## ID Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Gore High School

### Crest

**Achievement Standard 90923**

**Agricultural and horticultural science 1.9**

### Version 1

### Internal

Demonstrate knowledge of basic plant propagation techniques

Credits: 4

**“Knowing Growing”**

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**Student Instructions Sheet**

***Conditions:*** *In class, silent, individual assessment.*

***Time Allowed:*** *One hour*

Answer ALL parts to ALL questions

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| **Achievement** | **Merit** | **Excellence** |
| Demonstrate knowledge of basic plant propagation techniques. | Demonstrate in-depth knowledge of basic plant propagation techniques. | Demonstrate comprehensive knowledge of basic plant propagation techniques. |
| **Overall Level of Performance** | | |

In completing this assessment you must consider conditions important for successful propagation. You will need to refer to:

**Environmental conditions** which could include water, warmth, bottom heat, high humidity, time of year and light

**Biological conditions** which could include viable seed, plant type, plant material and plant health.

**Question One: Seeds**

1. **Describe** FOUR important steps in the **order** that should be taken to sow seeds **in containers** and **explain** how each of the steps affects germination



rate.

Justify why each step is important considering **biological** and

**environmental** conditions needed for successful germination.

You may draw labelled diagrams as part of your description.

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| **Description of step** | **Diagram of step** |
| **Step 1.** |  |
| **Biological conditions** | **Environmental conditions** |
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| **Description of step** | **Diagram of step** |
| **Step 2.** |  |
| **Biological conditions** | **Environmental conditions** |
|  |  |
| **Description of step** | **Diagram of step** |
| **Step 3.** |  |
| **Biological conditions** | **Environmental conditions** |
|  |  |
| **Description of step** | **Diagram of step** |
| **Step 4.** |  |
| **Biological conditions** | **Environmental conditions** |
|  |  |

1. A gardener wanted to grow dwarf beans in **early spring** to make sure they had fresh beans for Christmas dinner. They had the option of two techniques of propagation:

* sowing the seeds in **containers** and placing them in a glasshouse and then planting them out into the garden when they have germinated and started growing
* planting the seeds **directly in the ground**.

The gardener decides to start the seeds off in containers

Justify the choice by **comparing** and **contrasting** the two techniques.

Include in your answer:

* how the steps taken in the two techniques are **different**
* how **environmental**  conditions may affect the choice if an **early** crop is required.

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**Question Two: Cuttings and division**

**Environmental conditions** could include water, warmth, bottom heat, high humidity, time of year and light

**Biological conditions** could include, plant type, cells involved, plant material and plant health.



The diagram shows a *Pelagonium* stem which can be prepared for a

**softwood cutting.**

1. Describe THREE steps that you would take to make **softwood cuttings** and **explain** how each step affects the **biological** **conditions.**

You may draw ***labelled*** diagrams as part of your description.

**Step One:**

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**Step Two:**

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**Step Three:**

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(b) Describe **TWO environmental** conditions and what **equipment** can be used to provide the condition that would help speed up **root** production in **leaf** cuttings. **Explain** how these conditions will help the cuttings produce roots.

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| Description of **environmental conditions** and the **equipment** used to provide the condition | Explanation of how the **environmental conditions** will help the cuttings produce roots. |
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(c)

Many people have admired the rare and prize winning *Pelagonium* shown in the photo and there is a demand for large numbers of this plant.

Select *EITHER* of the following techniques which could be used to propagate from the plant.

* Division
* Softwood cuttings

Justify your selection by **comparing** and **contrasting** with those of the other option.

Include in your answer:

* **numbers** of plants which can be grown from one plant
* **survival rate** and speed to maturity
* **survival** of the original plant

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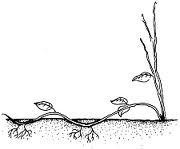
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**Question Three: Layering and cuttings**

The picture shows a **ground layered** plant.



(a) Describe THREE steps that you would take to produce new plants from **ground layering**.

You may include labelled diagrams.

|  |  |
| --- | --- |
| **Description of step** | **Diagram of step** |
| **Step 1.** |  |

|  |  |
| --- | --- |
| **Description of step** | **Diagram of step** |
| **Step 2.** |  |
| **Description of step** | **Diagram of step** |
| **Step 3.** |  |

(b) **Explain** how ground layering will affect root production in the new plant.

Your explanation should include TWO **biological** conditions and ONE **environmental** condition that will affect successful root production in the offspring provided in the steps which you have described in (a) Page 11.

**Environmental conditions** could include water, warmth, bottom heat, high humidity, time of year and light

**Biological conditions** could include, plant type, cells involved, plant material and plant health.

|  |  |
| --- | --- |
| **Biological condition: Explanation of how this is provided in the steps described in (a) Page 11** | **Explanation of how this condition will affect successful root production in the offspring** |
| 1. |  |
| 2. |  |
| **Environmental condition: Explanation of how this is provided in the steps described in (a) Page 11** | **Explanation of how this condition will affect successful root production in the offspring** |
|  |  |

1. A nurseryman has a very attractive rosemary bush with long flexible stems, shown in the photo below, which can be propagated by either **semi-hardwood heel cuttings** or **ground layering**. An order is received to produce 50 mature plants ready for sale in six months.



Compare and contrast the use of **semi-hardwood heel cuttings** and **ground layering** for this order.

Your comparison should include:

* **Numbers** of plants produced from one parent
* **Speed** to **maturity**

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