

Environmental Education: 3Rs (Reduce, Reuse, Recycle)

Hartland Landfill (Middle and High School)

Background Information

Over the last century our garbage has changed. It now includes many man-made materials and non-biodegradable items. Our society consumes an excessive amount of materials and convenience products, many with short shelf lives and long term impacts. A lot of these materials do not decompose, even when landfilled. Along with changing materials, how we deal with these materials has also changed. Waste management has evolved into a highly scientific, well-managed process. The biggest change occurred during the 1960's when health, safety and environmental concerns surfaced. The way garbage was managed was greatly altered. Dumps were replaced by sanitary landfills, and managed by engineers and highly-trained staff.

In the 1970s, the CRD became responsible for solid waste management planning for the region. The CRD acquired the Hartland dump site and began transforming it into its current operations as a sanitary, engineered landfill. Hartland is the only disposal facility in the region for municipal solid waste. Along with operating the landfill the CRD follows a solid waste management plan which guides the region on how best to manage its solid waste. This plan not only looks at maintain the landfill but also includes initiatives and programs to promote waste diversion such as recycling, composting, education, etc. In order to extend the life of the landfill we must work together to reduce the amount of garbage we throw away. With current rates of disposal Hartland Landfill will be full in 25 years. Our regional goal is to reduce our per capital garbage disposal from 380kg to 250kg extending the life of Hartland Landfill to 2100.

Activity types in this lesson:

Warm-Up: Survey

Video: Hartland Landfill Aerial Tour (1:34)

Hands-On: Build A Landfill

Listening: Podcasts

Expand and Connect

Warm-Up

Think about how you dispose of waste at home. Do you and your family use different ways to divert waste or do you put everything in the garbage and eventually the landfill? Complete the Garbage Habits at Home Survey to get an idea of ways you may or may not divert waste from the landfill.

Video

Watch the CRD's [Hartland Landfill Aerial Tour](#) YouTube video. Have students record the main areas of Hartland Landfill as they appear on the video. Ask students to research and describe the purpose of each part of the landfill site and how it is relevant to waste management and environmental protection. You can encourage students to take educated guesses, research online and/or use links and resources provided below to help them answer.

Areas seen in the Hartland Landfill Aerial Tour include:

Public Area (Recycling Drop-off); Hartland Learning Centre; Surface Water Diversion; Leachate Lagoons; Landfill Gas Utilization Facility; Active Landfilling Area; Closed Area - Reforested; Rock Excavation and Cover Material Storage; Hartland North Residuals Treatment Facility.

Listening

Podcast

To help students learn about different parts of an engineered landfill and general operations of landfills have them listen to the “How Landfills Work” episode from Stuff You Should Know podcast. *Please note this podcast is not specifically made for children. While they do give warnings before any episodes that may not be suited for younger audiences, please listen in advance to make sure it would be appropriate for your students.*

- Stuff You Should Know: How Landfills Work (46 min) – June 23, 2015 [<https://www.iheart.com/podcast/105-stuff-you-should-know-26940277/episode/how-landfills-work-29467735/>]
“Well-planned landfills have only recently come into widespread use. Recently, waste managers have found that they work a little too well and now the landfill is being reinvented.”

Information About Landfills

[What Happens in a Landfill](#)

[How a Landfill Works](#) (diagram)

[Hartland Landfill FAQ](#)

[Hartland Landfill Environmental Programs](#) provides a comprehensive program to monitor and evaluate the effects of landfilling operations on the environment. Learn about landfill gas, groundwater, surface water, and leachate monitoring.

Hands-On

Make your own landfill!

Building your own landfill by following the plan outlined from the University of Colorado Boulder’s, Teach Engineering: [Design, Build and Test Your Own Landfill](#). Would your landfill withstand major rain events? An earthquake?

Expand and Connect

Suggestions to expand learning and create connections:

Analyze and review the [2016 Waste Composition Study](#) for Hartland Landfill. The report summarizes and categories the types of waste (organics, wood, plastics, paper, etc.) thrown in the garbage and consequently landfilled. Students can compare results from the various buildings types (single family, multi-family, business, etc.) or use the data as a launching point to discuss where we could focus waste reduction strategies to extend the life of Hartland Landfill. Should we target efforts based on where the garbage is coming from (single family homes vs. multi-family vs. businesses) or target a material category (organics, plastic, paper, etc.)?

Focus on the [average waste stream analysis](#) chart and discuss what types of materials contribute the most to our landfill and discuss ways to reduce the amount of those materials going into the garbage. Which categories account for the most? Why do you think those materials are ending up in the landfill? What are some ideas to reduce the amounts of those materials ending up in the landfill?

Consider other ways to deal with solid waste such as composting. What are benefits to composting? How does composting help with landfill management? How does composting help with climate change?

Encourage students to set-up their own experiment to explore if/how things decompose in a landfill (anaerobic environment) versus an aerobic environment. For a sample activity plan see Science World’s [Rotting](#) demonstration set-up.

Still Curious?

More resources for follow up questions or learning extensions.

Hartland Landfill [2016 Waste Composition Study](#)

CRD's Environmental Resource Management [2018 Progress Report](#)

CRD's [3R Hierarchy](#) Educator's Resource (K-7)

Videos: [Hartland Landfill: A Year of Garbage](#) and [Garbage at Hartland Landfill](#)

CRD [Waste and Recycling](#)

[Victoria Compost Education Centre](#) – factsheets, workshops, education opportunities

Recycle BC

Recycle BC is responsible for residential packaging and paper recycling in BC. They are the stewardship group responsible for collecting your household packaging and paper recycling and getting it to processing facilities and markets.

What happens to my recycling?

<https://recyclebc.ca/what-happens-to-my-recycling-post-collection/>

<https://recyclebc.ca/what-happens-to-my-recycling-end-markets/>

Related podcast episodes

Please note this podcast is not specifically made for children. While they do give warnings before any episodes that may not be suited for younger audiences, please listen in advance to make sure it would be appropriate for your students.

Stuff You Should Know*

- Composting Nature's Most Interesting Process (57 min) – April 3, 2017 [<https://www.iheart.com/podcast/105-stuff-you-should-know-26940277/episode/composting-natures-most-interesting-process-29467891/>]

"You may think composting is just a bunch of old banana peels rotting away into dirt but, friend, you're not looking closely enough. Inside that compost pile is a microcosmic universe doing some magical stuff."

- Recycling and the Great Pacific Garbage Patch (27 min) – January 20, 2009 [<https://www.iheart.com/podcast/105-stuff-you-should-know-26940277/episode/recycling-and-the-great-pacific-garbage-29468157/>]

"Recycling has come a long way since its debut -- and so have landfills. In this twofer HowStuffWorks podcast, discover the realities of modern recycling and find out why the world's largest landfill might be more aptly described as an "oceanfill.""

- Recycling Update: How's It Going? (69 min) – July 24, 2018 [<https://www.iheart.com/podcast/105-stuff-you-should-know-26940277/episode/recycling-update-hows-it-going-29626098/>]

"It's been about a decade since Josh and Chuck last checked in on recycling and since then a lot has changed. A global commodities market dealing in recyclables has developed and recently crashed. Jump back into the fascinating world of recycling."

*These podcasts are often referring to processes and procedures used in the United States. They are good for a general idea and discussion starting points, however if you are looking for specific information about recycling and landfilling in our region refer to CRD information and resources.

If you have any questions about solid waste management in the region, or ways to expand this learning opportunity please contact us at education@crd.bc.ca.