Reading Household Product Labels

DESCRIPTION:
Students read labels from household products to recognize signal words and understand the basis for what makes these products hazardous. By taking an inventory of hazardous household products in their home, garage, or utility area, students identify and chart the products and write a brief report on their findings to an adult decision-maker in their household.
(This activity encompasses both language arts and science, and may be implemented in either classroom.)

RATIONALE:
In order to understand the cause of the Mysterious Illness Outbreak in Hydroville, students must have an understanding of terminology and concepts used in hazardous household labels. Along with this, they need to learn to communicate technical information to a non-technical audience.

PURPOSE/GOALS:
Students will:

- Identify hazardous household products based on product regulation labeling requirements and federal regulations.
- Read product labels noting signal words, hazardous properties, and routes of exposure.
- Inventory hazardous household products in their homes and identify unsafe storage and use of products.
- Write a one-page memo/report to an adult decision-maker in the household.

TIME ESTIMATE:
Prep: 35 minutes
Activity: Two 55-minute class periods

- **Part 1: Reading Hazardous Household Product Labels**
- **Part 2: Hazardous Household Products Inventory** (homework)
- **Part 3: Writing a Memo: Results of a Recent Hazardous Household Product Inventory** (optional: Language Arts or homework)

MATERIALS:

- Hydroville Learning Log
- 25-30 hazardous household products: oven/drain cleaners, pesticides, solvents, etc. along with a few non-hazardous/non-toxic products for comparison (shampoo, toothpaste, etc.)
- PowerPoint Slide Presentation: *Reading Household Product Labels* (see Hydroville website)

MATERIALS TO PHOTOCOPY:
(1 copy/student)

- Student Handout 1: What Makes a Product Hazardous?

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- Student Worksheet 1: Reading Hazardous Household Product Labels
- Product Labels for Mold Control (labels for Mold Control! Activity)
- Student Worksheet 2: Hazardous Household Products Inventory
- Student Handout 2: Writing a Memo: Results of a Recent Household Hazardous Product Inventory
- Writing a Memo – Scoring Guide

TERMINOLOGY:

Caution	Ingestion	Pesticides
Corrosive	Inhalation	Poison
Danger	Hazardous	Route of Exposure
Dermal	Irritant	Signal words
Flammable	Lethal Dose50 (LD_{50})	Strong sensitizer
Federal Hazardous Substances Act (FHSA)		Toxic
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)		Warning

BACKGROUND INFORMATION:
Refer to Student Handout 1: What Makes a Product Hazardous?

SUGGESTED LESSON PLAN:

Day 1 - Part 1: Reading Hazardous Household Product Labels

Getting Started

1. Gather 25-30 common household products from around your home, classroom, and school. Locate a variety of hazardous household products identified on the product label as danger, warning, or caution. Products should also vary in their hazardous properties: corrosive, irritant, strong sensitizer, flammable, and toxic.

   Examples: kitchen products (cleansers, drain cleaners); bathroom items (toothpaste, toilet bowl cleaner); household cleaners (detergents); lawn and garden supplies (fertilizers, pesticides); automotive and paint supplies, etc. Also include some non-hazardous products, e.g., shampoo, toothpaste, and other non-toxic substances, i.e., products that do not have signal words.

   NOTE: Include pesticides that are commonly used in the home or garden, e.g., ant killers, insect spray, and also cleaning products that advertise as "antibacterial", "disinfectant" and/or "kills mold".

   NOTE: If you are teaching the all of the Mold Control! activity, you can display the three featured mold-control products or print out the product labels included in Student Worksheet 1.
   - Lysol® Kitchen Disinfectant – Antibacterial Kitchen Cleaner
   - Heinz® Distilled White Vinegar
   - Tilex® Mildew Remover.

2. Display of the products in a visible area in the front of the classroom.

   SAFETY: Be sure that ALL products are safe for students to handle.

3. **Learning Log Prompts:**
   a. What do you think of when you hear the term "hazardous"?

- *A **hazard** is any substance that causes harm or adverse health effects.*
- *A **hazardous chemical** is defined as any chemical whose presence or use can cause adverse health effects.*

b. What qualities would make a substance hazardous?
According to the Federal Hazardous Substance Act (FHSA) of 1960, a hazardous substance is any product that is toxic, corrosive, flammable or combustible, an irritant, or a strong sensitizer. A hazardous household product requires labeling if the product may cause substantial personal injury or illness during handling or use, including ingestion by children.

c. How do you know if a product in your house is hazardous?
Read the product label to find out if a product is hazardous.

Doing the Activity

1. **Demonstration: "Hazardous" vs. "Non-hazardous" Household Products**
Have the students decide which of the products displayed are hazardous and which are not based on the definition for hazardous chemicals. Separate products into categories: "hazardous" and "non-hazardous"

2. Ask the students if they can suggest ways to separate the "hazardous" products into smaller classifications, e.g., signal words, location used, or other properties. Students should discuss the criteria they applied.

3. Distribute Student Handout 1: *What Makes a Product Hazardous?* This is a reading that provides students with background information on hazardous household product labeling requirements and definitions. After students complete the in-class reading assignment, or you may opt to show the PowerPoint Slide Presentation: *Reading Household Product Labels* as reinforcement. Discuss these key points:

   - Federal laws require companies that manufacture household products to warn consumers of their products' hazard to humans, animals, or the environment.
   - According to the Federal Hazardous Substance Act (FHSA), there are five properties that are used to identify hazardous household products: corrosive, irritant, strong sensitizer, flammable, and toxic.
   - FHSA requires hazardous substances to be properly labeled with signal words: Poison, Danger, Warning, and Caution to inform consumers of level of hazard. They are listed from most to least hazardous.
   - Possible routes of exposure: ingestion, inhalation, and dermal (skin or eye contact).
   - The Environmental Protection Agency (EPA) regulates **pesticides** under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The signal words for pesticides are based on toxicity testing. Signal words are associated with the level of toxicity of the product, e.g., highly toxic, moderately toxic, and slightly toxic based on toxicity testing.
   - Divide students into groups of 3 or 4. Hand out Student Worksheet 1: *Reading Hazardous Household Product Labels* to every student.

4. Working in groups, students read product labels of ten household products displayed in the classroom. Students should refer to Student Handout 1 to identify hazardous properties and signal words.

NOTE: If you are teaching the entire Mold Control! Activity, hand out the Product Labels for Mold Control along with Student Worksheet 1.

Wrap-up

1. As a class, use an overhead to share data collected in Student Worksheet 1.
2. Discuss the Conclusion Questions in Student Worksheet 1.
3. **Learning Log Prompt:** What conclusions can you draw from your data?
4. **Homework Assignment**: Distribute Student Worksheet 2: *Hazardous Household Products Inventory* to the students and review assignment. Students should bring the completed data table and the answers to the "Conclusion Questions" the following class period.

   NOTE: Instead of assigning Part 2 or for homework, students could inventory hazardous products found in the school building, e.g., bathroom cleaners, office supplies, auto shop supplies, etc.

5. **Extensions or Modifications to Homework Assignment:**
   - Students make bar graphs based on data collected in class based on categories of signal words or physical properties, e.g., "signal word vs. total number of products" or "physical property vs. total number of products".
   - Create a poster, a brochure, video, or oral presentation that is designed to inform the public about FIFRA and FHSA labeling laws.
   - Design a better product label or look for label violations from outdated products.
   - Translate information on labels into another language and/or provide product label information to families in the community.

Day 2 -

Part 2: Hazardous Household Products Inventory
Part 3: Writing a Memo: Results of a Recent Household Hazardous Product Inventory
(optional: Language Arts or homework)

Getting Started

1. Review homework assignment from last class: Student Worksheet 2: Hazardous Household Products Inventory.
2. **Learning Log Prompts:**
   a. Since you have investigated and inventoried your household, do you see any patterns in signal words and their products? For instance, do products with *Caution* as a signal word typically represent certain kind of products?

   b. Have students share their responses to the Learning Log prompts. Focus on terminology and signal words.

Doing the Activity (this could also be part of the homework assignment)

1. Give each student a copy of the Student Handout 2: Writing a Memo: Results of a Recent Household Hazardous Product Inventory. This one-page example of a memo gives the students a suggested approach to communicating technical information with their parents or adults in their household. Based on their data table and their message in their Learning Log, students create a message in this style recommending action or commending their readers.

2. Give students a copy of the Writing a Memo – Scoring Guide so they know how they will be graded.

Wrap-up

(This could be the in-class assessment for the activity in lieu of the writing a memo assignment)

1. **Learning Log Prompts:**
   a. What would you say to your family regarding the household hazardous products which you surveyed? Are they stored safely?
   b. Are there any recommendations you should make based on your findings?
   c. Would you like to recognize that the products are stored properly?
   d. Write a brief summary of what you found in your house, referring to the percentages and other specific criteria.

ASSESSMENT:

- Students turn in Student Worksheets 1 and 2.
- Students write a memo based on the results of their Hazardous Household Inventories. See Student Section for *Writing a Memo - Scoring Guide.* You can modify it according to your own point system. Using a point system to respond to written work is effective with students. It appears less "subjective" and communicates the areas needing their attention for revision.

RESOURCES:

- American Association of Poison Control Centers. www.aapcc.org.
- California Environmental Protection Agency. Department of Pesticide Regulation. Consumer Fact Sheet: How to Read a Pesticide Label…and Why. www.cdpr.ca.gov/docs/factshts/labelnew.htm.
- U.S. Consumer Product Safety Commission. Federal Hazardous Substances Act. www.cpsc.gov/businfo/fhsa.html.
- Mississippi University Extension Service. Hazardous Household Products. www.msucares.com/pubs/pub1756.html.
- National Pesticide Information Center. Environmental and Molecular Toxicology. Signal Words. Dec 1999. http://npic.orst.edu/
  For questions concerning pesticides and other hazardous household products, call NPIC @ 1-800- 858 - 7378 (PEST)
- U. S. Consumer Product Safety Commission. Office of Compliance. Requirements under the Federal Hazardous Substance Act: Labeling and Banning Requirements for Chemicals and Other Hazardous Substances. August 2002.
- U.S. Environmental Protection Agency. Office of Pesticide Programs. Read the Label First. www.epa.gov/pesticides/label/.
- U.S. Environmental Protection Agency. Office of Pollution Prevention and Toxics. Consumer Labeling Initiative. www.epa.gov/opptintr/labeling/index.htm.

TEACHER KEY

Part 1: Reading Hazardous Household Product Labels

NOTE: This data table includes examples of products that could be brought into the classroom:

Product	Hazardous Properties - List properties that make it hazardous.	Signal Word	Route of Exposure (Ingestion, Inhalation, Dermal – skin or eye contact)
All purpose cleaner	Irritant	Warning	dermal: eye irritant, skin sensitivity
Sealant	Irritant Toxic	Caution	Inhalation, dermal: skin sensitivity
Oven cleaner	Flammable	Caution	Inhalation, dermal: skin sensitivity
Lubricant (WD-40)	Flammable Toxic	Danger	inhalation, ingestion
Bleach	Irritant Toxic Corrosive	Danger	dermal: eyes and skin irritant, ingestion
Toilet bowl cleaner	Toxic Corrosive	Danger	inhalation, ingestion, dermal: eye and skin irritant
Cleanser	Irritant Strong sensitizer Corrosive	Caution	dermal: eye and skin irritant, ingestion
Insecticide	Toxic	Caution	dermal: eye and skin contact, inhalation, ingestion, skin sensitivity
Varnish Remover	Flammable	Danger/ Poison	ingestion, dermal: skin and eye irritant
Rat Killer	Toxic	Caution	ingestion, dermal: eyes and skin

Conclusion Questions: *(Answer in your Learning Log)*
NOTE: Answers are based on examples from table above. Answers will vary if using actual products.

1. Based on the findings from your product inventory, which hazardous properties were most common? *Toxic and irritant*
2. Which signal word was most common? *Caution*
3. Which products were most toxic? How did you determine this? *Drain cleaners, bleach, lubricant, and toilet bowl cleaners. They are labeled Danger/Poison.*
4. What are the three routes of exposure? Based on the findings from your product inventory, which route was most common? *Ingestion, Inhalation, and Absorption: skin/eye contact. Dermal appears to be most common.*
5. Which product(s) have signal words based on toxicity testing? *Pesticides and "anti-microbial" cleaners, such as a toilet bowl cleaner.*
6. What did you learn from this activity? *Answers will vary*

Part 2: Hazardous Household Products Inventory - Conclusion Questions

1. Create a data table to record the following data. Out of the 10 products you identified, how many are labeled *Danger, Danger-Poison*, *Warning*, and *Caution*? What percentage of the sampled products is represented by each category?

   Example:

Signal Words	***Category (%)***
Danger	*10*
Danger-Poison	*5*
Warning	*60*
Caution	*25*

2. List products that you identified that were stored improperly (according to manufacturer's label).
   Answers will vary, but many items are improperly stored where children can reach them.

3. If a product label reads "Store away from children", where would be a safe location to store this product in your home?
   A safe location would be a high cabinet or shelf.

4. Based on the manufacturer's direction for use for a specific product, what would a misuse look like? (For example, how could you misuse an oven cleaner?)
   If you were using an oven cleaner, a misuse would be to not to wear protective gloves. Another would be to spray surfaces other than inside an oven.

5. What can you do to reduce your route of exposure to hazardous products in your home?
   Answers will vary. Purchase safe alternative cleaning products that do not contain bleach or other hazardous chemicals, read product label and always follow directions, and use less product than required.

STUDENT PAGES

FOR

BACKGROUND ACTIVITY 6:

READING HOUSEHOLD PRODUCT LABELS

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