

Pollution Prevention (P2) in Schools

Why is (P2) important in schools?

According to the [Environmental Protection Agency](#), schools generate a variety of pollutants and waste. This fact sheet is intended to provide useful resources and tips to help manage and reduce pollution in schools. Adopting P2 measures may significantly reduce or even eradicate the generation of pollutants and waste as well as their impacts on the environment.

School P2 activities and approaches include:

1. Reducing mercury containing devices and hazardous waste generated
2. Reducing photographic waste and non-RCRA regulated waste streams mixing in RCRA waste streams
3. Reducing solid waste
4. Energy conservation
5. Water conservation

Chemical and hazardous waste:

- Find alternative and less toxic substitutes -replace mercury containing devices with mercury-free alternatives
- Chemicals and mercury containing devices should be purchased in small quantities
- Chemicals should be properly labeled, dated and inventoried to prevent surplus or expiration.
- Substance information, refill and cleanup procedures should be posted at all times
 - Note: Instrument cleaning or refilling should take place over a tray (to contain spills) and in a well ventilated area whenever possible.*
- Reduce hazardous waste generation by
 - o Conducting waste assessments
 - o Declarations - declare reducing hazardous waste as a commitment and goal to employees and as a university for accountability
 - o Upgrade equipment that produces less hazardous waste
 - o Resource recovery - following correct hazardous rules and guidelines, use a waste material from one process as a raw material for a different process
 - o Reduce over purchasing raw material(s) that could be characteristic as a hazardous waste
- Ensure proper disposal of chemicals and hazardous waste
 - o Avoid mixing non-hazardous waste with hazardous waste
 - o Avoid mixing incompatible chemicals

Reducing photographic waste and non-RCRA regulated waste streams mixing in RCRA waste streams:

- Ensure that the proper photographic chemical ratios and parts are used
 - o Create trainings for students and staff utilizing these substances to understand the environmental impact, costs and student fees associated with disposing of photographic chemicals before expiration
 - o Reuse and recycle photographic chemicals and water as much as possible
 - Bleach, bleach-fix, fix and developer can be recycled and reused
 - Use a counter-current rinsing system to reduce water consumption. Counter-current rinsing systems employ water circulation from previous rinsings to contact the film at its most contaminated stage. Fresh water enters the process only at the final rinse stage.
 - o Find a suitable outlet that can recycle or even reuse these photographic waste chemicals
 - o Ensure that photographic chemicals are properly stored
 - Use the smallest container possible for dipping or for holding photographic chemicals
 - Store and reuse developer in photo labs

- **Reducing Solid Waste**
 - o Update inventory of items (such as school offices, laboratories, health centers and food service areas)
 - o Use recyclable products (paper, metal, plastic and glass)
 - Print paper copies only when needed and print double sided
 - o Printing pollution prevention
 - Utilize print layouts that use the most efficient image size to the press sheet size to reduce paper waste
 - Schedule daily runs to reduce color changes and to run inks from lighter to darker
 - Prepare the amount of ink needed for daily jobs and usage
 - o Reduce unnecessary waste production generated on campus and sent off campus
 - Conduct a waste assessment of current processes
 - Switch to electronic versions of materials and send brochures, flyers and other information through an electronic format
 - o Compost
 - o Implement a recycling system (plastic and aluminum bottles, paper, cardboard and glass)
 - o Appliance recycling
 - o Donate textiles
 - Host textile donation drives at schools
 - Engage with local business or city municipalities for donation bins/infrastructure on campus

- Consumer Education
 - Incorporate proper signage for waste receptacles
 - Engage and teach employees, contractors and students on the importance of reducing waste
 - Offer rebates for reusable grocery bags, containers, mugs or cups for refilling
- **Energy Conservation**
 - Conduct Energy Audit
 - “Walk-throughs” of the school buildings
 - Analyze energy bills
 - Implement energy meters to give on-site real time energy usage and updates
 - Look for tax incentives and energy grants
 - Invest in renewable energy
 - Maintain Equipment
 - Ensure to shut the fume hood in school laboratories
 - *Shut the Sash* is a competition among universities to combat high energy usage by fume hoods in the laboratory
 - Retrofit old buildings
 - Insulate
 - Retrofit lighting and install light sensors
 - Install energy efficient double pane windows
 - Seal heating and cooling ducts
 - Green Buildings
 - Look into LEED Certifications to implement green building practices through energy, waste, design, water and air conservation. *Projects for Green Buildings: Building Design and Construction, Interior Design and Construction, Building Operations and Maintenance, neighborhood Development and Homes.*
 - Incentivize alternative forms of transportation
 - Carpooling, public transit passes, campus shuttles, bicycling
- **Water Conservation**
 - Meter/Measure/Manage
 - Optimize cooling towers
 - Low flow fixtures
 - Rainwater harvesting
 - Water-Smart Landscaping and Irrigation
 - Planting native plant species to the area
 - Permeable pavements

Chemical and hazardous waste links:

P2 in Schools: <http://www3.epa.gov/region5/waste/solidwaste/p2pages/pdfs/tb-p2-schools.pdf>
Mercury Use: Educational Institutions: <http://infohouse.p2ric.org/ref/04/03851/ed.pdf>
Case Study: University of Wisconsin La Crosse EH&S: 82 Ways to Reduce Hazardous Waste in the Lab
http://www.uwlax.edu/ehs/Hazardous_waste.htm
Reducing hazardous waste generation tips: <http://infohouse.p2ric.org/ref/11/10047.htm>
EPA Wastes: Hazardous Waste: <http://www3.epa.gov/epawaste/hazard/index.htm>
Case Study: University of Minnesota: Hazardous Waste- Waste Reduction Procedures:
http://www.dehs.umn.edu/hazwaste_chemwaste_umn_cwmgbk_sec7.htm
Hazardous Waste Requirements for LQG: <http://www.epa.gov/sites/production/files/2015-01/documents/lqgpdf.pdf>

Reducing photographic waste and non-RCRA regulated waste streams mixing in RCRA waste streams

P2 Silver Recovery Systems and Waste Reduction in Photoprocessing: <http://www.pneac.org/sheets/all/silver.cfm>
Three Stage Counter-Current Rinse Tank: <http://infohouse.p2ric.org/ref/01/00051.htm>
Pollution Prevention Options For the Photoprocessing Industry: <http://infohouse.p2ric.org/ref/23/22489.pdf>

Reducing solid waste:

Common Pollution Prevention Practices in Printing:
http://www.istc.illinois.edu/info/library_docs/manuals/printing/p2pract.htm
Conducting a Waste Assessment: <http://www3.epa.gov/epawaste/nonhaz/municipal/pubs/bus-guid/chap2.pdf>
Food Recovery Challenge: <http://www.epa.gov/sustainable-management-food/food-recovery-challenge-frc>
Composting Strategies for Colleges and Universities: <http://www3.epa.gov/epawaste/conservesmm/web-academy/2013/dec05.htm>
9 Steps to Start a Recycling Program: <http://infohouse.p2ric.org/ref/49/48995.pdf>

Energy Conservation:

Shut the Sash Competition Harvard: <http://green.harvard.edu/programs/green-labs#ShuttheSash>

Water Conservation:

EPA's Partnership Program: Water Sense: <https://www3.epa.gov/watersense/>.

Useful Links:

Green Chemistry: <http://www.epa.gov/greenchemistry/resources>
The Center for Chemical Process Safety (CCPS): Is a useful webpage to find case studies, management practices and information to prevent and/or mitigate releases of specific chemicals, hydrocarbons, and other hazardous materials. <http://www.aiche.org/ccps>
Arizona Department of Arizona Recycling: ADEQ's recycling program and helpful guide to find where you can recycle various items across Arizona. <http://azrecycles.gov/>

This resource summary was created by the Arizona Department of Environmental Quality's Pollution Prevention (P2) Program using funds from a P2 Grant provided by the U.S. Environmental Protection Agency.