

Contributing Teachers: Peter Pruefer
Jim Reed
Jean Schmit

"AVOIDING CHEMICAL WAR FARE"

CONCEPT: Using MSDS information

NATIONAL SCIENCE STANDARDS:

A	B	C	D	E	F	G

BACKGROUND INFORMATION:

Safety discussions should be an integral part of any lab program. This activity is useful for introducing MSDS as an important source of safety information. MSDS stands for Material Safety Data Sheet. It contains information that is provided by companies that manufacture or distribute chemicals. An MSDS is divided into sections and each gives some detailed information about a specific aspect of the chemical. A related rating system that specifies hazardous properties for use by fire fighters, is the HRF. This information often is included on a MSDS. In the HRF system, a scale from 0-4 is used to rate three categories: Health, Flammability, and Reactivity. The least dangerous is 0 and 4 is the most dangerous. For additional background information on MSDS, see the next activity "What's On the Label?"

OBJECTIVES:

Students will describe and compare the safety ratings of different household chemicals.

ESTIMATED TIME:

Two class periods, one to introduce the use of MSDS information using data on sodium chloride and one to compare the MSDS information of other chemicals.

PROCEDURE:

★ **NOTE: All classroom activities must be performed in a manner that follows your school district's safety guidelines. It is each teacher's responsibility to**

determine if this activity is appropriate for your classroom. Students must wear goggles when doing this activity.

1. Distribute a NaCl (sodium chloride) MSDS to each student group.
2. Discuss the information given in the different sections of the MSDS. It is important to know the usefulness and limitations of MSDS information. Note that serious potential health concerns are identified in the NaCl MSDS, even though salt is common and used everyday. For example, in sections 3 and 4, there are health hazards listed if salt is ingested in large quantities. However, section 5 shows that it is not a particularly hazardous chemical. This points out that MSDS information focuses on safe handling of a chemical and is reported independent of concentration. For example, concentrated acids have the same MSDS as diluted acids.
3. Collect the NaCl sheets
4. Distribute MSDS information for a different chemical to each group of students.
5. Discuss the HRF with the students (see background).
6. Have students answer questions from their MSDS information sheet (see sample). Students should be given enough time to answer each question completely and to prepare a description of the assigned chemical.
7. Suggestions for wrap-up:
 - (a) Have student groups present their descriptions to the whole class.
 - (b) Have two student groups present descriptions in debate form and have the class determine which one is more hazardous (three minutes for each group).
 - (c) Write a summary about the hazards of their assigned chemical.
 - (d) Have groups create a puppet show, skit, or a commercial on properties of potentially hazardous chemicals

EXTENSION ACTIVITIES

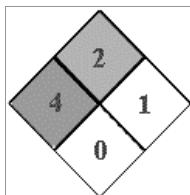
1. Create informational posters (art class).

2. Present commercials / skits to other classes.
3. Do a “Hazardous Household Chemical Safety Hunt”. Students identify hazardous chemicals in their home and identify where they are located.
4. Have students write a persuasive letter to their parents asking them to examine the storage and use of household chemicals.
5. Learn about disposal of chemicals.
6. Discuss and learn about “environmentally friendly” alternatives for household cleansers and other items.

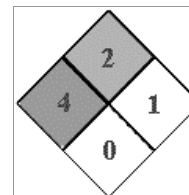
REFERENCES/RESOURCES:

1. Kareful, Hugh B. Working Safely with Chemicals. Genium Publishing Corporation; 1995, New York.
2. Corporation; 1995, New York.
3. Flinn Scientific has excellent safety information in their catalogue and MSDS may be obtained from them.
4. MSDS also are available from Genium Publishing Corporation; 1995, New York or may be found in the internet. They also are included in shipping materials when chemicals are purchased from suppliers.

Sample



MSDS Chemical Information



Name _____

Period _____

Use the information provided on the MSDS for your chemical to answer the following questions.

1. What does MSDS stand for?
2. What are the names of each section of the MSDS?
3. What is the chemical formula of your substance?
4. What is the HRF rating of your chemical?
5. In what common products is your chemical found?
6. Is your chemical a solid, liquid, or gas at room temperature?

Sample

7. Does your chemical dissolve in water?
8. What color is your chemical? Does it have an odor? If so, describe it?
9. How dangerous is this chemical? What precautions should be taken for the safe handling of it?
10. What would you do if this chemical came into contact with your eyes? With your skin?
11. Why would you think it is a requirement that an MSDS must be sent with every chemical that is shipped?