Stage 5 Agriculture Technology: Year 10
Unit C: Plant nursery production

Rationale for the development of this unit of work

The nursery industry is quite prominent in this local area. Wholesale nurseries are abundant on the fringes of Sydney to provide plants for the large market.

The skills obtained in this unit of work will enable students to understand the basic techniques in plant propagation and use these skills in the home garden, nurseries or to allow easy integration into training at TAFE.

Propagation of plants is also a rewarding pursuit that will bring great pleasure to students when they take propagated material home, or sell it to other members of the school community.

The timing of this unit is to take advantage of the availability of deciduous material in the winter for hardwood cuttings and also early spring for seedling production. Due to the distinct seasonality of many propagation procedures in many species, this topic may have components spread throughout the entire year. This is especially true with the time lag between a propagation method, and the final potting up many months later.

The major concepts and outcomes addressed are listed below.

Syllabus requirements	Key concepts	Outcomes
Intensive plant enterprise	Potting mixes Sexual and asexual reproduction Seedling propagation Misting Bottom heating Basic greenhouse design Propagation techniques: – Leaf cuttings – Softwood cuttings – Hardwood cuttings – Layering – Budding – Grafting – Plant tissue culture Basic plant classification	5.3.1 5.3.3 5.5.1 5.5.2 5.6.1 5.6.2

Concepts	Resources
Seedling propagation • Identify the components of potting mixes and the role of each.(peat or its substitutes, expanded clays, sand, water crystals, sterilised soil) • Understand he terms water retention and drainage in regard to potting mixes. • Use a suitable recipe to make potting mixes for seed propagation, striking cuttings and growing struck plants	Yates *Garden guide*
• Sow seeds of vegetables, herbs, native plants and exotic garden plants utilising a range of methods to break seed dormancy, e.g. scarification, heat, hot water, chilling and smoke.	Yates *Garden guide* *Enterprising Agriculture*, p. 394
• Provide a suitable environment for seed germination and growth by use of plastic covering, mist house or cold frame.	*Agriculture and You 1*, p. 75
• Evaluate the effect of soil conditioners, e.g. lime, gypsum, compost and fertilisers, on seedling growth by performing a controlled experiment. • Transplant seedlings to individual pots when necessary. • Compare a range of irrigation systems in seedling production. • Grow ferns from spores utilising a suitable method.	*Dynamic Agriculture 1, p. 103*
Sexual and asexual reproduction • Distinguish between sexual and asexual reproduction in plants in natural growth. • Identify plants that reproduce asexually. • Compare the advantages of each form of plant reproduction.	*Dynamic Agriculture 2*, p. 70
Basic plant classification • Recognise and identify the differences between ferns, conifers, monocot and dicot plants. • Utilise a simple plant key to identify garden plants.	

Concepts	Resources
Cuttings • Identify plants that are suitable to be propagated by cuttings at the current time of year. • Make cuttings of different plants utilising more than one method, e.g. hardwood, semi-ripe, softwood, leaf cuttings. • Provide a suitable growth environment to ensure success, e.g. misting, bottom heating, sandy mixes and high humidity.	www.ces.ncsu.edu/depts/hort/hil/hil-8702.html *Dynamic Agriculture 2*, p. 72 Yates *Garden Guide*
Layering: layering and air layering • Perform air layering or layering to suitable plants. • Utilise a suitable environment with high humidity to pot up and establish layered plants.	www.ces.ncsu.edu/depts/hort/hil/kil-8701.html *Dynamic Agriculture 2*, p. 73 Yates *Garden Guide* *Agriculture and You 1*, p. 85
Budding and grafting • Conduct a risk assessment for budding or grafting. • Graft onto a suitable rootstock, utilising correct and safe methods. • Correctly use the terms rootstock and scion. • Identify the situations where grafting is the most suitable propagation method, and what advantages it can have in plant production.	*Dynamic Agriculture 2*, p. 72 Yates *Garden Guide* Video: *Farming skills: Budding and grafting* Appleseed Productions 150A Ferguson St Williamstown 3016 *New Gippsland Seeds Grafted Tomato Kit*
Plant division • Divide a plant into plantlets, and pot them for further growth, e.g. Mondo grass, bromeliads.	*Agriculture and You 1*, p. 87
Plant tissue culture • Describe the process of propagating plants using plant tissue culture techniques. • Critically discuss the use of plant tissue culture in the horticultural production system.	*Agriculture and You 1*, p. 104

Concepts	Resources
Experimental design in agricultural situations • Each student to choose a species of plant to investigate. • Research the methods of propagation that are used to propagate the selected plant species. • Investigate one factor that effects the success of the propagation of the plant species using a controlled experiment. Examples might include different methods of propagation, lengths of cuttings, time of year, types of potting mixes, use of hormones. • Submit a report with details of the research and the controlled experiment, with conclusions based on the research.	

Assessment

There are nine assessment tasks listed below for this unit. They consist of tasks that are assignments, skills and formal tests. The mark grid below gives an indication of the value of each task and how it will contribute to the overall assessment of the students for each outcome.

Tasks

- Use a suitable recipe to make potting mixes for seed propagation, striking cuttings and growing struck plants.
- Sow seeds of vegetables, herbs, native plants and exotic garden plants utilising a range of methods to break seed dormancy.
- Evaluate the effect of soil conditioners on seedling growth by performing a controlled experiment.
- Make cuttings of different plants utilising more than one method.
- Layer or air layer a plant.
- Graft using a grafting or budding technique.
- Divide and pot up a plant.
- Report on propagation investigation.
- Topic test.

Tasks contributing to semester report	5.3.1	5.3.3	5.5.1	5.5.2	5.6.1	5.6.2
Make potting mixes.		▯			▯	▯
Sow seeds utilising a range of methods to break seed dormancy.		▯			▯	
Evaluate the effect of soil conditioners on seedling growth.		▯	▯			
Make cuttings of different plants utilising more than one method.		▯			▯	
Layer or air layer a plant.		▯			▯	
Graft using a grafting or budding technique.		▯			▯	▯
Divide and pot up a plant.		▯			▯	
Report on propagation investigation.	▯		▯	▯		
Topic test	▯		▯	▯		▯