How to build a miniature composter

Background information

This activity is ideal for creating an individual research tool for students. Students can create their own indoor compost unit by adding different types of organic matter that will break down. They can observe the actual composting process in action, especially if a clear container is used (the organic matter will decrease in size and become unrecognisable). Students can compare composter design, the moisture content and nutrient ratios of mixtures to be composted, and the quality of the end compost product. This activity may take around 2- 3 weeks to complete.

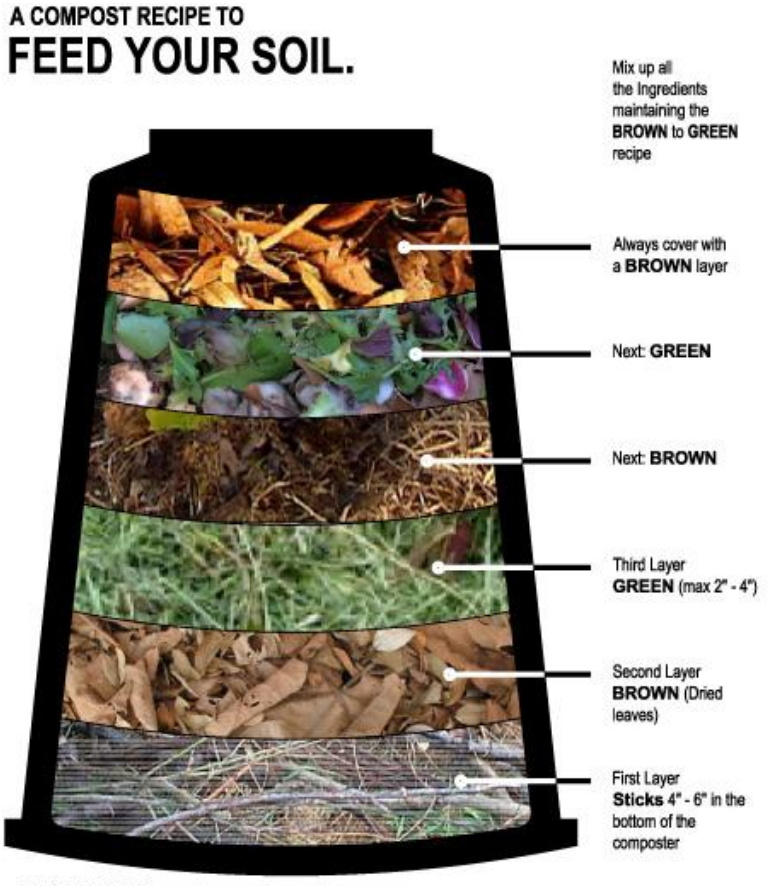
Compost recipe

Greens – these are nitrogen-rich organic waste materials such as kitchen food scraps (with the exception of meat and cooked food), fruit and vegetable peels, ground coffee beans, tea bags, grass and plant clippings, hair, fur, blood and bone, and seaweed.

Browns – these are carbon-rich organic waste materials such as dried leaves, sawdust, wood shavings, hay, vacuum cleaner dust, shredded paper and newspaper, egg shells, crushed sea shells and wood ash.

Visit www.createyourowneden.org.nz for more information and facts on the composting process, as well as a poster showing the materials that can and cannot go into a compost system.

The following diagram shows you how to properly layer materials into the miniature composter:



Composting tips:

- Decomposition in a compost bin works best when there are slightly more brown materials than green materials (by volume) present and these materials are moist and aerated.
- Do not use dairy or meat products in your miniature compost.
- Layer compost to get the best results.
- Composting on a small scale will work best if you add materials no larger than 1-2cm.
- Always wear gloves when handling organic waste.

Equipment needed

- Newspaper or cloth to protect surfaces while making the composter
- One container for each group of students (choose one of the following: an ice cream or yogurt container, a large jar or glass, or a soft drink or milk bottle with the top cut off).
- Soil (or finished compost)
- Organic waste material from the kitchen and garden such as food scraps, paper, leaves or grass clippings (see the compost recipe for a detailed list)
- A dark piece of plastic or a small piece of carpet to cover the compost
- Water
- Labels for the containers
- Ruler
- Thermometer
- Magnifying glass
- Gloves
- Camera

Activity instructions

1. Arrange the newspaper over your work areas for protection.
2. Label each container with the names of the materials you will compost in them and/or how you will layer the material.
3. Add the soil along with the green and brown organic wastes into the container in the following way:

   Start with: 3-5cm soil layer dampened with water

   Layer: 2cm of green and brown materials

   Add: 3cm soil (or finished compost)

   Layer: 2cm of green and brown materials

   Cover: with a small piece of carpet or another 3cm soil layer.

   Enclose the composter in a sheet of dark plastic if a clear container is used.

4. Measure and record the temperature of the composter.
5. Measure and record the height and the temperature of the materials in the composter daily to begin with, then approximately every 4 days. You can also take pictures and record your observations if you are using a clear-sided composter.
6. Check the composter to ensure it is still moist. Add water if it is brittle or dry.
7. You may try mixing the compost once a week to allow air to mix with the ingredients.
8. Use your finished compost on the garden or on pot plants after you have reviewed your results.

(**Note:** In these small systems the temperature may reach its peak within the first 24 hours.)

Key Questions

- Can you predict which organic items will break down quickly?
- Can you predict which organic items will take a long time to break down?
- Can you graph and discuss the temperature and height results?
- How long does it take to compost using this method?
- What does the end compost product look like? Smell like? Feel like?
- How does the temperature vary over time?
- How does the 'lid' (carpet, plastic or soil layer) aid the development of the compost?
- Does mixing aid the development of the compost?
- When and where is the most heat produced?
- Does the type of organic matter used affect the compost product?
- Does the type of organic matter used affect the amount of moisture produced?
- Does the type of organic matter used affect the time it takes to compost?
- What effect does layering have?
- Which of the different sized or shaped composters work best?
- How long does it take for the composter to make compost (compare your results to your initial predictions)?

Visit www.createyourowneden.org.nz for more information, facts and additional learning activity ideas, as well as a guide to setting up a school compost bin, worm farm or bokashi system.