

Activity 1: [Propagation from cuttings]

[Stanley Barker DPI Box Hill, <http://www.vicnet.net.au/~herring/pigprop.htm>
<http://www.anbg.gov.au/PROPGATE/growing.htm>]

Curriculum connections

Use of this learning and teaching activity may contribute to achievement of elements of the Standards. Indications of relevant Domains and Levels in the Victorian Essential Learning Standards are provided to assist teachers to make decisions about the appropriateness of the activity for their students.

Victorian Essential Learning Standards Domains and (Levels):

Discipline - based Learning Science (5)

“Students analyse what is needed for living things to survive, thrive or adapt.” L5

Duration: 45 minutes.

Setting: The classroom or possibly an outside area.

Summary

This activity enables students to understand plant propagation techniques and introduce them to the ideas of plant genetics and cloning through an engaging, hands on activity.

Student outcomes

This activity will enable students to:

- Better understand the nature of the similarities between, and diversity of, living things and their sustainable relationships with each other and their environment.
- Research aspects of plant genetics and cloning.
- Observe the success of their propagation over time.
- Assess and compare seed and cutting propagation techniques.

Background notes for teachers

Pigface (*Carpobrotus modestus*) - A cactus-like groundcover with purple edible fruit.

Pigface once grew abundantly on the northern plains of Victoria. The introduction of hard-hooved sheep and cattle caused great destruction to this succulent plant. Edward M Curr in his memoir, "Recollections of squatting in Victoria" describes pigface growing during the 1840s.

"The plain, for the thirty miles we followed it, from the Campaspe to Mount Hope, was one bed of ripe fruit, some juicy and some dried like raisins. As often, however, as I crossed the same country afterwards, I never again saw the pigs' faces ripe, so that I fancy that they only came to maturity in exceptional years. The plant is now nearly, if not quite, extinct in that locality. "

Cotyledon - a leaf-forming part of the embryo of a seed plant. Monocotyledons have one and dicotyledons have two cotyledons in each seed.

Clone - plants which have been propagated from cuttings or by layering (i.e. vegetatively) have an identical genetic make-up to parent plant. They are called clones.

Asexual reproduction means that an organism reproduces somehow by mitosis: splitting in two, budding, fragmentation and regeneration, etc. **Asexual reproduction** produces identical offspring or clones.

Sexual reproduction means that two reproductive cells or gametes must have joined together.

Sexual reproduction allows for variation among the offspring.

Note that it is NOT the number of parents that makes the difference. Just check to see if two cells or even two nuclei are joining together ... that's sexual reproduction.

Cutting versus Seed Propagation techniques

1) In your own words, briefly describe what you understand the term cloning to mean?

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2) Propagation using cuttings is an example of asexual plant reproduction. List some of the advantages of employing the cutting propagation technique given that it is a method of cloning the plant.

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3) If you wanted to grow more of your favourite rose bush or your super apple tree that produces great big red apples would you use seeds from the plant or take cuttings? Explain

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4) Why might plants that grow from seeds be more likely to find new areas to grow than ones that grow from cuttings?

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Materials

- Stanley knives /secateurs
- Potting mix
- Forestry tubes
- water

The activity

Propagation from cuttings is a vegetative method and therefore each plant produced is *genetically identical* to the parent plant. Cuttings should be made as soon as possible after the plant material is collected. However, if kept cool, moist and free of fungus, some plant material can be stored for several days. Not all species of plants can be propagated from cuttings. Cuttings taken from species of Eucalyptus do not readily form roots. This is also the case with many Acacia species and most monocotyledons, e.g. grasses.



1. **Cut a length of pigface runner containing a number of leaf nodes**



2. **Cut the length of pigface runner between each leaf node.**



3. **Fill a tube with potting mix, and bury the pigface stem just below the surface. Firm the soil around the cutting.**



4. Place the tubes containing pigface in water for the first week then allow the water level to fall below the tubes. Water weekly in cool weather, twice weekly in hot weather.



5. When the pigface has grown another 3 to 6 cms. (1 - 2 inches) and there is a good root structure it is ready to plant out.



6. Pigface 1 month after planting in late spring.



7. Pigface will tolerate very dry soil, but needs water during summer until it becomes established.



8. This area of Pigface was planted 3 years previously and the cutting above was taken from this area.

Extension activities

Investigate and research cloning, plant reproduction and genetics in greater depth. Try propagating some other indigenous species eg kangaroo apple (*Solanum aviculare*) from cuttings and seed and compare the results.

Related LandLearn/Landcare activities

Seed germination activity, Seed sowing activity