



WASTE LESSON PLAN

How Things Compost

Make a composter in a glass jar using fruit and vegetable scraps, and observe the ongoing process of decomposition.

- Soil composition and decomposition
- Waste reduction
- Predicting and recording observations



Background

Composting is one of the simplest and most effective ways to decrease the amount of garbage we make. It also prevents methane pollution from forming at the landfill, where food and yard waste break down in an oxygen-starved environment. It recycles nutrients and helps us build healthy, fertile soil for our plants and gardens.

Source: [Saskatchewan Waste Reduction Council](#)

Timeline

The process takes at least one month.

Materials

- **Carbon (brown) materials:** Dry leaves, bits of straw, paper towel, dead plant material, etc.
- **Nitrogen (green) materials:** Grass clippings, fruit or vegetable scraps, tea bags, coffee filters, etc.
- **Micro Organisms/Bacteria:** Garden soil (not sterile potting soil).
- **Experimental items:** Small pieces of aluminum foil, twigs, milk cartons, cardboard, plastic, etc.
- **Water**
- **Clear glass jar:** Like a large, pickle jar (1 for each group).
- **Cheesecloth (15cm square) + Elastic Band:** Use as a cover for the jar. Secured with an elastic band, the cheesecloth keeps bugs away and allows airflow.



Procedure

Day 1

- 1) The Saskatchewan Waste Reduction Council has several short videos describing different ways to compost. View the videos [here](#) to introduce this activity.
- 2) Have students name some things that can be composted. Looking at the materials, discuss what a good compost mix includes:
 - “Brown” material (carbon-rich). Brown materials include things like fallen leaves, straw, unbleached paper towel, sawdust or any other dead, dried plant material.
 - “Green” material (nitrogen-rich). Green materials include things like grass clippings, fruit or vegetable scraps, coffee grounds, garden waste and other fresh plant materials.
 - Soil: a source of microorganisms and bacteria.
 - Water, warmth and air.
 - Students may ask about meat and dairy products. These items are compostable but are not encouraged for household composting as they will rot and cause unpleasant odors.
- 3) In small groups, have students make a compost jar:
 - Spread plastic on work surface.
 - Place a layer of soil in the jar.
 - Add a layer of brown compostable material, such as dead leaves.
 - Add a layer of green material, such as fruit or vegetable pieces. (Mentioning the “yuck” factor upfront helps. Collect “greens” the day of the activity for the least amount of old fruit smell)
 - Pack the jar full of layers of soil and compostable materials.
 - Add a few experimental items like pieces of cardboard or plastic.
 - The contents of the jar should be moist. Add a small amount of water if needed.
 - **Students should label each jar with their names and the date.**
 - Cover the jar with the square of cheesecloth, held in place with an elastic band. Place in an out-of-the-way place, so it can “stew”. Keep it inside in winter months so that it does not freeze.
 - Wash hands.
 - Complete the **Day 1, Compost Observation Record**.



Day 2 (one week later)

- 1) Have each group observe and record the appearance and odor of their jars using the **One Week Later, Compost Observation Record**.
- 2) Students may want to change their predictions, and should record their changes.
- 3) If the contents of the jar are dry, add a little water.
- 4) Cover the compost jar and put it away.
- 5) Discuss what they observed.

Day 3 (after one month)

- 1) Put plastic on the work surface and have each group dump out their jar onto the plastic. Observe and record the appearance and odor of their jars using the **After One Month, Compost Observation Record**.
- 2) Revisit predictions and note discrepancies.
- 3) You may choose to continue the experiment longer, by replacing the compost in the jars to continue decomposing, but the base of the experiment is complete. At this time, students can remove any large pieces of wood and paper, and any experimental items that remain. Put the compost into a school compost bin or bury it in the garden where decomposition can continue. Clean the jars for reuse or recycling.
- 4) Class discussion:
 - What decomposed the quickest, the slowest, or not at all?
 - How did their predictions differ from their findings?



Day 1
Compost Observation Record

Date:

Student Names:

Appearance

1) What items did you put in your compost jar?

2) How do you think your compost will change in 1 week?

3) Which materials do you think will compost quickly? Which ones will take longer to compost? Explain why.

Odor

1) What does it smell like?

2) Do you expect the smell to change? Why or why not?



One Week Later Compost Observation Record

Date:

Student Names:

Appearance

1) What items do you recognize in your compost?

2) How has your compost changed from last week?

3) Which items decomposed slower or faster than you thought they would? Change your predictions if needed.

Odor

1) Has the smell changed from last week? If so, how has it changed?

Water

Did you need to add water? Yes____ No____



After One Month
Compost Observation Record
Student Names:

Date:

Appearance

1) List the items in the jar here. What items do you still recognize?

Item	Compostable (it decomposed over time)	Will not compost (it didn't change over time)

2) Did the items decompose faster or slower than you predicted?

3) Based on your experiment, what composts, and what does not compost?

Odor

1) Has the smell changed from last time? If so, how has it changed?



Additional Resources

[Saskatchewan Waste Reduction Council \(SWRC\)](#): Information on various methods of composting, and descriptive videos.

Landfill Demonstration Lesson: Examine the role of the landfill in solid waste management. Information on methane gas and leachate. Download it [here](#).

City of Saskatoon: [Landfill Gas Collection and Power Generation System](#)

Curriculum Connections

Grade 3 Science: Outcomes: ES3.1 Investigate the characteristics, including soil composition and ability to absorb water, of different types of soils in their environment. **ES3.2** Analyze the interdependence between soil and living things, including the importance of soil for individuals, society, and all components of the environment.

Grade 4 Social Studies: Outcome: RW4.2 Investigate the importance of agriculture to the economy and culture of Saskatchewan.

Grade 5 Science: Outcomes: MC5 Investigate how reversible and non-reversible changes, including changes of state, alter materials. **MC5.3** Assess how the production, use, and disposal of raw materials and manufactured products affects self, society, and the environment.

Social Studies: Outcome: RW5.1 Explain the importance of sustainable management of the environment to Canada's future.

Grade 6 Science: Outcome: DL6.5 Assess effects of microorganisms on past and present society, and contributions of science and technology to human understanding of micro-organisms.

Social Studies: Outcome: RW6.2 Contribute to initiating and guiding change in local and global communities regarding environmental, social, and economic sustainability.

Grade 7 Science: Outcome: IE7.3 Evaluate biogeochemical cycles (water, carbon, and nitrogen) as representations of energy flow and the cycling of matter through ecosystems.

This lesson was adapted from Recycle Saskatchewan: How things Compost