PROBLEM SOLVING ACTIVITY

Odd One Out

Observe the three plants in the pictures below. Consider their appearance, function, and requirements (what they need to grow/where they might be grown). Record your ideas in your workbook.

Which of these plants is the odd one out? Justify your answer and share your ideas with a partner.

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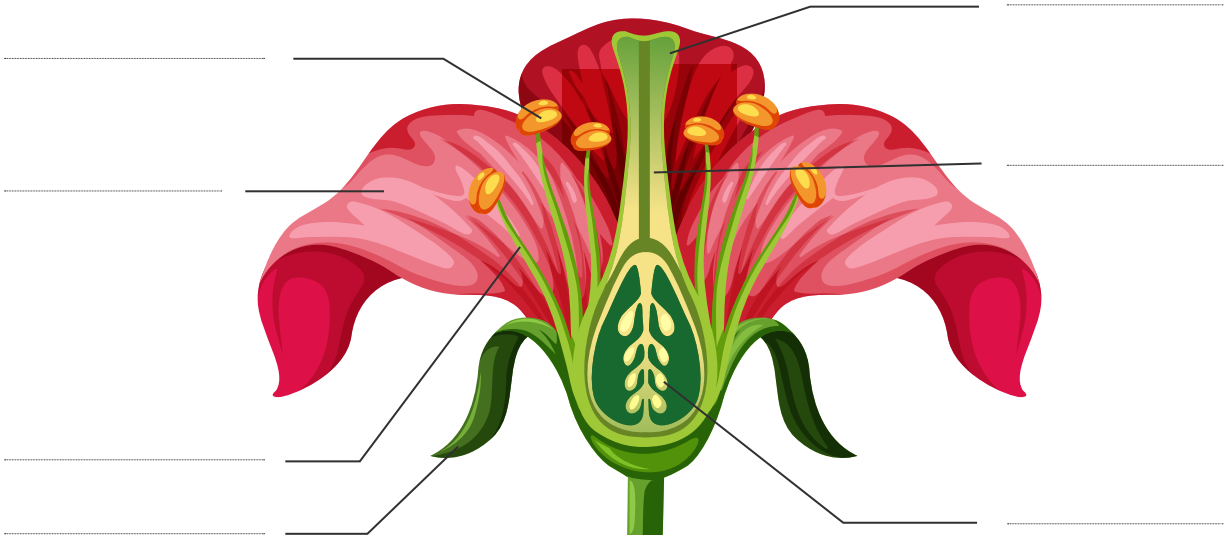
RESEARCH AND RESPONSE TASK

Sexual Reproduction in Plants

Scan the QR code or click on the link to watch the video about sexual reproduction in plants. Answer the questions below using the information provided in the video.

Sexual Reproduction in Plants: (4:06) https://www.youtube.com/watch?v=R8_ScKzLAfE

1. Label the reproductive parts of the flower.



2. Use the word bank in the box below to complete the sentences.

stamen	wind	gametes	water	carpel	pollinators

a) The anther and the filament are the male parts of the flower, known as the _____.

b) The stigma, style and ovary are the female parts of the flower, known as the _____.

c) _____ are the sex cells contained in the anthers and ovaries of flowering plants that must fuse together during sexual reproduction.

d) _____ , _____ and _____ help flowering plants to reproduce by transferring pollen from one plant to another.

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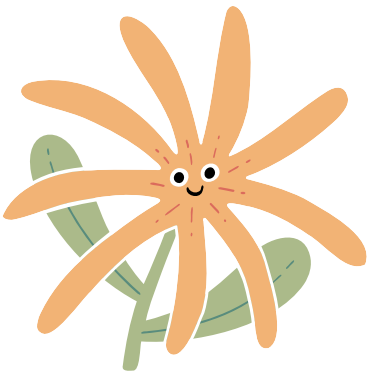
RESEARCH AND RESPONSE TASK

Sexual Reproduction in Plants (cont.)



3. Complete the table below by recording the role of each of the parts of the flower.

Parts of flower	Role in reproduction
Petals	
Sepals	
Anther	
Filament	
Stigma	
Style	
Ovary	

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RESEARCH AND RESPONSE TASK

Asexual (Vegetative) Reproduction in Plants

Asexual reproduction only requires one parent and allows for that organism to reproduce genetically identical clones of itself. No gametes are required for asexual reproduction to take place. There are a number of different ways plants may reproduce asexually.

Scan the QR code or click on the link to read the information about natural and artificial forms of asexual reproduction in plants. Use the spaces provided to take notes and answer the questions about the information you have read.

- **Vegetative plant propagation: https://www.sciencelearn.org.nz/resources/1662-vegetative-plant-propagation**

1. Explain the term vegetative plant propagation.

2. Explain the **advantages** of vegetative propagation.

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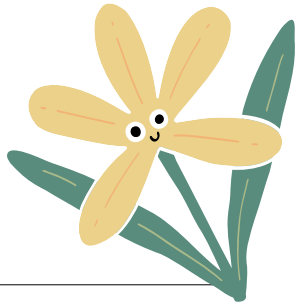
RESEARCH AND RESPONSE TASK

Asexual (Vegetative) Reproduction in Plants (cont.)



3 Explain the **disadvantages** of vegetative propagation.

4. Describe and draw a diagram showing each of the types of natural vegetative propagation in plants.

Tubers:

Stolons (Runners):

Bulbs:

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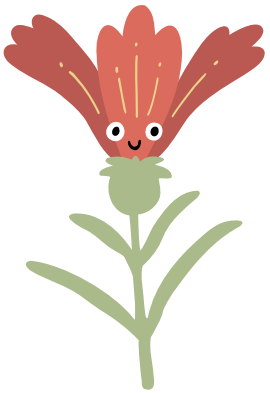
INFORMATION SCAVENGER HUNT TASK

Nursery Industry Fast Facts Scavenger Hunt



Australia's Nursery Industry is responsible for the large scale production and distribution of plants used for ornamental purposes, fruit and vegetable production, forestry and landscaping. This diverse industry employs people throughout Australia along each of the stages of the value supply chain.

1. Read the questions, and record an estimate of each answer in the table below before the timed activity begins.
2. Use the QR code or click the industry facts link to find the correct statistic. Record your answer in the table.

   Facts at a Glance: https://www.greenlifeindustry.com.au/static/uploads/files/nursery-facts-at-a-glance-2020-21-wfkptzcbbiqw.pdf

Question	Estimate	Answer
a) What is the approximate value of the Nursery Industry to Australia's economy?		
b) Approximately how many people are employed by Australia's Nursery Industry?		
c) How many plants were produced and distributed by the Nursery Industry between 2020–2021?		
d) What is the estimated average wage for someone working in the Nursery Industry?		
e) What percentage of the plants produced by the Nursery Industry are fruit trees, nut trees or vines?		
f) What percentage of growers made a profit greater than $2 million between 2020–2021?		

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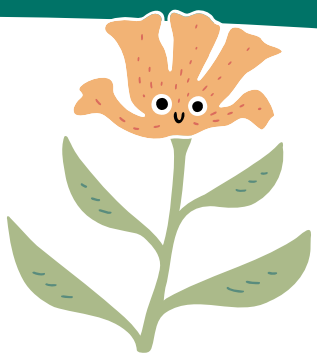

INFORMATION SCAVENGER HUNT TASK

Nursery Industry Fast Facts Scavenger Hunt (cont.)

3. Record any other interesting facts you have learned about Australia's Nursery Industry.

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RESEARCH AND DESCRIBE TASK

Plant Propagation Techniques

Scan the QR codes to learn about the following plant propagation techniques used by the nursery industry to address environmental challenges and meet the needs of consumers. Record a description for each of the types of propagation.

Propagation technique	Description
Tissue culture: https://www.rbgsyd.nsw.gov.au/science/australian-plantbank-1/conservation-and-research-at-plantbank/tissue-culture-and-cryopreservation/tissue-culture	This form of propagation uses small fragments of plants which are treated with nutrients and hormones to stimulate their growth. Tissue culture propagation is able to produce many clones from the one mother plant which grow more rapidly than plants grown from seed.
Grafting and budding: How to Graft (5:07) https://www.abc.net.au/gardening/how-to/how-to-graft/9430148	

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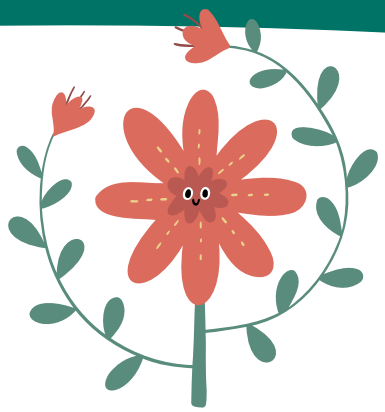

RESEARCH AND DESCRIBE TASK

Plant Propagation Techniques (cont.)

Propagation technique	Description
Layering: Propagating by layering (6:06) https://www.abc.net.au/gardening/how-to/propagating-by-layering/9428330	
Cuttings: Cuttings 101 (1:28) https://www.abc.net.au/gardening/how-to/cuttings-101/9437930	

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GROUP CASE STUDY

Case Study – Avocado Tissue Culture Propagation

Tissue culture propagation is used in the nursery and horticulture industries as an asexual form of plant reproduction. This form of propagation uses small fragments of plants which are treated with nutrients and hormones to stimulate their growth.

Tissue culture propagation is being implemented in a variety of plant production systems to address issues such as pest and disease impacts on crops, the rate of growth time required to form new plants for production, as well as vastly increasing the number of plants propagated from a single parent plant.

Scan the QR code or click on the link to watch the video about avocado tissue culture propagation. In your groups, record your answers to the following questions on a piece of A3 or butchers paper.

Avocado tissue propagation: (1:59) https://youtu.be/itAcSPKEYhE

1. Explain the possible advantages and disadvantages of the use of avocado tissue culture propagation for the avocado industry.

2. Explain the problem researchers were trying to address when they began their work on avocado tissue culture propagation.

3. Explain how this form of propagation could improve the productivity, profitability and sustainability of the avocado industry.

4. Describe the current method of avocado propagation described in the video and record some of the issues surrounding this form of propagation.

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