**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­\_\_\_\_\_\_\_\_\_**

**Gore High School**

**Year 11**

# Plant propagation

**As 90923 Demonstrate knowledge of basic plant propagation techniques**

**Homework workbook**

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| **YEAR 11 PLANT AND HORTICULTURAL SCIENCE****Homework worksheet** |

**QUESTION ONE**

(a) Explain TWO differences between **sexual** and **asexual** propagation.

Difference one:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Difference two:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(b) A gardener wants to grow fifty cabbages and a red rose just like the one he has in his garden already.

Choose the best propagation method – **sexual** or **asexual** – for the cabbages and the rose and explain why you made your choice.

Method for fifty cabbages: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explanation for this choice \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Method for the red rose: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explanation for this choice \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**QUESTION TWO**

1. Explain the difference between **pollination** and **fertilisation** in flowers.

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(b) **Cross pollination** may produce different plants than **self pollination**. Explain why this is.

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**QUESTION THREE**

Explain how **wind** and **insect** pollinated flowers have different structures and why they are different.

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| **YEAR 11 PLANT AND HORTICULTURAL SCIENCE****Homework worksheet** |

**QUESTION ONE**

(a) Explain **cross pollination** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(b) A white rose is cross **pollinated** with a red rose. Assume the allele for red is (R) and is completely dominant over the allele for white (r). Use the punnet square to show the possible results of this cross.

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(c) What is the **phenotype** of the offspring? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(d) What is the **genotype** of the offspring? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(e) Plants produced by cross pollination are **hybrids**. Explain how hybrids are different from plants produced from self pollination.

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**QUESTION TWO**

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C

B

A

1. Label **parts** A,B and C
2. Explain the **functions** of parts A,B and C

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(c) Explain how a seed is **formed** beginning with pollination and ending with the seed.

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**QUESTION THREE**

1. Explain **seed dispersal** and why it is important in seedling survival.

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| **YEAR 11 PLANT AND HORTICULTURAL SCIENCE****Homework worksheet** |

**QUESTION ONE**

(a) Choose TWO **environmental** conditions which are important in seed germination and explain how they are essential to the process.

Environmental condition one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explanation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Environmental condition two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explanation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**QUESTION TWO**

Explain how you can provide these conditions when planting seeds in **containers** and **directly** in the garden.

In containers \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Environmental condition one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explanation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Environmental condition two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explanation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**QUESTION THREE**

Explain seed **viability** and how it affects seed germination

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**QUESTION FOUR**

(a) Explain how the methods of ***pricking out*** and ***thinning out*** help the growth of seedlings.

In your explanation:

* Describe the processes of pricking out and thinning out
* Explain how these methods improve the growth of the seedlings

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(b) Explain the process of ***hardening off*** seedlings and how this helps their survival.

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| **YEAR 11 PLANT AND HORTICULTURAL SCIENCE****Homework worksheet** |

**QUESTION ONE**

Plums can be propagated in winter using deciduous hard wood cuttings.

Describe FOUR steps that would help deciduous hardwood cuttings successfully produce roots. You may draw labelled diagrams in the space provided.

|  |  |
| --- | --- |
| **Description of steps** | **Labelled diagram (optional)** |
| Step One: |  |
| Step Two: |  |
| Step Three: |  |
| Step Four: |  |

(b) Identify TWO environmental conditions which are needed for ***leafy cuttings*** which are not required by deciduous hardwood cuttings and explain why there is a difference.

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Condition Two: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**QUESTION TWO**

A grower decided to use stem cuttings rather than division to produce as many plants as possible although their success rate might be lower.

Support the grower’s decision by justifying why using deciduous hardwood cuttings is better than division in relation to:

* The number of plants produced
* Survival rate

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| **YEAR 11 PLANT AND HORTICULTURAL SCIENCE****Homework worksheet** |

**QUESTION ONE**

Describe in four steps how to **ground layer** a plant. You may use labelled diagrams to help your explanation.

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| --- | --- |
| **Description of step** | **Explanation of how the step affects root production (biological conditions)** |
| Step 1. |  |
| Step 2. |  |
| Step 3. |  |
| Step 4. |  |

(b) Describe **TWO** environmental conditions that would help speed up root production and **explain** how you would provide these conditions.

|  |  |
| --- | --- |
| **Description of environmental conditions** | **Explanation of how the environmental conditions could be provided** |
|  |  |
|  |  |

(c) Compare and contrast the advantages and disadvantages of growing plants from ground layering from growing the plants from seeds.

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| **YEAR 11 PLANT AND HORTICULTURAL SCIENCE****Homework worksheet** |

A student wanted to grow sunflowers and was told by her teacher that they can be started off in punnets in the classroom and then transplanted or planted outside directly in the garden.

She carried out the investigation with other girls in her class and gained the following results after 9 weeks.

Garden 1 – 1.5 m – started in punnets, 2.1m straight in garden

Garden 2 – 1.2 m – started in punnets, 2.3m straight in garden

Garden 3 – 1.3 m – started in punnets, 1.3m straight in garden

Garden 4 – 1.5 m – started in punnets, 2.4m straight in garden

Write a report of this investigation.

**Question one – Complete the investigation plan**

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| --- |
| 1. **Purpose** of investigation (this may also be in the form of an aim, testable question, prediction or hypothesis)
 |
| 1. Name the **key factors** which may be involved in the investigation
 |
| 1. Which **single factor** will be changed? (This is the independent variable)
 |
| 1. Which factor(s) do you think will have to be **measured or observed** in order to get some data or information from the investigation? (These are the dependent variables)

How will it/these factors be **measured** or observed? |
| 1. What other factors do you think are important in this investigation and would have to be **controlled** to make it a fair test? (Controlled variables)
 |
| Factors | What influence could this have on the investigation and how will this variable be kept the same (controlled) or measured? |
|  |  |
|  |  |
|  |  |
| 1. How could you ensure that the results are reliable and there is sufficient information to help make a useful and valid conclusion? (Repeats)
 |

**Question Two – written method**

**Now use the information on this planning sheet to write a detailed step-by-step method.**

**Aim**

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# Method

**Question Three**

Record and process the data collected in the investigation

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**Part 4: The report**

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| Interpretation of results and conclusion linking your interpretation to the purpose |
| * Evaluation of the conclusion in terms of the method. You may comment on:
* reliability of data (repeats / outliers etc)
* limitations to the investigation (sources of error etc)
* changes made to your original method.
* Horticultural science ideas related to the investigation. This would explain the results you obtained.
 |