



The Medicine Chest

A collection of safe disposal curriculum activities and service-learning resources



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We dedicate *The Medicine Chest* to our youth who are working to make a significant difference in their communities as they develop important lifelong learning skills, including leadership and civic responsibility.

-Robin Goettel and Terri Hallesy
Project Coordinators, Illinois-Indiana Sea Grant Program

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We would like to thank the following agencies and organizations for providing permission to reprint their resources in this Medicine Chest publication.

Pharmaceuticals in Our Water Supplies (article)

Courtesy of: Arizona Water Resource, Water Resources Research Center, University of Arizona
<http://ag.arizona.edu/azwater/awr/july00/feature1.htm>

Meds lurk in drinking water (article)

Courtesy of: Associated Press

Tips on Student Research Projects (article) & *High School Research Projects* (article)

Courtesy of: Dorit Sasson, The New Teacher Resource Center
<http://newteachersupport.suite101.com/>

Chemicals, the Environment, and You: Explorations in Science and Human Health – Lesson 1 & Lesson 5 (classroom lessons)

Courtesy of: BSCS and Discovery Channel

Resource Management: Protecting your Drinking Water (classroom lesson)

Courtesy of: U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water
http://www.epa.gov/SAFEWATER/kids/teachers_9-12.html

Service Learning Level 2: "Raise Your Voice" – Note to Helper, The Real Deal, and Speak Out (Three 4-H activities)

Courtesy of: The National 4-H Council

Symbiosis Newsletter Article, Vol. 4, No. 1, "There is Medicine in These Waters"

Courtesy of: The Teleosis Institute, <http://www.teleosis.org>

Home and Lawn Care Checklist: "Personal Pollutions" (activity)

Courtesy of: U.S. Environmental Protection Agency, in *The Watershed Patch Project*, 2004

Reflection Activities (activity), *Post Reflection Activities* (activity), *Reflection Activities to be Used Throughout* (activity), & *Reflection Opportunities – Segments 1-6* (activity)

Courtesy of: Earth Force, Inc. This may also be downloaded from: <http://www.earthforce.org>

Community Partnerships – Meeting Community Needs (fact sheet)

Courtesy of: Pennsylvania Service Learning Alliance

Building Effective Partnerships for Service Learning (classroom lesson)

Courtesy of: National Service-Learning Clearinghouse. Scotts Valley, CA: Learn and Serve America's National Service-Learning Clearinghouse, 2008.

http://www.servicelearning.org/instant_info/fact_sheets/cb_facts/build_partners/index.php

Talk It Up: Advocating for Service Learning (article)

Courtesy of: Academy for Educational Development

Curriculum Development for K-12 Service-Learning (fact sheet)

Courtesy of: RMC Research Corporation

http://www.servicelearning.org/instant_info/fact_sheets/k-12_facts/curriculum/

Give Water A Hand (fact sheet), published in the Leader Guidebook and Action Guide, 1996.

Courtesy of: Environmental Resources Center, University of Wisconsin

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What's in Your “Medicine Chest”?

Acquire an understanding of why safe disposal of unwanted medicine is an important issue of concern so your students can become active “agents for change” in your community.

Incorporate a model high school service-learning program, P²D², which establishes a strong partnership between your school, local pharmacies, government officials, law enforcement, and water management agencies. Have your students organize community collection events based on information learned through lesson plans from multiple disciplines, including environmental science, civics, music, art, language arts, and foreign language.

Find out how this service-learning unit aligns with National Education Standards. Relevant Illinois and Indiana state standards are also included, which can provide helpful linkages to standards in other states.

Enhance your students’ grasp of the content through supplemental activities that are provided. These offer multiple tools for learning, including word searches, puzzles, an experiment, a risk assessment case study, an estimation activity, an interactive service-learning activity to guide student research and action planning, and a description of a 4-H guide that offers five inquiry-based activities.

Get the latest links to science-based research and data so your students can do their fact-finding using credible background information from Websites and fact sheets. *Tox Town* and *Tox Mystery* provide great opportunities for interactive learning via the Web.

Discover what makes a service-learning project successful. Included are great prompts for student reflection activities, action plan templates, and tips for building community partnerships and organizing festivals.

Check out creative student projects that have sparked community interest, understanding, and action. You’ll see examples of billboards, eco-poems, songs, designed collection boxes, a rain barrel, and student presentations.

Help us improve this educational resource by providing feedback. We will be updating the PDF files on our Website to make them more relevant and current, based on your comments. Please complete and return the *Feedback Form* at the end of this resource. Downloadable files can be accessed at www.iisgcp.org/education/safe_disposal_curriculum.html.

Introduction

The Medicine Chest is a compilation of multidisciplinary, standards-based classroom lessons, sample stewardship activities, and background information for teachers and high school students on how the improper disposal of unwanted medicines can be harmful to people, pets, and the environment. Through use of this classroom instructional resource, students will serve as “agents for change” providing useful information about medicine disposal to family members and various community sectors. Students who actively take part in the numerous activities provided in this collection will be equipped to deliver messages and help people make conscientious decisions when disposing of medications and other household chemical products.

In response to a growing national concern about improper disposal of unused or expired medicine and medicine misuse, educators from the Illinois-Indiana Sea Grant Program in University of Illinois Extension are creating a community-based campaign. This campaign involves educating youth about important actions people can take to protect local waterways, help prevent accidental poisonings, limit illegal use by teens, and reduce identification and medicine theft.

This collection of activities can be used both as a classroom resource and in more informal educational settings, such as after-school clubs or after-school programs. Youth will reap many benefits as participants in the provided authentic, problem-based learning scenarios. They will gain skills in decision-making, cooperative learning and teamwork, communication and leadership. Their involvement in this curriculum will also help protect and improve the quality of our waters.

Goals of this curriculum collection are listed on reverse side.



Introduction (cont'd)

Curriculum Goals

The Medicine Chest—A collection of safe disposal curriculum activities and educational resources

- To inform youth and their families about the harmful effects of improper disposal of medicines and other household chemicals on the aquatic life in lakes and rivers and the importance of properly disposing of these potentially toxic substances.
- To provide teachers with best practices for creating a community awareness campaign on safe medicine disposal methods aimed at adults.
- To incorporate a variety of educational approaches for instructing youth.
- To inform high school teachers about the Prescription Pill and Drug Disposal Program (P²D²) multi-disciplinary curriculum, created by educators at Pontiac High School in Illinois. This Program uses a creative service-learning approach to guide students as they develop community service projects about safe disposal of unwanted medicines.
- To provide additional quality lesson plans and supplemental activities, which will encourage students to become actively engaged in this timely topic.
- To support community stewardship by offering creative project examples and guidance that will inform the public about appropriate disposal practices.



Overview of the Unwanted Medicine Disposal Issue



Overview of Unwanted Medicine Disposal Issue

Prescription drug use is increasing significantly in quantity and types. In 2008, the total sales for prescription drugs reached \$291.5 billion, a 1.4 percent increase from the previous year.¹ At the same time, antibiotics, anti-convulsants, mood stabilizers, and hormones have been detected in the drinking water supplies of 24 major metropolitan areas.²

Although the exact risk to humans from low levels of pharmaceuticals has yet to be determined, the presence of so many varied prescription drugs and over-the-counter medicines is a cause for growing concern, especially when coupled with the fact that more and more medications are being prescribed. And, these medicines have been shown to harm fish and other aquatic wildlife, according to the U.S. Geological Survey.

So how do these chemicals get into the environment? One source is direct outflow to water from wastewater treatment plants. When medicines expire or are no longer wanted, people often flush them away. Wastewater treatment plants were never designed to remove these chemicals. Unwanted medicines that are flushed can also kill beneficial waste sewage bacteria and damage septic systems.

Another possible source is from the sludge of wastewater treatment plants and the manure from medically-treated domestic animals. Sludge is typically applied to farmland as a soil amendment and might be a source of contamination of groundwater and runoff. Veterinary treatment on fish farms and direct runoff from livestock farms might be another source.

When people throw medicine in the trash, there can be a risk of leakage from old or poorly designed landfills. Even non-leaking landfills represent a potential source, since water from them is often pumped out and is usually treated by the municipal wastewater system.³ What's more, when people place medicines in the trash without taking precautions to secure the container, disguise the content, or make the medicine inedible, this can result in children and pets being unintentionally poisoned.

The concern for proper disposal of unwanted medicine ties in closely with another growing problem. "Nearly seven million Americans are abusing prescription drugs—more than the number who are abusing cocaine, heroin, hallucinogens, Ecstasy, and inhalants, combined. That 7 million was just 3.8 million in 2000, an 80 percent increase in just six years. **Nearly 1 in 10 high school seniors admits to abusing prescription painkillers.** Approximately 40 percent of teens and an almost equal number of their parents falsely believe abusing prescription painkillers is safer than abusing "street" drugs." ⁴ Through the multifaceted service-learning program, presented in *The Medicine Chest*, youth will be empowered to take action that will serve as a catalyst to help reduce teenage drug abuse.

¹ Ruiz, Rebecca. "America's Most Medicated States." *Forbes.com*, 31, August, 2009

<http://www.forbes.com/2009/08/17/most-medicated-states-lifestyle-health-prescription-drugs.html>

² Donn, Jeff et al. "AP Probe Finds Drugs in Drinking Water." *Associated Press*, 10 March, 2008.

³ K. Barnes, et al. Spring 2004 "Pharmaceuticals and Other Organic Waste Water Contaminants Within a Leachate Plume Downgradient of a Municipal Landfill" *Ground Water Monitoring and Remediation* 24, No.2, pages 119-126.

⁴ Drug Enforcement Administration. 2009. "Prescription Drug Abuse—A DEA Focus." Online at www.usdoj.gov/dea/concern/prescription_drug_fact_sheet.html.