

Pollution Prevention (P2) for Colleges and Universities

Colleges and universities use toxic substances and generate hazardous waste as a result of conducting routine activities such as operating science labs and through the use of chemicals in art, photography and vehicle maintenance classes. Additionally, maintaining the campus facilities also generates waste. This fact sheet is intended to provide useful resources and tips to help reduce pollution at the source in schools.

Reducing Toxic Substance Use

- Reduce the use of toxic substances by searching for nontoxic chemicals or less toxic substitutes. See EPA's [Safer Choice](#)¹ website for more information. Toxic substances that can be reduced or eliminated include:

- ⇒ Cleaning products
- ⇒ Chemicals used for laboratory experiments
- ⇒ Chemicals used in courses such as art, vehicle maintenance, medical and veterinary sciences.

The benefits include less chemical exposure by students and staff, less waste generated that needs to be managed as a hazardous waste, and safer chemicals for the environment and student health.

- Label, date and inventory chemicals to prevent disposal of raw materials due to expiration.
- Obtain further information on [identifying alternatives](#)² through the Occupational Safety and Health Administration website.
- See the American Chemical Society's webinar on [How to Create a Greener and More Sustainable Lab](#)³.



Reducing Mercury Containing Products

- Replace mercury-containing devices such as light bulbs, mercury gauges, manometers and thermometers, that must be managed when disposed under the hazardous waste regulations (40 CFR Parts 260-273) or universal waste rules (40 CFR Part 273), with mercury-free alternatives.
- In addition, other products used in labs, home economics, art classrooms, the nurse office, and facility maintenance can be replaced with [safer alternatives](#)⁷ including:
 - ⇒ Inorganic mercury compounds (mercury chloride, mercury nitrate, mercury oxide)
 - ⇒ Vermillion paint
 - ⇒ Fungicides and pesticides
- For more information see EPA's [Mercury in Your Environment](#)⁸ webpage.

Reducing Hazardous Waste Generation

- Inventory stock of chemicals in all departments before purchasing new material.
- Make a list of all the expired or unused chemicals that were managed as a hazardous waste to determine if they can be eliminated from use.
- Reduce photographic waste
 - Find a suitable outlet that can [recover](#)⁹ precious metals (silver) from photographic waste. Ensure compliance with the hazardous waste regulations.
 - Use counter-current rinsing system to reduce water consumption.
- Limit or reduce the use of paint thinners, paints, inks and other solvent containing materials by revising lesson plans to either work in groups or substitute the chemicals with others that do not need to be managed as a hazardous waste.
- Do not mix hazardous waste with non-hazardous waste. This can increase your waste volumes.
- Do not store incompatible hazardous waste.

Integrated Pest Management



What is Integrated Pest Management?

Integrated pest management is an environmentally friendly, common sense approach to controlling pests.

Reduce pesticide use by:

- Setting action thresholds.
- Determining if the pests identified are beneficial pests.
- Select pesticides made from natural plant based ingredients.
- See EPA's [Managing Pests in Schools](#)⁴ webpage.
- See [Information on Pests in Schools and Their Control](#)⁵.
- Check out [Pest Notes Library](#)⁶ to learn about specific pests or pest management topics.

Shut the Sash in your Laboratories!

What is a sash?

The sash is the front, or glass portion, of the fume hood which can be moved up or down.

Why is this important?

Fume hoods exhaust air that must be replaced with incoming air that has to be cooled or heated. This is a big expense for college or university laboratories. An open hood can cost up to \$6,500 in air conditioning per year. A closed sash can reduce the cost by 85%.

For information see Harvard's [Shut the Sash](#)¹⁰ program and download their [Fume Hood Strategy White Paper](#)¹¹.

Learning more about Pollution Prevention

- See [The Association for the Advancement of Sustainability in Higher Education](#)¹² website.
 - ⇒ Find [case studies](#)¹³ in the following topics:
 - * Campus engagement
 - * Coordination and planning
 - * Curriculum
 - * Waste
 - * Transportation and purchasing
 - * Case studies by discipline

Improving Air Quality

- Check out Maricopa County's [Trip Reduction Program](#)¹⁴ to reduce air pollution (carbon monoxide, ozone, particulate matter) through the development of a single occupant vehicle reduction program.
- Download Maricopa County's [Clean Air Make More](#)¹⁵ App to receive information for reducing air pollution.

References

¹EPA. Safer Choice: <https://www.epa.gov/saferchoice>.

² Occupational Safety and Health Administration. Transitioning to Safer Chemicals: https://www.osha.gov/dsg/safer_chemicals/step3_identify.html.

³ American Chemical Society. *How to Create a Greener and More Sustainable Lab*: <https://www.youtube.com/watch?v=66ijRtMZ5C8&index=18&list=PLLI MW6nMYOalUc0CiGtGPjY4pIDbgR42D>.

⁴ EPA. Managing Pests in Schools: <https://www.epa.gov/managing-pests-schools>.

⁵ EPA. *Information on Pest in Schools and Their Control*: <https://www.epa.gov/managing-pests-schools/information-pests-schools-and-their-control>.

⁶ University of California. Integrated Pest Management Program. *Pest Notes Library*: <http://ipm.ucanr.edu/PMG/PESTNOTES/index.html>.

⁷ Agency for Toxic Substances and Disease Registry. *Safe Alternatives to Products that Contain Mercury*: https://www.atsdr.cdc.gov/dontmesswithmercury/pdfs/mercury_safe_alternatives.pdf.

⁸ EPA. Mercury in Your Environment: <https://www.epa.gov/mercury>.

⁹ International Journal of Emerging Technology and Advanced Engineering. *Extraction of Silver From Photographic Waste*: http://ijetae.com/files/Volume2Issue11/IJETAE_1112_94.pdf.

¹⁰ Harvard University. *Shut the Sash Program*: <https://green.harvard.edu/programs/green-labs/shut-sash-program>.

¹¹ Harvard University. *Validating cost and energy savings from Harvard's Shut the Sash Program*: <https://green.harvard.edu/sites/green.harvard.edu/files/FumeHoodWhitePaper.pdf>.

¹² The Association for the Advancement of Sustainability in Higher Education: <http://www.aashe.org/>.

¹³ The Association for the Advancement of Sustainability in Higher Education. *Campus Sustainability Hub*: <https://hub.aashe.org/browse/types/casestudy/>.

¹⁴ Maricopa County. Air Quality Department. *Trip Reduction Program*: <https://www.maricopa.gov/2388/Travel-Reduction-Program>.

¹⁵ Clean Air Make More: <http://cleanairmakemore.com/>.

Additional Resources

International Alliance of Research Universities (IARU). *Green Guide for Universities*: http://www.iaruni.org/images/stories/Sustainability/IARU_Green_Guide_for_Universities_2014.pdf.

Pinellas County Department of Environmental Management. *Waste Reduction Assistance in Printing and Publishing Operations*: <http://www.pinellascounty.org/environment/pollutionPrevent/p2r2PDFs/mangmentPDFIndustry/Printers%20Booklet.pdf>.

Responsible Purchasing Network (RPN). *Green Cleaning P2 Calculator*: <http://www.responsiblepurchasing.org/janitor/index.asp>.