



Beluga Whale

Garbage Talk Hero Inspiration

Belugas are near the top of the Arctic marine food chain. They eat fish, crabs and other small animals. If there are contaminants in the environment, tiny plants and invertebrates can absorb them. Fish eat millions of small invertebrates, and the contaminants can concentrate in the fish; this is called **bioaccumulation**. When larger species consume the fish, they too are consuming the contaminants, allowing the contaminants to travel and concentrate up the food chain. Scientists call this **biomagnification**. Many contaminants also float in on air currents, polluting Arctic ecosystems.

Beluga Whale

Nunavut Country Food Fact Sheet

SMART Board / Promixa Ready

Northern Resources

Gr.7 Keep Our Habitats Safe

GARBAGE TALK

OBJECTIVE : Students will learn about litter, the effects of bioaccumulation and about some of the strategies in place to help us protect the environment.

When too much of something dangerous enters an ecosystem, that environment can become polluted or contaminated. Small actions or small amounts of something dangerous can build up over time. This includes litter and also toxins. Citizens are not the only perpetrators of waste in the environment; businesses and industries also produce waste. If we want individuals, businesses and industries to make proper waste management a priority, we must first understand what we stand to lose by not preventing waste in the environment.

[Pg 2 Curriculum Links](#)

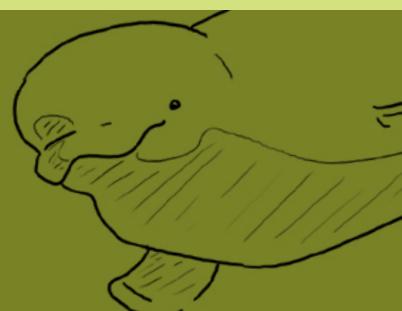
[Pg 3 Teacher's Resources](#)

[Pg 4 Lesson Plans](#)

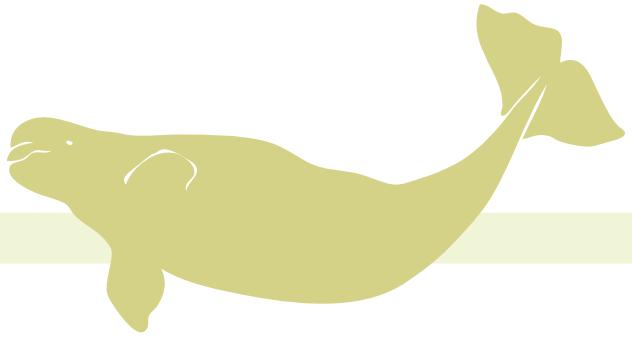
[Pg 12 Wild Ideas](#)

[Pg 13 Glossary](#)

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CURRICULUM Links



Grade 7 Science

Part A: Interactions and Ecosystems - Outcomes 1,2,3,4

Part B: Plants for Food and Life - Outcomes 1,2,3,4

Grade 7 Social Studies

Attitudes (embedded throughout), Geography of the Circumpolar World, Changes in the Circumpolar World, Current Events

Grade 7 English Language Arts

General Outcome #1: Specific Outcomes: 2.2, 2.4

General Outcome #2: Specific Outcomes: 1.1, 1.2, 2.2

General Outcome #3: Specific Outcomes: 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4

General Outcome #4: Specific Outcomes: 4.3

General Outcome #5: Specific Outcomes: 2.3

Innuqatigiit

Relationship to the Environment Themes:

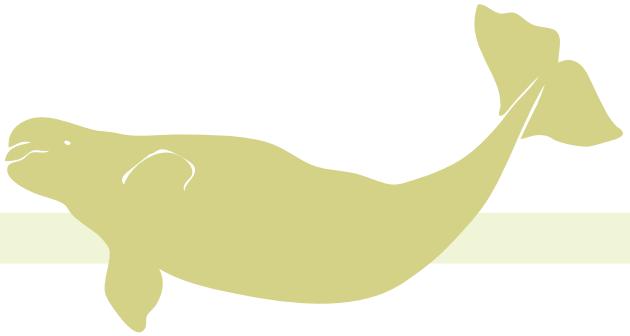
Land, Water, Whales



© Peter Ewins / WWF-Canada

The Inuit community of Arctic Bay (also known as Ikpiarjuk), Baffin Island, Nunavut, Canada.

TEACHER'S Resources



Videos

Wake-up Call (6:00)

[www.gaiafoundation.org/
wakeupcall/](http://www.gaiafoundation.org/wakeupcall/)

Village of Widows (52:00)

[www.lindumfilms.com/
villageofwidows](http://www.lindumfilms.com/villageofwidows)

This documentary recounts the tragedy of the people of Deline, who were employed by the Canadian Government to transport uranium during World War II.

Clean up toxic waste in Nunavut (3:00)

[www.youtube.com/
watch?v=tZYWKVhoyQs](http://www.youtube.com/watch?v=tZYWKVhoyQs)

Websites

AANDC

www.aadnc-aandc.gc.ca

Aboriginal Affairs and Northern Development Canada (formerly known as Indian and Northern Affairs)

Finding True North

[www.findingtruenorth.ca/
sustainable-iqaluit/](http://www.findingtruenorth.ca/sustainable-iqaluit/)

Department of Environment Nunavut: contaminated site remediation

[www.gov.nu.ca/sites/default/files/
contaminated_site_remediation_-
property_owners_guide_english_
feb_12.15.pdf](http://www.gov.nu.ca/sites/default/files/contaminated_site_remediation_property_owners_guide_english_feb_12.15.pdf)

Reports

Contaminated Sites in Nunavut

[www.alternativesnorth.ca/
Portals/0/2007%2003%2017%20
Contaminated%20Sites%20in%20
Nunavut.pdf](http://www.alternativesnorth.ca/Portals/0/2007%2003%2017%20Contaminated%20Sites%20in%20Nunavut.pdf)

Contamination in dump fire smoke

[www.lobalnews.ca/news/1460763/
icaluit-women-warmed-dump-
fire-smoke-poses-risk-to-unborn-
children/](http://www.lobalnews.ca/news/1460763/icaluit-women-warmed-dump-fire-smoke-poses-risk-to-unborn-children/)

Mercury Warning

[www.nunatsiaqonline.ca/stories/
article/65674high_mercury_
levels_prompt_health_advisory_
in_nunavut/](http://www.nunatsiaqonline.ca/stories/article/65674high_mercury_levels_prompt_health_advisory_in_nunavut/)

Toxins Accumulate in Arctic Peoples, Animals, Study Says

[www.news.nationalgeographic.com/
news/2004/08/0827_040827_
tvarctic_toxins.html](http://www.news.nationalgeographic.com/news/2004/08/0827_040827_tvarctic_toxins.html)

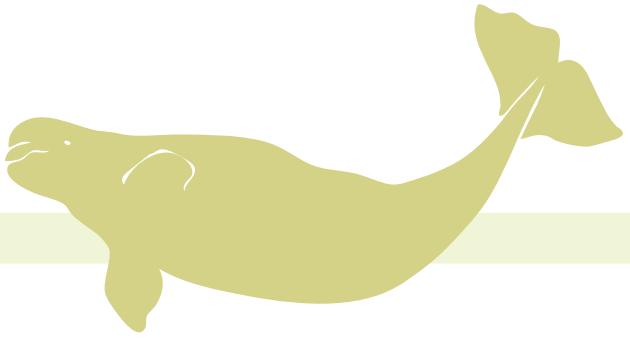
Big Picture 2010: Contaminated Sites in Nunavut

[www.publications.gc.ca/collections/
collection_2012/aadnc-aandc/R71-
70-2012-eng.pdf](http://www.publications.gc.ca/collections/collection_2012/aadnc-aandc/R71-70-2012-eng.pdf)



© Angela Giampiccolo / WWF-Canon

LESSON Plans



Lesson 1: Too Much Garbage in the News!

15 minutes

Ask your students if they have heard about waste in the news recently. Share the photo and news story “Spanish sperm whale death linked to UK supermarket supplier’s plastic” with the class.

1. *What are these stories about?* Small bits of garbage have killed this bird and whale. “If you don’t pick it up, they will”
2. Locate where each animal is from on a map. Write a list on the board of all the types of garbage that were found in each animal.
3. *Have you seen these types of garbage around your community? How would garbage like this make its way into the ocean?* Wind blows garbage into water bodies and most communities’ water drains into streams and rivers which lead to the Arctic Ocean where ocean currents take the debris to unexpected places.
4. Discuss how, over time, even small amounts of things that don’t seem very dangerous can add up to be deadly to wildlife!



The stomach contents of an albatross chick on Midway Island, the world's most remote marine sanctuary more than 2,000 miles from the nearest continent.

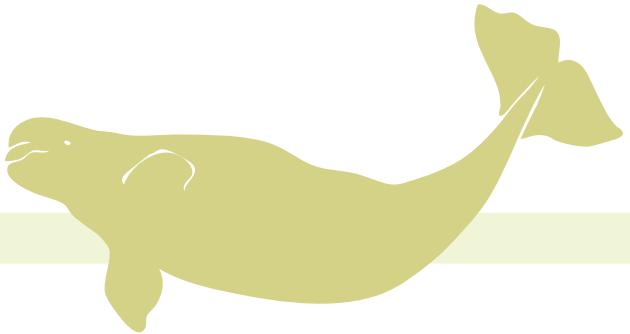
▶ [Bird Island - Plastic Vs Nature \(4:00\)](#)

Watch the trailer

▢ [Spanish sperm whale death linked to UK supermarket supplier's plastic](#)

The Guardian, UK

LESSON Plans



Lesson 2: Hazardous Waste

1 class period.

Small amounts of anything can add up and become dangerous over time. That's true of litter, and it is also true of toxins and chemicals. There are many things in our houses, communities and camps that are actually hazardous waste!

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Inquire about hazardous waste

What are some examples of household hazardous waste? Paints, fuel, oil, antifreeze, car batteries, rechargeable batteries, expired medication, fluorescent bulbs, thermostats, propane tanks, aerosol cans, household cleaners... Find out if your community has an annual household hazardous waste collection.

□

Household Hazardous Wastes

Nunavut Department of Environment - *Environmental Protection Regulations and Guidelines*

Hand out the Hazardous Waste student handout on the next page or project it on a SMART Board and read as a class.

Project *Why Hazardous Waste Matters* sheet onto a SMART Board and uncover each photo one at a time.

1. Visualize one litre of oil and 1,000 litres of water
2. A litre of oil will contaminate 1,000,000 litres of water
3. Visualize one thermostat and 1,000 litres of water
4. A thermostat will contaminate 5,000,000 litres of water

How can contaminating water affect the rest of the environment? Write the following on the board:

DDT (pesticides), PCBs (industrial chemicals), dioxins (contaminants). *What are these?* Persistent Organic Pollutants (POPs) are chemical substances released into the environment through human activities. POPs can travel long distances and tend to concentrate in colder climates such as Canada's north! POPs are very stable and can last in the environment for decades and bioaccumulate, meaning they can concentrate in living organisms.

Country food in Nunavut

Important Note: Country food should be promoted!

Although there have been concerns about mercury in the environment, it is very important to stress that country food (traditional foods harvested from the land) are very healthy. When faced with the decision to eat healthy local food over highly processed imported foods, fish from our rivers and lakes and animals from our oceans and land are better for us as long as the portion guidelines are followed in places where there is concern. The main thing to stress in this lesson is that we need to learn about what the dangers are and make sure we continue to monitor our environment. See the following news article:

www.livehealthy.gov.nu.ca/en/healthy-eating/country-foods

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Extension

Discuss ways that you can help stop litter or hazardous waste from entering the environment. Have the students make their own poster that communicates the hazards of litter or hazardous waste in the environment!

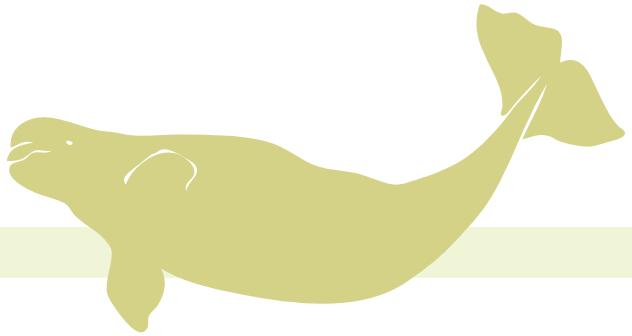
□

20 Most Creative Environmental Ads

View some examples here.



HAZARDOUS Waste



Hazardous waste is material that is considered a dangerous contaminant when it is no longer being used for its intended purpose. These wastes have the potential to harm human health or the environment and range from paints, oils and solvents to acids, heavy-metal containing sludges and pesticides. Despite the image of the North as a pristine environment, there is a history of hazardous waste and contamination. By learning more about what materials are hazardous and the history of our area, we can help protect our land by changing how we dispose of these materials.

Electronic waste (or **e-waste**) includes TVs, cell phones, computers and laptops and is the fastest growing waste stream in Canada. Many provinces have regulated e-waste recycling programs in place. It is important to properly recycle e-waste because it contains hazardous chemicals, heavy metals and also precious metals that can be recovered.

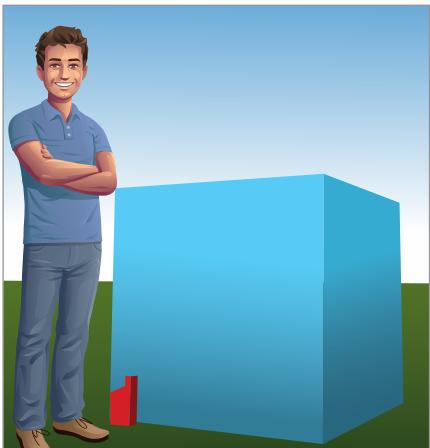
Many Nunavut communities have begun to separate electronic waste from the solid waste. This prevents e-waste from being burned in the landfill. The Government of Nunavut is currently researching issues as part of a Nunavut-wide Solid Waste Management Strategy.



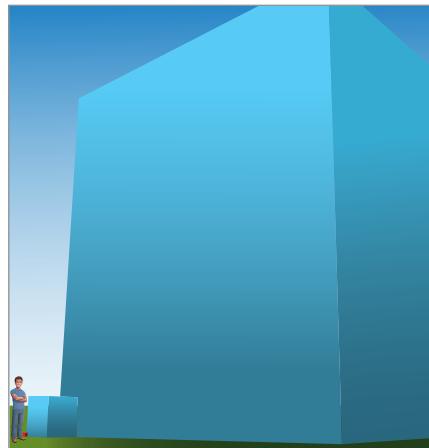
© Jamessee Moulton / Government of Nunavut



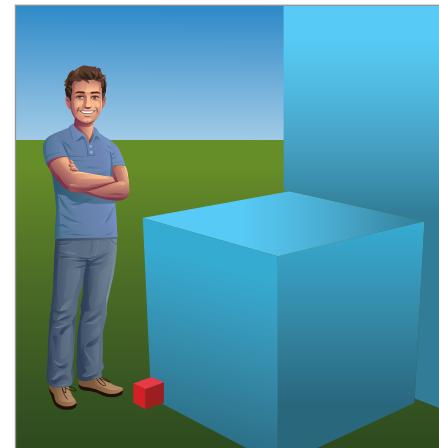
HAZARDOUS Waste Matters



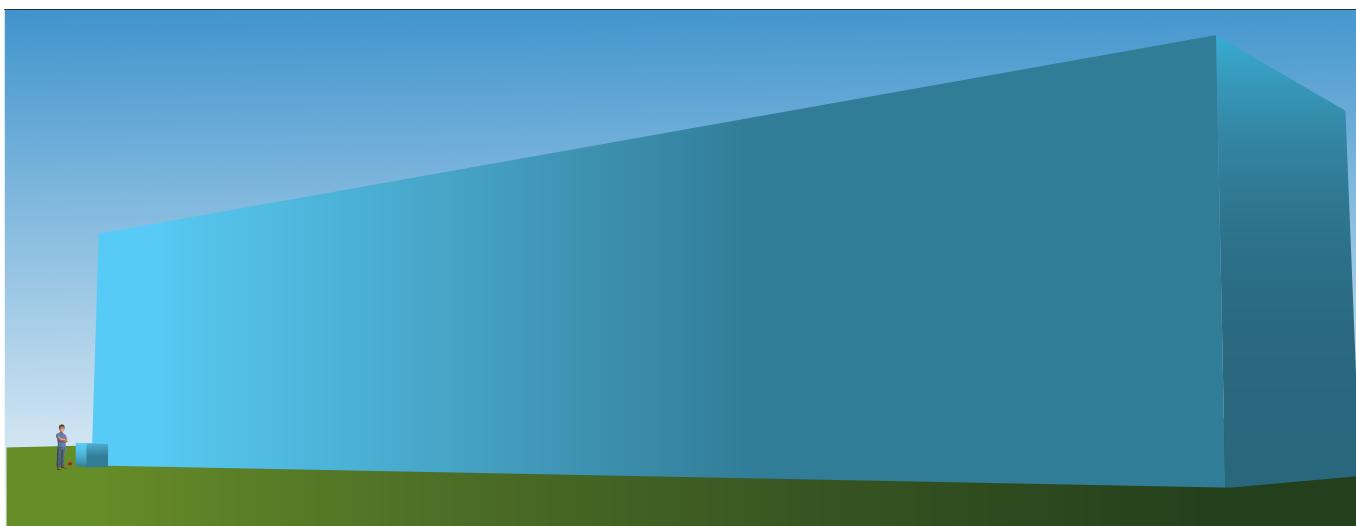
Visualize a litre of used oil and 1,000 litres of water.



One litre of used oil could contaminate 1,000,000 litres of drinking water.



Visualize one thermostat and 1,000 litres of water. 1 thermostat contains 3 - 5 grams Mercury.



One thermostat could contaminate 5 million litres of drinking water.

HAZARDOUS Waste Matters

Other types of hazardous wastes are often collected during community hazardous waste collection events. *Does your community have one?* These events collect household hazardous waste, which are items that can be flammable, corrosive, explosive or toxic, and we do not want in our landfills. Household hazardous waste includes household cleaners, paint, batteries, solvents, oil, pesticides, fertilizers, items with mercury and aerosol cans.

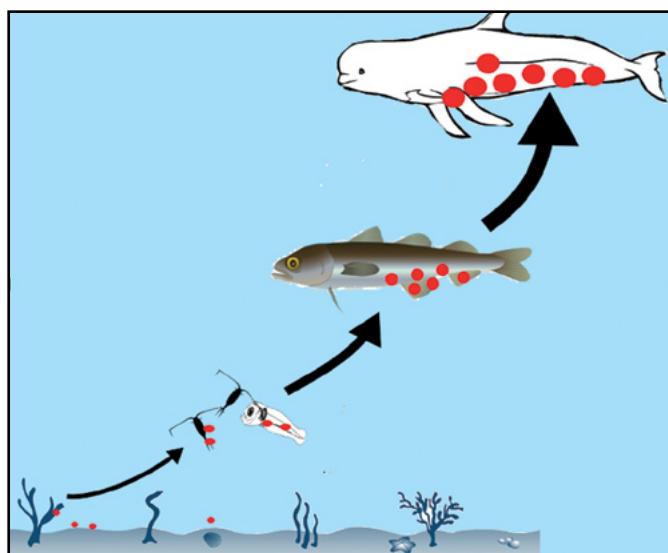
Why are these materials so important to divert from our landfills and ensure they are shipped to proper recycling facilities? There are many ways that hazardous material can harm us and the environment. For instance, one litre of used oil will contaminate 1 million litres of drinking water! The amount of **mercury** in one thermostat will contaminate five million litres of drinking water (the Canadian Drinking Water Quality Guidelines for mercury are 0.001 mg/L)!

Substances that contain **heavy metals** and/or **persistent substances** can be dangerous because they can **biomagnify** or **bioaccumulate** and become riskier to higher order species such as fish, birds and mammals. Bioaccumulation occurs in a species through the accumulation of heavy metals and substances through ingestion. When predatory fish, birds and mammals eat these species, the substances move through the foodchain , concentrating the toxins; a process of biomagnification. Mercury is an example of a persistent toxic substance that bioaccumulates in our environment. The most important pathway for mercury bioaccumulation is through the **food chain**. In the water, **plankton** can absorb mercury through passive surface absorption and is generally not harmful. However, top predators are particularly vulnerable to these contaminants because they feed at the top of the food chain and therefore accumulate contaminants from the species they prey on. *Why should this concern us?*



From landfills to local environment how to curb Nunavut's toxic waste

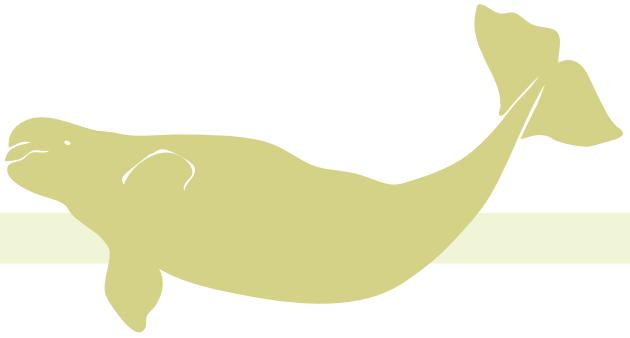
Discuss with the students what they think about the approach of using media and petitions to try to change political decisions? What can they do to make a difference in their community? Remind the students that small actions can lead to change.



© Blair Carter / Ecology North

Aquatic bioaccumulation creates an opportunity for toxins to concentrate in an organism. Toxin levels increase moving up the food chain (a process called biomagnification) and are highest in top predators.

LESSON Plans



🎲 Bioaccumulation Game

This is an activity about food chains, which is based on one living thing in the ecosystem eating another. Play with the mayfly, Arctic grayling and beluga whale, or choose some other animals.

You'll need

- Different coloured pipe cleaners (approximately 30 for each student, one third must be a special colour)
- One paper bag per student
- Coloured armbands or headbands to identify what animal they are

Steps

1. Divide the students into three groups, with the ratio being 1:3:6 (i.e.: 2 belugas, 6 Arctic Char, 12 mayflies)
2. Give each student a paper bag (their “stomach”)
3. Have all the students help to scatter the pipe cleaners outdoors in the play area or in the gym. The pipe cleaners represent their food!
4. Explain the rules of the game: the mayflies will be feeding first, and will try to gather as many pipe cleaners as possible. Next, the predators join the fray. When a mayfly is tagged by a char, the mayfly gives the char their stomach bag and waits at the sideline. At some point, the big predators, the belugas, will come out to feed on the char!
5. Yell out “mayfly feeding time” or have a music cue to let the mayflies go. They will collect as many pipe cleaners as possible. After about 2 minutes, yell “char hunting season is on!” and let the char run after the mayflies. After another few minutes yell “beluga hunting time” and have the belugas chase the char. End the game when there is only one mayfly and one char left.
6. Gather the students together. Announce that there was a toxic spill in their feeding ground and all of a certain colour of pipe cleaner represents poisoned food. (If you had 9 colours of pipe cleaners, you can choose 3 colours to be poisonous.)
7. Have the students “dissect” their bellies to see how much poison they have accumulated. Any mayflies with poisoned pipe cleaners are now dead and any char with more than half of their food poisoned dies, too. The beluga with the highest amount of poison will not die, but it won’t be able to reproduce!
8. You can play again if you have time, changing student roles and the colours of the poisoned pipe cleaners.
9. Back in the classroom, have the students make a chart with # of toxins along one axis and type of animal along the other. Explain how in older and bigger animals, the amount of toxins can build up over time.

LESSON Plans

Lesson 3: Who's Responsible for Our Hazardous Waste?

1 class period.

- ?
- Have a class discussion about the responsibilities of hazardous waste.

What can WE do about dangerous garbage in our environment? Some examples; don't buy products that contain hazardous materials, store hazardous materials properly, pick up litter and pack out all garbage when out on the land.

- On the overhead projector, show a photo of a camp with garbage. Have the students point out all of the garbage and discuss what could be done with it. This could also be modified to be a wall poster for your classroom. If you don't have an example you can use the before and after pictures from the [WWF's Clean Camps, Clean Coast initiative](#).

Are there any times when we can't control waste or hazardous things entering our environment? What happens then? Some examples; mines or businesses that have polluted communities and left, landfills, etc.

This question will lead you to the Waste Reporter activity (see Extension Activities in right hand column).

Have students investigate

- What industry is involved in this situation?*
- What groups are raising issues about the situation?*
- What are the main concerns with what has happened?*
- Has the issue been resolved?*
- What's the response from government or industry?*



Extension

The Great Canadian Shoreline Cleanup

The Great Canadian Shoreline Cleanup, presented by Loblaw Companies Limited and a joint conservation initiative of Vancouver Aquarium and WWF, promotes an understanding of shoreline litter issues by engaging Canadians to rehabilitate shoreline areas in their communities through cleanups. Each year, Great Canadian Shoreline Cleanup engages tens of thousands of Canadians of all ages in every province and territory to get their gloves dirty, feet wet and make our aquatic ecosystems cleaner, healthier and safer for all living things. [Check out the 2014 results](#)

Extension

Village of Widows (52:00)

Discuss the legacy of industry in the North. This documentary recounts the tragedy of the people of Deline, who were employed by the Canadian Government to transport uranium during World War II.

Waste Reporter

Have students look for a recent article about waste. Key words to search include: Iqaluit's Dumcano, Nunavut Contaminated Sites, Oil Spills in the Arctic. If you don't have access to a computer lab, bring in a few recent newspapers with these types of articles.

What WWF Is Doing

Find out how WWF is working with governments, industry and communities to promote the responsible development of Arctic resources.

Contaminants in Nunavut: Inuit

Capacity-Building Workshop Summary Report

Have students review the report and discuss if the recommendations are being followed.



LESSON Plans

Lesson 4: How Do We Protect Our Environment?

1 - 2 class periods.

Now we understand some of the issues and why it is important to protect our environment from residential, industrial and commercial hazardous waste. *But how do we make sure this message is heard?*

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Stewardship

Let's discuss what "stewardship" means. Write how we can be stewards of the land on the board and add ideas under it. *What do you do if you are a good steward of the land?* Research issues, get involved in politics, do your best, communicate what you know to others, etc.

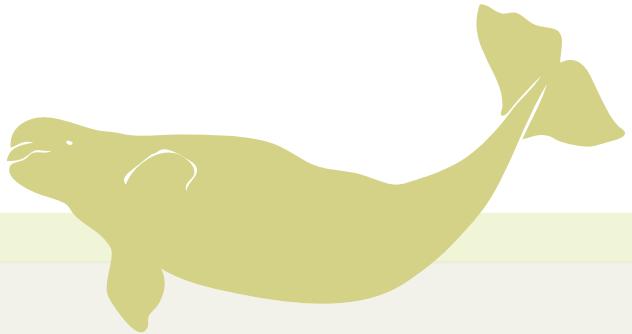
?

Let's communicate!

Review some things we can do to protect our environment from trash and write them on the board. *How do many things get communicated these days?* Advertisements; in print, on the radio or TV and through social media. Have the students break into groups and create an ad to show on TV or YouTube about protecting the environment. Give them a topic if they need help: picking up litter, remembering to recycle, bringing your reusable bag to the store, not dumping hazardous waste. Give students 15 - 30 minutes to come up with their ad and then provide time for them to practice and have them perform it in front of the class.

Extension Activity

Have the students record a video of their ad and post to social media. Maybe it will go viral!



© Sybille Klenzendolf / WWF-Canada

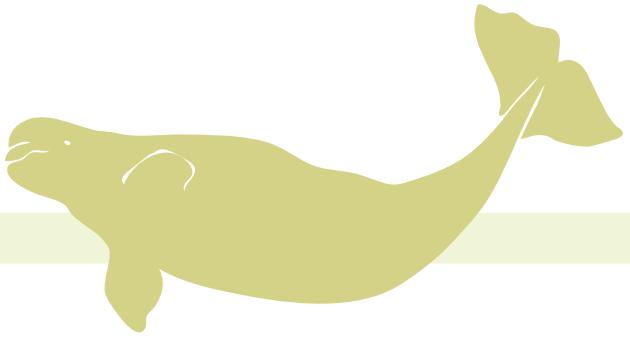
Polar bears in a town dump

?

Waste Investigator

Choose a contaminated site from the **Big Picture 2010** report (see **Teacher's Resources**) and task students with creating a presentation about waste in the environment. Students should outline the issue, how it is being managed and the plans to prevent damage in the future. This can be assigned to small groups as well. If working in small groups, ensure that the students have a plan to divide the project fairly.

WILD Ideas



Great Canadian Shoreline Cleanup

Participate in the Great Canadian Shoreline Cleanup, an annual event that encourages thousands of Canadians in every province and territory to cleanup their local shoreline. There are curriculum-linked lessons and activities for Grade 7 available [here](#).

Stay Local

Pinpoint a local environmental issue that needs your help. Once you have selected a topic, you can

- Talk to your local politicians (local, territorial and federal levels)
- Plan an activity to raise awareness locally (movie screening in your library or recreation centre, presentation to city or hamlet, bring a presenter to your school district)
- Contact your local paper. They are always interested in learning about youth concerns and actions.

② Goodbye Honey Buckets

Students will investigate Arctic geology and hydrology as well as tundra ecology as they consider options for sewage treatment. Public safety, environmental impact and issues of construction and engineering will be explored.

③ Students on Ice

There are many interesting initiatives that your students can get involved with if they are keen to become more involved with learning about and protecting the environment. Students on Ice provides youth from around the world with the chance to explore both poles.

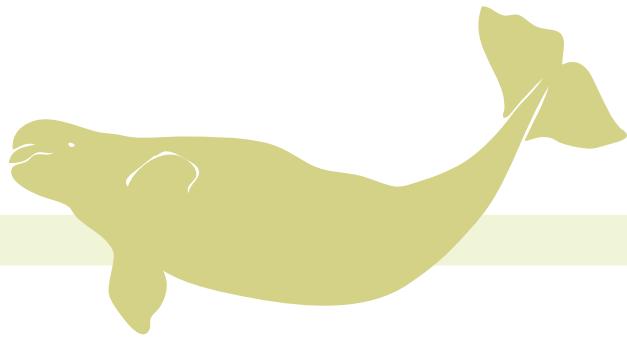
DEW Line

Here's an example of waste management and what has been agreed to by Inuit and the Canadian government. The Distant Early Warning Line ("DEW" line) was a line of radar stations above the Arctic Circle stretching all across Alaska, Canada, Greenland and Britain that "protected" Canada and the United States during the Cold War. These radar stations were created to notify Canada and the U.S.A. against Russian intercontinental ballistic missiles that would be designed to strike in Canada and the U.S.A. This DEW line began in 1953 and exists even today. The Inuit involved in the negotiations to use their land for these sites developed clauses that stipulated that when these sites were abandoned they had to be returned to their original state (prior to DEW Line construction). Many of these sites have been deemed unnecessary so everything that had been used to build them (bulldozers, graders, rock crushers, earth movers, snow throwers, tracked vehicles, drum stocks of gasoline, antifreeze, gear oil, grease, aviation fuel, buildings, airstrips, electronic equipment, docks, and anything else that had been brought in) all had to be dug up and removed.

Extension

What makes a project like the DEW line so difficult to remediate? Research the existing DEW stations across Nunavut - is there one near your community?

Glossary



Nunavut has two official languages: Inuktitut and Inuinnaqtun. Inuvialuktun is used in some parts of western Nunavut. Languages develop over thousands of years and they tell us a lot about the people who speak them and the environment that they live in. You've probably heard that Inuit have many different words for snow. This is because there are many different types of snow in the Arctic and knowing the difference between them and what they can be used for at one point in time would have meant the difference between life and death. We asked speakers of some of these languages to

translate some of the key words in these resources and provide literal back translations. You'll see that some words translate easily while some require very long explanations. The same is true when trying to translate from Aboriginal languages into English and French. There are many words that have no translation. Try using these translations to have a conversation with your students about the differences between languages and how they reflect different ways of life and ways of thinking. This would be a great opportunity to invite a native language speaker into the classroom too.

Contamination

The process whereby one substance becomes unintentionally mixed with another substance.
Eg. The water is contaminated with arsenic.

Inuktitut Sururnaqtut / Things that are of a destructive or spoiling nature

Inuvialuktun 1. Qakiqtuaq / Something spoiled for being in the sun too long
2. Asiuyiyaa inuumun / It spoiled it for the human

Inuinnaqtun Huungiqtauhimaniq / Damaged

Remediate

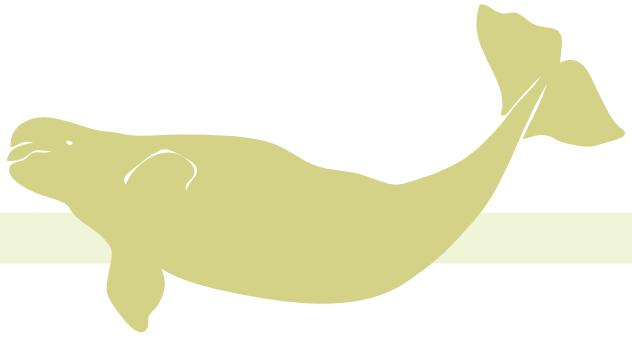
The process of returning something to its original state or close its original state.

Inuktitut Salumariaqtauniq / To clean again

Inuvialuktun Atdjigiiktuk

Inuinnaqtun Aulanianungaqtitauffaaqtuq / Brought back to its original state

Glossary



Hydrocarbon

An organic compound that is made entirely of Hydrogen and Carbon. Diesel and Gasoline are Hydrocarbons

Inuktutit Uqsualuit / Different substances of oils and gas

Inuvialuktun Uqsuryuaq / Fuel oil

PCB

A complex compound of chlorine and benzene used widely in industrial processes.
Very damaging to the environment if released.

Inuktutit Sururnaqtuq / Things that cause destruction or spoil whatever it touches

Lead

A very dense metal that can contaminate water and soil, making it harmful to people

Inuktutit 1. Aqirruq / Soft pliable / 2. Auktitagaq / Melting/welding uses

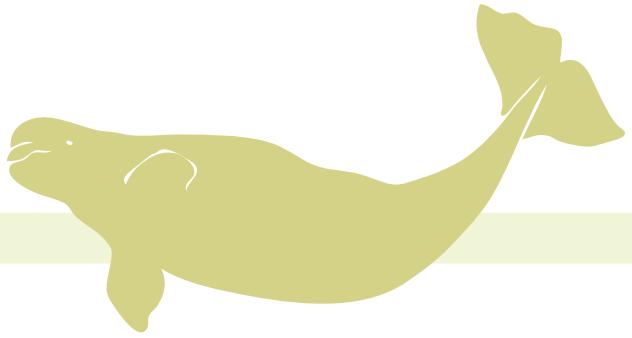
Intrinsic value

A value that exists in something when it is unaltered as opposed to a value attached to something as a means to an end.

Inuktutit Aktuqtausimanani suli pimmariujuq / Items of value in untouched state

Inuvialuktun Suaryun / Belongs to

Glossary



Natural capital

A term used to describe the ecological goods and services provided by a region in its natural states.

Inuktitut Piusituqanginni piqutinglu pijjitirautingilu /
By nature, their items of value and their services

Inuvialuktun Nakuuyuq nuna / Good land

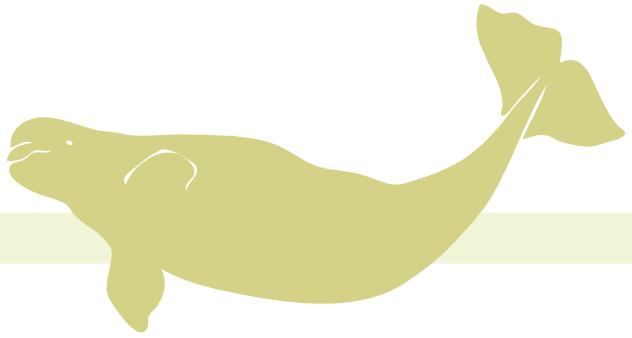
Economic value

The monetary value of resources.

Inuktitut Kiinaualiurunnarnirmut Pimmariuningit / With money making potential, things of value

Inuvialuktun Nunaami manik

URLs



Some hyperlinks have been embedded throughout the **Keep Our Habitat Safe** resource. If a link appears to be broken, try visiting the homepage or keying in the URL as it's written below.

Beluga contaminants fact sheet
<http://www.aadnc-aandc.gc.ca/>

Bird Island movie trailer
<https://www.youtube.com/watch?v=ulkY7mOkdqs>

Nunavut hazardous waste pamphlet
<http://gov.nu.ca/environment/information/documents/195/184>

Creative environmental ads
<http://scribol.com/art-and-design/20-most-creative-environmental-ads>

Great Canadian Shoreline Cleanup
<http://www.shorelinecleanup.ca/>

Village of Widows film
<http://lindumfilms.com/villageofwidows>

Environmentally friendly household cleaners pamphlet
http://www.enr.gov.nt.ca/sites/default/files/brochures/environmentally友好的_household_cleaners.pdf

WWF work with governments in conservation efforts
<http://www.wwf.ca/conservation/arctic/whatwwfisdoing/>

Great Canadian Shoreline Cleanup lessons
<http://schools.wwf.ca/lessons/grade/7/97>

Students on Ice
<http://studentsonice.com/about-us/>

Clean Camps, Clean Coast

<http://blog.wwf.ca/blog/2013/10/28/partnering-clean-camps-clean-coasts-arctic/>



WWF is working to build a future where people live in harmony with nature. The Schools for a Living Planet program empowers educators and students of all ages with the tools they need to lead us into a sustainable future. Schools for a Living Planet is grounded in the principles that make WWF a global success - including strong science and a focus on solutions.

Ecology North is a charitable, non-profit organization that has engaged Northerners in hands-on learning opportunities in the Northwest Territories since 1971. Our mission is to bring people and knowledge together for a healthy Northern environment. Education, public engagement and youth involvement are integral to all of our program streams that include climate change adaptation, watershed protection planning, waste reduction, food sustainability and alternative energy promotion.

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For more information, visit www.cibc.com.

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