Hazards of
Household Waste

Grades: 5 – 6

Time Allotments: Teacher Preparation: 1 – 2 hours

 Lesson and Activity: Two 45- or 60-minute periods

Vocabulary: Hazardous Waste, Household Hazardous Waste

Corresponding Core Curriculum Content Standards:

Language Arts: 3.2.5/6 C., 3.3.5/6 B.

Science: 5.1.4.D.3

Technology: 8.2.4.C.1

Objectives:

Students will –

* Identify words, symbols, pictures, directions and warnings used on packaging and labels that contain household hazardous materials.
* Identify specific types and categories of hazardous materials;
* Identify reasons why people purchase materials and products that are hazardous;
* Describe strategies for reducing use of hazardous materials or from entering the solid waste stream or environment;
* Describe why such materials can be harmful to human health and the environment.

Materials: For teacher’s presentation:

- Array of household hazardous waste products or containers (10 - 13 examples)

- Box of zip-lock clear plastic bags or regular plastic bags that are knotted at the end

(need one for each sample package of household hazardous waste)

- Copies of “The Hazards of Household Waste” worksheet – one per team

- Array of non-hazardous items, products or methods (8 – 10)

- Sheet or blanket to use as a table covering

- Blank sheets of paper

 For each team of students:

- Copy of “The Hazards of Household Waste” worksheet

- Pencil

- Sheet of blank paper for closure activity

Preparation:

• Review background information about household hazardous materials – types, needs and uses, packaging, disposal and safety and health issues. Two online resources are provided at the end of this lesson and additional resources are listed in the resource section of this curriculum supplement

• For demonstration #1: Collect samples (10 – 13) of products from home and school settings that are considered to be household hazardous materials. Packages should be empty and rinsed. Such items can include shoe polish; window cleaner; nail polish and nail polish remover; oven cleaner; bleach (must include Clorox); weed control; bug spray; ant traps; Lysol spray; paint thinner; turpentine; batteries; hair spray; hair color; car wax; antifreeze; windshield wiper fluid, motor oil; etc. Each item should be sealed in a zip-lock or tied/sealed clear plastic bag

• For demonstration #2: Collect samples (6 - 8) of non-toxic products and items that offer solutions to the use of certain household hazardous waste materials or products. Such items can include a fly swatter; mouse live-trap; mothballs; piece of window screen; piece of steel wool; hand tool to remove weeds; hand broom; and vinegar

Anticipatory Set:

• Ask students the following questions:

- Are there products and chemicals in your homes that your parents tell you not to touch or inhale? If you are helping them with a chore do they tell you not to get the chemical on your hands or in your eyes? Do they tell you to wash your hands afterwards? Why do you think they caution you about these materials?

- Ask students to identify some household products they think can be harmful to people. List their ideas on the board. To encourage brainstorming have them imagine potential hazardous materials typically stored or used in various rooms of a house - Explain to the students that during this lesson they will take a closer look at household hazardous materials and how their packaging and waste differs from other types of solid waste

Teacher’s Presentation or Modeling:

- The teacher should focus on the list of household hazardous waste compiled with student input. For each product or material, ask students what its purpose is, why people purchase it or what problem it is known to solve or prevent. For example, bug spray kills pests and keeps them from visiting the sprayed area for a period of time

- Ask students: What do you think hazardous material is? What dangers can they pose to people? What dangers can they pose to the environment? Use their ideas to create another list on the board

- The teacher should explain to students that there are laws in place regarding how hazardous materials are to be stored and used at home, as well as how their waste should be disposed of

- Ask students: Why do you think household hazardous waste materials receive “special treatment” in terms of how they are disposed of? (They can kill the microorganisms in publically owned treatment works, or the containers can leak when crushed in a garbage truck, and spill on the roadway and reach the natural world.)

Guided and Independent Practice:

• Arrange desks in the classroom to form a ½-circle with desks facing the center of the

room. Divide students into pairs or groups of three and explain that they will work as

small teams on this investigation

• Give each team one household hazardous waste container or package sealed in a clear

plastic bag. Also, give each team one copy of “The Hazards of Household Waste”

worksheet and make sure each team has pencils. Have them write down the name of

their product on the line for “item #1” on the worksheet

• Ask teams to examine the labeling on their package or container. Have them write

down on the worksheet any words, pictures, phrases or symbols (clues) that

communicate a warning of danger, health or environmental risk. Have them also write

down any directions given for how the product is to be used, stored or disposed of

• Ask each group to identify their product and clues (words, pictures, symbols or

phrases) that communicated some type of warning. These can be grouped (on the

board) into the four categories described below:



Toxic Materials: Labels often contain skull and crossbones and usually state “WARNING – KEEP OUT OF REACH OF CHILDREN” or DANGER/POISON.” Materials may be carcinogenic.



Flammables: Labels usually say “EXTREMELY FLAMMABLE – KEEP AWAY FROM ANY SOURCE OF IGNITION” and “HIGHLY FLAMMABLE – KEEP AWAY FROM FLAMES.”



Corrosives: These have a low or high pH and can burn skin and mucous membranes. Labels usually state “CORROSIVE – AVOID CONTACT WITH SKIN OR EYES.”



Oxidizers: These chemicals react strongly with other compounds and may cause fires or explosions. Labels usually say “WARNING – STRONG OXIDIZER.”

Make a separate list on the board for any directions given regarding the disposal of the product or package and write down input from each team . Once completed, have teams swap items with another team and complete the same information in the space allotted on the worksheet for “item #2” (They have a better idea of what clues to look for after the discussion). When everyone is finished give each group the opportunity to add to the list and categories on the board any new information about their product or package that wasn’t already listed.

Closure:

Ask students the following questions:

- Did you learn anything new from this activity about household hazardous materials that you have at home? If so, what?

- What did you learn about properly using and storing such products? Why is it important to read and follow directions?

- What are some ways that people improperly dispose of hazardous materials? (They empty liquids into storm drains, sewers, the ground, or the toilet, or they throw half –empty containers into trash.)

- How can these actions effect the environment? (Contaminants can enter the air, soil or water systems as well as open waterways or groundwater sources; can accumulate in humans and other wildlife as well as food chains)

- What are some solutions regarding disposal within many communities and neighborhoods? For example, what can you do if you have an extra amount of chemical left over from a project? (Purchase only the amount that is needed; share leftovers with someone who can use them; recycle used oil locally, save for county Household Hazardous Waste collection events.)

- Distribute a sheet of blank paper to the students. Put items for “Demonstration #2” onto a large desk or table and cover them with the sheet or blanket. Bring the table or desk into the center of the circle made by the desks. Uncover the items. Explain to students that they must work individually to identify and select from the items three non-toxic solutions to some of the problems addressed by hazardous waste materials. For example, use of the fly swatter would eliminate use of a hazardous pesticides spray. Ask them to list the three items and problems each solves on the paper. When everyone is finished have them discuss findings as a class.

Assessment:

Responses to questions from teacher;

Participation in teams to examine the packages or containers;

Responses to information needed for the “The Hazards of Household Waste” worksheet; and

Non-toxic solutions (three) to reducing/preventing hazardous waste from being used.

Extension:

Find out if your county or municipality coordinates a local “Hazardous Waste Dropoff Day.” Learn how the programs are promoted to the public and see if students can assist with coordinating the program or helping to promote it

Safety/Clean Up:

Be sure students are cautioned not to open or discharge any of the bagged household hazardous waste containers or packages. All containers should be empty, rinsed and clean. Items should be disposed of properly when lesson is completed and students should be encouraged to wash their hands after the lesson is through

Helpful Resources:

EPA Schools: Classroom and Laboratory Resources
<https://19january2017snapshot.epa.gov/schools-chemicals/schools-classroom-and-laboratory-resources_.html>

Wikipedia:
<http://en.wikipedia.org/wiki/GHS_hazard_pictograms>

EPA Household Hazardous Waste
<https://www.epa.gov/hw/household-hazardous-waste-hhw>

List of county recycling webpages: <http://www.nj.gov/dep/dshw/recycling/county_websites.htm>