

PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI
LESSON NOTES

School: Penang Sangam High School
Subject: Agricultural Science
Year/Level: 11

Week 18

Strand	Strand as 11.3 Agronomy
Sub Strand	Sub-strand 11.3.2 HORTICULTURE
Content Learning Outcome	Demonstrate the assessment methods used in determining the physical properties of the soil.

LESSON 5: MICRO PROPAGATION (TISSUE CULTURE)

LESSON OUTCOME: *At the end of this lesson the student will describe the micro plant propagation method*

Vocabulary

Protoplast – the colourless material comprising the living part of a cell

Aseptic – free or freed from pathogenic microorganisms

Ex-plant – pieces of tissue or organ removed from a plant or animal.

Callus culture – is a growing mass of unorganized plant parenchyma cells

Stolons – special slender horizontal branch serving to propagate the organism.

Steps of micro propagation

Stage I: Selection of planting material – where a healthy plant with desired characteristics is chosen for tissue culture e.g. using axillary buds

a) vegetative parts (shoot tip, meristem, leaves, stems, roots)

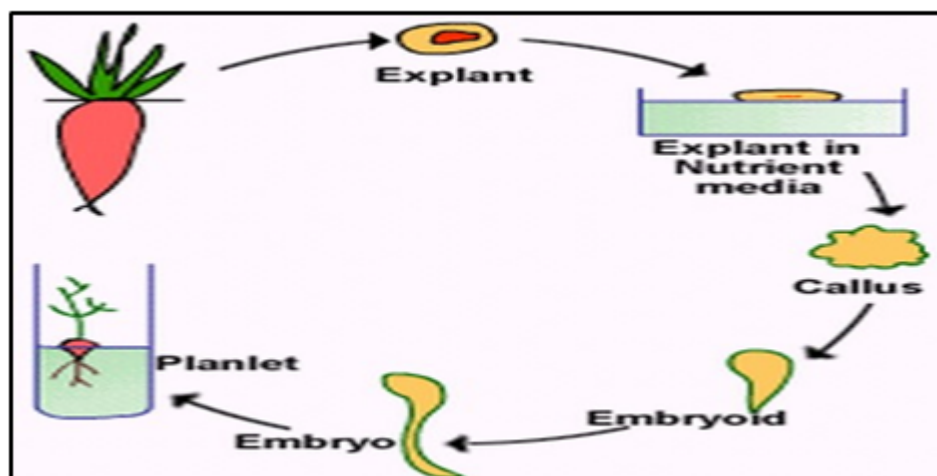
b) reproductive parts (anthers, pollen, ovules, embryo, seed, spores.)

Stage II: Initiation stage -The explant is extracted under sterile conditions and placed in a nutrient medium with disinfectant solution of suitable concentration for a specific period. Bleach, Ethyl alcohol, bromine water, mercuric chloride, silver nitrate, sodium hypochlorite, calcium hypochlorite can be used as disinfectant.

Stage III: Multiplication stage- The explant is placed in a growth medium which provides all it requires to undergo rapid tissue multiplication and the formation of a callus.

Stage IV: Rooting stage- the callus is divided up and provided with a different growth medium to induce root formation from Stage III plants.

Stage V: Acclimatization stage. Transfer of the plants to potting medium for growing out and hardening. the parent plant and planted out e.g bulbs, stem tubers, rhizomes, corms and suckers.



ADVANTAGES AND DISADVANTAGES OF PROPAGATION BY TISSUE CULTURE TECHNIQUE

ADVANTAGES	DISADVANTAGES
Produces large number of plants in a short time	Requirement of sophisticated facilities e.g. High Tech Lab
Produces disease free plants	Requirement of skilled personnel
A technique that uses a small explant from a plant to mass produce plants	High production and maintenance cost

Student Activity

1. Differentiate between the propagation of plants by stem cuttings and root cuttings.

2. Discuss one way in which micro propagation can prevent a plant from extinction.

AS 11.3.2.2 LANDSCAPING





Lesson 1 Overview of Landscaping

Vocabulary



- **Landscape Architecture** - the design of outdoor public areas, landmarks, and structures to achieve environmental, social-behavioural or aesthetic outcomes.
- **Landscaping** - any activity that modifies the visible features of an area of land, including: living elements, such as flora or fauna
- **Aesthetic** - concerned with beauty or the appreciation of beauty.
- **Ornamental** - a plant grown for its aesthetic appearance.

Notes

The four main elements of a landscape are:

1	Natural Elements 	landforms, terrain shape, elevation, bodies of water
2	Living Elements 	flora and fauna
3	Abstract Elements 	weather and lighting
4	Human Elements 	paving, walls, parapets, bridges, sculptures, steps, bollards, planters

Landscaping is divided into two components which complement each other.

1. Hard landscaping  http://www.neonusantara.com	- where inanimate elements like paths, water features, structures, pergolas and walls give the landscape form and structure on which the softer elements can perform.	2. Soft landscaping  http://www.bucksgardens.co.uk	- where the flowers, trees, shrubs, lawns and animals softening the landscape
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Types of landscaping include

1. Environmental landscaping

- which is used for educational, sporting and aesthetic purposes.

Gardens



<http://www.charliesgardens.com>

Lawns



<http://www.blueskyturf.com>

Playing fields



<http://www.schmidtlawncare.com>

Parks



<http://www.123rf.com>

2. Residential landscaping

- which is meant to improve the area to be lived in by individuals and families.

Apartment



<http://www.usagold.net>

Bungalow



<http://www.ontarioarchitecture.com>

Mansion



<http://www.home-designing.com>

3. Commercial landscaping

- which involves buildings used for business.

Office building



<http://www.hampshirehills.co.uk>

Restaurant



<http://www.naturafashiongardening.com>

Shopping mall



<http://www.-cache-ak0.pinimg.com>

Hotel



<http://o.homedsgn.com>

Student Activity

Differentiate between soft and hard landscaping.

Homework

Identify properties where landscaping is practiced.

Lesson 2: Benefits of Landscaping

Vocabulary

Conservation - the act of preserving, guarding, protecting or wise use

Notes

Discuss the reasons for landscaping

1. Economic reasons:

- Increases tourist revenue
- Increased property value
- Employment

2. Life style reasons

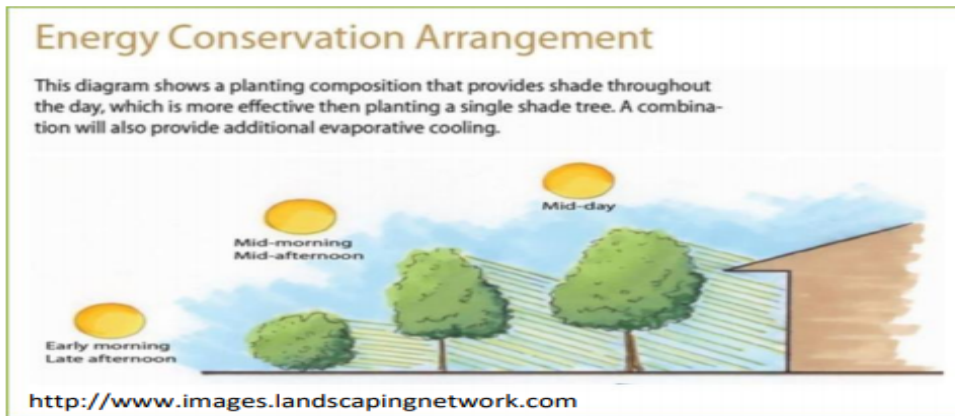
- Physical exercise
- Healthy food
- Therapeutic – the aesthetic value of landscaped areas afford patients solace and tranquillity and so assist in healing
- Privacy
- Creates outdoor rooms

3. Environmental reasons

- Protects water quality
- Improves air quality
- Reduces noise, wind and glare

4. Conserves energy

- Landscaped gardens can reduce the fluctuations in temperature of the environment so can reduce utility bills and conserve energy.
- trees, hedges, grasses and shrubs can protect buildings from harsh winds
- trees and hedges can absorb heat from the sun to help keep the surrounds cooler



5. Haven for Wildlife

- A landscaped garden can attract wildlife such as lizards, toads, birds, spiders and insects.
- Natural landscaping is a haven for wildlife because it offers shelter from predators as well as natural food supplies. Connecting with plants and trees provide immeasurable health and emotional benefits. Landscaped areas including house plants, gardens and backyards reduce the need to travel to the rainforest or the woods for the benefit that nature provides.

Homework

Discuss the effect that landscaping your school compound would have on the school community.

Lesson 3: Limitations of Landscaping



Site	- the location on the surface of the earth.
Investment	- time, energy, or matter spent in the hope of future benefits

Notes

Landscaping is a financial investment and can be both Labour-intensive and costly depending on the size of the work that needs to be carried out. Landscaping a home garden will differ in costs when compared to landscaping a resort lawn.

Homework

Explain why landscaping can be a costly exercise.

Lesson 4: Landscaping Skills

Skills	Description
Planning	Before landscaping begins, the landscaper must meet the client at the site and discuss the client's "dream" for the area so that ideas can be envisaged
Designing	Using a map of the property, the landscaper will sketch out possible landscapes.
Constructing	landscaping elements are constructed
Establishing	Selected vegetation is established
Maintaining	The landscape is maintained e.g. paths are swept, lawn mown, hedges trimmed, structures repaired, and drains kept clear of debris.



Student's activity

List the skills that a landscaper needs
