

COMPOSTING IN SCHOOLS

Adapted from the USDA People's Garden *Implementation and Beyond* guide. Please be sure to refer to pages 28 and 35 for more detailed information on composting.



COMPOST is a dark, crumbly, and earthy smelling form of decomposing organic matter. It is the magical secret ingredient that makes all garden soil hum with life and vigor and is critical to a garden's health and productivity. Compost also improves soil structure and tilth, making it a more hospitable and even nurturing place for plants and organisms to live.

EVERY SCHOOL GARDEN SHOULD HAVE SEVERAL COMPOST OPTIONS: a worm composting bin is generally kept inside, it can take small amounts of food scraps, produce a great soil amendment and kids can explore what lives in the bin all year round. A 3-bin outdoor composting system is very appropriate for a good-sized school garden. This system can take care of larger amounts of fruit and veggie scraps and also garden and yard trimmings. *Note: methods for composting in a worm bin versus an outdoor bin do vary. Please do not follow the following directions for a worm bin.*

THINGS to KNOW BEFORE YOU START: Composting is easy, cheap and good for the environment and fun to do, but there are some key tips to follow so your bin doesn't get smelly or attract pests. While a small composting system helps provide great usable compost but almost never produces as much as the garden will need.

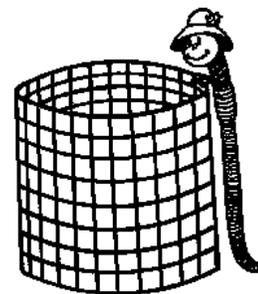
Composting is similar to cooking – start with a pot, add the right mixture of ingredients, let it heat up, and out comes nutritious compost! But, without the right ingredients, things can go very wrong!

For tips on how to build various bins visit the [Cornell Waste Management Institute](#). For detailed resources, ideas for student activities, and much more, please visit [Cornell Composting in Schools online](#).

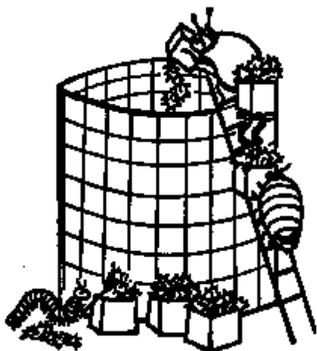
Tip: Think of composting working just like a deciduous forest works. Leaves drop to the ground, pile on top of green and brown plants, twigs, nuts, and soil. Throughout the fall and winter these piles of organic matter get rained and snowed on and wind blows through the forest. Come spring the piles have decomposed leaving a new layer of soil and nutrients on top of the

THE RECIPE:

Step 1. CHOOSE A BIN for your school garden compost. A simple welded wire bin is <\$15, very easy to set-up, to use and to harvest finished compost. If the bin is really used, you may eventually need two or three of these bins. Another popular set-up in school gardens is a 3-bin pallet system. For more specific info on these and other bin options, please visit cctompkins.org/compost.



Step 2. GATHER INGREDIENTS. Think of compost



ingredients falling into two categories: **“GREENS”**, which are made mostly of nitrogen and are (with a few exceptions) the color green or another color and **“BROWNS”** which are mainly made of carbon and generally brown in color. A compost bin should always have **three times as many browns as greens** (by volume). Too many **greens** in relation to the amount of **browns** is the #1 cause of compost troubles including lack of decomposition, flies, smells, excessive moisture or rodents.

Here are ingredients that fall into the **green** and **brown** categories. You do not have to add *each* ingredient to your bin.

GREENS

Food scraps — any mixture of some or all of the following ingredients:

- Vegetable peels and seeds
- Egg shells (crumbled ideally)
- Any vegetable or fruit scraps*
- Coffee grounds and filters, tea bags
- Breads and grains
- Some manure from poultry, cows, horses or rabbits**

Garden debris — any mixture of some or all of the following ingredients:

- Stems, leaves, fruits you’re not going to eat, etc.*
- Grass clippings, green

BROWNS

Yard or Garden debris – add a mixture of some or all of the following ingredients:

- Hay or straw
- Wood chips
- Grass clippings, brown
- Weeds and other garden waste
- Leaves, dry and brown
- Ashes, cooled and grey
- **Shredded** newspaper
- Sawdust

***The smaller the size/pieces, the better and faster it will compost.**

****It is suggested to avoid using manure in a school compost bin unless it is a commercially produced fertilizer product.**

DO NOT put in the compost bin:

- Meat, bones, dairy products, oils, and fats. While these are compostable, they require a higher temperature to decompose. That temperature can be difficult to obtain, and those produces will attract animals if not done correctly.
- Glossy paper, plastics of any kind, chemicals, tomatoes or plants with blight or other diseases.
- Any parts of plants if they have disease or fungus.

Step 3. Now that you have a bin and you know what you can and cannot put in it; you are ready to **ADD INGREDIENTS** to the bin.

- Pile coarse woody sticks inside the base of your bin to create a nest 1-2 feet high. This nest will allow air to easily circulate throughout the bin.

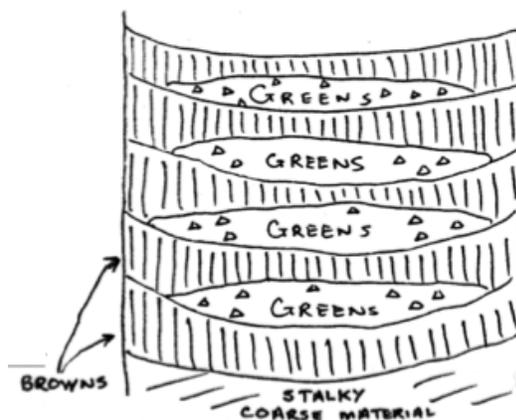
- Layer a **generous** amount of **browns** on top of the sticks being sure you make a **bowl shape** and not a volcano shape with the **browns**.

- Add **greens** to the center of the bin. If adding a lot of **greens**, spread with a shovel or pitchfork to make a thin layer being **VERY CAUTIOUS** to keep **greens** from getting close to the edge of the bin.

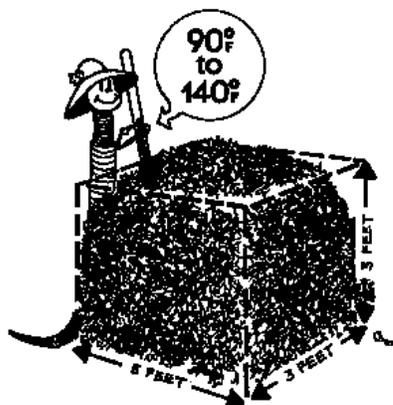
- Add a thick layer of **browns** to cover the **greens**, ensuring again that you've made a bowl shape and not a volcano. **Be sure the browns cover the greens completely and go right to the edges of the bin.**

- Continue this layering method of adding **greens** and **browns** until your bin is full.

Cut-away view of layers within a bin



Source: ccetompkins.org



Step 4. LET THE PILE COOK

By layering **greens** and **browns** and ensuring airflow in this mixture, you have created the perfect habitat for micro and macro organisms to do their work and help your compost pile to heat up – exactly what is needed for the ingredients to decompose and turn into that nutritious soil we long for.

Consider getting a [Compost Thermometer](#) so you and your students can observe and monitor the bins temperature. (For student research project ideas, visit the [Cornell Composting](#) web site). A healthy school garden compost bin will easily reach 90 degrees at its center, and can reach upwards of 140 degrees! Check the temperature

in the middle and at the edges of the bin. Is one area hotter? Is your bin hot on a very cold day? What about on a rainy day? Do certain types of **browns** affect the temperature of the bin?

The composting process will take 3-9 months. The length of time will vary depending on the time of year, the types of **browns** you're using and how hot your bin gets. Once you fill the bin, you will notice the volume settle after a few days. You can continue to add **browns** and **greens** to the bin, repeatedly filling it up, or (and a preferred method), is to let your full bin sit for 3-9 months undisturbed other than monitoring the temperature if you choose, and start the layering process over in a second bin. Starting a second bin rather than continuously using the same bin will make it easier to harvest the nutritious soil amendment you and your students created.

Step 5. HARVESTING

Before you harvest, assess if your compost is ready to use in the garden. Some good clues that decomposition has basically stopped are if the temperature of the bin has leveled off for at least a week, you can no longer identify any original **browns** or **greens** (with the exception of woody sticks), and the compost should have a crumbly texture, dark color and smell earthy.

While you will be able to harvest some usable compost to add to your garden, a small compost bin will *not* produce all of the soil amendment your garden needs for the year. You should expect to harvest **40 times less** usable compost by volume as compared to the quantity of **greens** and **browns** put in the bin. That said, harvesting compost is rewarding, fun and is the best way to show students how "waste" from the garden can turn back into food for the plants.

To harvest, if you stopped adding new ingredients to the bin months ago, you can simply by shovel the compost out of the bin. The welded wire bins are easy to just lift up and off the pile so you have easy access. If you've continued adding new materials to the bin, the ingredients at the bottom might be ready to use while those in the middle and top need more time so you will need to separate unfinished compost from finished compost. A simple way with some bin styles including welded wire, one person can lift the wire a foot or two from the ground, while another shovels out finished compost from the bottom of the bin. If this is not possible, use a screen of 1/2-inch hardware cloth to sift the entire bin. The finished compost will fall through, while the pieces still breaking down will remain in the screen so you can return them to your compost pile for further decomposition.

QUICK TIPS:

- Keep a well-stocked supply of **browns** right next to the compost bin. You or a compost volunteer should be in charge of always ensuring **browns** are easily available.

- If multiple people are adding to the bin, offer a short training on how to add ingredients to it.
- Keep an eye on the bin as it fills. Ensure that only **browns** can be seen from the outside of the bin.
- NEVER just add **greens** without covering them thoroughly with **browns**. If you do not have a supply of **browns** on hand, you must wait until you do to compost your **greens**.
- NEVER pile **greens** or **browns** to make a volcano shape in the center of the bin. This will cause the bin ingredients to eventually roll down the volcano and spill onto the sides of the bin. **Greens** not covered by **browns** will smell and attract animals.

References and Credits:

Image credits from Cornell Composting, <http://compost.css.cornell.edu/>

Cornell Waste Management Institute, <http://cwmi.css.cornell.edu/composting.htm>

Cornell Cooperative Extension – Tompkins County, <http://ccetompkins.org/compost>