Lesson Plan: Hazardous Products Substitutes

Adapted from Rethink Recycling: An Oregon Waste Reduction Curriculum, Oregon Department of Environmental Quality – www.deq.state.or.us

Goal: To teach students about why certain products are dangerous to our health and the environment, and what some substitutes are to these products.

Assessment: Students will learn to recognize signal words and visual symbols that indicate the presence of hazardous substances and create a recipe book for safe substitutes for home use.

Age Group: Grades K-3

Time: 45-60 minutes

Materials:
- A set of 3 cups labeled with “Caution”, Warning”, and “Danger” for each pair of students and one for the teacher, or just one set for you to demonstrate for your students.
- A set of measuring spoons, eye dropper and container filled with colored water for each pair of students, or just one set for you to demonstrate for your students.
- 1 large container filled with colored watered
- 1 large container, empty
- Dishwashing gloves
- Safety glasses or goggles
- Surgical mask
- Examples of products with labels (or just product labels) containing the words caution, warning and danger. Alternatively, you can use magazine cut outs of these products.
- General art supplies
- Magazines with pictures of nature
- Spray bottle filled with vinegar and water
- One copy of the MPCA Non-Toxic Cleaning Recipes card per student. This can be found at the link below: http://www.pca.state.mn.us/index.php/view-document.html?gid=11368
**Vocabulary**

**Signal Words** – words on a product’s label which indicate the degree of hazard (how toxic or hazardous a product can be).

**Danger** – one of three signal words. Products that have this signal word on the label are extremely flammable, corrosive or highly toxic. They pose the greatest hazard.

**Warning** – one of three signal words. Products that have this signal word on the label are moderately hazardous.

**Caution** – one of three signal words. Products labeled with this signal word are mildly to moderately hazardous.

**Activity**

- Show the class three cups labeled: “Caution”, “Warning”, and “Danger”. You can also pair students and hand them each a set of cups.
- Write on the chalk board “Signal Words” and identify the words “caution”, “warning”, and “danger”.
- Explain that something that has the label caution is the least hazardous, but sometimes there are products that perform the same function that are even less hazardous because they carry no warning labels at all. Help students understand that it is always better for human health and the environment to choose the least toxic product necessary to do the job.
- Show students examples of products with warning labels, or use the labels that have been removed from the products, or use magazine cut outs of these types of products.
- Make sure each pair of students has a measuring spoon, an eye dropper, and a container filled with colored water.
- Have the students measure two tablespoons of colored water and pour into the “Caution” container.
- Measure out one teaspoon of colored water and pour into the “Warning” container.
- Measure one drop of colored water and pour into the “Danger” container.
- **The amounts in each container are the amounts of each product that would seriously hurt or kill a 150 lb. adult. Which product is the most dangerous?** The Danger label—it has only one drop of colored water.
- **How are you different from a 150 lb. adult? Would it take more or less of a hazardous product to make a child sick? Less.**
- **What type of protective clothing or measures should be worn when cleaning/working with chemicals?** In some cases, items worn might include: gloves, goggles or safety glasses, ventilation masks (surgical mask), and special protective overalls.
- Show students examples of gloves, mask and goggles.
- Have the students point to the parts of their own bodies these items protect (eyes, lungs, skin) and to identify the 5 routes into the body for hazardous substances (eyes, nose, mouth, ears, skin).
- Fill the second large container with water only. Ask students if they think it would be okay to dump hazardous chemicals into rivers, lakes or streams. Explain that by pouring chemicals into the sink or toilet, means that chemicals may get into our rivers, lakes and streams from overflowing septic systems or waste water treatment plants during heavy rains or when chemicals are difficult to remove thoroughly from waste water.
- **There is a lot of water running in our rivers, lakes and streams. IF each person puts just a small amount of chemicals into the water supply it will all get “washed away”, right? Let’s do an experiment to see what happens.** One at a time, have each student come forward and drop a drop of colored water into the plain water. Prompt students to observe how the color of the water changes as more students add colored water.
Who can tell me what is happening to the water? Do you think the same thing might happen to our rivers, lakes and streams, if we aren’t careful with dangerous chemicals at our homes? Yes!

Give each student a copy of the MPCA Non-Toxic Cleaning Recipe card and have students create a recipe book. With teacher’s help, students can copy out some substitute product “recipes.” Use magazines to cut out pictures of nature, clean air, and water for use in decorating their books.

Have them create a pledge to try one or more less toxic substitutes at home and take it home for their parents to sign.

Using spray bottle filled with water and vinegar, allow students to practice cleaning windows or mirrors.

**Extensions**
- Make advertisements for the “new” products that will substitute for the hazardous ones. Review advertisements for different chemical products. Discuss how ads make us believe that chemicals are better than natural cleaners.
- Visit Dakota Valley Recycling Household Hazardous Waste website at: [http://www.dakotavalleyrecycling.org/for-residents/household-hazardous-waste](http://www.dakotavalleyrecycling.org/for-residents/household-hazardous-waste) and have students report on their findings.

**Minnesota Teaching Standards**

**Kindergarten**
Health Education: 1.1, 7.1, 8.1

**1st Grade**
Science: 1.1.1.1.1, 1.1.1.1.2
Health Education: 1.1, 2.1

**2nd Grade**
Science: 2.1.2.2.2
Health Education: 1.1, 7.1

**3rd Grade**
Science: 3.1.1.2.1, 3.1.1.2.4
Health Education: 1.1