FortWhyte Alive
HUMAN. NATURE.
Naturescape for Educators
bringing biodiversity into the schoolyard

What Marvelous Garbage!

About one third of the average school's garbage can be composted. In an outdoor compost bin, decomposers such as bacteria, fungi, worms and insects break down dead food waste into essential nutrient-rich soil.

Starting a Compost Project

Here are 5 essential steps in a successful school composting project.

1. **Get connected** with composting initiatives at other schools in your division and community. Find grants to fund your project. Invite a speaker from Green Action Centre to present to staff and students. Put together a list of goals for the project during the coming year, two years, and five years.
2. **Complete a waste audit** involving one classroom or the entire school. Great online resources include the Recycle Rangers Program in Ontario (visit www.recyclerangers.ca). Keeping track of the weight of your wastes allows you to track your progress.
3. **Identify a motivated teacher to coordinate the compost project**. Coordinating this project should be listed on the roster of extracurriculars, and valued accordingly. The coordinating teacher will identify a group of motivated students to be the Compost Team and coordinate collection and management of the school compost program.
4. **Consult school custodians** during the entire planning process. They can contribute to decisions about the indoor collection system and outdoor compost bin locations. You will also need to access a janitor's sink for washing out the compost pails.
5. **Purchase materials**, including:
    a. **Outdoor compost bins**: Black plastic bins are available from garden centres, or the Nature Shop at FortWhyte Alive. Wooden bins can be built in cooperation with a local high school with a carpentry program, a community group or with assistance from local non-profits.*
    b. **Indoor collection pails**: You will need one for each classroom. Use any large buckets with lids, such as empty cat litter pails. Provide clear labels with Do and Don't compost instructions.
    c. **Brown materials**: Carbon-rich brown materials such as dry leaves, shredded paper or dry grass will keep your compost pile working at its best. Identify sources of these materials, and store in sealed bins next to your composter.
    d. **A compost turner or garden fork** for aerating the compost.

*e.g. Green Action Centre, Urban Eatin' Gardener's Co-op.

Compost Ingredients

DO ADD — 2-3 parts carbon-rich "brown" wastes	DO ADD — 1 part nitrogen-rich "green" wastes	DON'T ADD — Wastes that smell, attract pests, and are slow to break down
 Dry, brown, untreated grass clippings; straw	 Fruit and vegetable scraps	 Meat products and bones
 Dry leaves	 Coffee and tea bags	 Dairy products (e.g. cheese, yogurt, butter)
 Wood chips and twigs	 Eggshells	 Oily foods, fried foods, spreads
 Shredded paper and cardboard	 Fresh plant and grass clippings	 Prepared and processed foods (e.g. sandwiches, pizza, etc.)
 Napkins	 Bread, plain pasta and rice*	 Plastic, foil and other garbage

*In order to avoid confusion, since most of these wastes will be prepared foods containing "Don't Add" materials, many schools choose not to compost these items.

The Finished Product

Finished compost is the ideal organic fertilizer. Fall is the best time to clean out the bins. Get creative: identify community groups who would maintain the composters over the summer, in return for compost for local gardens. You can also work with school maintenance to find places to use it onsite.

Composting Tips

- Keep sealed totes of brown wastes next to the composter. Ideally, with every pail of food scraps, add 2 to 3 pails of brown waste.
- Aerate the mixture by turning the compost pile once a week, using a garden fork or a compost aeration tool, available from Lee Valley Tools.
- Check moisture levels each week. Material should be moist, only yielding a trickle of moisture when it is squeezed. Water when necessary.
- Take the compost pile's temperature. The ideal range is 104° to 131° Fahrenheit. To heat up the pile, add more green wastes. Turning the pile will cool it off.
- Decomposition slows down during Manitoba's deep freeze winters. Take any finished compost out of the composter in fall to make room for winter additions.

Composting with the Curriculum

Pre-school

GARBAGE MONSTERS

Worms, insects and bacteria are a few examples of organisms that eat compost. Show pictures of these organisms to the class. Have your class draw a creature they think might like to eat garbage. Have them draw what garbage the creature could eat. If available, use compostable paper and add the drawings to the compost bin to feed the real compost monsters.

Kindergarten – Grade 1

WHAT EATS GARBAGE?

Allow students the opportunity to look at and interact with earthworms. Before school, dig up some earthworms from your garden. Take your class outside and divide into small groups. Place a worm on a damp paper towel on a plate and give one to each group. Have students record information about the worm (colour, shape, warm or cold, wet or dry). Discuss how worms help people by eating dead leaves and food scraps and "pooping" out healthy soil. Have students find a nice location to release their worms into soil at school.

Science: Colours, Characteristics and Needs of Living Things, The Senses, Characteristics of Objects and Materials; **Social Studies**: Active Democratic Citizenship, Managing Information and Ideas, Critical and Creative Thinking, Communication, Me, The World Around Me, My Environment.

Grades 2–3

DIGGING FOR WORMS

Have students dig in a designated area to find worms. Place them in a container to count. Have students think about how a worm might eat, breathe or move. Worms help to improve the soil. Here is what your worms can tell you:

1–2 worms: Your soil needs more organic matter

5–9 worms: Your soil is doing well

10 or more: You have healthy, biologically active soil

Discuss the importance of healthy soil.

Science: Growth and Changes in Animals, Air and Water in the Environment, Growth and Changes in Plants, Soils in the Environment; **Social Studies**: Active Democratic Citizenship, Managing Information and Ideas, Critical and Creative Thinking, Communication, Communities in Canada, Exploring the World, Communities of the World

Grade 3

THE GREAT PLANT EXPERIMENT

Discuss what plants need to grow, then have each student start a bean seed. You can germinate seeds in cups of damp paper towel, making daily observations. Then, have students transplant them into soil-filled pots. Use finished compost from your composter, if you have one. Apply different treatments to different plants, labeling them as you go as to how much compost, light or water they will receive. Graph your results and discuss.

Science: Growth and Changes in Plants, Soils in the Environment, **Social Studies**: Active Democratic Citizenship, Managing Information and Ideas, Critical and Creative Thinking, Communication, Exploring the World, Communities of the World; **Math**: Statistics and Probability.

Grade 3

BUILD A MINI COMPOSTER

Have students construct mini composters to observe the process of decomposition. Use clear containers such as pop bottles with tops removed, with small holes for aeration. Layer the containers with damp soil or finished compost, and green and brown materials, cut into small pieces. Cover the top with another layer of soil, add a perforated lid, and place on a tray to collect any moisture. Make as many observations as possible over the weeks, including temperature, moisture and rate of decomposition.

Science: Material and Structures, Soils in the Environment, **Social Studies**: Active Democratic Citizenship, Managing Information and Ideas, Critical and Creative Thinking, Communication, Communities of the World.

Grade 4

CRITTER HUNT AND FOOD WEB

Have your students make piles of grass and leaves. Visit the pile over the week to look for insects, spiders and other critters. Have students gather critters into small, clear containers. Discuss adaptations that these invertebrates have for life in a leaf litter habitat. Have students place their contained critters in a circle and connect them in a food web using a piece of string. Use labels to categorize the groups as herbivore, omnivore, carnivore, predator, prey or decomposer. Discuss how simple it was to change, create or destroy the mini- habitat. Discuss human impact on our surroundings, and how diversity keeps ecosystems healthy.

Science: Habitat and Communities; **Social Studies**: Active and Democratic Citizenship, Managing Information and Ideas, Critical and Creative Thinking, Communication, Living in Manitoba.

Grade 5

GARBAGE GARDEN

Discover how different materials decompose. Collect a variety of garbage materials. Using a chart, describe each material based on size, material, hardness etc. Cut a section (quarter-sized) of each piece of garbage and place it in a labeled section of an egg carton. Cover the items with soil and place your "garbage garden" outside in the sun. Have students predict what might happen to each substance. Keep soil moist and check compartments once a week to make observations. Discuss physical or chemical changes and what might affect the rate of these changes. Graph the findings and compare the findings to students' predictions. Discuss the impact of garbage in the environment and why composting works.

Litter	Years to Decompose
Paper	2-4 weeks
Cotton	1-5 months
Rope	3-14 months
Wool	1 year
Wood building scraps	14 years
Tin can	100 years
Aluminum can	200-500 years
Plastic	400 years
Glass	unknown

Science: Properties and Changes in Substances, Weather; **Social Studies**: Active Democratic Citizenship, Managing Information and Ideas, Critical and Creative Thinking, Communication; **Math**: Statistics and Probability.

Grade 6

THAT'S IN THE DIRT?!

Ask students to predict what types of organisms might live in the compost. Make a Burlese Funnel (see **Figure 1** of the attached insert) to gather these organisms. Leave the lamp on during the day to keep the soil moist. The organisms will try and get away from the light and travel down into the container. Collect and sort your findings, using invertebrate guides.

Science: Diversity of Living Things; **Social Studies**: Active Democratic Citizenship, Managing Information and Ideas, Critical and Creative Thinking, Communication.