



NATURE RECYCLES

BACKGROUND

Decomposers are nature's recyclers. When plants and animals die, decomposers break them down and release nutrients back into the environment where other living organisms can use them. By composting organic wastes, such as food scraps and garden cuttings, we are reducing the amount of waste going into landfill sites and we are creating a resource that both improves soil structure and adds essential nutrients to soil.



CURRICULUM CONNECTIONS

Key concepts include:

- Organisms in a food web play different roles: producers, consumers and decomposers.
- Decomposers play a crucial role by returning nutrients to the environment.
- Soil is made up of organic and inorganic matter.
- Biodegradable materials can be decomposed by natural biological processes; non-biodegradable materials cannot.
- Composting organic waste, instead of sending it to landfill, is one way in which we can live more sustainably and act as environmental stewards.

The activities below allow students to observe, compare, contrast, classify, record, evaluate, and use various communication skills.

Discussion Starter

Watch ClearWaterKids Challenge – [Root to Stem](#) (2:31)

Ava, Ari and Potato the Chicken try to solve this riddle: What does a chicken have to do with potato peels? They look at food waste and composting, and demonstrate how to grow fresh food from vegetable scraps.



Pre-viewing Probes

- Show some empty food packaging alongside fruit/vegetable scraps. *What do all of these have in common? (We throw them away.) What are some differences between this group (the packaging) and this group (the fruit/veg scraps)?*
- *Where do these go when we are finished with them?*
- *What does a chicken have to do with potato peels? What do you think the link might be? Let's watch the video to find out.*



Post-viewing Prompts

- *Did anything in the video surprise you? What and why?*
- *What does a chicken have to do with potato peels?*
- *What did you already know about composting before you watched the video? What did you learn about composting from the video? What else would we need to know if we were going to start composting at school?*
- *What actually happens to food and garden scraps in a compost pile or composter? How does it happen?*
- *Have you ever grown food from scraps?*
- *Is there anything that you normally throw out at home that you think might be grown into food?*

Explore Outdoors

Be a Decomposition Detective

In this activity, students will head outside to look for signs of decomposition in the school yard or in natural spaces around the school. In the fall, or in the spring after the snow has melted, students can examine leaf litter to see how the leaves and plant matter have changed over time. They may also discover decomposers such as fungi and macroinvertebrates. If available, rotting logs are great places to discover decomposers and signs of decomposition. You may see new plants growing out of decomposing logs, demonstrating the full cycle: from life to decomposition to new life.

Set the stage for outdoor exploration by telling students that they are going to become Decomposition Detectives. Ask them:

- *Where could you look?*
- *What clues might show that decomposition is happening?*
- *What tools might help you? (For example, magnifiers, magnification boxes)*
- *How can we record your discoveries and questions during your investigation? (For example, devices for taking photos and recording oral questions, and/or a central whiteboard and markers or clipboards and pencils.)*
- *When you are investigating leaf litter or a rotting log, how can you ensure your own safety and the safety of living things you might find? (You may wish to provide gloves. Caution students to keep their hands out of their mouths, and ensure that they wash their hands thoroughly after the investigation. If looking under logs, students should be supervised to ensure that fingers, toes and the communities they are investigating are not endangered.)*

Follow-up: Our Discoveries

Back in the classroom, make a list of the information collected by the student detectives about the trees they inspected as a lead-in to discussion about them.

- *What did you notice first?*
- *Did anything surprise you?*
- *Do you have questions about what you saw, heard, smelled, felt?*
- *What are you wondering about?*

Experiment: Biodegradable vs Non-biodegradable

Students will observe what happens to a variety of biodegradable and non-biodegradable items when they are buried in soil for several weeks.

Before the experiment:

- Have students brainstorm items that get thrown out during/after lunch at school each day and record each item on a sticky note. (Don't forget to include things that teachers throw out too, such as coffee pods and sticky notes!)
- Have students sort the sticky notes into two categories: biodegradable (break down completely over time through natural processes—these tend to be items that are organic or made of materials that come from living things) and non-biodegradable (do not break down—these tend to be inorganic or made from non-living materials).
- Ask students to think about how an experiment could be set up to prove whether an item is biodegradable or non-biodegradable.

What You Need

- A variety of biodegradable and non-biodegradable items that students have included in their lists, as well as some other items they may wish to test, such as leaves and paper
- Clean mason jars

What to Do

- 1 Put a different item in each jar, being certain to include an equal number of biodegradable and non-biodegradable items. Ensure that each item is visible so that changes can be observed.
- 2 Fill each jar with soil.
 - It is important that the soil comes from outside and has natural microbes and decomposers. Most store-bought soil will not have this content.
 - Add a few tablespoons of water to each of the jars to keep the soil moist, but not soaked. Throughout the observation period, moisten the soil using a spray bottle.
 - Keep the lids off the jars. You may need to put the jars near a window or in a well-ventilated area.
- 3 Record hypotheses about what will happen to the items over several weeks.
- 4 Record observations (by writing, drawing and taking photos).
- 5 At the end of several weeks, students will analyze their data and determine whether their hypotheses were correct.
- 6 Finally, students reflect on:
 - Which items changed the most and what caused those changes?
 - Which items changed the least and why?
 - Which outcomes were surprising?

Take Action



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Don't Throw it Out!

Help reinforce students' understanding of the importance of taking action to reduce, reuse, recycle and rethink.

- *When we put food and garden scraps in the garbage, where do they end up? Do they ever break down? (In some cases, these items get sandwiched between inorganic materials in landfill sites and, as a result, cannot break down. This means that nutrients are being wasted, and organic matter is taking up valuable space in landfill sites.)*
- *Why is it better to buy reusable lunch containers than recyclable packages? (While it is better to recycle than to throw items into the garbage, making old plastic into new items still uses up a lot of energy and generates a lot of greenhouse gases. Furthermore, not everything we put into recycling actually gets recycled.)*
- *Are there some products marketed as "biodegradable" that actually won't break down or are not allowed in your compost bin? (Check with your municipality to find out).*
- *What would the world be like if no one reduced, reused or recycled?*
- *What can we do to reduce the amount of biodegradable matter we are putting into the garbage?*

Find out how you can:

- Start a compost in the classroom with these [tips](#) from EcoSchools Canada.
- Grow fresh food from leftover produce with these simple [instructions](#).

More to Explore

- Look for these theme-related books:
 - *Black Gold* by Sara Cassidy and Helen Flook (Orca Book Publishers, 2017)
 - *Charlie's Dirt Day* by Andrew Larsen and Jacqueline Hudon-Verrelli (Fitzhenry & Whiteside, 2015)
 - *Design Like Nature: Biomimicry for a Healthy Planet* by Megan Clendenan & Kim Ryall Woolcock (Orca Book Publishers, 2021)
 - *Frankenstink! Garbage Gone Bad* by Ron Lightburn (Tundra Books, 2015)
 - *A Log's Life* by Wendy Pfeffer and Robin Brickman (Simon and Schuster, 1997)
 - *Trash Revolution: Breaking the Waste Cycle* by Erica Fyvie and Bill Slavin (Kids Can Press 2018)
 - *Trash Talk: Moving Toward a Zero-Waste World* by Michelle Mulder (Orca Book Publishers, 2015)
 - [ClearWater Kids Booklist](#) for more great Canadian books on nature and science.
- Visit [Science North](#) for more hands-on, curriculum-linked learning resources and lesson plans.