Environmental Education for Everyone

Webinar on the EPA's K-Grey Educational Resources

April 17, 2012

Outline

- EPA's Office of Environmental Education
- EE Resources – Our philosophy
- EPA Program Offices: Educational Resources
  - Resource Options: Lesson Plans, Homework, Activities & Games, Public information & Interactive web tools
- K-Grey Resources
- A Look at the Office of Environmental Education's Resources Online

The Office of Environmental Education: http://www.epa.gov/education

- National Environmental Education Act
  - Grants
  - Student Awards (PEYA)
  - Teacher Awards (PIAEE)
  - National Environmental Education Advisory Committee
  - EE training agreement with Cornell University
  - **EE resources** for formal and informal educators/students/public

Office of Environmental Education Website

Our Philosophy

EPA EE Resources Should:

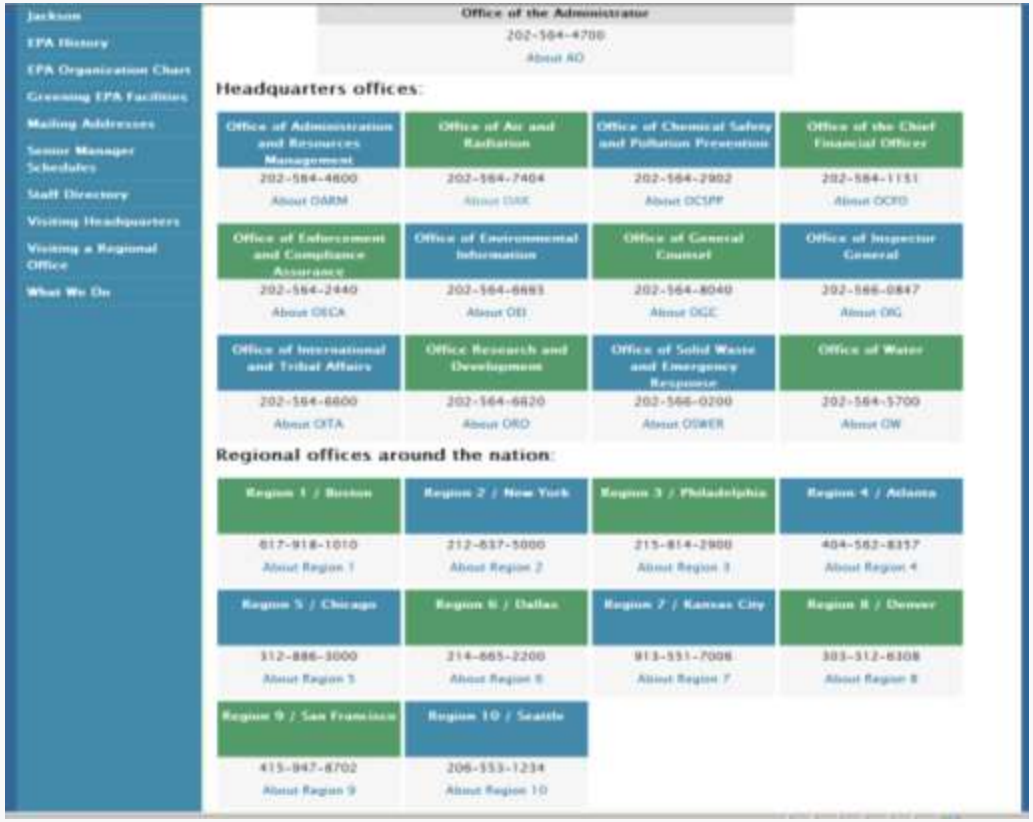
- Connect students & residents with their communities
- Address real world & local problems
- Encourage stewardship activities
- When appropriate, be place-based, experiential, outdoors

Our EE resources also strive to:

- Be interdisciplinary and integrative: Flexible to use in a variety of classes & subjects
- Be relevant and responsive to local issues & current events
- Utilize creative and critical thinking

EPA's Program Offices:

http://www.epa.gov/aboutepa/organization.html



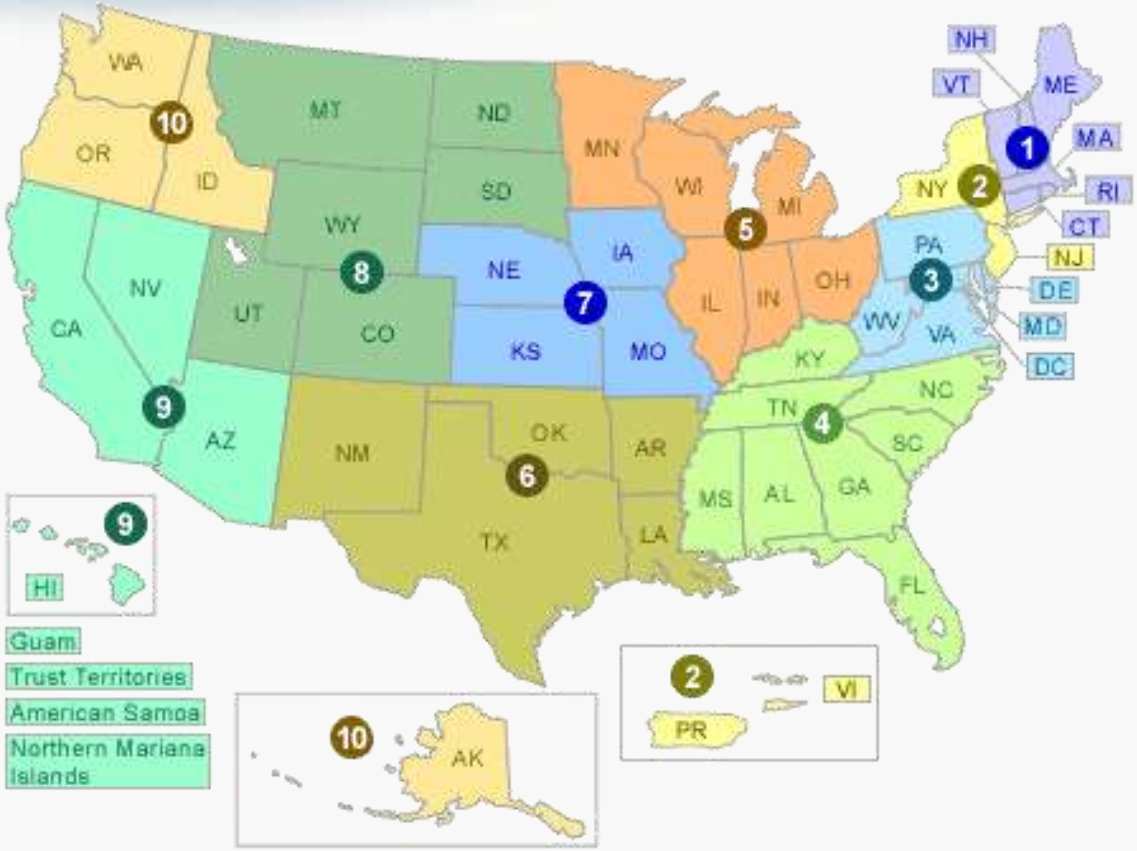
EPA Headquarters Offices:

- **Office of Air & Radiation**
- **Office of Chemical Safety & Pollution Prevention**
- Office of the Chief Financial Officer
- Office of Enforcement & Compliance Assurance
- Office of Environmental Information
- Office of General Counsel
- Office of Inspector General
- Office of International & Tribal Affairs
- **Office of Research & Development**
- **Office of Solid Waste & Emergency Response**
- **Office of Water**

The EPA also has 10 Regional Offices around the country. Each Region has an EE Coordinator.

Regional Offices:

- Region 1: Boston, MA
- Region 2: New York, NY
- Region 3: Philadelphia, PA
- Region 4: Atlanta, GA
- Region 5: Chicago, IL
- Region 6: Dallas, TX
- Region 7: Kansas City, KS
- Region 8: Denver, CO
- Region 9: San Francisco, CA
- Region 10: Seattle, WA



http://www.epa.gov/aboutepa/where.html

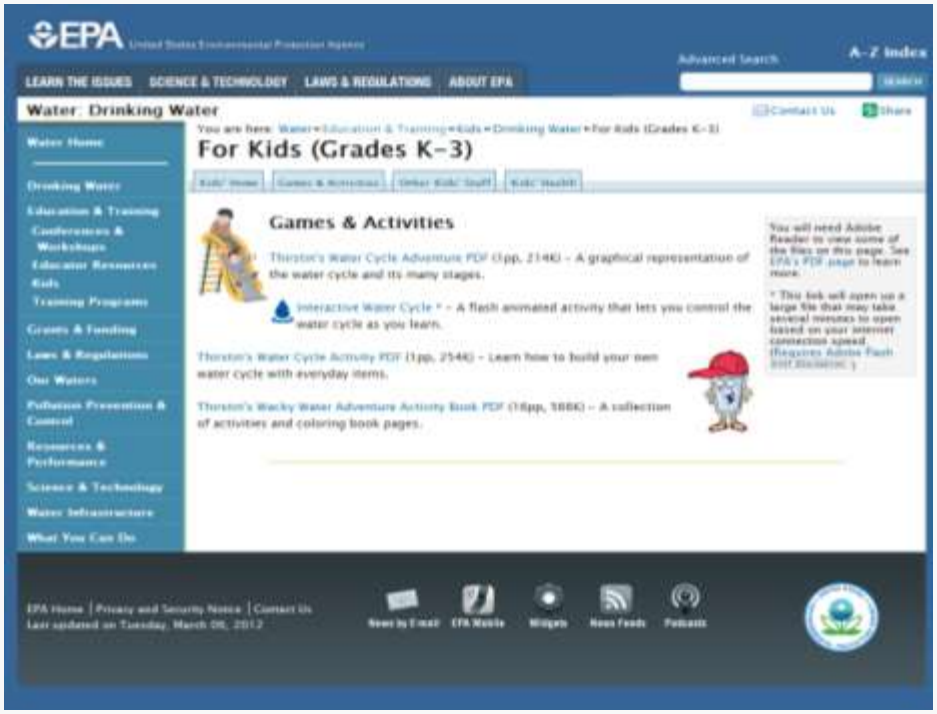
Program Office Web Resources:

- **Office of Air & Radiation:**
  http://www.epa.gov/air/ : Links for youth & Educational resources
  • OAR also includes Climate Change Information:
  http://www.epa.gov/climatechange/
- **Office of Chemical Safety & Pollution Prevention:**
  http://www.epa.gov/aboutepa/ocspp.html
- **Office of Research & Development:**
  http://www.epa.gov/research/
  http://www.epa.gov/aboutepa/ord.html
- **Office of Solid Waste & Emergency Response: (Recycling)**
  http://www.epa.gov/aboutepa/oswer.html
  http://www.epa.gov/epawaste/index.htm : Links for youth & Ed. Materials
- **Office of Water:**
  http://water.epa.gov/
  http://water.epa.gov/learn/ :Links for Ed. Resources, Youth & training

Education Resources from Program Offices

Office of Water Website

Water Resources for Youth

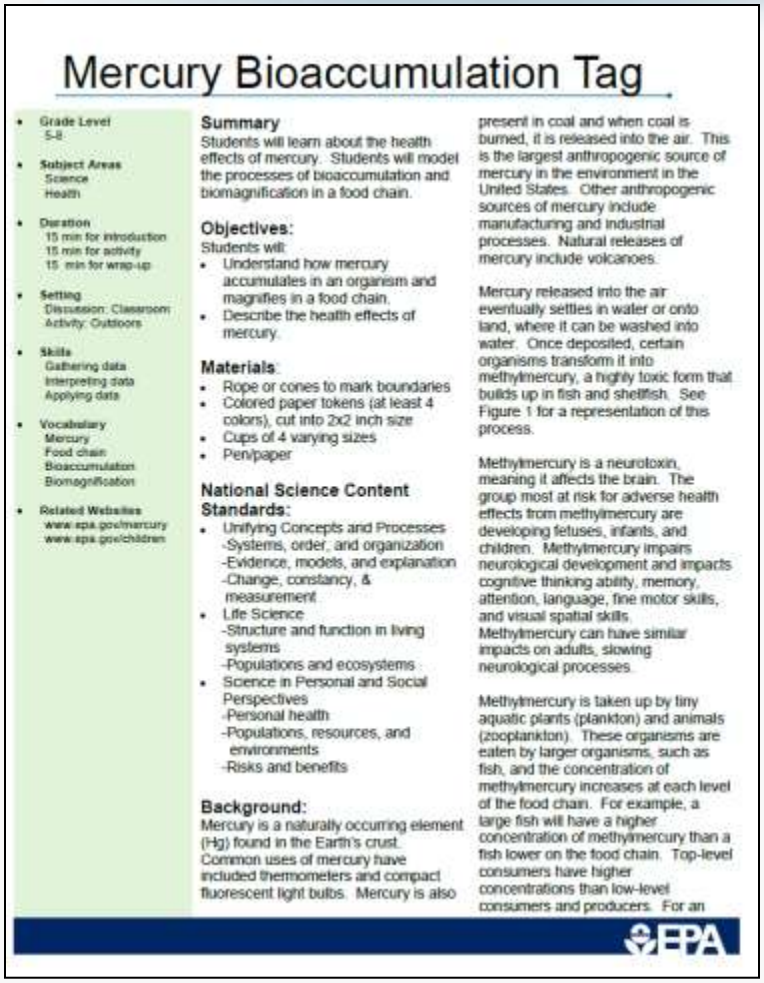


Climate Change Resources:

http://www.epa.gov/climatechange/kids/index.html

Many EE options are available at EPA:

1. Lesson plans for educators & parents
2. Homework/classroom help
3. Science experiments
4. Games and activities



Mercury Bioaccumulation Tag

- **Grade Level**
  5-8
- **Subject Areas**
  Science
  Health
- **Duration**
  15 min for introduction
  15 min for activity
  15 min for wrap-up
- **Setting**
  Discussion: Classroom
  Activity: Outdoors
- **Skills**
  Gathering data
  Interpreting data
  Applying data
- **Vocabulary**
  Mercury
  Food chain
  Bioaccumulation
  Biomagnification
- **Related Websites**
  www.epa.gov/mercury
  www.epa.gov/children

Summary

Students will learn about the health effects of mercury. Students will model the processes of bioaccumulation and biomagnification in a food chain.

Objectives:

Students will:

- Understand how mercury accumulates in an organism and magnifies in a food chain.
- Describe the health effects of mercury.

Materials:

- Rope or cones to mark boundaries
- Colored paper tokens (at least 4 colors), cut into 2x2 inch size
- Cups of 4 varying sizes
- Pen/paper

National Science Content Standards:

- Unifying Concepts and Processes
  -Systems, order, and organization
  -Evidence, models, and explanation
  -Change, constancy, & measurement
- Life Science
  -Structure and function in living systems
  -Populations and ecosystems
- Science in Personal and Social Perspectives
  -Personal health
  -Populations, resources, and environments
  -Risks and benefits

Background:

Mercury is a naturally occurring element (Hg) found in the Earth's crust. Common uses of mercury have included thermometers and compact fluorescent light bulbs. Mercury is also present in coal and when coal is burned, it is released into the air. This is the largest anthropogenic source of mercury in the environment in the United States. Other anthropogenic sources of mercury include manufacturing and industrial processes. Natural releases of mercury include volcanoes.

Mercury released into the air eventually settles in water or onto land, where it can be washed into water. Once deposited, certain organisms transform it into methylmercury, a highly toxic form that builds up in fish and shellfish. See Figure 1 for a representation of this process.

Methylmercury is a neurotoxin, meaning it affects the brain. The group most at risk for adverse health effects from methylmercury are developing fetuses, infants, and children. Methylmercury impairs neurological development and impacts cognitive thinking ability, memory, attention, language, fine motor skills, and visual spatial skills. Methylmercury can have similar impacts on adults, slowing neurological processes.

Methylmercury is taken up by tiny aquatic plants (plankton) and animals (zooplankton). These organisms are eaten by larger organisms, such as fish, and the concentration of methylmercury increases at each level of the food chain. For example, a large fish will have a higher concentration of methylmercury than a fish lower on the food chain. Top-level consumers have higher concentrations than low-level consumers and producers. For an

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Lesson Plans

- Outlines what the teacher needs in order to teach a specific topic
- Includes a background section, materials, and step-by-step instructions
- May include student handouts or worksheets

Science Experiments

- Similar to lesson plans
- Step-by-step procedures for both teachers and students
- Incorporates & interprets EPA research
- Use easily obtained or common classroom materials

Games & Activities

OSW's Planet Protectors

OPPT's Chemicals Around Your House Tour

K through Grey

- EE is not just about K-12 students -even though this is an important demographic
- Our goal is to share EPA content from K through Grey
- Other priorities include working with other offices:
  - America's Great Outdoors http://americasgreatoutdoors.gov/
  - Aging Initiative www.epa.gov/aging
  - Faith-based Communities http://www.epa.gov/fbnpartnerships/
  - Environmental Justice http://www.epa.gov/compliance/environmentaljustice/index.html
  - OnCampus ecoAmbassadors http://www.epa.gov/ecoambassadors/oncampus/
  - Informal Educators and Associations, NEEF: www.neefusa.org

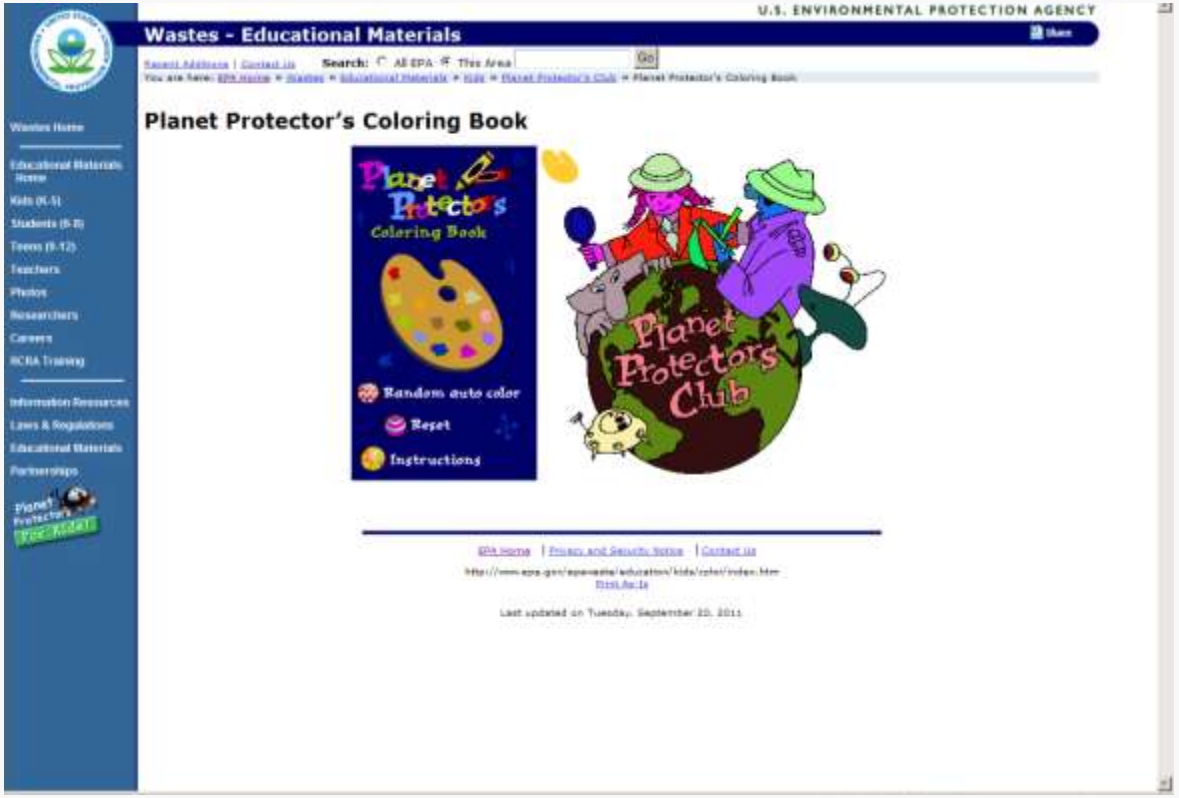
Student Page

http://www.epa.gov/students/

Teacher Page

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

Resources for Young Children



Resources for Middle School Age

Resources for High School

Resources for Adults/Aging

Resources for Older Adults

Let's take a look at EPA's website and how to find more resources we have to offer!

Thank you for listening!

Questions?