works 42 hours this week?  
   ____________________________

18. Calculating water flow rates is important when installing irrigation systems within gardens and open landscape areas. If a 9-litre bucket is full in 18 seconds what is the flow rate per minute?

   The formula to determine flow rate is: \[
   \text{Flow rate per minute} = \frac{\text{Volume of bucket}}{\text{Time}} \times 60
   \]

   Answer  =  ____________________________
19. Estimate the size of the following angles by selecting the appropriate answers from the list below. Circle the correct answer.

a. 
   i. 30°  
   ii. 110° 
   iii. 170° 

b. 
   i. 30°  
   ii. 110° 
   iii. 190° 

20. Find the value of x° in the following:

   a. 
      \[ \begin{align*} 
      \angle X &= 46° \\
      \angle Y &= \angle Z \\
      \angle X &= 46° + \angle Y + \angle Z \end{align*} \]

   b. 
      \[ \begin{align*} 
      \angle X &= 30° \\
      \angle Y &= \angle Z \\
      \angle X &= 30° + \angle Y + \angle Z \end{align*} \]

   x = ____________  

21. Find the perimeter of these shapes.

   a. 
      \[ \text{Perimeter} = 2(15000 + 3000) = 36000 \text{ mm} \]

   b. 
      \[ \text{Perimeter} = 2(10000 + 9000 + 2000) = 39000 \text{ mm} \]
22. If each square represents 1 square metre, what is the area of the shape shown?

23. A bricklayer estimates there are 55 bricks to the square metre. How many bricks are needed to create a 6 square metre garden retaining wall?

24. Calculate the area of this circle? Use the formula $A = \pi r^2$, where $\pi = 3.14$.

25. A concrete footing, in the shape of a cylinder has a radius of 400mm and a height of 600mm. What is the volume of the footing in metres? Use the formula $V = \pi r^2 h$, where $\pi = 3.14$.

26. What is the area of these shapes?
   a. 
   b. 

   Area = ________________   Area = ________________

27. a. A circular flowerbed with a radius of 3 metres is to be surrounded by a concrete path 1 metre wide. Calculate the area of the path. Use the formula $A = \pi r^2$, where $\pi = 3.14$. 

   ________________
b. A quote to supply and lay the concrete for this path is $10 per square metre. What is the cost of the path?

_________________________

28. If each cube represents 1 cubic metre, what is the total volume of the shape shown?

_________________________

29. Calculate the volume of the cylinder using the formula $V = \pi r^2 \times \text{height}$. Use $\pi = 3.14$.

_________________________

30. If the volume of this box is 24 cubic metres, how high are the sides?

_________________________

Section 3: Gardening Knowledge

Plants

1. Plant botanical names are recorded using the Latin language and are written using *italics*. Plant common names are written in English and begin with a capital letter. Which of the following is *NOT* a common name? Circle the correct answer.

   a. Seaside daisy
   b. *Eucalyptus camaldulensis*
   c. River red gum
2. Most plants produce flowers, leaves, stems, and roots. They all carry out different functions for the plant. Which of the following is NOT a leaf function? Circle the correct response.

a. Release oxygen into the air  
b. Anchor the plant to the ground  
c. Manufacture sugar

3. Which of the following is NOT a function of a plant’s root system? Circle the correct response.

a. Uptake of water and nutrients from the soil.  
b. Production of seed.  
c. Anchor the plant to the soil.

4. Plants require nutrition to allow them to grow, flower and produce seed. Which one of the following is NOT considered a nutritional substance?

a. Iron  
b. Nitrogen  
c. Phosphorus  
d. Wetting agents  
e. Potassium  
f. Calcium

5. A tree type is determined by either of two main growth groups: evergreen (has leaves in all seasons) and deciduous (lose their foliage during the winter or dry season). You have been asked to recommend a species of tree that is to be planted in a client’s back yard outside the kitchen window. The client has requested that the tree provide shade in the summer and allow light to come through in winter.

Which would you choose; an evergreen tree or a deciduous tree?

6. Plants are used in many industries and can be found in many everyday use products. Plants also act as air purifiers and help to reduce carbon levels within the atmosphere. What other benefits do plants provide for us? Circle the incorrect benefit from the list below.

<table>
<thead>
<tr>
<th>Building products</th>
<th>Food substances</th>
<th>Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastics</td>
<td>Habitat for insects</td>
<td>Medicine</td>
</tr>
<tr>
<td>Cotton fabrics</td>
<td>Reduce water table levels</td>
<td>Natural chemicals</td>
</tr>
</tbody>
</table>
7. Many plants produce fruits that contain seeds inside the flesh. Which of the following fruit has its seeds on the outside? Circle the correct response.
   
a. Orange
b. Apple
c. Strawberry
d. Tomato

Irrigation & Soil Structure

8. An automated irrigation system has been installed in a garden that you are maintaining. The irrigation controller is functioning correctly, however the timing schedule for when the irrigation will turn on needs to be adjusted.

Considering issues such as water wastage through sun evaporation during the heat of the day and how plants respond better to deep watering around their root zones when the sun is shining, when would you program the system to turn on?

   a. Turn on several times in short bursts during the middle of the day?
b. Turn on once during the morning for a longer period?
c. Turn on several times in short bursts at night?

9. Soil structure and soil composition are very important elements for the successful growing of plants. Most plants grow well in free draining soil. Which step would most improve the drainage in an area that was waterlogged and had water pooling on the soil surface? Circle the correct response.

   a. Core or spike the area to relieve compaction and aid in drainage of the topsoil profile?
b. Integrate some clay into the soil?
c. Integrate a fertilizer into the soil?
d. Increase the irrigation water flow within the irrigation controller?

10. Implementing sustainable environmental practices is a vital component of horticultural activities. Are the following statements true or false? Circle the correct response.

   a. Australian tropical plants that thrive on lots of water and lots of nutrients would be the best plants to plant in a hot and dry area.

       True       OR       False

   b. Australian native plants that thrive with minimal summer watering and low nutrients are the best plants to plant in a hot and dry area.

       True       OR       False
11. Soils in Australia are said to be typically nutrient poor, requiring fertiliser to be added. Typically soils are tested for their structure, texture, pH (concentration of Hydrogen ions in the soil) and infiltration rates (the ability of water to drain through a soil profile). Different soils have a variety of these characteristics. Circle the one characteristic of soil that is \textbf{NOT} important to infiltration rates.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>\textbf{NOT} Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wettability of the soil</td>
<td>Drainage</td>
</tr>
<tr>
<td>Compaction rates</td>
<td>Uneven soil surface</td>
</tr>
<tr>
<td>Swelling/Shrinking</td>
<td>Water quality</td>
</tr>
<tr>
<td>Salinity</td>
<td>Moisture content</td>
</tr>
</tbody>
</table>

\textbf{Pest & Diseases}

If a plant is suspected of having a pest or a disease, then management steps need to be taken to control these elements, otherwise the plant will suffer and can potentially die. Some of the available options we have to control these elements consist of removing the infected part of the plant, we can spray chemicals to kill the disease and we can feed the plant with fertilisers.

12. Draw a line to match the appropriate action for the plant related issue:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Broken branch due to storm damage</td>
<td>Apply a liquid fertiliser to the leaves</td>
</tr>
<tr>
<td>b. Caterpillars feeding on new leaf growth</td>
<td>Remove the branch using a pruning saw</td>
</tr>
<tr>
<td>c. Insect grubs feeding on plant roots</td>
<td>Apply a chemical root insecticide to soil</td>
</tr>
<tr>
<td>d. Plant leaves gone yellow and weak</td>
<td>Apply a systemic insecticide to leaves</td>
</tr>
</tbody>
</table>

13. Plant health is very important as plant diseases can be spread very easily. If you work in multiple gardens and move from location to location, what would be the most effective way you could prevent the spread of disease between plants and other gardens? Circle the correct response.

a. Use blunt and dirty tools all the time
b. Wear long sleeves to protect your skin
c. Clean and sterilize your tools in between every job

14. Insects can cause widespread damage to plants eating farmers’ crops and orchard leaves. Some insects cause damage via chewing and eating the plant leaves and roots, whilst others by piercing and sucking sugars from the plant leaves and young stems.
a. Which two of the following adult insects have chewing and eating mouthparts? Circle the correct answers.

- Locust
- Butterfly
- Aphid
- Mosquito

15. Nutrients are essential for plant growth, what part of a plant is responsible for extracting nutrients from the soil?

a. Stems
b. Flowers
c. Roots
d. Bark
Section 1 - Literacy, Reading and Comprehension

1. Outdoors, career, sectors, horticulture, maintenance, gardens, management, career, opportunities, employees.

2. Watering, Chemicals, Hazard, Certificate, Sprinkler, Equipment, Vocational, Garden, Career, Participate

3. Irrigation, Leaflet, Chemicals, Valve, Sunblock, Solvents, Pruning, Virus

4. a. The main purpose of the horticultural industry seeks to design, develop and maintain a variety of different living landscapes to suit the desired focus.
   b. Communication is the most important tool or skill to use to ensure a project is completed successfully. There are so many stages between the start and completion of a structure that require people to communicate with each other.
   c. You can tell if someone has understood the instruction you gave them from the feedback the receiver gives you.
   d. Verbal: speaking to each other, Written: sending a request, Electronic: sending an email.

5

<table>
<thead>
<tr>
<th></th>
<th>Issues</th>
<th>PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Spray drift over the body</td>
<td>Full body spray suit, protective eye wear and respirator mask</td>
</tr>
<tr>
<td>b.</td>
<td>Foreign objects in your eye</td>
<td>Protective eye wear</td>
</tr>
<tr>
<td>c.</td>
<td>Crushing toes and feet</td>
<td>Steel cap boots</td>
</tr>
<tr>
<td>d.</td>
<td>Chemical splashes</td>
<td>PVC apron, gloves and protective eye wear</td>
</tr>
<tr>
<td>e.</td>
<td>Falling from heights</td>
<td>Safety harness</td>
</tr>
<tr>
<td>f.</td>
<td>Handling small sharp objects</td>
<td>Gloves</td>
</tr>
<tr>
<td>g.</td>
<td>Noisy machines and tools</td>
<td>Ear protection/ear muffs</td>
</tr>
</tbody>
</table>

6. a, b, c, d & f

7. a. Inform work colleagues immediately and c. Organise for someone to fence off area.

8. a. Gloves, c. Safety glasses and d. Ear muffs

9. E, D, A, B, C, and F

10 Mower (B)

Section 2: Mathematics

1. 54m$^2$ of turf

2. 30mm or 3cm

3. a. 9 litres of mixed solution b. 90mls of concentrated chemical

4. 3.6m$^3$ of soil

5. 855 pavers
6. 45 plants required
7. 3,375m of wire required
8. 31m of rope
9. a. 25%  b. 16.37  c. 3/8  d. 2½  e. 5:4  
   f. 35°
10. a. 44  b. -1.5  c. 76  d. 114  e. 24  
   f. 2  g. 81  h. 5
11. a. i. 3,434  ii. 13,719  
      b. i. $31.68  ii. 804.339  iii. 3.13 m  
      c. i. 68.7  ii. 41.4  iii. 392.7  
      d. i. 0.345  ii. 216  iii. 281
12. a. $125  b. 50%
13. a. $524.00  b. $471.60  c. $52.40
14. a. 20  b. 5
15. a. 280000  b. 2000
16. $1700.00
17. $1,204.00
18. 30 litres per minute
19. a. i. 30°  b. ii. 110°
20. a. 44°  b. 150°
21. a. 36,000mm  b. 40,000mm
22. 14m²
23. 330 bricks
24. 314m³
25. 0.30m³
26. a. 8m²  b. 40m²
27. a. 21.98m²  b. $219.80
28. 6m³
29. 628m³
30. 3m
Section 3: Garden Knowledge

1. *Eucalyptus camaldulensis*

2. b. Anchor the plant to the ground

3. Production of seed

4. Wetting agents

5. Deciduous tree as it loses its leaves in winter and allows light to come through the window.

6. Plastics

7. c. Strawberry

8. b. Turn it on once in the morning for a longer period

9. a. Core or spike the area to relieve compaction an aid in drainage of the top profile

10. a. False       b. True

11. Soil Flammability/ignition

12. a. Remove the branch using a pruning saw  
      b. Apply a systemic insecticide to the leaves  
      c. Apply a chemical root insecticide to the soil  
      d. Apply a liquid fertilizer to the leaves

13. c. Clean and sterilize your tools in between every job

14. Locust and Aphid

15. c. Roots
Contributions
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