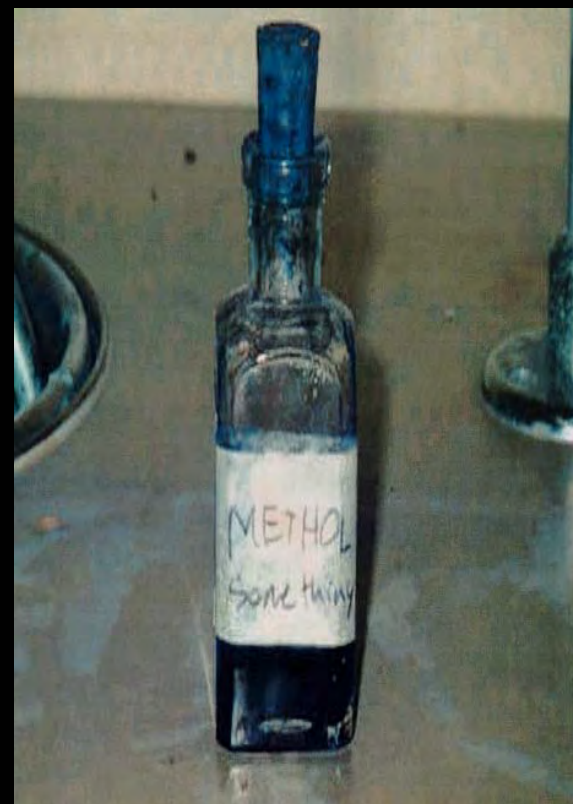


No More "*Methyl Something*" : Improving Management of Curriculum Chemicals in Schools

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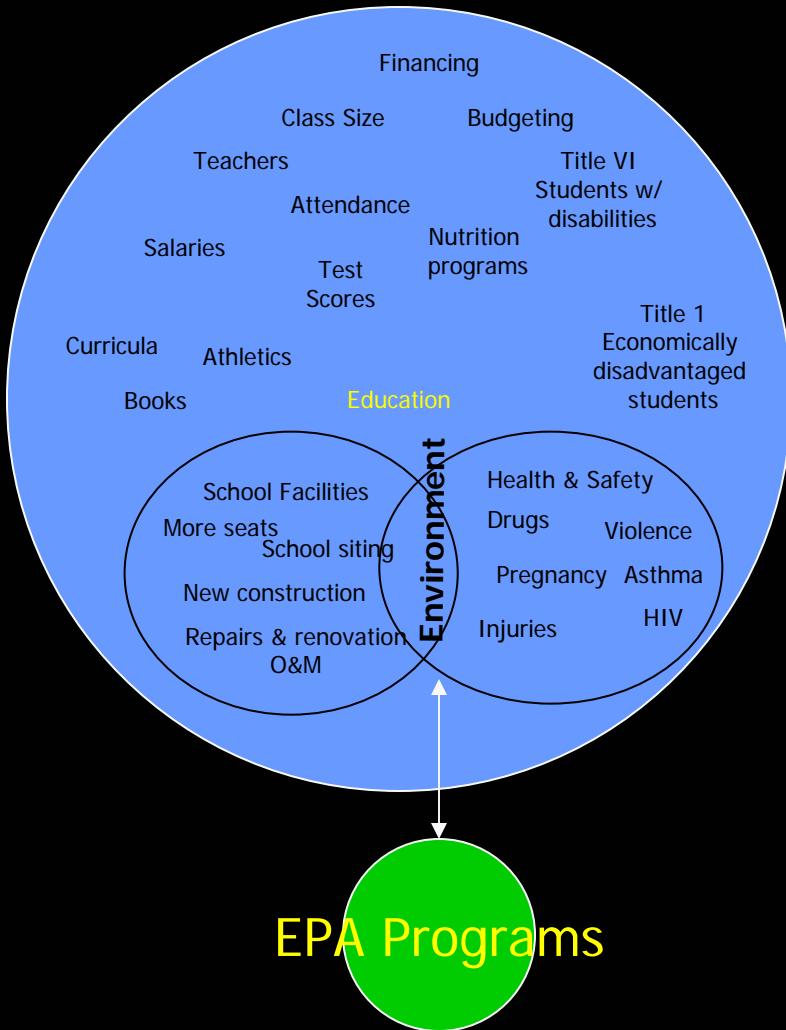


What Is Our Goal? i.e. the commercial!

EPA/Federal/State Programs should support Schools in their primary Mission, which is educating Kids!

Environmental (& health & Safety) issues must be viewed In context with each other

EPA & States & Partners Provide tools (training, technical Support, guidance) to schools



And now....

More Information on Chemicals!

Where Are The Chemicals?

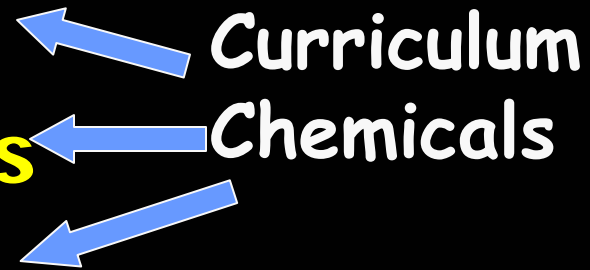
- Maintenance Areas

- Vocational Shops

- Science Laboratories

- Art Classrooms

- Offices



Why Be Concerned About Chemical Management?

- **Health hazards:** immediate & long-term
- **Safety hazards:** stability of shelves, storage methods and incompatibility
- **Environmental harm:** groundwater, discharges to streams/rivers, air pollution
- **Hidden costs/liabilities:** lawsuits, fines, Paperwork/fees, insurance premiums, etc

Types of Chemicals Posing Hazards in Schools

- **Extremely flammable**
- **Corrosive**
- **Poisonous**
- **Carcinogenic**
- **ANYTHING STORED IMPROPERLY**
- **Reactive: explosive, heat generating, fume/vapor generating**
- **Unknowns**

Examples : Poor Storage Practices

- **Water reactives near / under sink**
- **Heavy containers on high shelves**
- **Corrosives on (corroded) metal shelves**
- **Flammables stored on wood**
- **Alphabetical storage (incompatible?)**
- **Unlabelled/"mystery" contents**
- **Chemicals next to food**

Why are there problems with chemical management in schools?

- Lack of awareness
- Lack of environmental management system
- Lack of "somebody in charge" (add-on duty)
- Discount warehouse store effect
- Spend it or lose it monies

Why are there chemical management problems in schools? (contd)

- **Stockpiles from the 1950's – era of Sputnik and technology race**
- **Often little communication across Academic, Administrative, & Facilities departments**
- **Facilities often not built for handling chemicals (ventilation, storage problems)**

Incompatible Chemical Storage



Stockpiling/Overpurchasing and Underestimating Hazards



Poor Choice of Chemicals (high flammability material)



Metal shelving deterioration



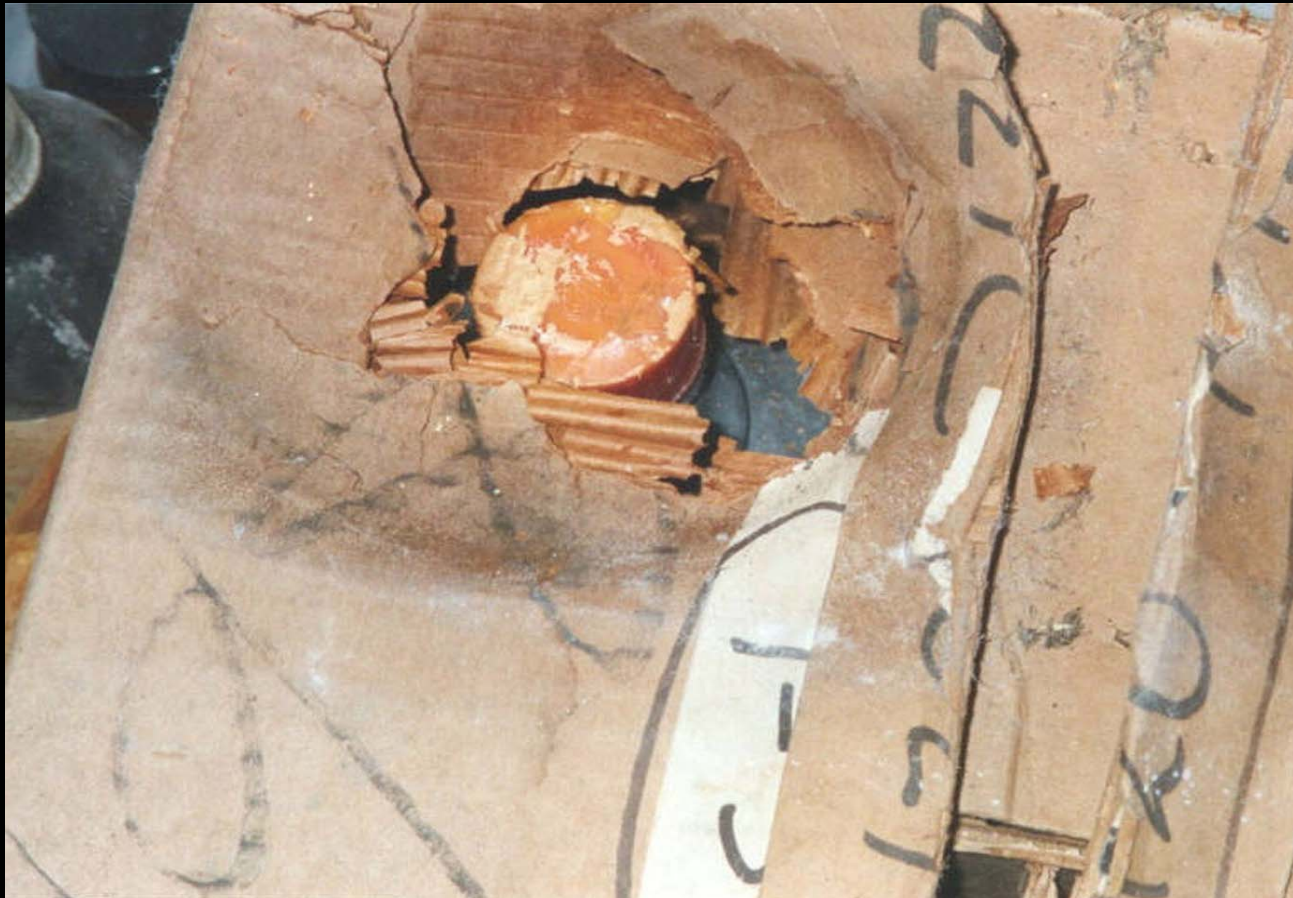
Excess Chemicals in Storage



Special Case : Mercury

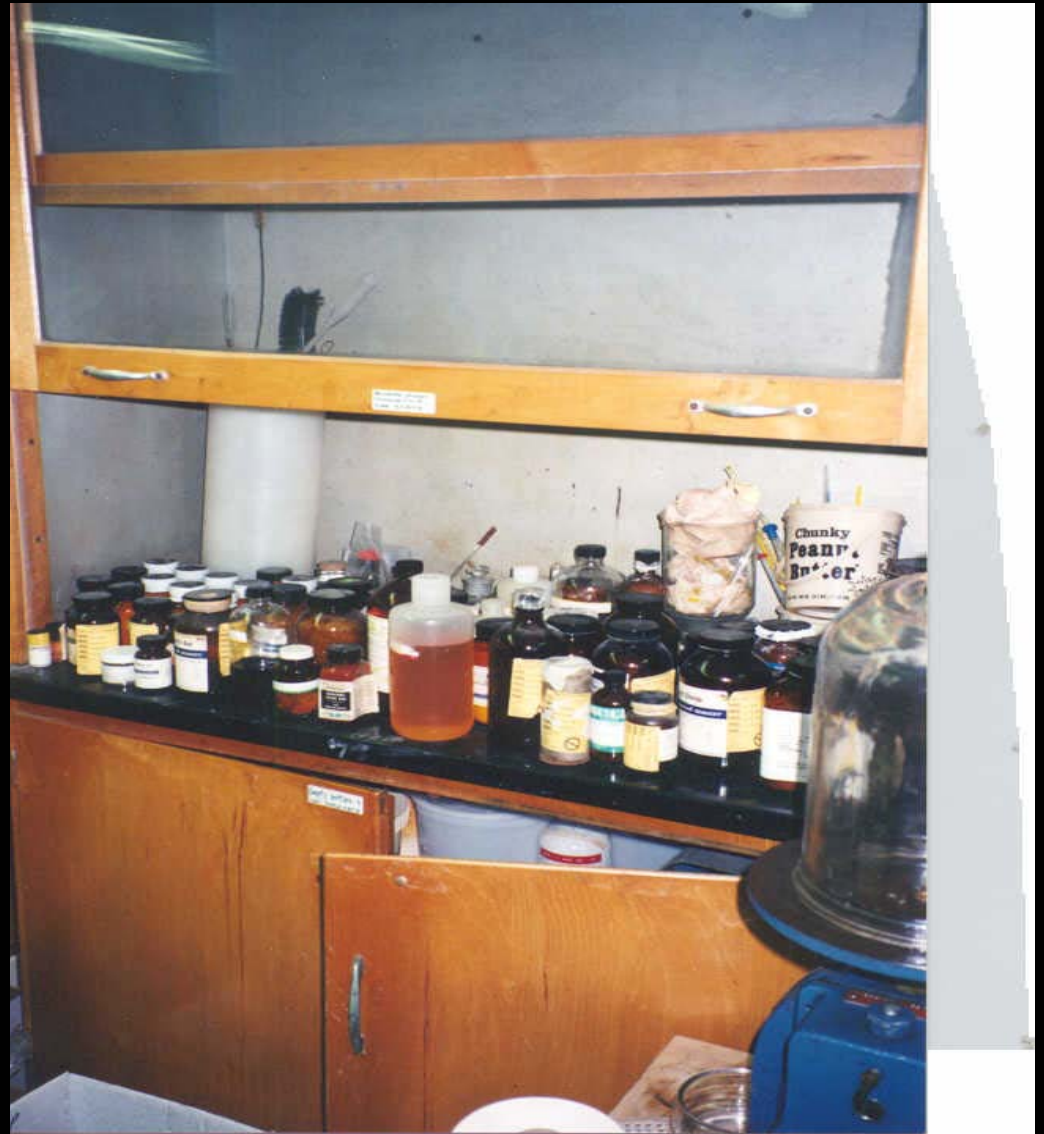


Special Case : Acutely Toxic



Imminent Risk Nitric Acid + Cyanide

Dysfunctional Fume Hood



**Nitric
"Sombrero"**

or...

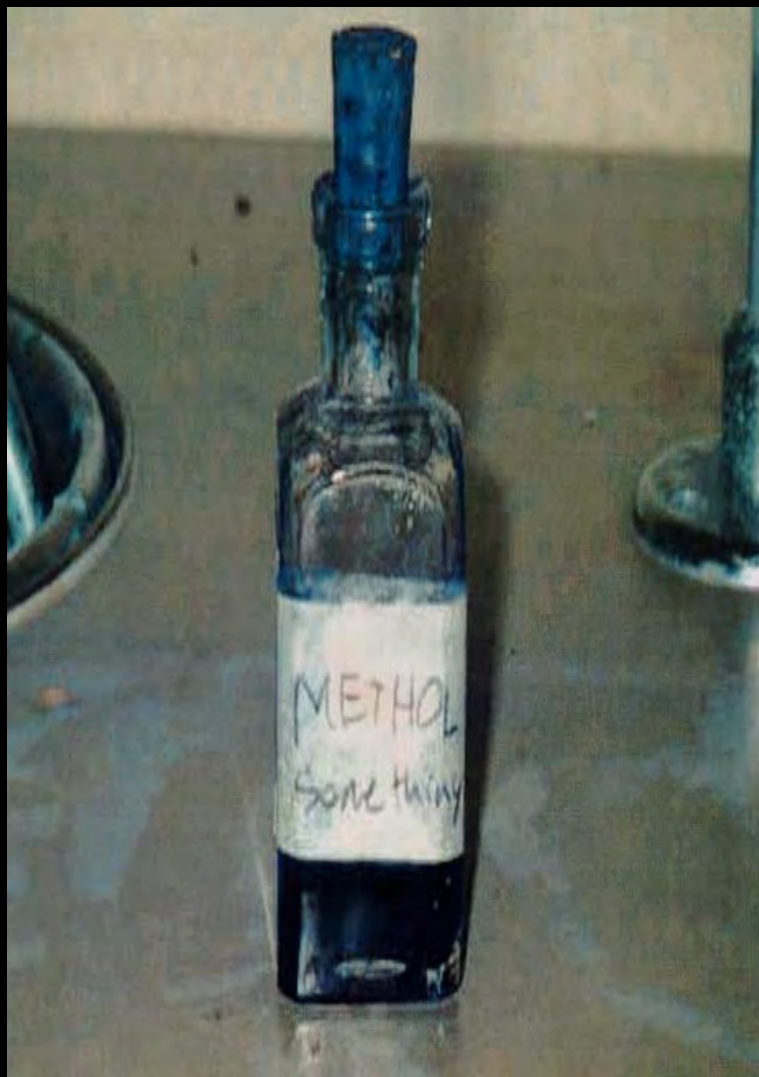
**Nitric
"Gnome"**



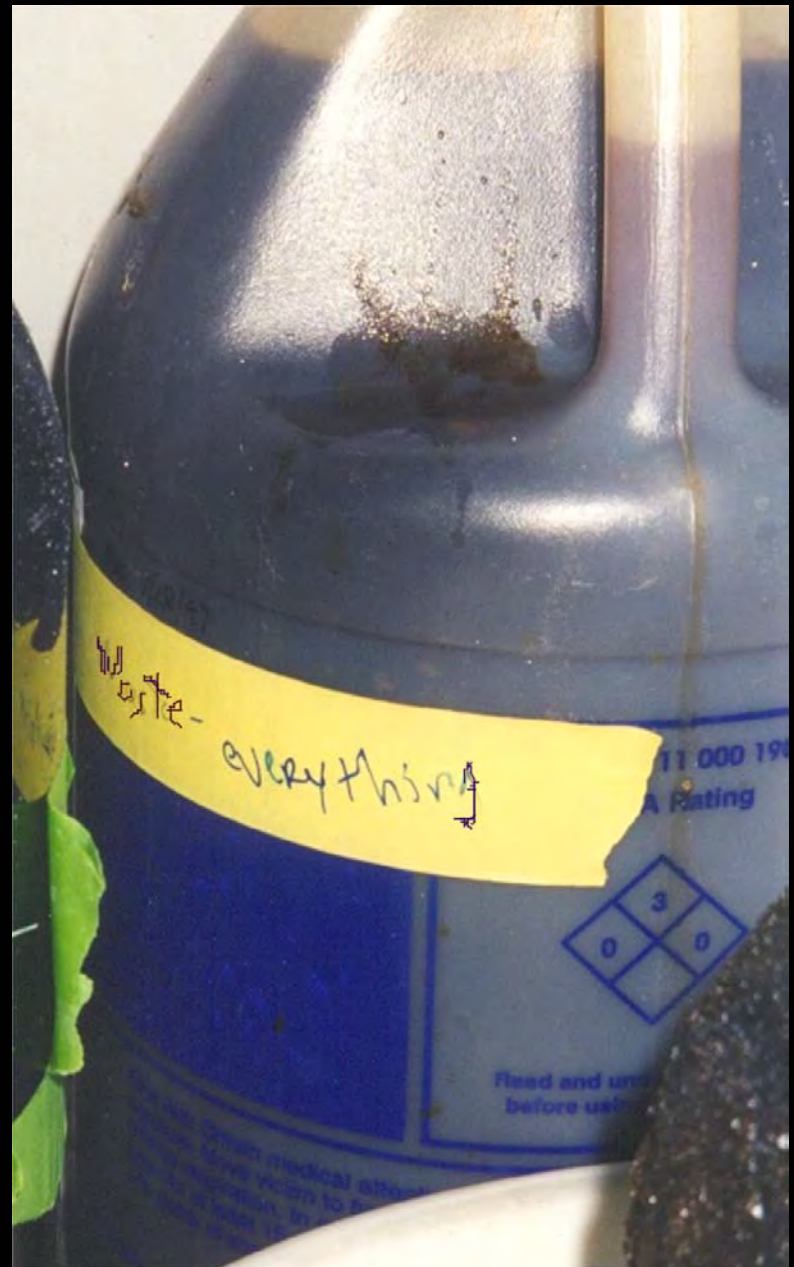
Improper storage of water reactive



At least we know it's organic....



What IS it????



You're Probably Already Convinced That the Situation Requires Action

- **Timeframe**
 - Short term
 - Longer term
- **Actors**
- **Actions**

Short Term Actions

- Learn about chemical hazards
today's presentation is just the first step
- May be requirements at various levels
 - Federal (e.g. OSHA HazCom, Chem RTK)
 - State
 - Local (e.g. building or fire code)
 - District

Short Term Actions

- **Build awareness in**
 - Administration
 - Business Officials
 - Purchasing
 - Facilities / Maintenance
- **Elements to build awareness of**
 - Issue is important
 - It needs attention
 - It needs funding

Short Term Actions

- **Work with professionals to identify hazards**
- **Get rid of the Stockpiles**
 - **Prescreen**
 - **Inventory**
 - **Remove chemicals**
 - **Hazardous**
 - **Outdated**
 - **No longer needed**

Short Term Actions

- **For inventory remaining**
 - **Obtain and Maintain Material Safety Data Sheets**
 - **Keep 1 set in lab**
 - **Keep 1 set in office**

Longer Term Goals

- **Develop a chemical management system**
 - **Purchase**
 - **Storage, including labeling**
 - **Use, including labeling**
 - **Disposal**
 - **Emergency Planning – spills, explosions, accidents**

Longer Term Goals

- Use safer chemicals & less too
 - Order min quantities, consistent with use
 - Try to keep only 1 year's worth stock
- Prohibit certain chemicals period
(hazard potential outweighs educational potential?)

e.g. IDPH “Dirty Dozen”

- Barium chloride
- Benzene
- Carbon disulfide
- Carbon tetrachloride
- Cyanide compounds
- Formaldehyde
- Hydrofluoric acid
- Mercury & compounds
- Picric acid
- Potassium metal
- Sodium metal
- Thermite

e.g. From King County, WA

- **King County, Seattle, WA, Rehab the Lab, Database of School Chemicals:**

<http://lhwmp.org/HWApp/projects/schools/ChemList.aspx>

Longer Term Goals

- Order “safer” alternatives, packaging, dilutions, kits
 - Green chemistry
 - Microscale approaches (e.g. spot plates instead of test tubes)
- Centralize inventory/purchasing

Longer Term Goals

- **Develop and maintain chemical hygiene plan for lab chemicals (*at least*)**
- **Chemical Hygiene Plan identifies**
 - **Responsibilities**
 - Administration
 - Teachers
 - Students
 - **Basic rules and procedures**
 - Safety
 - Handling of hazardous materials
 - Spill procedures
 - Waste procedures
 - Training

Longer Term Goals

- Chemical hygiene plans intended for the protection of EMPLOYEES
- Model plan (IL) at http://www.isbe.net/ils/science/pdf/science_safety.pdf
- Inform school or district chemical hygiene plan

Longer Term Goals

- **Regularly budget for removals (Cradle to grave)**
- **Address chemical issues in context with other environmental concerns**

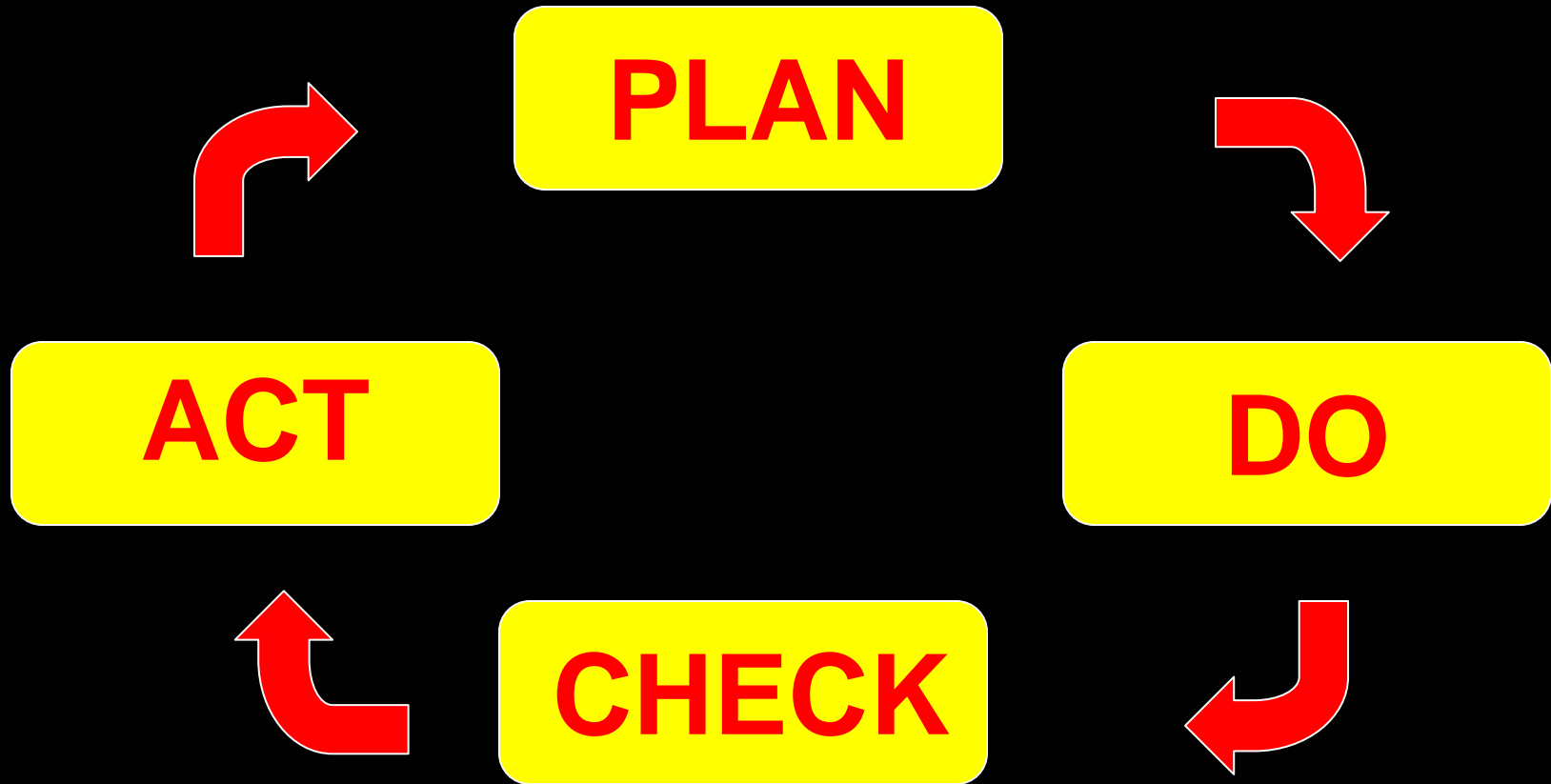
Need To See “The Big Picture”

- **Chemical management can affect**
 - **Safety**
 - **Health**
 - **Indoor Air Quality**
- **Chemical mismanagement can affect**
 - **Drinking Water Quality**
 - **Stormwater Quality**
- **Environmental stewardship**

Need To See "The Big Picture"

- **Look At Chemical Management as part of bigger set of EHS Issues (e.g.)**
 - Poor IAQ
 - Pests /pesticide use
 - Mold
 - Deferral of maintenance
 - Funding
- **Environmental Management Systems (EMS) - puts issues in context & addresses continuous improvement**

Environmental Management System Approach



Special Case : Mercury

- Schools should get rid of mercury
 - Bulk
 - Equipment
- Any Hg spill greater than 1 fever thermometer is a LARGE spill – **get help!**
- Any Hg spill greater than 2 TBS must be reported

Any time one pound or more of mercury is released to the environment, it is mandatory to call the [National Response Center \(NRC\)](#). The NRC hotline operates 24 hours a day, 7 days a week. Call (800) 424-8802. Note that because mercury is heavy, only two tablespoons of mercury weigh about one pound

In Cleaning Up Small Hg Spills

- Never use
 - Broom
 - Vacuum cleaner
- Don't pour down drain
- <http://epa.gov/mercury/spills/index.htm>

Resources

- School Chemistry Laboratory Safety Guide, Consumer Product Safety Commission (www.cpsc.gov) and National Institute for Occupational Safety and Health (<http://www.cdc.gov/NIOSH/>) : <http://www.cdc.gov/niosh/docs/2007-107/pdfs/2007-107.pdf>
- Material Safety Data Sheets <http://www.siri.org/>
- Flinn Scientific <http://www.flinnsci.com/>

More Resources

- Council of State Science Supervisors
 - Making the Connection
 - Science Safety: It's Elementary
 - <http://www.csss-science.org/safety.shtml>
- Rehab the Lab, Safe labs that don't pollute
<http://www.govlink.org/hazwaste/schoolyouth/rehab/>

Still More Resources

- EPA's School Chemical Cleanout Campaign
www.epa.gov/sc3
- EPA's Healthy School Web Portal
www.epa.gov/schools
- EPA's Mercury Web Site
www.epa.gov/mercury
- Mercury in Schools Project
<http://www.mercuryinschools.uwex.edu/>