Compost in a Bottle Experiment

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This experiment will demonstrate the decomposition process and simulate the breakdown of organic matter into compost.

What is Decomposition?

Decomposition is the process by which a material is broken down into simpler parts. Composting is a great example of the decomposition process.

Why compost?

Composting organic matter has a number of environmental benefits:

- Is a great way to recycle nutrients into your soil- you will save on fertilisers;
- It will reduce evaporation from your soil- saving you water;
- It produces minimal amounts of methane (a greenhouse gas), unlike landfilling; and
- It saves on transporting your waste away from your house to the landfill.

How does compost work?

Compost relies on four main ingredients:

- Carbon material (dry leaves, paper and newspaper);
- Nitrogen material (grass clippings, food scraps);
- Water; and
- Air.

Once combined, these ingredients attract bacteria and fungi, which start to feed on the organic matter. As they feed and multiply, they produce heat as a by-product. This heat also helps the decomposition process. Air and oxygen mix through the compost allowing the bacteria and fungi to grow. Moisture also helps these micro-organisms survive and multiply.

Experiment:

Aim: To observe the decomposition process undertaken in a compost bin, and monitor the rate of breakdown.

Time: 30 minute set up with weekly observations over 3-4 weeks

What each student will need:

1. Clear 2ltr plastic bottle with lid
2. Two cups of fruit and vegetable scraps
3. Two cups of dried grass clippings/leaves
4. Two cups of garden soil
5. One cup of shredded newspaper
6. Spray bottle containing water
7. One tablespoon of fertiliser (eg blood and bone)
8. Clear tape
9. Scissors
10. Permanent marker
11. Gloves

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Method:

1. Cut around the bottle neck to form a flip top lid (large enough to pour the ingredients in).
2. Pour 2-3 cm of soil into the bottom of the bottle.
3. Using the spray bottle, moisten the soil.
4. Add 2-3 cm of fruit and vegetable scraps on top of the soil.
5. Add another 1 cm layer of soil.
6. Using gloves, sprinkle with 1/3 of the fertiliser over the soil.
7. Add a layer of leaves and grass.
8. Cover with another 1 cm layer of soil.
9. Lay moist newspaper over the soil.
10. Repeat steps 4-9.
11. Tape the top of the bottle closed.
12. Mark the top of the compost on the side of the bottle.
13. Place bottles in a sunny spot.
14. Once a week, mark the height of the compost on the bottle and observe the changes in volume and rate of decomposition.

TIP: if the compost gets too moist, take the lid off to dry it out.
Alternately, if the compost gets too dry, spray it with a little water.

Results:

Discuss the process of decomposition.
Research and draw a picture of the decomposition cycle.
What happened to the food scraps? What happened to the paper?
Did the overall volume of the compost increase or decrease over the period of observation?
Did you see any mould or fungi growing in the compost?
Research what should not be put in the compost bin and why.

Once you have finished the experiment, don't forget to put the compost on the garden!

Further activities:

Start a compost bin at home or school.
Design a poster outlining what should and should not be put in the compost bin.
Conduct an experiment to assess growth rates of seedlings using compost and poor quality soil.

For any further information please contact Council's Waste Education Officer on **02 4974 2848.**

The City of Newcastle