

Glass Recycling

(and Mercury Exposure):
Lesson 18

Objectives

- ◆ Students will examine facts about glass recycling.
- ◆ Students will understand proper mercury disposal.
- ◆ Students will translate text into test questions.



Standards

- ◆ E.12.C.4 Students know processes of obtaining, using, and recycling of renewable and nonrenewable sources. E/S
- ◆ N.12.B.4 Students know scientific knowledge builds on previous information. E/S
- ◆ N.12.B Students understand the impacts of science and technology in terms of costs and benefits to society.

Vocabulary

- ◆ **Raw Material:** according to Merriam-Webster, a raw material is crude or processed material that can be converted by manufacture, processing, or combination into a new and useful product.
<wheat...is *raw material* for the flour mill -- C. A. Koepke>.
- ◆ **Cullet:** furnace ready scrap glass.



Vocabulary

- ◆ **Mercury**: an element and a metal. Mercury is the only liquid metal at room temperature. It is toxic to the central nervous system.
- ◆ **Amalgam**: according to Merriam-Webster, amalgam is an alloy of mercury with another metal that is solid or liquid at room temperature according to the proportion of mercury present. It is used especially as a dental cavity filling material.

Glass Facts

- ◆ Glass containers are an environmentally superior packaging—nontoxic, high value, and completely recyclable.
- ◆ **100% recyclable**
- ◆ Glass can be recycled again and again with no loss in quality or purity. Glass containers go from recycling bin to store shelf in as little as 30 days—again and again.
- ◆ In 2005, glass made up 5.2% of the municipal solid waste stream by weight, and of that, 25.3% of glass containers were recycled.

Glass Facts

- ◆ Made from domestically plentiful, nontoxic raw materials—silica, sand, soda ash, limestone and up to 70% recycled glass—glass is one of the safest packaging materials.
- ◆ Recycling glass reduces consumption of raw materials, extends the life of plant equipment such as furnaces, and saves energy.
- ◆ **Superior, lightweight packaging**
- ◆ Today's glass containers are more than 40% lighter than they were 20 years ago.

Mercury Facts

- ◆ Mercury is a metal. It is the only metal that is liquid at room temperature.
- ◆ Mercury can be absorbed through the skin.
- ◆ Because mercury can become a gas at room temperature, you must also be careful not to breathe in the mercury gas.

Handling a Mercury Spill

- ◆ Tell a responsible adult.
- ◆ Do not play with it.
- ◆ Open windows and doors that vent to the outdoors.
- ◆ Immediately remove children from the area.
- ◆ Call NDEP Spill Reporting Hotline: 888-331-6637



Mercury Containing Products

◆ Batteries

- Certain alkaline batteries prior to 1998, button batteries

◆ Measuring Devices

- Thermometers, Thermostats, Barometers, Manometers, Certain switches

◆ Lighting

- Fluorescent lamps, Mercury vapor lamps, High-pressure sodium lamps
- Metal halide lamps & neon lamps, Strobe lights.

Mercury Containing Products

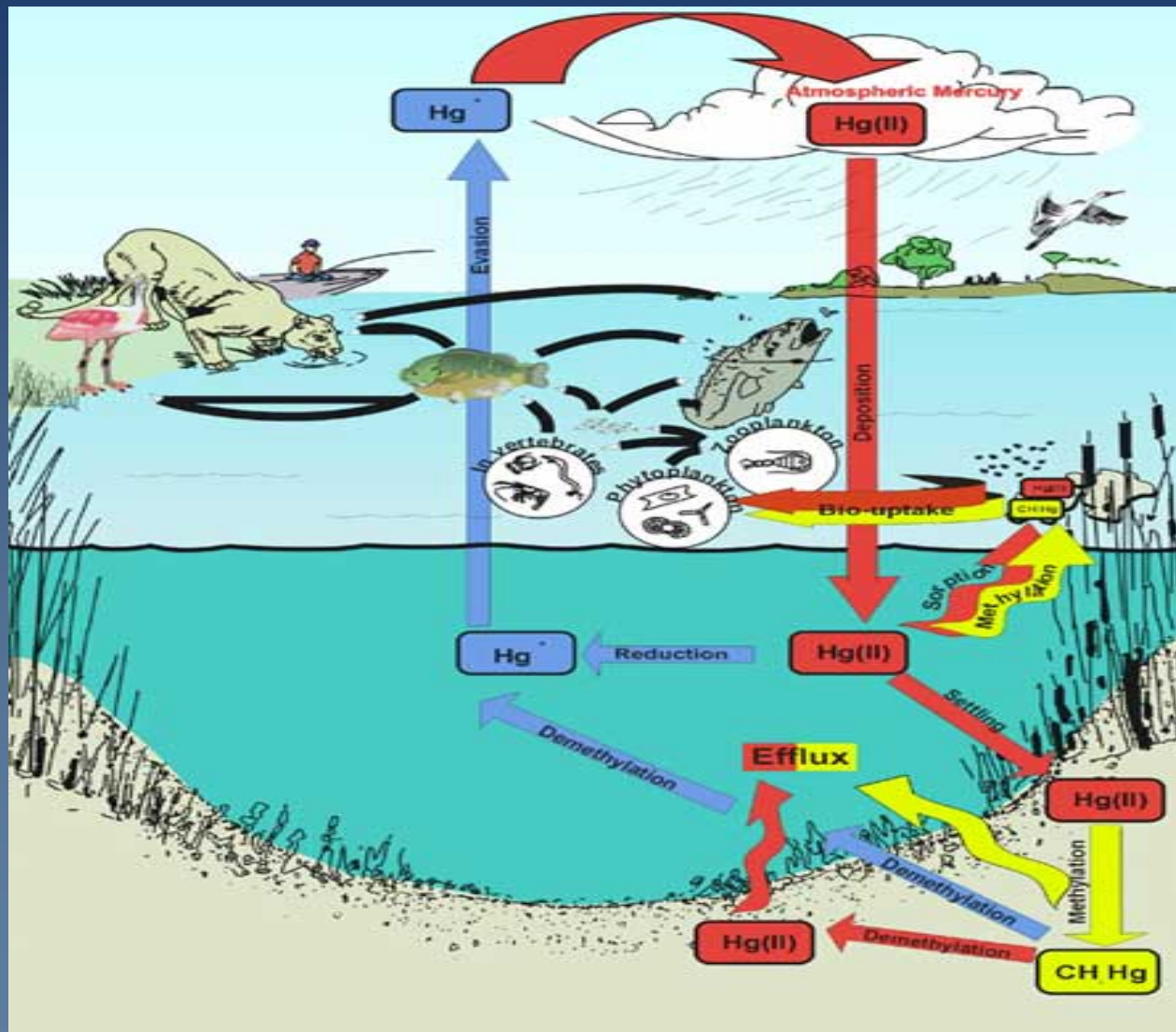
◆ Dental Amalgam

- Mercury is used in dental fillings because it is durable, inexpensive and able to bond with some metals.
- Alternative fillings are made of gold, porcelain, ceramic or plastics.

◆ Historical Uses

- Certain pigments of latex and oil-based paints pre 1991
- Pesticides / fungicides, Felt hat manufacturing

Mercury Life Cycle



Assignment

- ◆ Work individually to create test questions and answers based on information about glass and mercury.
- ◆ After about 20 minutes, students pair share questions and answers.
- ◆ Share with the class some of the best test questions and discuss answers.



Assignment Examples

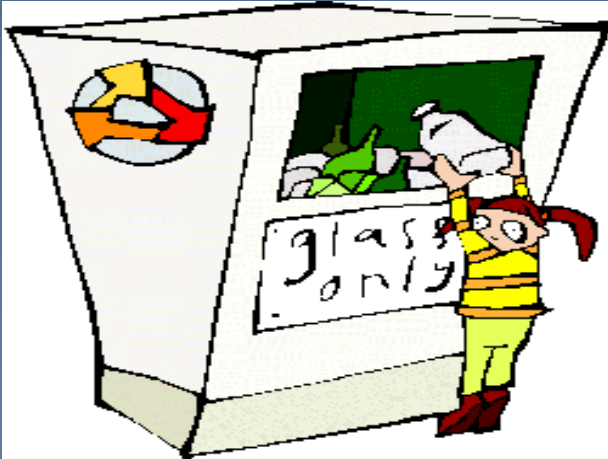
- ◆ Example:

- Write 2 test questions concerning the “Recyclability” and “Environmental Choice” of glass:

- ◆ 1. *How quickly can recycled glass return to the shelf? As little as 30 days*

- ◆ 2. *What is glass made out of? Silica, sand, soda ash, and limestone*

Recycle Glass!



Additional Links

- ◆ “How Glass Gets Recycled”
 - <http://earth911.com/glass/video-how-glass-gets-recycled/>
- ◆ “Rumpke: Glass Recycling Process”
 - http://www.rumpkerecycling.com/recycling_basics/videos.aspx
- ◆ “Mercury- Contamination Concerns”
 - <http://www.youtube.com/watch?v=P6CUotiTyeg>