

## Lessons 23, 24

<b>Stage 1 – Desired Results</b>	
<p><b>Established Goals:</b> 8-4-17 Identify substances that may pollute water, related environmental and societal impacts of pollution, and ways to reduce or eliminate effects of pollution. GLO: B2, B3, B5, D5</p>	
<p><b>Understandings:</b> <b>Students will understand that...</b> Substances that they may use in their homes can be toxic.</p>	<p><b>Essential Question:</b> What are the various ways humans impact water and how do they attempt to fix the water they have damaged? How do we learn about water from a sustainability focus?</p>
<p><b>Students will know...</b> That there are alternatives to toxic substances.</p>	<p><b>Students will be able to...</b> Identify substances and activities within a household that contribute to water pollution Identify safe cleaning alternatives for commercial cleaning products.</p>
<b>Stage 2- Assessment Evidence</b>	
<p><b>Performance Tasks:</b> Identify substances that contribute to water pollution.</p>	<p><b>Other Evidence:</b> Work cooperatively in a group situation.</p>
<b>Materials Required</b>	
<p>Substances found in a variety of areas from in and around the home (2 per group) Internet access</p>	
<b>Stage 3 – Learning Plan</b>	
<p><b>Background Information:</b> Pollutants that come from homes often originate in the kitchen, bathroom, or garage. Some chemicals such as oil, paint thinner, and pesticides often find their way down the drain and into the water system. Household cleansers, such as drain cleaner, oven cleaner, and tarnish remover have caustic chemicals that lower water quality. These products have chemical ingredients that may not be removed during water treatment. A partial solution would be to avoid putting these chemicals directly into water in the first place. Hazardous household wastes can be taken to approved disposal sites. Fortunately, there are non-toxic alternatives that can be used instead of some household cleansers. Items such as baking soda and vinegar can be used in different combinations to clean different areas of the home. Baking soda can be used in place of a room deodorizer. Boiling water, vinegar, and baking soda can be used with a plunger to take the place of a toxic drain cleaner. Vinegar wiped with newspaper can be used as a window cleaner. Scouring powder can be replaced by baking soda and vinegar. Salt, baking soda, and a piece of aluminium foil in warm water can take the place of a tarnish remover.</p>	
<p><b>Prior Preparation</b> Prepare a copy of the “Household Contaminant Survey” sheet (BLM #1) and a copy of the “Alternative Cleaning Products” sheet for each student (BLM #2).</p>	
<p><b>Procedure</b> Setting the stage</p> <ol style="list-style-type: none"> <li>1. Divide class into six teams (approximately 4-5 per team). Have at least two products per team on hand. Have each student fill out one contaminant survey sheet using the two team products. Have the students work in teams to find the information.</li> <li>2. Assign a different area of the house to each team: kitchen, garage, garden &amp; yard, bathroom, basement, and laundry room.</li> <li>3. Get students to create a diagram of a home to demonstrate how their cleaners may get into our water systems(i.e. flushed down the toilet, poured down the kitchen sink).</li> </ol>	
<p><b>Activity</b></p> <ol style="list-style-type: none"> <li>1. Have each team fill in the remaining contaminant survey sheet with the products brainstormed for their area of the house.</li> </ol>	

2. Have students collect data from their own homes. Explain that some products will not have an entry in each category.
3. Have the students meet in their teams and combine their lists into a master list for their area.
4. Have the students use the “Alternative Cleaning Products” handout to fill in the “Household Cleaners Survey” sheet for the cleaning products they found (BLM #2)

Potential resources:

<http://es.epa.gov/techinfo/facts/safe-fs.html>

[http://www.eartheasy.com/live\\_nontoxic\\_solutions.htm](http://www.eartheasy.com/live_nontoxic_solutions.htm)

**Follow-Up (next lesson)**

A. Review data with students:

1. What products did they find?
2. How do we use these products?
3. How do these products affect water? (This may be on the label under the caution statement.)
4. How can we relate this activity to Sustainable Development?

**Homework Learning Activities**

Collect data from homes as to toxic chemicals that are disposed of in water

Determine safe alternatives to these cleaners (from internet or other sources)

**Extension Learning Activities**

Extensions

- Have the students keep track of how many times they use alternative cleaning products.
- Let the students share this project with their families at home. Encourage them to show their families their home surveys and the list of alternative products that could be used.
- Have the students watch television advertisements and check the products advertised for environmental or physical safety.
- Have the students make their own handbooks to take home and refer to as needed.
- Encourage a group of students/class to make these non-toxic products and sell as a fundraiser during the holiday season.

# Household Cleaner Survey

BLM 22.1

Name of Product	Main Ingredients	Container Composition	Caution wording	First Aid Treatment recommended	Disposal Procedures

## Sondage sur les dégraissants à domicile

Nom du Produit	Ingrédients principaux	Composition du récipient	Langage de l'avertissement	Premiers soins recommandés	Comment s'en défaire

**Alternative Cleaning Products** (22.2)

<b>Product and what it does</b>	<b>Safe Alternative Ingredients</b>

## Autres produits de nettoyage (22.2)

<b>Produit et ce qu'il fait</b>	<b>Autres ingrédients sécuritaires</b>

