

Growing with compost



Background information

This activity explores the effectiveness of compost as a natural fertiliser. Students may conclude that compost benefits plant health and growth, reducing the need for manmade fertilisers and harmful chemical pesticides. These products can over-fertilise plants, so they become soft, prone to disease, fluid filled and need increased watering (due to excess mineral salts).

By comparing different compost types, students can identify the benefits of each type and what type is most suitable for the conditions they are growing their seedlings in. This activity can be carried out in your school garden or in containers within the classroom. This activity will take 6-10 weeks to complete.

Equipment needed

- » Containers or plant pots, 500 ml is a suitable size. Reuse ice cream containers or large yogurt containers with drainage holes made in the bottom. All containers must be the same size to achieve a fair test, so make the choice based on what is most widely available amongst your students.
- » Soil (e.g. top soil)
- » Plant seeds and/or seedlings (e.g. beans or lettuce). If you are using seedlings, ensure they are of uniform size (approximately 75mm in height) and type (e.g. all lettuces). This is to achieve a fair test. You will need about 36 seeds or seedlings.
- » Gardening tools, a trowel, gloves, and a watering can.
- » One used clear plastic 2-litre soft drink bottle for each plant. Remove the cap, then cut the neck off the bottle and reuse the base turned upside-down to cover each seedling.
- » A warm and sunny growing environment. Remember to keep conditions for all plants the same to ensure a fair test.
- » A camera to document plant growth at regular intervals.
- » Labels for containers, including a control with no additives (i.e. just topsoil).
- » Different types of compost to test:

Ensure the same amounts of each type of natural fertiliser is mixed with the topsoil before planting. Add 1/4 of the volume of the container – this is 125ml of compost product to 375ml of topsoil in a 500ml container.

- Vermi-cast from a worm farm
- Soil with finished fermented bokashi product dug in to it
- Compost from a traditional composting method, including garden wastes

Suggestions

You could invite a gardening expert from your local community to share their knowledge and assist with planting.

You could choose to undertake a similar investigation using different growing mediums such as soil, clay, potting mix, or sand.

You could choose to undertake a similar investigation using different liquid fertilizers such as vermi-liquid ('worm tea'), Bokashi liquid, a 'compost tea' (liquid compost made with a plant, e.g. comfrey immersed in water with no oxygen) and a store bought manmade liquid fertiliser. The concentrations of the liquids added must be equivalent to ensure a fair test.



Activity instructions

1. Plant seedlings in containers in the classroom or in school gardens. They must all be put in the same location under the same conditions to achieve a fair test.
2. Where possible, choose seedlings from plants that are already growing in the school garden, or those that have been brought from home. If you need to buy the seedlings, visit www.yates.co.nz to find out what plant varieties will grow best at the time of year that you are carrying out this activity.
3. If you are planting in the school gardens, you will need to grow your seedlings in 4 different growing areas in order to achieve a fair test: a control area with topsoil only; an area with a topsoil/compost mix; an area with a topsoil/vermicast mix; and an area with a topsoil/bokashi mix. Plant 3 seedlings in each area of the garden.
4. If you are planting in containers, you will need to grow your seedlings in 12 containers: 3 control containers with topsoil only; 3 containers with a mix of topsoil and compost; 3 containers with a mix of topsoil and vermicast; and 3 containers with a mix of topsoil and bokashi.
5. If using containers, make sure they are all labeled and aerated (i.e. have holes in the bottom).
6. If planting in containers use 3 labeled controls with topsoil only, or set aside and label one area in the garden where the seeds or seedlings are to be grown without any compost added.
7. Fill 3 500ml containers with 125ml compost and 375ml topsoil. Mix the two together in the pot so the compost is evenly distributed. If planting in the garden remove 750mls soil from where you are planting the seedlings and mix with 250ml compost, return to the garden. Label each container or area of the garden.
8. Fill 3 500ml containers with 125ml vermi-cast and 375ml topsoil. Mix the two together in the pot so the compost is evenly distributed. If planting in the garden remove 750mls soil from where you are planting the seedlings and mix with 250ml vermin-cast, return to the garden. Label each container or area of the garden.
9. Fill 3 500ml containers with 125ml bokashi and 375ml topsoil. Mix the two together in the pot so the compost is evenly distributed. If planting in the garden remove 750mls soil from where you are planting the seedlings and mix with 250ml vermin-cast, return to the garden. Label each container or area of the garden.
10. Before planting dampen each container or garden area with the same amount of water, 50ml each should be sufficient unless the soil is very dry.
11. Dig a small well in the middle of the soil in the labeled container and plant the seed or seedling. Plant 3 seeds or seedlings in each labeled area of the garden. Water each seedling with an additional 50ml water.
12. Record the height/size of each seedling at this stage.
13. Put the seedlings in a sunny area, but not in the direct sunlight. Seedlings planted in outside gardens can be covered with a shade cloth to prevent too much sunlight and bird damage. Inside pots can be covered with the cut off bases of clear plastic bottles to act as a miniature glass house.
14. Water the seedlings regularly, about twice a week, making sure that each plant receives the same volume of water. Be careful not to overwater.
15. Set up a recording chart noting details such as the growth rate, how often/amount watered, position in the room, air temperature, bugs seen etc. Where possible, take photographs of the plants every time details are recorded.
16. After 6–10 weeks, students can analyse their results and decide what type of compost is best for their school and/or home gardens.

When seedlings start to grow too large for the containers, they can be transferred to a larger container or re-planted outside.

Key questions

- » What predictions can you make about which type of compost will produce the best results?
- » Did you observe any differences in the growing plants, such as:
 - Stem strength
 - Leaf size
 - Leaf colour
 - Flower
 - Root development
 - Over all appearance of plants
- » How did the control plant grow?
- » Which compost produced the best results?
- » Were your initial growing predictions correct?

Visit www.createyourowngarden.org.nz for more information, facts and additional learning activity ideas, as well as posters showing the materials that can and cannot go into different compost systems.

