



Lesson One: THE MERCURY MESSAGE

In the **Quicksilver Question Web Module**, students learn about a group of teenagers who accidentally contaminate their town with mercury.

In this activity, students respond to the *Quicksilver Gazette* article, “Arkansas Teens Poison Town with Mercury.” Students have the opportunity to send a persuasive letter that can travel back in time, reaching the Arkansas teenagers the day before they discover the abandoned mercury. In the letter, the students warn the teens about the dangers of mercury to human health and the environment.

This lesson addresses the following New Mexico State Education Standards in Language Arts for grades 5-8.

- I-A – Listen to, read, react to, and interpret information.
- I-C – Apply critical thinking skills to analyze information
- I – D – Demonstrate competence in the skills and strategies of the reading process.
- II-B – Apply grammatical and language conventions to communicate.
- II – C – Demonstrate competence in the skills and strategies of the writing process.

This lesson is based on the article from the **Quicksilver Question Web Module** entitled “Arkansas Teens Poison Town with Mercury.” This *Quicksilver Gazette* article is based on a real article that appeared in *Time.com* on January 26, 1998. The original article was titled “The Quicksilver Mess” by S. C. Gwynne.

Materials: (for each student or group)

- Copies of the *Quicksilver Gazette* article, “Arkansas Teens Poison Town with Mercury.”
- Optional: art materials for creating time capsules.

Lesson Overview

New Mexico State Education Standards

Teacher Background

Teacher Preparation

Procedure

- Ask students to read the *Quicksilver Gazette* article on the teenagers who poisoned their town with mercury. This article is accessed by using the save/print function in the module or downloading it from the “For Teachers” page of the Quicksilver website.
- Now, ask the students to imagine how things may have turned out differently if the teenagers had known about the dangers of mercury. How may the teenagers

Web Module: QUICKSILVER



You can assess your students' letters by using the following criteria to award points.

Extra credit can be given for creating creative time capsules.

Letter content:

- Topic of letter is clear.
- Appropriate tone.
- Creativity attempted.
- Specific facts and details are included to support your point.
- Constructs sound argument.
- Position is clear, compelling and well supported.
- Anticipates opposing viewpoints.

Letter conventions:

- Proper grammar, spelling and punctuation.
- Interesting and conversational.
- Neatly handwritten or typed.
- Recipient identified with appropriate salutation.
- Writer identified with appropriate closing.

Letter timeliness:

- Project completed on time.

have reacted when they found the mercury in the abandoned factory if they knew of its dangers? What would your students do if they were in a similar situation?

- Ask your students to write a persuasive letter to the teenage boys who found the mercury. Tell the students to imagine that their letters will be able to travel through time to reach the boys the day before they found the mercury in the abandoned factory. Students should use the information that they gained from the **Quicksilver Question Web Module** to warn the teenagers about the dangers of mercury. In particular, students may want to refer to the Health Clinic brochure, "Mercury and You" as well as the Toxicologist's "Introduction to Toxicology." These documents can be obtained by going into the module, visiting the two locations, and using the save/print features. The documents can also be downloaded directly from the "For Teachers" page of the Quicksilver website.
- Optional: Students can package their letters in some kind of container that they think will help it withstand the stresses of time travel. Students can be creative in decorating the containers.



Lesson Two: TOXIC TALES

Lesson Overview

In the **Quicksilver Question Web Module**, students learn about a case of mass mercury poisoning in Iraq.

This activity relates to the reading, *Toxic Tales*, about the poisoning in Iraq caused by eating imported wheat seeds. In this activity, students learn about the use of symbols as a form of communication both through history and in our daily lives. They also learn about the international symbols for hazardous chemicals and design a label that could have been used to warn the Iraqi people about eating the wheat seeds.

This lesson addresses the following New Mexico State Education Standards in Language Arts for grades 5-8.

- **I-A** – Listen to, read, react to, and interpret information.
- **I-D** – Demonstrate competence in the skills and strategies of the reading process.

New Mexico State Education Standards

The **Globally Harmonized System for the Classification and Labeling of Chemicals** uses a combination of symbols, colors and words to provide information about a substance's physical, health and environmental hazards. It is used to assure safety in trade and transportation of chemicals across international borders.

The development of an international set of chemical safety symbols began as early as the 1950s. The Globally Harmonized System (GHS) was created with the input of many different nations. It has been adopted by the United Nations, which recommends it be disseminated throughout the world.

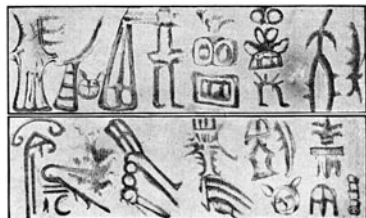
The goal of the Globally Harmonized System is as follows:

“By promoting common, consistent criteria for classifying chemicals and developing compatible labeling and safety data sheets, the Globally Harmonized System (GHS) is intended to enhance public health and environmental protection, as well as reduce barriers to trade. The purpose of the GHS is to promote common, consistent criteria for classifying chemicals according to their health, physical and environmental hazards, and to encourage the use of compatible hazard labels, material safety data sheets for workers, and other hazard communication information based on the resulting classifications.” (www.hazmat.dot.gov)

For a more in-depth understanding of symbols and communication, consult the following resources that were used to prepare this lesson:

- **Globally Harmonized System for the Classification and Labeling of**

Teacher Background



Chemicals

<http://hazmat.dot.gov/globharm.htm>

- **Symbols throughout the World**

Follow the links on this website to explore the use of symbols around the world and through history.

<http://www.symbols.net>

- **Hieroglyphs**

If you would like to go into more depth about the use of symbols through history, you may want to focus on Egyptian hieroglyphics.

<http://www.greatscott.com/hiero/index.html>

- **Emoticon Lesson Plans**

Your students are probably familiar with the use of symbols, or emoticons, in e-mail correspondences. The following websites include lesson plans on emoticons.

<http://www.atacc.ab.ca/makegoodconnections/7-9emot.html>

<http://www.lessonplanspage.com/CIEmoticons68.htm>

Teacher Preparation

Materials (for each student)

- “Toxic Tales” reading from the **Quicksilver Question Web Module**
- **Student Handout** on international chemical safety symbols
- Paper and colored pens or pencils
- Optional: Overhead transparency of **Student Handout**

Procedure

- Introduce students to a list of symbols that were used historically to aid in communication. Your students may be able to add to this list. Some examples include:
 - Morse code
 - Egyptian hieroglyphics
 - Cave paintings
 - Navigation and cartography symbols
- As a group, try to develop a list of symbols that are currently used in our everyday lives. Some examples include:



- Weather
- Mathematics
- Nautical
- Flags
- Road signs
- Sign language
- Rebus—picture puzzles

- Fabric care labels on clothing
- Emoticons (or “smileys”) for email correspondences
- Computer icons
- Music
- Astrology



- Encourage students to read the *Toxic Tales* article about mercury poisoning in Iraq. As they read, ask them to consider the following questions. How was poor communication the cause of the mass mercury poisoning? What could have been done differently to prevent the poisoning?
- Tell students that there is an international set of symbols used to denote hazardous chemicals, called the **Globally Harmonized System for the Classification and Labeling of Chemicals**. This system was developed in order to promote safety in the transport and use of chemicals across international borders. The international system of symbols was developed in hopes of preventing poisonings and other chemical accidents from happening in the future.
- Review the **Student Handout** with your class by using an overhead transparency of the pages. Cover the definitions of the symbols with a piece of paper. See if your students can identify the meaning of each symbol.
- Challenge the students to design a new packaging label to replace the labels that were used on the wheat seeds sent to Iraq. The label should be entirely of their own design, although they can use the chemical hazard symbols shown on the **Student Handout** for ideas.
- The label needs to clearly communicate that the wheat seeds are treated with a poisonous fungicide, should only be used for planting, and should not be eaten. The label also needs to communicate that you cannot wash the poison out from the grain. The labels cannot rely on any writing, since they need to be understood by non-English speakers. Encourage students to consider that the symbols we may readily associate with a meaning (such as the skull and crossbones representing something dangerous or poisonous) may not hold the same meaning in other cultures.
- The label needs to communicate complex information. You may want to suggest that some students design their labels to show how to use the seeds. Other students may choose to show what not to do with the seeds. These two approaches may provide an interesting comparison between students’ projects.
- Each student should create a drawing of his or her packaging label for the wheat seeds.



Student Assessment:
You can assess the students’ projects by awarding points for the following criteria:

- Neatness of product.
- Creativity attempted.
- Does not rely on written words.
- Could be understood by non-English speaker.
- Provides warning that the seeds are only to be planted.
- Provides warning that the seeds should not be eaten.



TOXIC TALES

Student Handout #1

Name _____

Date _____



Student Handout

What is the Globally Harmonized System for the Classification and Labeling of Chemicals?

The Globally Harmonized System (GHS) is a series of symbols that can communicate information about chemicals without using any words. The symbols provide information about a substance's physical, health and environmental hazards. The symbols can help keep people and the environment safe when dangerous substances are sold and transported across international borders.

The GHS uses a combination of symbols, colors, patterns and numbers to communicate specific information. Here are examples of some of the GHS symbols:



Harmful to aquatic life



May cause (brain, lung, kidney, etc.) damage through prolonged or repeated exposure



Causes severe skin burns and eye damage



Toxic if (swallowed, inhaled, or in contact with skin)



Flammable



Explosive



Danger

Design a New Label

The Globally Harmonized System can communicate important information to people who know how to read the code, such as scientists and firefighters. However, not everyone knows how to read the GHS symbols.

Can you design a label that can be understood by people from another country? First, read the Toxic Tales story about the people of Iraq who were poisoned from making bread from wheat seeds that had been treated with mercury. You are challenged to create a new label to go on the wheat seed packages. Your label needs to communicate that the seeds are safe for humans if planted but not safe to be eaten directly, even after washing. Your label can only use symbols, patterns, colors and numbers—no words. However, your label can include more than one symbol.