

Roots & Shoots Eco-Cleaning

EcoTeam Lesson 3: The Water Cycle



Time needed

50 minutes

Cost

Less than \$10.00

Weather requirements

None

Advance preparation

Select products, collect materials and make recipe cards.

Overview

Students examine the phases of the water cycle in this EcoTeam lesson. This Roots & Shoots activity displays care and concern for the environment, animals and the human community by showing students how to take simple steps in their homes and schools to keep pollutants out of the water cycle. Students will be following recipes to make their own non-toxic, biodegradable (or “eco-friendly”) cleaning products to use in a cleaning day at school.

Background Information for Facilitator

Since the Clean Water Act was passed in 1977, our country has taken many steps to control direct pollution from industries and sewage treatment plants. Today, pollution called Nonpoint Source (NPS) is the main threat to our aquatic and marine environments. Nonpoint Source pollution occurs when precipitation runs over land or through the ground, picks up pollutants and deposits them in rivers, lakes or coastal waters. NPS pollutants include oil, sediment, bacteria from livestock and toxic chemicals from fertilizers and pesticides. Any pollutant a drop of water picks up on its journey through the water cycle can become part of the NPS problem.

Even after water is purified in wastewater treatment plants, chemicals from pesticides and household cleaners may remain. These pollutants are detrimental to drinking water supplies, recreation, fisheries and wildlife. One way that we can help limit NPS pollution is by making careful and informed decisions about products we use in our homes, schools and workplaces. Using “eco-friendly” cleaning supplies can help protect the water quality of our rivers, lakes and oceans.

Eco-friendly cleaning products differ from traditional cleaning products in that they:

- Do not introduce pollutants to the environment through the water cycle.
- Cause less pollution as a byproduct of manufacturing.
- Reduce waste from packaging.
- Are less likely to cause eye, lung and skin irritation.
- Are less likely to cause injury if accidentally ingested.
- Save money (in most cases).

Many eco-friendly cleaning supplies can be made using ingredients commonly found around the house. Baking soda, vinegar and oil soap are the main ingredients in these products. This activity shows how the choices we make every day, including the types of cleaning products we use, have an impact on the earth. It also demonstrates how every individual's actions can help make our water cleaner and better for all living things.

Materials

- Ingredients (Baking soda, vinegar, Murphy Oil Soap®, salt and water)
- Containers for products (reused glass jars and spray bottles)
- Cleaning equipment (sponge, newspaper, paper towels)
- Measuring cups (1 cup, ½ cup, ¼ cup, 1 tablespoon)
- Labels of traditional cleaning products

White vinegar is made from the double fermentation of the sugars in corn and rye. Baking soda, or sodium bicarbonate, is made from soda ash, which is mined in the form of an ore called *trona*. About 17 million tons of trona is mined each year in Wyoming from the largest known deposit in the world.

Procedures

Select products to make and use in school and collect the materials ahead of time. Remind students of the EcoTeam lesson on the Water Cycle and explain that they will be applying what they have learned in this lesson on “eco-cleaning.” Pass out the journal page; have students read the passage and let them know where the traditional products or labels are located throughout their room.

After students have completed Part One of their journal page, divide students into groups that will make a product and clean a designated area. Give each group a recipe sheet, ingredients, a container for the finished product and supplies for cleaning (sponge, newspaper, etc.) After students make and use their product, they should return to their seats and complete Part Two, the “Eco-friendly Cleaning Product Report,” on their journal page. They can share their cleaning product reports with the class by designing a commercial or print advertisement for their product-- stating its benefits to people, animals and the environment; creating labels for their new products; taking before and after pictures of the areas they cleaned; or by giving a simple report-style presentation.

Product	Ingredients	Recipe and tips
All-purpose cleaner	<ul style="list-style-type: none">• Baking soda• Vinegar• Water	Mix 2 Tbsp baking soda with 1 pint warm water, put in spray bottle. Add a splash of vinegar to cut grease.
No-streak glass/window cleaner	<ul style="list-style-type: none">• Vinegar• Water	Mix ¼ cup white vinegar and 1 quart warm water. Apply with a spray bottle and wipe with crumpled newspaper for lint-free results.
Scouring powder for tub, sink and toilet bowl	<ul style="list-style-type: none">• Baking soda• Murphy Oil Soap®	Sprinkle baking soda on surface or in toilet bowl. Add a few drops of oil soap. Scrub and then rinse well to avoid leaving a hazy film. A paste can also be made with the ingredients.
Drain cleaner	<ul style="list-style-type: none">• Baking soda• Vinegar• Boiling water	Pour ½ cup baking soda down drain first. Then pour in ½ cup vinegar. Let it fizz for a few minutes, then pour a teakettle full of boiling water down drain. Repeat if necessary.
Oven cleaner	<ul style="list-style-type: none">• Baking soda• Salt• Water	Mix one cup of baking soda and 1 tsp salt with enough water to make a paste. Apply to oven surface and let it stand for a while. Scrub with scouring pad.

Sources

Clean Water Coalition of University of Wisconsin Extension. “Clean Water One Step at a Time.” *Keeping Them Clean – Cars, Lake and Streams*. <http://clean-water.uwex.edu/cwc/carwash.html> (2 July 2002).

Environmental Media Service. *Eco-friendly Alternatives to Commercial Cleaners and Other Household Products*. http://www.ems.org/household_cleaners/alternatives.html (24 July 2002).

Environmental Protection Agency. “Nonpoint Source Pollution Factsheets.” *Pointer No. 1*. <http://www.epa.gov/OWOW/NPS/facts/point1.htm> (25 July 2002).

Seattle Public Utilities. “Conservation & Environment: Green Cleaning Kits.” *Recipes*. <http://www.cityofseattle.net/util/ept/clngn/recipes.htm> (2 July 2002).

All-purpose Cleaner

Ingredients

- Baking soda
- Vinegar
- Water

Baking soda is made from soda ash that comes from *trona*, an ore mined in Wyoming. White vinegar is made from the sugars in corn and rye.

Recipe

Put 1 pint of warm water into a spray bottle. Add 2 tablespoons baking soda and one tablespoon vinegar to the bottle. Screw the top on tightly and shake to mix. Spray on surfaces and wipe with a sponge.

Glass & Window Cleaner

Ingredients

- Vinegar
- Water

White vinegar is made from the sugars in corn and rye.

Recipe

Put $\frac{1}{4}$ cup vinegar and 4 cups of water into a spray bottle. Screw the top on tightly and shake to mix. Apply to glass and mirrors and wipe with a crumpled newspaper.

Tub & Sink Cleaner

Ingredients

- Baking soda
- Oil Soap
- Water

Baking soda is made from soda ash that comes from *trona*, an ore mined in Wyoming.

Recipe

Put about $\frac{1}{2}$ cup of baking soda into the glass jar. Add a few drops of oil soap and enough water to make a paste. Stir with a spoon. Spoon some of the paste onto a sponge and scrub sink and tile. Rinse well with water.

Name _____



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Part One

Imagine a drop of water sunbathing on the surface of a puddle in the school parking lot. It is warmed by the sun until it evaporates and becomes part of the water in the air and the clouds. When the weather conditions are right, condensation occurs and it falls to the earth as precipitation. Where does it go once it reaches the ground? Is it used by humans, animals, or plants? Maybe it is used by plants or animals, or maybe it is used by humans to fight a fire, wash a car, clean a shower or tub, or water some tomatoes.



When people use water to wash their cars or clean around their homes, whatever cleaning products they use enter the water cycle. You might have even noticed warnings on some cleaning supplies that say they are harmful to people.

Locate the warnings on one of the cleaning product labels in your classroom and copy them into the space below.

When these cleaners enter the water cycle, they can be damaging to fish, animals and plants, as well as cause harm to people. Even after water is treated, it may contain a little bit of that harmful substance and may return to the environment through the water cycle. We can really make a difference in keeping our water clean and healthy. Everyone benefits from the use of cleaning supplies that are “eco-friendly” --or not harmful to people, animals and plants.

Your class will be making eco-friendly cleaning supplies out of some everyday ingredients. Even though these are not poisonous to people and animals, you should never put them in or near your mouth because they might make you sick. You will record the results of your cleaning below.

Part Two

Eco-Friendly Cleaning Product Report

Type of cleaner: _____

Ingredients: _____

What you cleaned: _____

How well did it work?



Dear Parent or Guardian,

As part of the EcoTeam curriculum, your child's class is learning about the water cycle, or the constant movement of water from the earth's surface to the atmosphere and back. The class also learned that harmful substances may enter the water cycle through some human activities and learned how we can help prevent this by making careful and informed decisions about the cleaning products we use in our schools, homes and workplaces.

Even after it is purified in wastewater treatment plants, water may contain persistent chemicals from pesticides and cleaners. Since these pollutants are detrimental to drinking water supplies, recreation, fisheries and wildlife, using an eco-friendly (or non-toxic and biodegradable) alternative is beneficial for all living things. For a Roots & Shoots project, our class made some eco-friendly cleaning supplies out of common ingredients and had a cleaning day at school. You can ask your child what cleaning product his/her group made in school and how well it worked. Below are some recipes for products you might want to try at home:

Product	Ingredients	Recipe and tips
All-purpose cleaner	<ul style="list-style-type: none"> • Baking soda • Vinegar • Water 	Mix 2 Tbsp baking soda with 1 pint warm water, put in spray bottle. Add a splash of vinegar to cut grease.
No-streak glass/window cleaner	<ul style="list-style-type: none"> • Vinegar • Water 	Mix ¼ cup white vinegar and 1 quart warm water. Apply with a spray bottle and wipe with crumpled newspaper for lint-free results.
Scouring powder for tub, sink and toilet bowl	<ul style="list-style-type: none"> • Baking soda • Murphy Oil Soap® 	Sprinkle baking soda on surface or in toilet bowl. Add a few drops of oil soap. Scrub and then rinse well to avoid leaving a hazy film. A paste can also be made with the ingredients.
Drain cleaner	<ul style="list-style-type: none"> • Baking soda • Vinegar • Boiling water 	Pour ½ cup baking soda down drain first. Then pour ½ cup vinegar. Let it fizz for a few minutes, then pour a teakettle full of boiling water down drain. Repeat if necessary.
Oven cleaner	<ul style="list-style-type: none"> • Baking soda • Salt • Water 	Mix one cup of baking soda and 1 tsp salt with enough water to make a paste. Apply to oven surface and let it stand for a while. Scrub with scouring pad.

Following these few tips when washing your car at home will also help protect our water!

- Wash over an unpaved area --This lets the ground filter the soapy water, instead of sending it down the street into a storm drain and right into a local stream or river.
- Use non-toxic detergent --If you choose a special product for cars, read the label carefully. *Seventh Generation Citrus Cleaner and Degreaser®* and *Citri-Solve Cleaner and Degreaser®* both work well.
- Keep water use low --Use a bucket instead of keeping the hose running the whole time.

Sincerely,