

Conduct A Chemical Survey

- **Grade Level**
5-8
- **Subject Areas**
Science
Health
- **Duration**
30 minutes
- **Setting**
Classroom discussion
Homework
- **Skills**
Data collection
Written communication
- **Vocabulary**
Chemical safety
Pollution prevention
- **Related Websites**
<http://www.epa.gov/p2>
<http://www.epa.gov/children>

Summary

Students will learn about chemical safety and how it can be used as a pollution prevention technique.

Objectives:

Students will:

- Be able to define what makes a chemical toxic.
- Understand chemical safety as it relates to pollution prevention.

Materials:

- Copies of student page
- Pen/pencil
- Parental supervision, as needed

National Science Content

Standards:

- Unifying Concepts and Processes
-Evidence, models, and explanation
- Science in Personal & Social Perspectives
-Personal health
-Risks and benefits

Background:

Pollution prevention is essential for protecting human health and the environment. Pollution prevention, or P2, is reducing or eliminating waste at the source by modifying production, use of less toxic substances, re-use of materials, and better conservation techniques. The Pollution Prevention Act of 1990 established, when feasible, the prevention and reduction of waste as a national policy. Each September, EPA promotes Pollution Prevention week, highlighting the efforts of EPA, its partners, and the public in making pollution prevention a priority in sustainability.

Reducing or preventing the use of some chemicals is one way to prevent pollution.

Keep pesticides and other toxic chemicals away from children to prevent the risk of exposure. Tips include:

- Store food and trash in closed containers to keep pests from coming into your home.
- Use baits and traps when you can; place baits and traps where kids can't get them.
- Read product labels and follow directions.
- Store pesticides and toxic chemicals where kids can't reach them - never put them in other containers that kids can mistake for food or drink.
- Keep children, toys, and pets away when pesticides are applied; don't let them play in fields, orchards, and gardens after pesticides have been used for at least the time recommended on the pesticide label.
- Wash fruits and vegetables under running water before eating - peel them before eating, when possible.

Students will be conducting a chemical survey of items in their homes. If needed, notify parents ahead of time that students will be looking in the bathroom, kitchen, laundry room, garage, and/or shed to determine what kinds of chemicals are in their home.

Procedure:

Warm-Up:

Discuss what are chemicals with students:

1. What are chemicals? List examples of chemicals, especially those that are common at home.
Use examples ranging from hand

soap to pesticides to dishwasher detergent. Use <http://www.epa.gov/kidshometour/kitchen.htm#view> as a resource.

2. What makes a chemical toxic or non-toxic? *The dose of a chemical determines whether it is harmful or not. Some chemicals are harmful in small doses, while others are only harmful in high doses.* Review this as a concept for students. Chemicals should be used as directed on the label.

Discuss pollution prevention with students:

1. What is P2? *P2 is pollution prevention—reducing and eliminating waste. By being aware of the chemicals present in the home, students can help make sure that the chemicals are only used in the ways directed on the label. Furthermore, students can help their families realize what chemicals are present in the home, and become more cognizant of purchasing chemicals. Students can encourage their families to look for common chemicals that are better for people and the environment.*

Activity

1. Tell students that they will be completing a home survey of household chemicals. Hand out the student page. Brainstorm household chemicals students can look for, such as hand soaps, dish detergents, kitchen and bathroom cleaners, etc.
2. Each student will fill out the Household Chemical Survey as homework.
3. At the following class period, discuss what students found during their surveys.
 - a. How many chemicals did students find at home? What kind of chemicals did they find? *Answers will vary by student.*
 - b. In what rooms were the chemicals located? *Look for answers ranging from kitchen, bathroom, garage, shed, laundry room, etc.*
 - c. Did any of the chemicals have warning labels? Which ones? *Answers will vary by student. Chemicals such as cleaning products, pesticides, fertilizers, etc. should have warning labels.*
 - d. What influences their family's purchase of chemicals? Is it brand name, price, or safety? *Answers will vary by student.*
 - e. How can you prevent being exposed to toxic chemicals? *Reading the label, only*

allowing adults to handle toxic chemicals, reducing the number of chemicals in the home, keeping toxic chemicals away from kids, etc.

f. What are other ways you can prevent pollution at home? *Look for a variety of answers including water and energy conservation, reducing, reusing, and recycling products.*

Wrap Up

1. How can students make sure that their homes are chemical-safe? *Students can talk to their parents about purchasing products for the home that are both effective and safe for the environment. Additionally, chemicals should be kept in areas that are out of the reach of children or in cabinets that have child-proof locks.*
2. What are ways students can prevent or reduce pollution at school? *Pollution prevention includes conserving energy and water, purchasing products that are made with recycled content, buying WaterSense fixtures or EnergyStar appliances. Students can conserve water and energy at school by reporting leaks to administrators and turning off lights when they leave a classroom. Students can also purchase school supplies that have recycled content. Students can also start or improve a recycling program at school.*

Assessment:

Assesses students based on the completion of their tables and the accuracy of their answers for the discussion questions. Look for rational answers based on the activity and from the sample answers given in italics throughout this lesson plan.

Extensions:

1. Conduct a chemical assessment of your school. Take a guided look in the janitor's closet. What does the janitor use to make the school clean? Are any of these harmful to students? Are there safer, environmentally-friendly options?
2. Explore energy conservation as a way to prevent pollution. Use EPA's Power

Profiler (<http://www.epa.gov/cleanenergy/energy-and-you/how-clean.html>) to explore energy sources in your area. Calculate your school's emissions. Come up with a class plan to reduce energy consumption at school.

3. Use EPA's Tools to Reduce Waste in Schools toolkit (<http://www.epa.gov/osw/education/toolkit.htm>) to conduct a waste assessment of your school.
4. Pick 5 for the Environment! Have each student pick 5 steps they would be interested in doing to help protect the environment. Have students check out EPA's Pick 5 website (<http://www.epa.gov/pick5/>) to learn about different options and write up what steps they would take. Students can present their selected choices to the class and how he/she will incorporate environmental protection into his/her life.

EPA Resources and Related Links:

Learn About the Chemicals Around Your House

<http://www.epa.gov/kidshometour/kitchen.htm#view>

Pick 5 For the Environment

<http://www.epa.gov/pick5/>

Planet Protectors Club

<http://www.epa.gov/osw/education/kids/planetprotectors/>

Pollution Prevention (P2)

<http://www.epa.gov/p2/>

Pollution Prevention Toolbox

<http://www.epa.gov/reg5rcra/wptdiv/p2pages/toolbox.htm>

Teacher Resources

<http://www.epa.gov/students/teachers.html>

Waste Education Resources

<http://www.epa.gov/wastes/education/index.htm>

