Cloning a living organism

This practical gives you a chance to:

* clone a living organism
* compare the features of a clone with its parent
* find out which features of a clone might be influenced by environment and which depend on its genetic make-up
* explore your feelings about cloning living things

### Procedure

SAFETY:

TAKE CARE! Carry a scalpel on a white tile, with the blade on the tile and pointed away from you.

Wash your hands after you have finished preparing and planting the cutting.

### Investigation

1. Collect a pot filled with compost, a white tile and a scalpel.
2. Cut a portion of the organism to be cloned as described by your teacher.
3. Trim the piece as described by your teacher.
4. Take a close look at the end of the stem. Use a magnifier.
5. If you choose to use rooting powder, dip the cut end into the powder.
6. Push the stem firmly into the middle of the compost, so the cut end is at least 3 cm under the surface.
7. Collect a plastic bag and a small beaker of water.
8. Put your pot in the bag. Pour in the water. Seal the bag.
9. Take your clone home and keep it moist, but not soaking in water. You can take the bag off after 2-3 days, and leave the clone on a saucer on a windowsill. Keep watering every 2-3 days.
10. Observe your clone over the coming weeks and bring it back to class when your teacher asks you to.

**QUESTIONS**

1. What did you notice about the tissues of the stem? Does it look as if all the cells across the stem are the same, or are there differences between them?
2. Describe your clone after 2/3 weeks:

leaf colour

leaf shape

arrangement of leaves

flower colour (if flowering)

height

number of leaves

1. Compare your clone after 2/3 weeks with the original organism.
2. Which of the features of your clone depend on the genetic material in its tissue?
3. What do you think about cloning plants in this way? Would you feel the same about producing new animals from sets of animal cells? Why?

**ANSWERS**

1. There are usually rings of tissue within the stem which look different from one another. There will usually be a definite outer layer and you may see structures like a ring of beads which are the vessels carrying water and food chemicals up and down the stem. One of the tissues in the cutting must be able to redifferentiate in order to become root tissue for the cutting.
2. Depends on students own observations.
3. The leaf colour, leaf shape, arrangement of leaves on the stem and flower colour should be consistent between clones and with the parent plant. The height and number of leaves may vary significantly.
4. The leaf colour, leaf shape, arrangement of leaves on the stem and flower colour depend on the genetic material in its tissue.
5. Find out what the students think at this stage.