LESSON PLAN	The Hazards of Common Household Chemicals
GRADE	2 (AB, BC, MB, NB, NL, NS, NT, NU, ON, PE, QC, SK,YK)
SUBJECT	Science and Technology
TIME NEEDED	60 minutes
VOCABULARY	Concepts related to household hazard materials such as poisonous/toxic substances, explosive substances, corrosive substances, flammable substances, alternative ecologically-friendly solutions.

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Started in 1994, EcoKids is a free Earth Day Canada environmental education program that offers curriculum-linked materials and activities for Canadian elementary schools to engage in environmental action. For more information visit www.ecokids.ca

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This lesson plan was generously created by Maxine Wise Curriculum Design and Evaluation Course PED 3103, Faculty of Education, University of Ottawa. The development of this lesson plan is made possible with support of the Developing a Global Perspective for Educators Cohort at the Faculty of Education, University of Ottawa. Special thanks to Professor Nicholas Ng-A-Fook for facilitating this partnership with Earth Day Canada

LEARNING OBJECTIVES/OUTCOMES

With the recent classification of bisphenol-A as toxic, it is important for students to understand the environmental impact of purchasing and using certain household chemicals. Through this lesson, students will understand that common household chemicals can be dangerous to them, to their community and to the non-human environment. They will also be able to identify and safely dispose of household hazardous waste. Finally, students will be introduced to alternative, ecologically-friendly solutions.

MATERIALS REQUIRED

- Notebooks , pencils, pens
- Newspaper
- Soap ,water, borax, eucalyptus oil, spray bottle
- Safety goggles, smocks, latex gloves
- Smart board or video projector and laptop
- Markers, flyers, magazines for extension activities
- Tape or glue, scissors and poster material.

DESCRIPTION OF ACTIVITY

Hook (3 minutes)

- Handout stickers of four different hazardous symbols, one to each student, and ask the students to place their on their shirt for everyone to see.
- Ask the students to organize themselves into groups based on the appearance of their symbols.

Open (5 minutes)

- Initiate the teacher lead discussion by asking the students to describe their group's symbol. Find out what they think the symbols represent.

Body (42 minutes)

- Continue the opening discussion by creating a *hazardous waste* concept map on the board.. While doing this, explain the meaning of *household hazardous waste* and the potential dangers of such products.

  Household hazardous waste is the discarded, unused, or leftover portion of household products containing toxic chemicals. These wastes CANNOT be disposed of in regular garbage.

  Explain how household hazardous waste affects us as individuals, within the community, and within the non-human environment. For example, *"Commonly used hazardous products can pollute the air, water, and soil, and recombine to form other even more dangerous compounds. Persistent substances can build up in the bodies of wildlife. They can also accumulate in the fruits and vegetables we grow and in the livestock we raise. Trace amounts can contaminate groundwater supplies and well water."* http://www.earthday.ca/pub/assets/pdfs/CAN/back_household.pdf (Approximately 5 min.).
- Have the students remain in their groups as you share with them the meaning behind their symbols. Incorporate these meanings into the concept map. Provide a detailed definition for the following

  Poisonous/toxic substances: are dangerous to people and animals even in small amounts. They are also capable of causing injury or death, especially by chemical means (e.g. bleach).
  Explosive substances: produce vapour or explode when they react with other substances (e.g. fireworks).
  Corrosive substances: it eats away at other substances and even kills skin tissue (e.g. car batteries).
  *Flammable substances: are gases, liquids and solids that ignite and continue to burn in air if exposed to a source of ignition (*e.g. gasoline lighter).

  Review the definitions with the class and explain any vocabulary that is novel to them to aid their comprehension (Approx. 10 min).
- Explain how to *safely dispose* of these chemicals. Use a short video clip to introduce this topic from the government of Ontario's waste recycling/disposal program "Make the Drop" (Approx. 5 min.). http://www.youtube.com/watch?v=sPvg8WJDGW0
- As a follow-up to the video, provide samples of potential household hazardous products like paint cans and aerosol spray cans in the classroom. Also provide a blue recycling box and a cardboard box labelled "Orange Drop" which ties into the hazardous waste disposal program in Ontario called "Make the Drop".
- Tell the students that we are going to pretend that we are on a game show called "Who Wants to Save the Planet?" The teacher's role is the host of the show. The groups will choose team representatives who will act as contestants. Each contestant will be dressed in safety gear wearing safety goggles, smocks and latex gloves. They will sort through the waste and find the products which have the same symbols that match their team's symbol (the sticker on their shirt). They must answer the following questions: A) What is this product used for? B) What substance does this symbol represent? (e.g. *poisonous/toxic substances, explosive substances, corrosive substances, and flammable substances).* C) How can this product be disposed of in a safe manner? D) Should we dispose of it in the blue recycling bin or in the orange drop bin? The contestant can get advice from their team members. They must write the answers to the questions on the board. Another team member will simultaneously draw a picture of

this product next to the written answers. The first group to complete the answers correctly wins a prize! (Approx. 15 min.).

- Introduce the concept of *ecologically-friendly household solutions*.
- With the assistance of a few volunteers in the class, demonstrate how to make an ecologically-friendly disinfectant. Have the volunteers dress in safety gear (latex gloves, safety goggles and smocks). Explain why the solution you will make is a safer alternative than some of the store bought disinfectants. Ask the students prompting observation questions that will encourage discussion about the appearance of the ingredients before and after they are mixed (e.g. are they liquids or solids? Is the color transparent or opaque? Does it appear hard, runny, greasy or granular? What happens when they are mixed together? How does it appear? What does it smell like? Have the entire class participate by cleaning their desks with this solution (Approx. 12 min).
- As an **extension activity**, if time permits, you could have each student mix the ingredients themselves and record their observations in their notebooks, along with a drawing of their observations.

Disinfectant Ingredients and Instructions:

Create the following three solutions and test them to see which works best.

- Soap and water
- Mix 100 ml borax with 1 L water
- Mix 50-100 ml eucalyptus oil with 1 L of water in spray bottle; shake mixture before use to disperse the oil.

Close (10 minutes)

- Everyone gathers on the carpet and sits down.
- Ask them to express their thoughts about what was learned. This will help in assessing their comprehension of the lesson.
- Provide a quick summary of what was covered in today's lesson.
- Review the homework assignment with the class. Students will fill out a worksheet that tests their knowledge of the concepts and vocabulary that was taught in class.

ASSESSMENT (DESCRIBE OR PROVIDE RUBRIC)

- Scaffolded guided inquiry can be used by observing the student's science notebooks and classroom discussion to see if there are any misconceptions in the student's understanding of the concepts learned in class.
- By reviewing the student's written homework, the teacher will be able to gage how well students are able to communicate their knowledge and understanding with regards to the concepts learned in class related to household hazard materials such as poisonous/toxic substances, explosive substances, corrosive substances, and flammable substances, and alternative ecologically-friendly solutions.

EXTENDED ACTIVITIES

- Using flyers, magazines and newspapers, have the students continue to work with their assigned group to create a collage depicting their understanding of hazardous waste and its effects on society and the non-human environment. They may include the appropriate warning symbols next to each product and label them accordingly. Students will have the opportunity to share their collage and the meaning behind it to grade one students. This assignment could later expand in their Language Arts class where they will share what they learned in a newsletter. Copies of the newsletter can be printed and made available in the school's library for all students to read.

- The students can write a reflection in their journals about hazardous products found in their home. They can include ideas of how they can involve their family in disposing of these hazardous wastes. Parents can sign next to the journal entry. By doing so, the students will feel that they are teaching their families to be more ecologically friendly. The journal entry will also be useful in educating the student's parents about what is being taught in the classroom.

PRINT AND WEB SITE REFERENCES

WEBSITES

http://digitalliteracy.mwg.org/curriculum/process.html
http://toxmystery.nlm.nih.gov
http://www.ottawa.ca/residents/recycling_garbage/hhw/index_en.html
http://69.164.216.210/VirtualHouse/virtualhouse.html
http://www.dowhatyoucan.ca/
http://www.makethedrop.ca/
http://www.videojug.com/interview/dangerous-consumer-products
http://www.earthday.ca/pub/assets/pdfs/CAN/back_household.pdf

VIDEOS

"Make the Drop" http://www.youtube.com/watch?v=sPvg8WJDGW0

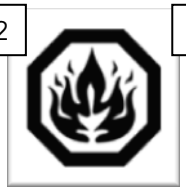
HOMEWORK ASSIGNMENT

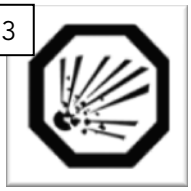
1) Match the symbol with its name. Choose the symbol name from the list below:

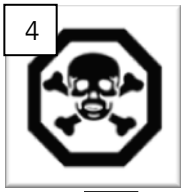
a) Flammable substance c) Corrosive substance

b) Explosive Substance d) Poisonous/toxic substance

1  ☐

2  ☐

3  ☐

4  ☐

2) Match each hazardous substance with its definition.
Fill in the blanks below.

<u>Substances:</u>

1. Flammable substance _____
2. Corrosive substance _____
3. Explosive Substance _____
4. Poisonous/toxic substance _____

<u>Definitions:</u>

a. Are dangerous to humans or animals, even in small concentrations.
b. Explode or produce vapours when they react with other substances.
c. Eat away at other substances.
d. Easily sets fires.

3) What does hazardous waste mean?

_____
_____
_____
_____
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_____
_____

4) What does it mean to be ecologically-friendly?

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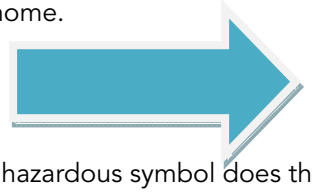
5) On the back of this paper, using crayons or pencil crayons, draw a picture of a hazardous substance found in your home.



b) What hazardous symbol does this product have?

_____
_____

c) What it is the product used for?

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