



Composting Workshop

In this workshop we discuss waste and how composting can be an effective strategy for reducing waste that ends up in landfills. We assess how much waste we create as individuals and as communities and compost organic waste from our lunch in the garden to observe over the next few weeks.

Grade Level

5

Curriculum Objectives

Science and Technology: Understanding Earth and Space Systems

Overall Expectations

- Analyse the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources

Specific Expectations

- 1.1 – Analyse the long-term impacts on society and the environment of human uses of energy and natural resources, and suggest ways to reduce these impacts
- 3.3 – Describe chemical changes in matter as changes that are irreversible

Materials

- Student snack and lunch organic waste from one or two days
- Kitchen scale
- Dried leaves
- Shredded newspaper
- Spades
- Waterproof markers and popsicle sticks
- Decomposition slide deck (available on the Growing Up Organic website)

Activity

Before the Activity

Over the course of a few days, ask students to place all of their waste from snacks and lunches in a collection container (one for organic waste [e.g. fruit and vegetable peels], the other for non-organic waste [e.g. plastic wrappers]) Have a list of what is acceptable and what is not; do not include meat scraps, dairy products or eggs.

Part 1: The waste we make

Observe the waste that has been collected over the course of the past day or two. How much organic waste is there? How much non-organic waste? Ask the class to estimate how much waste they collected from their lunches. Weigh the material collected to see which guesses were closest. Together, estimate or calculate:

- How much waste would the class make in one week?
- How much would all the classes make in a week? In a school year?

Calculate these amounts and write them on the board.

- What are some of the negative consequences related to sending garbage to landfills?
- Which consequence (if any) concerns you the most?

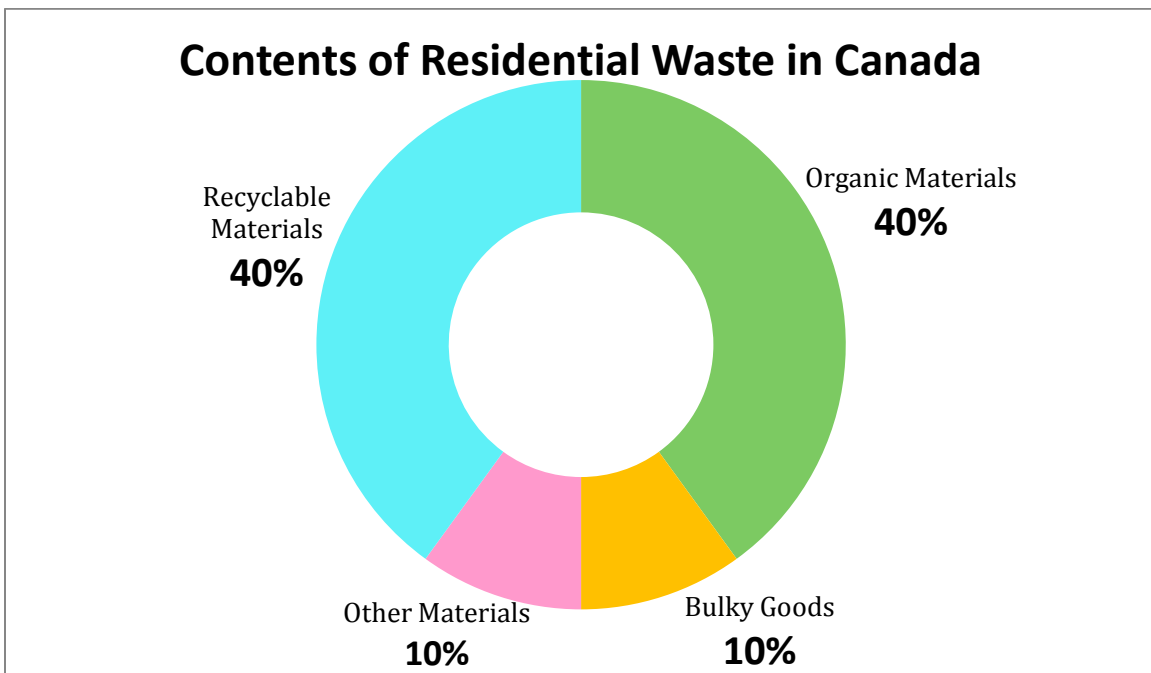
As it decomposes in landfills, food and other organic waste produces methane, a greenhouse gas 25 times more powerful than carbon dioxide! This happens because our food and garden waste gets trapped under loads and loads of garbage without access to oxygen/air, which creates conditions that allow for the growth of methane-producing bacteria.

Biodegradable waste decomposing is the third largest source of methane after fossil fuel production and large-scale agricultural production. Shipping waste from cities to landfills by truck produces even more greenhouse gas emissions.

- What are some of the ways we can reduce the amount of garbage we send to landfills?
- What can we do with the food waste we've collected?

List as many ideas as possible.

In 2009, Canada produced 1720 pounds of garbage per citizen! Compared to other countries, that's a lot! It's about twice as much as the average person in Japan. Fortunately with a little effort we can divert a lot of this waste by re-using, re-cycling and composting. In the average household, 40% of the waste produced is compostable!



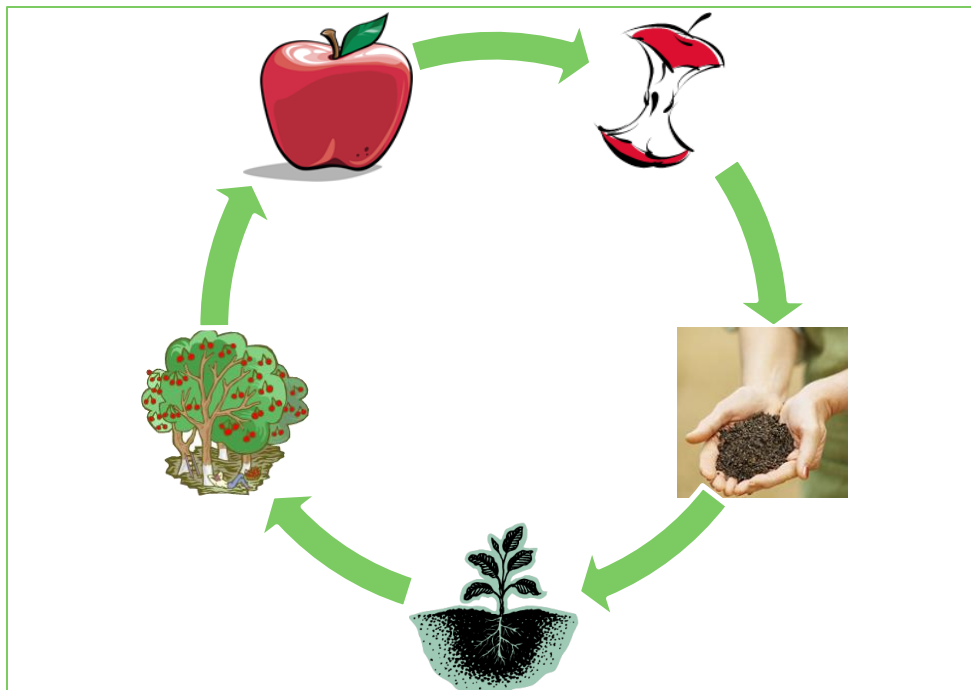
Data source: Federation of Canadian Municipalities, 2009:
http://www.fcm.ca/Documents/tools/GMF/Getting_to_50_percent_en.pdf

Give short introduction to concept of composting and chemical changes in matter.

- How do we define 'decompose'?
- What causes things to decompose?

Heat, moisture and micro-organisms work together to decompose food, releasing the nutrients which we can use to enrich our garden soil. These nutrients will be taken up by our new plants in the spring, generating more food!

This creates what we call a “closed loop”:



Decomposing is a **chemical** change: this means it cannot be reversed: you cannot turn the soil back into food scraps! Almost everything around us that was once alive is organic matter and can be composted. Some things take a short amount of time, like our lunch scraps, and other things, like a pair of leather shoes, take a very long amount of time.

Part 2: How long does it take?

With the help of the “Decomposition” slide deck query students on how long they think it will take the following items to decompose in a landfill. This game can be structured as a competition by dividing the class into two teams and assigning points to correct answers.

- Orange peel (6 months)
- Banana peel (2 – 10 days)
- Wool socks (1-5 years)
- Plastic bags (10-20 years)
- Cotton rags (1-5 months)
- Plastic diapers (500-800 years)

- Leather shoes (25-40 years)
 - Aluminum cans (80-100 years – but recyclable!)
 - Styrofoam cups (never)
- (Source: Learning for a Sustainable Future, 2008)

Part 3: Compost pockets

Explain that the trick to building good compost, especially if we want the outcome to be nutrient-rich compost for the garden, is providing these micro-organisms with the right diet. Micro-organisms need water and air. They also need what we call “brown” organic matter, and “green” organic matter – they need about half and half.

Browns

Dried leaves, straw, sawdust, twigs, newspaper, pine needles...

Greens

Vegetable and fruit scraps, coffee grounds, fresh grass clippings or weeds...

In small groups have students dig 12” holes in the garden and layer fruit and vegetable scraps from their respective lunches/snacks with brown materials collected from the garden or classroom (paper clippings, dried leaves).

Tips:

- ❖ Don't use meat, fat, milk or eggs because pets or animals will try to dig them up!
- ❖ Make sure food scraps are covered by at least 8 inches of soil.

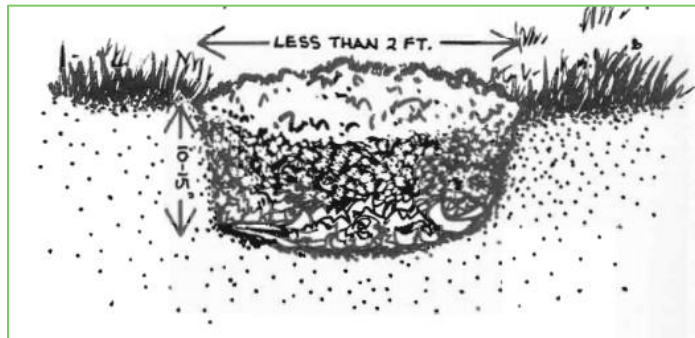


Image credit: Cornell Waste Management Institute

Use the before and after worksheets to make note of what was placed in the hole. Identify the locations of the compost pockets with markers.

Part 4: Follow-up (four weeks later)

Compare end results in one month:

- How does the compost look? How does it smell?
- What composted fastest? What composted slowest, or not at all?
- What combination was best?

Spread the compost throughout the garden beds and mulch with a layer of leaves to put the garden to bed for the winter season.