

Get the Lead Out

Developers:

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Comprehensive Services
For School-Age Parents
School District of Philadelphia

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Grade Level:

7 to 12

Discipline:

Environmental Science

Goals:

1. To heighten student awareness of the impact of having high levels of lead in the home.
2. To introduce students to a safe and simple method of testing for the presence of lead.

Objectives:

- Students will be able to test for the presence of lead in the home.
- Students will collect and gather data based on their observations.
- Students will interpret their results and decide what options are available or what precautions should be taken to reduce their family's exposure to lead.

Background:

Lead is an odorless, tasteless, soft, gray metal. On exposure to air, lead is rapidly covered with a film of oxide, hydroxide, and carbonate. Similarly, when lead is exposed to water with dissolved oxygen, lead hydroxide, sulfate and carbonate are formed. A small amount of the salts then pass into solution. Lead salts are found in air, food, household dust and soil. If ingested or inhaled over a period of time, lead and its salts may cause serious internal damage such as impaired kidneys, nervous system and red blood cells. Particularly susceptible to the toxic metal or salts are small children.

According to tests compiled for the Environmental Protection Agency (EPA), our tri-state region is free from high level of lead in the drinking water. However, Philadelphia is the exception. Of the 162 homes tested by the city's Water Department, 15% exceeded the federal guidelines which specify that no more than 10% of the homes should exceed a lead level of 15 parts per billion.

Lead gets into the drinking water through the use of lead-containing pipes, solder, brass and chrome-plated faucets. The homes most likely to have a lead problem are older houses with lead pipes and homes with lead service lines.

Materials:

Lead Check™ swabs, lead and copper pipe, leaded and lead-free solder, lead sinkers, ceramic pieces, glassware (including crystal), old toys and food cans.

Safety Tips:

1. Don't touch the solder from any pipe you may find in your house. If you do touch it wash your hands thoroughly.
2. Don't touch the swab tip. If you touch it accidentally, wash your hands thoroughly.
3. Once you have completed your testing with the Lead Check™ swab, put it in a plastic bag and bring it back to school.

Procedure:**Part 1**

1. Illustrate the proper way to use the Lead Check™ swabs for the class.
2. Illustrate how to handle the various test objects.
3. Pass the swabs to the students.
4. Have the students test the objects as listed below in the data table.
5. Analyze and discuss data.

Materials	Lead Present (Pink)	Lead Not Present (No color change)	Comments
Lead and copper pipes			
Solder			
Sinkers			
Ceramic pieces			
Glassware			
Crystal			
Toys			
Food cans			

Procedure:

Part 2

1. Give the class additional swabs to take home.
2. Have students test the follow areas or items at home as listed in the data table below

Area or item in the home	Lead Present (Pink)	Lead Not Present (No color change)	Comments
Any exposed pipe near the washing machine			
Any solder on pipe joint			

3. Interpret and discuss the data with your family.
4. In order to reduce your family's exposure to lead, read and share the following guidelines as listed below:
 - The lead levels can be substantially reduced by running the water for 15 to 30 seconds until it is cold.
 - Do not drink or cook with hot tap water. Lead salts are more soluble in hot water than in cold. Also, boiling hot tap water increases the danger by increasing the lead concentration by evaporation.
 - Do not add hot water to baby formula.
5. Students will prepare a brief oral presentation of the data as a basis for their results.
6. Finally, pupils will discuss what precautions they will take now and in the future to reduce their family's exposure to high levels of lead as a basis for their conclusions.

***Note:** This hands-on-science experiment can be used in cooperative learning groups.