

ENVIRONMENTAL STEWARDSHIP

SCHOOL GROUNDS CLEAN UP CAMPAIGN

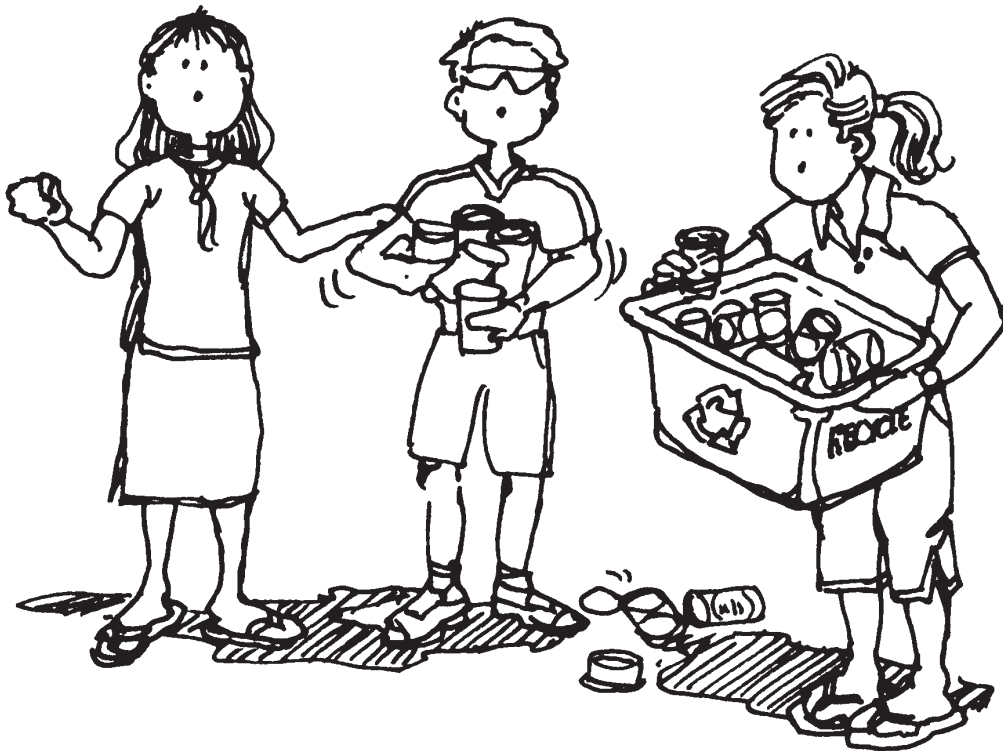


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SCHOOL GROUNDS CLEAN UP INTRODUCTION

Background

Litter takes years to break down. It releases pollutants into the air, water, and soil and can impact wildlife. A School Grounds Clean Up campaign is an excellent way to educate students about the negative impacts of litter on the environment and how they can help to make a difference in their community.

DESIGNING YOUR CAMPAIGN

Plan your campaign

- Choose to host a one-time event or implement a weekly, monthly, or seasonal clean up campaign.
- Get permission for students to pick up litter around the schoolyard or in a nearby park.
- Consider safety: order gloves and bags for students to use.
- Research the impacts of litter on the environment.

Communicate

- Call to action: communicate the event, the goal and the benefits to taking action.
- Place recycling and garbage bins throughout the school and key outdoor areas.
- Share statistics of the environmental impact of littering on posters and in school announcements/assemblies.

Implement and monitor success

- Create clean up teams to pick up litter in different areas of your schoolyard and local community.
- Weigh the collected bags of litter and share the results with your school and community. Also share interesting items found.
- Make it fun: use QR codes to make groups, create a scavenger hunt associated with the clean up, have teams dress in team colours, award prizes for pre-determined categories (e.g., most litter, best team spirit, most interesting item found, etc.).

Celebrate success, reflect and evaluate

- Celebrate via your school newsletter, announcements, website, or blog.
- Organize a Litter Art Show where students use found materials to create sculptures for display in the school.

Tips for success

- Educate students on proper litter pick up and disposal procedures.
- Encourage participation from the whole school community and expand the campaign to include areas beyond the school.

EcoSchools in ACTION!

R.L. Graham P.S (YRDSB) created a PowerPoint of the harmful impacts of litter on the environment and animals to share with the whole school. Each classroom was given 10 items to sort into garbage and recycling as a school-wide challenge and then the whole school went outdoors to pick up litter around their schoolyard.

Resources

Pitch in Canada
www.pitch-in.ca

Great Canadian Shoreline Clean Up
www.shorelinecleanup.ca

Cure Litter
www.curelitter.ca



SAFETY CONSIDERATIONS

Tips for a Safe School Grounds Clean Up Campaign

Adapted from Pitch-In Canada

Before the event

- *Site Visit:* Check for possible hazards and consider what can be done to minimize any dangers. Young children should not clean along roads or around parked cars.
- *Equipment:* Order gloves, bags, and any other equipment you might need for a safe clean up, i.e. a safety vest.
- *Volunteers:* Determine how many teachers will be supervising their students during the clean up event. You may want to ask parents or community members for additional supervision.

During the event:

- *Supervision:* Set clear boundaries before starting the clean up. A helpful tip is to print a map of the area and assign groups to specific locations. During clean up, make sure students remain in the pre-set boundaries.
- *Safety First:* Before starting, inform students of items they should not pick up (e.g., broken glass, discarded needles, etc). Inform students they should call an adult to deal with dangerous items. Caution students to be careful around parking lots and along roadways.
- *Waste Disposal:* Contact your local government or private waste disposal company to collect the garbage bags students have picked up.
- *Wash Up:* After the clean up, ensure that all students wash their hands thoroughly.

LETTER TO PARENTS/GUARDIANS

[Insert Date]

Dear Parents/Guardians,

School grounds and community clean up events make a difference. These actions, although small, have significant positive impacts on the environment and demonstrate the power of working together. In fact, if only 5% of Canada's population picked up 1kg of litter in one day, 1.4 million kg of garbage would not pollute our environment¹.

At [insert School Name], we will be participating in a School Grounds Clean Up campaign on [insert date] to demonstrate our commitment to creating a healthy and sustainable world. [Teachers/community members] will take their students outdoors to pick up litter on the school grounds [and/or local neighbourhood]. Each student will be [asked to bring/given gloves and bags]. Students will be informed of safe and proper procedures for collecting and disposing of litter.

Participating in a School Grounds [and/or community] Clean Up will build environmental stewardship and teach students the importance of reducing, reusing, and recycling to decrease the amount of waste we produce. They will also learn that litter in the environment can impact air, water, soil, and wildlife.

We ask that you sign and return the attached permission form. Thank you for your support in our School Grounds Clean Up campaign and for making a difference for our environment!

Sincerely,

The EcoTeam [Insert Name]

[Insert School Name]

Parent Consent Signature:



Fillable PDF form is available at www.ontarioecoschools.org

¹ www.curelitter.ca

SCHOOL COMMUNICATIONS

Use this information in school newsletters, campaign posters, and morning announcements.

Before Clean Up Day: Every day, humans generate more waste even though landfill space is declining, and careless disposal results in more litter turning up in the environment. This waste releases harmful pollutants into the air, water, and soil, and can impact wildlife. During the week of [insert date], [insert School Name] will be participating in a School Grounds Clean Up campaign to pick up litter on our school grounds [and/or local neighbourhood] to show our commitment to keeping our Earth healthy. All students will be educated about safe procedures for collecting and disposing of litter items. To monitor the results of our clean up day, we will count the number of bags collected and weigh each bag.

After Clean Up Day: Congratulations [Insert School Name]! We collected [insert weight or number of bags collected] of litter from our school grounds [and/or local neighbourhood] during our School Grounds Clean Up campaign! Together, we are helping to reduce the amount of waste and pollution in our environment. By following the 3Rs (Reduce, Reuse, Recycle) and taking action to clean up our environment, we are helping to create a sustainable future.

Calendar Highlights:

- National Cleanup Week is September 20-28 (Great Canadian Shoreline Cleanup)
- Waste Reduction Week is the third week of October
- Pitch-In Canada Week is the last full week of April
- International School Grounds Day is the first Friday in May

Facts & Trivia: Incorporate facts and trivia about littering and recycling into your daily announcements and encourage students to share their own knowledge and reflect on what they learn.

- Most litter occurs within 5 metres of a receptacle.¹
- The majority of litter is food wrapping/containers and cigarette butts.¹
- People under the age of 25 are more likely to litter in a group; however, people over the age of 25 are more likely to litter when they are alone.¹

- If 5% of Canada's population picked up 1 kilogram of litter each, it would mean that over 1.7 million kilograms of garbage had been cleaned up.¹
- 6.5 million trees are cut down each year just to make disposable cups.¹

EcoSchools in ACTION!

Staff and students at *Iona Academy Catholic School (CDSBEO)* wore blue and green clothing for their School Grounds Clean Up event to demonstrate their commitment to a clean environment.

- In the fall 2013 Great Canadian Shoreline Cleanup campaign there were 25,961 food wrappers, 18,499 plastic bottles, and 12,499 plastic bottle caps collected in Ontario alone.²
- 50 percent of the plastic that we use is only used once and then thrown away.³
- Enough plastic is thrown away each year to circle Earth four times.³
- There are approximately 500 billion plastic bags used worldwide each year and more than 1 million plastic bags are used every minute.³
- The Great Pacific Garbage Patch off the coast of California is the largest ocean garbage site in the world. It is twice the size of Texas and the plastic pieces outnumber sea life six to one.³

ITEM	TIME IT TAKES TO BREAK DOWN ¹
Banana peel	3-4 weeks
Paper bag	1 month
Wool sock	1 year
Aluminum can	200-500 years (but if recycled, it can be reused in 6 weeks)
Plastic bag	20-1000 years
Glass bottle	1 million years
Plastic juice container	1 million years
Styrofoam	1 million years +

¹ www.curelitter.ca

² www.shorelinecleanup.ca

³ <http://ecowatch.com/2014/04/07/22-facts-plastic-pollution-10-things-can-do-about-it/>

WHOLE SCHOOL ACTIVITIES

There are several opportunities to involve the whole school community in School Grounds Clean Up activities and campaigns. School EcoTeams can develop and present the following events and initiatives:

- Whole school assembly
- Student eco-themed skits
- Talent show/coffee house
- Student featured videos and presentations
- Speaker series
- Student organized info booths
- Eco-themed spirit day

Waste Reduction Pledge: Create a leaf, a blue box Earth, etc. to distribute to every student. Ask the students to write down one thing that they will continue to do to minimize waste and one goal they have. Collect the pledges and display them in a common area of the school.

Weekly Reusable Days: Designate one (or more) days each week to minimize waste and commit to reusable items. Get creative and participate in Tupperware Tuesdays, Water Bottle Free Wednesdays, or Thirsty Thursdays.

Classroom Waste Challenge: Challenge classrooms to participate in various events to gain points and win the Golden Garbage Can/Recycling Bin. Events could include a sorting waste relay challenge where classes must correctly sort a number of items into the appropriate bins, trivia questions about litter in our environment, or which class can collect the most garbage (by weight).

Clean Up Buddies: Create leadership opportunities by pairing up older students with younger students to clean areas of the school together.

Scavenger Hunt: Create a litter scavenger hunt to motivate students, items can be specific or more general, i.e. plastic bottle cap or most unusual item. Scavenger hunts can be held in classrooms, communal school spaces, and outdoors. Award prizes for students or classes who find certain items or check the most items off their lists.

QR Code Challenge: Create QR codes based on facts and trivia using an online generator. In groups, students can use mobile devices to scan the codes and answer the trivia questions as part of their clean up initiative or scavenger hunt. QR codes can also be used to engage students with helpful tips and reminders.

Film Festival: Set up a “movie theatre(s)” in your gymnasium, cafeteria, or library. Multiple films can be screened at once for different grade levels. Preview the films and provide guiding questions for student consideration. Hold follow up discussions to address central messages and themes.

Suggested films:

WALL-E	TRASHED	PLASTIC PLANET
Primary	Junior	Intermediate
Junior	Intermediate	Senior
Intermediate	Senior	

EcoSchools in ACTION!

St. Emily (OCSB) has Subway Sandwiches delivered once a week for lunch. They saved the sandwich bags and used them as gloves in their schoolyard clean up.

Pitch-In Canada Campaign: Pitch-In Canada holds a variety of clean up campaigns throughout Ontario during the school year. The 20 Minute Makeover challenges schools and communities to spend 20 minutes of their day/week/month/year cleaning their school grounds or local community area. The Adopt-a-Block program encourages schools and community volunteers to adopt areas in their neighbourhoods.

Great Canadian Shoreline Cleanup: The Great Canadian Shoreline Cleanup holds clean up campaigns across Canada and Ontario twice a year, from September to October and April to July. Schools can also host private cleanup events and participate in their year-round cleanup activities.



LEARNING ACTIVITIES

LEARNING ACTIVITY
K-3



Lesson 4: Trash Trials

Students become material scientists and experiment with items found on the schoolyard and in the classroom trash bin. The goal of this lesson is to identify the various material properties of everyday objects and to categorize objects based on their material properties. The suggested follow-up activities allow students to apply this knowledge to a creative design challenge.

Students will be able to: [1] Describe some features and properties of naturally occurring and human modified materials; [2] Identify materials that ‘harm’ or ‘do not harm’ the aquatic environment; [3] Design a fictional creature based on their knowledge of structures and material properties.

LEARNING ENVIRONMENT

Individual, paired or small group
Activity stations

MATERIALS

- Shoebox or cloth bag
- For each activity station:
- Variety of natural objects
 - Samples from lunch trash
 - Pennies
 - Paper clips
 - Magnets
 - Small tubs filled with water
 - Table coverings

OPTIONAL MATERIALS

Rings for sorting objects into categories

WORKSHEETS

One per student or group:
Waste-O Worksheets

Time Required

60 min; may be extended over two periods

Setup

In a shoebox hide one interesting object from the lesson to create a Mystery Box for the introduction. Set up your classroom for small group activity stations. Cover activity stations with the table coverings and set small tubs filled with water on each activity table.

K – Grade 1 - Separate activity stations into themes. One set of Mystery Materials for each group should be set aside for the final “trash trial” experiment.

Grade 2 - 3 - Small containers containing a variety of objects for independent sorting can be placed at each activity station along with a small bucket of water.

For a full list of suitable objects and station organization see the Extended Setup.

Vocabulary

experiment, magnet, metal, wood, paper, plastic, wax, transparent, clear, flexible, inflexible, float, sink, absorb, repel.

Curriculum Connections: Trash Trials

Specific Expectations	Grade	Curriculum Organizer
Ks10, Ks11, Ks15 Exploration and Experimentation Ks16, Ks17, Ks19, Ks20 Use of Technology	K	Science and Technology
1s4 Relating Science and Technology to the Environment 1s16 Understanding Basic Concepts	1	Science and Technology: Needs of Living Things
1s24 Relating Science and Technology to the Environment 1s25, 1s26, 1s27, 1s28, 1s29, 1s30 Investigation and Communication Skills 1s33, 1s34, 1s35, 1s36, 1s37, 1s38, 1s39 Understanding Basic Concepts		Science and Technology: Structures and Mechanisms
2s4 Relating Science and Technology to the Environment 2s7, 2s13 Investigation and Communication Skills	2	Science and Technology: Growth and Changes in Animals
<i>2s21 Relating Science and Technology to the Environment</i> <i>2s22, 2s23, 2s24, 2s25, 2s26, 2s27 Investigation and Communication Skills</i>		Science and Technology: Movement
2s38, 2s41, 2s42, 2s43, 2s44 Investigation and Communication Skills		Science and Technology: Liquids and Solids
2s54 Relating Science and Technology to the Environment 2s59 Investigation and Communication Skills		Science and Technology: Air and Water
3s18 <i>Understanding Basic Concepts</i>	3	Science and Technology: Growth and Changes in Plants
<i>Relating Science and Technology to the Environment, Investigation and Communication Skills & Basic Concepts</i> <i>(3s24, 3s25, 3s26, 3s27, 3s29, 3s30, 3s31, 3s32, 3s33, 3s34, 3s35, 3s36, 3s37, 3s38, 3s39, 3s40, 3s41)</i>		Science and Technology: Structures
3s63, 3s64, 3s67, 3s68 Investigation and Communication Skills 3s69, 3s72 <i>Understanding Basic Concepts</i>		Science and Technology: Soils in the Environment

NOTE: Learning expectations in italics depend on completing the suggested follow-up activities listed for your grade level.

Introduction

Mystery Box Game

The object of this game is for students to use their knowledge of material properties to guess the mystery object. This game is a twenty questions style game. Select one student to put their hand into the bag with the hidden object (the mystery bag) and feel the object for 10 seconds, they must not tell anyone what it is. The object of this game is for the class to try to guess the mystery object. Questions must be answered with a yes or no. You can introduce the style of questioning by asking one to two questions to start.

Suggestions for Mystery Box Questions:

Is it hard/soft?	Is it squishy?
Can you bend it?	Is it slimy?
Is it used to package food?	Would it make a sound if you dropped it?
Is it from a plant?	Is it smooth?

Let students know that they will be experimenting with their senses to find out more about different materials, objects and water.

Extended Setup

Trash Trial Activity Stations

Choose some of the following objects for students to test in water:

Metals and Magnets – Paper clips, pennies, pop can tabs and magnets

Soil and Stones – Soil/sand/clay, stones, sieve or sand filter

Plants and Animals – Twigs, wood blocks, tree cones, needles fruit pits and peels, bones, feathers

Plastic Station – Candy wrappers, styrofoam containers, bottle lids, drinking straws

Mystery Materials – potato chip bag, magnets, leather, cotton cloth, paper

Starting with the mystery object, introduce a few of the materials that students will be examining during the class. As a large group, practice separating them into “natural objects” (unchanged by humans) and “unnatural objects” (changed by humans). You can list the material they are made of (plastic, cotton, feathers), and for older students you may also wish to identify their source (oil, plants, animals, etc.).

Trash Trial Experiments

Explain to students that some of these materials may be found as shoreline litter. Students must examine materials at the stations to learn about how they act in water. Take some time to review the vocabulary.

K - Grade 1**Grade 2 - 3****Direct Instruction****Step-by-Step Experiment**

Before placing any of the objects in water, ask students to take a moment and think about how the objects in front of them will behave.

Pose a sequence of questions to the group e.g. "Which objects will... _____?". For each question, ask students to select and test one object.

Suggested criteria are as follows:

float/sink; bend/bend a little/bend a lot; absorb water/repel water; fall apart in water/does not fall apart; keep the same shape in water/change shape in water; made by people/come directly from nature; plastic/metal/wood/other; recyclable/compost/trash.

Mystery Materials Experiment

At the last station provide students with a set of additional materials that are more difficult to sort and classify (see [Extended Setup](#)). Students will have to use what they have learned to test these new objects. Give several minutes to have the students place their objects in the water and test their predictions.

Guided Practice**Timed Experiments**

Separate students into stations. Give several minutes to have the students place their objects in the water and test their predictions.

Worksheet Option

Have the students work in small groups or pairs to complete the [Waste-O Worksheet](#) by drawing or writing the names of objects in the squares provided. Students must also list the material or source of these objects. To add some fun have students see if they can get five in a row for a bingo-style game.

Closure**Draw Conclusions**

Ask students to sort materials based on category lists. What title could we give the objects that fall apart in water? That float? Young students may use categories like metal, plastic and wood. Older students may design their own categories for objects based on their material properties. In a large group or in small working groups, construct a chart to reflect your findings. Chart headings should reflect the categories you picked, and list the items and properties of each category.

Explore Context

Open a discussion with the group. Have students select objects they think might pose a threat to shoreline animals. Why? Have students separate out all materials that may harm an animal in preparation for the independent portion of this lesson.

Independent Practice

Water Trash Monster / Natural Treasure Creature

Students must use what they have learned about their materials to make a creature with the following characteristics:

- Water Trash Monster** This monster would float really well and catch the ocean winds. It would travel far because it would not soak up water or break apart. It would last forever because it would not be eaten by insects or worms. It is sneaky and pretends to be animal food, but is unhealthy to eat and pollutes the water.
- Natural Treasure Creature** This creature would live happily in the compost, shoreline or the forest. This creature has the super special ability to feed insects, animals or plants when it breaks down.

This activity can be done in pairs, as individual work or collaboratively as a whole group. If you would like to conduct this activity as a large group, consider setting aside a bulletin board space in the classroom that students may add to over the period of several days or weeks. Students can bring in objects they have found on the schoolyard.

Assessment

The [Mystery Box Game](#) can be used as a formative assessment to gauge students' knowledge of material properties and vocabulary. The creature design challenge may be used as a formative or summative assessment for submission. Have students share or explain their monster-creature with the class. Alternately, have students label their Water Trash Monster or Natural Treasure Creature and write a short description explaining its features, special abilities and impact on the environment.

Suggested Follow-up Activities

Create a Field Guide – Use the students' artwork to create a book or display of Natural Treasure Creatures of Water Trash Monsters for the school. Students may name their creatures and write why they are safe or dangerous for the environment.

Grade 1: Oil Cleanup – Challenge students to use their knowledge of materials to create a strategy for an oil cleanup using materials like: string, straws, sponges and fabric. Use blue food colouring in the water (to help provide visual contrast) and a few drops of cooking oil. Extend the discussion by asking students to brainstorm how oil might affect the fur, feathers and scales of mammals, birds and fish. Test their theory in an experiment.

Grade 2: Boat Build – Challenge students use their knowledge of materials to design and create a boat that floats in water. Use a water table or school yard puddles to have students try to sail their boats. Discuss how boats can pollute aquatic environments. You may choose to use some of the images from the [Data Card](#)

Photos section (Appendix) to open your discussion. Suggested rules for your boat build: [1] your boat must be designed with recycled materials; and [2] no waste should be created by the boat.

Grade 3: Beaver Dam Challenge – Building on the material properties explored in the lesson, open a discussion about why humans use various synthetic and constructed materials to build structures. Consider that beavers build dams using natural objects, compare and contrast human dams and beaver dams. How does each structure accomplish its task? What materials are selected?

Beavers build dams to create homes for themselves, but they also create important wetland habitats for many other creatures. In this way, beavers are wetland stewards, creating watery habitats where marsh plants clean and purify water the water for all of us. Challenge students to use materials like sticks, twigs, modeling clay, grasses, etc. to create a beaver dam that will hold back water. They must use their knowledge of structures and beaver building techniques to complete this project.



Lesson 6: Traveling Trash

What happens to the litter that's left behind on a shoreline? In the Pacific Ocean, circular ocean currents carry trash to one location in the middle of the ocean. Estimates vary, but it's reported that this "Great Pacific Garbage Patch" ranges from the size of Texas to the size of the continental United States. This series of science experiments will develop students' understanding of ocean currents and what types of litter persist longest on their oceanic journey.

Students Will Be Able To: [1] Perform science experiments to demonstrate how ocean currents work; [2] Perform science experiments to determine which types of litter biodegrade fastest and slowest in water; and [3] Draw conclusions that explain what might happen to shoreline litter upon reaching the ocean.

LEARNING ENVIRONMENT	Time Required
Small group	45 minutes plus cleanup time
MATERIALS	Setup
<ul style="list-style-type: none"> • Two clear baking dishes • Four straws • Food colouring • "Chads" from a hole punch • Ziploc and a weight • One ice cube • Four watertight containers • Four pieces of garbage • Writing materials • Four sieves or strainers • Images: Pacific Ocean currents; "Pacific Garbage Patch" 	<p>You may wish to have drop cloths or newspaper to protect classroom desks.</p> <p>There are three experiments described in this lesson. If you wish, you can set up two of each experiment, providing an opportunity for students to work in six small groups instead of three large groups. If you prefer smaller groups, double the materials and create two of each experiment.</p>
WORKSHEETS	Vocabulary
One set for each group: Experiment Instruction Cards	temperature, wind, current, force, hypothesis, experiment, conclusion, pollution, ecosystem, biodegradation, renewable and non-renewable resource

Curriculum Connections: Traveling Trash

Specific Expectations	Grade	Subject
4s4 Relating Science and Technology to the Environment 4s14 Understanding Basic Concepts	4	Science and Technology: Habitats and Communities
4m90, 4m93 Data Relationships 4m95 Probability		Mathematics: Data and Probability
5s34 Relating Science and Technology to the Environment 5s37, 5s39 Investigation and Communication Skills	5	Science and Technology: Properties of Matter
5s50 Overall Expectation 5s60, 5s61 Understanding Basic Concepts		Science and Technology: Conservation of Energy
5m79, 5m81 Data Relationships		Mathematics: Data and Probability
6m90, 6m93 Data Relationships 6m95 Probability	6	Mathematics: Data and Probability
7s18 Understanding Basic Concepts	7	Science and Technology: Interactions in the Environment
7s 46 Investigation and Communication Skills		Science and Technology: Substances and Mixtures
7s66, 7s68 Investigation and Communication Skills Understanding Basic Concepts		Science and Technology: Heat in the Environment
7m90, 7m93 Data Relationships 7m95 Probability		Mathematics: Data and Probability
8s56 Understanding Basic Concepts	8	Science and Technology: Fluids
8m73, 8m76 Data Relationships 8m79 Probability		Mathematics: Data and Probability

Introduction

How does shoreline litter reach the shores? Once we find litter on a shore, do you think it usually stays there? Probably not. Where do you think is the likeliest place for this litter to go? If it reaches the ocean, where does it go then? This series of science experiments will help us answer these questions.

Extended Setup Instructions

Experiment Instruction Card One for each group
Experiment Worksheet One for each student

Station One: Ocean Currents – Wind Station

Set up one deep baking dish filled halfway with water. Beside it, place four straws, food colouring and a small handful of "chads" (small paper holes punched out of your hole punch)

Station Two: Ocean Currents – Temperature Station

Set up one deep baking dish filled halfway with water, one ice cube, two different colours of food colouring, a small handful of paper chads and one sealed Ziploc bag containing hot water and a rock to weigh it down.

Station Three: Shoreline Litter Persistency Test Station

Set up four watertight containers (such as lidded jars or wide mouth reusable water bottles) and four different types of garbage from today's lunch (for example, a potato chip, a paper napkin, a candy wrapper, a plastic drinking straw or a pop can tab). The garbage must be small enough to fit into the lidded containers. Try to aim for a mix of organic and inorganic garbage.

Direct Instruction

Prepare for Experiments

Divide students into three large groups or six small groups. For three large groups, set up one of each experiment; for six small groups, set up two of each experiment. Review safety and behaviour expectations around working with water in the classroom.

Guided Practice

Give each group an experiment card below and allow students to carry out the science experiments. Students perform one experiment per group.

Afterwards, ask each group to present its findings to the class. Now consider a real-life example of ocean currents and litter that won't break down: the gyre of debris known as the "Great Pacific Garbage Patch." Show students the photographs of the Pacific Ocean currents and the "Great Pacific Garbage Patch." What types of garbage do you think you would be most likely to find there?

If you guessed plastic, you're absolutely right. Plastic doesn't completely decompose for tens to hundreds of years, but it does break down into small particles, creating a kind of plastic soup or sludge over vast distances of ocean. It's estimated by scientists that some samples of water in the "Great Pacific Garbage Patch" contain more plastic than plankton!

Closure

Reflect and Discuss

This activity is easy to adapt and extend to match the Ontario science curriculum for grades 4 through 8. Try these extension questions to enable students to reflect on their findings:

Grade 4: What are the environmental consequences when people throw their plastic litter on shorelines? Does this demonstrate respect for the environment? Are any animals adapted to be able to survive in plastic "soup" like the water found in the "Great Pacific Garbage Patch?"

Grade 5: What are the potential environmental impacts of using plastic water bottles and disposable food packaging instead of reusable packaging? How can we act as better caretakers for the shorelines and water in Canada? Is the plastic that we find in the oceans a renewable or non-renewable resource? What states and changes in matter did you observe in your investigations (e.g. ice melting, mixing of different temperatures of water)?

Grade 6: Why do you think the estimates on the size of the "Great Pacific Garbage Patch" vary so widely? Why is the middle of the ocean considered an extreme environment? What makes the "Great Pacific Garbage Patch" so hard to study and why aren't there very many photos of it? What technologies can you think of to fix the problem?

Grade 7: What are the requirements for sustaining a healthy ocean ecosystem? How does litter on a shoreline ecosystem end up affecting the health of an ocean ecosystem thousands of miles away? What are the human impacts on your local shoreline ecosystem and on the middle of the Pacific Ocean?

Grade 8: What current systems are in place to help manage the production and disposal of waste? What kinds of pollution affect water quality? How do municipal water treatment facilities filter out trash that makes its way to the sewer? How could we find out the answer?

Experiment Instruction Card

Station One: Ocean Currents – Wind Station

Materials: one baking dish filled halfway with water, straws, food colouring, two sieve, paper “chads” (paper holes from your class hole puncher).

Your baking dish with the water inside represents the ocean. Ask one student to carefully hold one of the straws just above the water level on one edge of the baking dish. Ask them to blow gently into the straw and watch how the water reacts. The air coming out of the straw represents a *wind-driven current* in your ocean. What does this mean?

While the first student stops for a moment, assign a second student in your group to face the opposite direction and to generate a gentle wind current on the opposite side of the baking dish by blowing gently on the water surface.

Now, using your best group cooperation, have students blow into both straws at the same time to create a clockwise current of water. What do you think happens to a single drop of water in your ocean when the wind blows like this from above? Record your hypothesis.

Let’s see what happens if we introduce litter to our model ocean. The pile of paper chads at your station will represent shoreline litter that has blown into the ocean. What do you think will happen to the chads when the ocean current carries water clockwise around your ocean? Record your hypothesis.

Sprinkle the chads gently (a few at a time) into the water as the two students continue to generate a clockwise current. See what happens to the chads. Did they travel the way you expected? Record your findings.

Use the sieves and the materials at the station and find the fastest way to separate the chads from the water. Leave the station as you found it.

Discuss:

- What did the wind-driven current do to the litter in your ocean?
- Is there anywhere in your ocean for the litter to go?
- How do you think this litter would affect animals if your ocean had marine life in it?
- What do you think this means for shoreline litter that we see in our community?

Experiment Instruction Card

Station Two: Ocean Currents – Temperature Station

Materials: one baking dish filled halfway with water, one Ziploc bag of hot water and a rock to weigh it down, two colours of food colouring, an ice cube, two sieves, paper “chads” (paper holes from your class hole puncher).

What do you think will happen to the water in your ocean when it has different temperatures on either side? Record your hypothesis.

Place the Ziploc bag of hot water in one corner of your baking dish. Place the ice cube at the opposite corner of your baking dish.

Place two drops of one colour of food colouring beside the hot water in your ocean. Place two drops of another colour of food colouring beside the cold water in your ocean. Watch what happens. Record your findings. Was your hypothesis accepted?

The paper chads will represent shoreline litter that has blown into the ocean. When litter reaches your ocean, what do you think will happen to it based on how the water currents are moving in your ocean? Record your hypothesis.

Gently sprinkle the chads in the water a few at a time and wait to see whether they are moved by the water. Record your findings.

Use the sieves and the materials at the station and find the fastest way to separate the chads from the water. Leave the station as you found it.

Discuss:

- The movement of the water caused by temperature in your ocean is called a *current*. What did the temperature-driven current do to the litter in your ocean?
- Is there anywhere in your ocean for the litter to go?
- How do you think this litter would affect animals if your ocean had marine life in it?
- What do you think this means for shoreline litter that we see in our community?

Experiment Instruction Card

Station Three: Shoreline Litter Persistency Test Station

Materials: four watertight containers to represent the action of waves in the ocean, four different types of garbage to represent shoreline litter

Place one different type of garbage into each container and close the lids tightly. Gently test to ensure that when you turn the jar over, no water leaks.

Of the four different types of garbage at your station, which one do you think will break down the most quickly? Which one do you think will break down the least quickly? Record your hypothesis.

Assign four responsible students in your group to each take one container. This student is going to create the movement of water in the ocean by shaking. Ask one person to keep an eye on the time and then instruct each of the four students to shake their jar vigorously for three minutes. After three minutes of shaking, record your findings. Was your hypothesis accepted?

Discuss:

- What types of garbage break down faster than others?
- What word can you think of to describe garbage that breaks down quickly in the environment?
- What type of garbage do you think will persist longest in the ocean?
- What do you think this means for marine animals?
- What do you think this means for shoreline litter that we see in our community?

Experiment Worksheet**Name****Date****Group Members****Our Research Question****Hypothesis****Materials and Procedure****Labeled Diagram of Our Experiment****Observations****Conclusion and Analysis****Notes on Group Discussion**



Who cares? Environmental Activist Bulletin Board

Overview

As a class, students will examine a Canadian environmental activist or organization. In pairs or small groups, students will then research another environmental activist and prepare an entry for an Environmental Activist Bulletin Board.

Curriculum Links, Grade 10 Civics and Citizenship

- Overall Expectations – A1, B1, C1, C3
- Specific Expectations – A1.6, B1.3, C1.1, C1.3, C3.1, C3.2

Concept of Political Thinking – Political Significance, Objectives and Results

Citizenship Education – Identity, Attributes, Active Participation

This learning activity can be modified and adapted to meet curriculum requirements in other grade levels and subject areas. Environmental activism research projects can take place in English, Science, Social Studies & Humanities classes among others, allowing the core principals to remain the same with different learning objectives.

Planning Notes

Prior Learning

Students should be familiar with the concepts of civic action, activism, and the common good. Students should be aware of environmental issues, such as climate change, pollution, and resource depletion. Students should be familiar with how to conduct internet research. Students should be comfortable working in groups of two to three.

Materials

- A brief article featuring a Canadian environmental activist or organization (electronic or hard copy)
 - Electronic: laptop, internet connection, projector
 - Hardcopy: copies of article**
- A computer lab or library with internet access
- Copies of *Environmental Activist Bulletin Board Worksheet* (Appendix 1)
- White paper, colourful paper, scissors, glue, and markers
- Cleared bulletin board in or near classroom
- Title “Environmental Activist Bulletin Board”, stapler or pushpins

**Consider modelling environmental practices by printing or photocopying on Good On One Side (GOOS) paper.

Recommended Class Time: 2 periods

- 1 period – discuss activism, read article, summarize article, explain activity, model activity, form pairs, and research activist or organization.
- 1 period – complete *Environmental Activist Bulletin Board Worksheet* (Appendix 1), create Activist Bulletin Board, and debrief the activity.

Student Tasks

1. Activate prior student knowledge by facilitating a discussion with students around environmental activism. Consider asking students the following questions:
 - What is activism?
 - What does it mean to be an environmental activist?
 - Why are some individuals and groups engaged in civic action?
 - Why might it be important for individuals and groups to engage in civic action?
2. Find an article that features a Canadian activist or organization focused on environmental clean up campaigns. See Resources for suggestions on where to find an article. State the topic and the title of your selected article featuring a Canadian environmental clean up activist or organization. Facilitate a discussion with students to draw out their questions about the topic. Consider asking students the following questions:
 - Are you familiar with the environmental activist/organization featured in the article?
 - Where might you have heard about the activist/organization?
 - Could you summarize your knowledge about the activist/organization?
3. Share your selected article featuring a Canadian environmental clean up activist or organization. Read through the article with your students. Model how to mark a text. Highlight key words and concepts and cross out less important information. **Variation:** If you are distributing hardcopies of the article, have students practice marking a text. Consider having students share their selections and key concepts in small groups and then as a class, to generate consensus.
4. Work as a class to craft a summary of the article on the chalkboard. Model paraphrasing. Consider asking students the following questions to help develop the summary:
 - Who or what is the article about?
 - What is the purpose of the article?
 - What stands out as being of particular importance?
 - What are some key words and concepts we've highlighted?
5. Explain that students will be contributing to an Environmental Activist Bulletin Board. Distribute the *Environmental Activist Bulletin Board Worksheet* (Appendix 1). Read through the worksheet with students. Explain that students will be working in groups of two to three to research an environmental clean up activist or organization. Students will summarize their research and will then complete the *Environmental Activist Bulletin Board Worksheet* (Appendix 1). Completed Worksheets will be reviewed by the teacher before students create posters to be posted on the Environmental Activist Bulletin Board.

6. Work as a class to create the first Environmental Activist Bulletin Board entry based on the article you read as a class. Use the class summary to complete the *Environmental Activist Bulletin Board Worksheet* (Appendix 1).
7. Take students to the computer lab or library. Discuss where students might begin their research (see Resources). Circulate, answer questions, and provide support where needed.
8. Ask that students complete and submit the *Environmental Activist Bulletin Board Worksheet* (Appendix 1) for assessment (Assessment For Learning).
9. Ask students to generate their entry for the bulletin board using colourful paper, markers, and the information from their completed Worksheet (Appendix 1). Ask students to prepare their entry on paper of a size that would allow for the posters of the entire class to be displayed on a bulletin board in the school.
10. Once students have completed their bulletin board entries, invite students to post their posters around the classroom and to take a Gallery Walk to view all the entries. Encourage students to take a picture of any activist or organization that interests them.
11. Ask students to organize their desks in a manner conducive to class discussion. Have students share in an informal way who they researched and what major learning took place (Assessment For Learning). Consider asking students the following questions to facilitate the round-table discussion:
 - How is your individual or organization engaged in civic action?
 - What actions do they engage in to generate environmental change? How do they know their actions are successful in generating the change they would like to see?
 - How do their actions contribute to the common good?
 - Was there an activist or organization that you saw on the Gallery Walk that caught your attention? If so, why?
 - When you consider the various courses of action these individuals and organizations implement to address environmental issues, which action do you think has the greatest impact?
 - Has your view of activism changed over the course of this activity? If so, why?
12. Using the title and a stapler or pushpins, create a bulletin board featuring your class' entries. Invite the whole school community to view your students' work.

Extension

- Select two or three entries from the class to inform a debate. Give students the hypothetical situation that there is \$100,000 of grant money available to the environmental organization that can prove its environmental actions have had the most impact. Divide students into teams, assign an environmental organization, and facilitate a debate. Potential areas of discussion:
 - What is the goal of the environmental organization?
 - Are some environmental goals more important than others?
 - What actions have the environmental organization implemented to bring about change?
 - How effective has the environmental organization's actions been?
 - How do you measure success?

Resources

- Encourage students to try local community members and organizations with experience in clean up campaigns first - for example, a local conservation authority, the city/municipality, or a member of the school's EcoTeam.
- <http://planetfriendly.net/heroes.html> - information about Canadians who make a difference around the world
- <http://www.ted.com/topics/environment> - TED talks featuring environmental activists
- http://en.wikipedia.org/wiki/List_of_environmental_organizations - list of environmental organizations by type and country

Recommended Organizations

Great Canadian Shoreline Cleanup

Pitch-In Canada

Tree Canada

WWF Canada

Appendices

Appendix 1 – *Environmental Activist Bulletin Board Worksheet*

NAME

PARTNER

Environmental Activist Bulletin Board Worksheet

Name of environmental activist or organization _____

Actions What actions have the activist or organization implemented to bring about change?

Results/Impact How effective are the activist or organization's actions?

Reach Where is the activist or organization trying to effect change? *(please check one)*

- Globally
- Nationally
- Locally

How can I get involved *(Where do I find more information?)*?

Website _____

Volunteer website _____

Additional resources _____

Activist or organization
logo *(optional)*

Source(s) _____

**TEACHER
SIGNATURE**