

# Mercury-free and Non-hazardous Alternatives for Schools

Your school might contain mercury and other hazardous materials that have been used in the past or might still be used for teaching and other purposes. Hazardous materials can be found in many areas, including science labs, art rooms, maintenance areas, nurses' offices, and home economics rooms. They might be dangerous because of their toxic, flammable or reactive properties. If these materials are being handled, stored or disposed of improperly, they can pose a risk to students, staff and the environment.

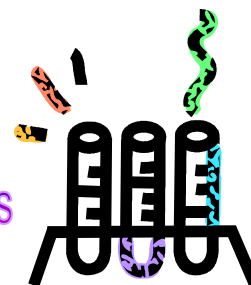
This fact sheet is designed to help schools identify and find alternatives to mercury and other hazardous materials that might be present in your facilities. There are many adequate substitutes that exist for devices used in schools that contain mercury.

## Auto body Class, Industrial Arts Class, and Wood and Metal Shops

<b>Item</b>	<b>Alternative</b>
Mercury gauges	Electronic or aneroid gauges
Manometers, carburetor synchronizers, other pressure-measuring devices	Aneroid and electronic manometers and analog gauges (also known as vacuum gauges)
Switches in electrical equipment, relays, boilers, cooling and heating equipment, mercury-containing wall-mounted light switches manufactured before 1991 ("silent" switches)	Mercury-free switches, temperature devices, and relays; and gas equipment with electronic ignitions
Solvent based products	Water-based or bio-based solvents
Lubricants	Bio-based lubricants
Wood preservatives with pentachlorophenol	Untreated wood and non-wood alternatives



## Biology, Chemistry, Physics and Science Rooms



Item	Alternative
Elemental mercury	
Mercury barometer	Aneroid and digital; new liquid one is being developed
Mercury compounds Mercury (II) chloride Mercury iodine Mercury nitrate Mercury oxide Mercury (II) sulfate	Magnesium chloride/sulfuric acid or zinc Formalin Freeze Drying Phenate method Ammonia/copper sulfate, neosporin, mycin Copper catalyst silver Nitrate/potassium/chromium (III) sulfate
Mercury gas law apparatus	A simple Charles' Law apparatus may suffice.
Mercury hydrometer	
Mercury hygrometer	Spirit-filled glass bulb , digital and aneroid
Mercury lab thermometer	Alcohol and mineral spirits glass bulb, and digital
Mercury molecular motion device	
Mercury sling psychomotor	Mineral spirits glass bulb thermometers, some can fit in old frames
Hg spectral tube	16 alternative gases are available
Mercury vacuum gauge	Needle or digital gauge
Zenker's solution (mercury chloride)	Zinc formalin
Colorimetric chloride analysis	Ion-selective electrode method
Residual mercury may be present in drains, traps, and catch basins	Properly clean traps and basins. Recycle mercury.
Formaldehyde or formalin	Formaldehyde-free preservatives
Solvents	Water-based or bio-based solvents

## Heating, Ventilation and Air Conditioning Laboratories/Classrooms

Item	Alternative
Mercury thermostats	Air-controlled, reed switch, vapor-filled diaphragm, snap-switch and programmable electronic (digital)
Mercury U-tubes	Electronic and aneroid gauges
Mercury switches	Hard-contact switches, solid-state switches, electro-optical switches, inductive sensors, capacitive sensors, photoelectric sensors, and ultrasonic sensors
Mercury thermostat probes	Electric flame sensors, electronic ignition
Float switches	Magnetic dry reed switches, optic sensors, and mechanical switches

## Home Economics Classrooms

Item	Alternative
Mercury cooking thermometer	Spirit-filled glass bulb, and digital
Washing machine (power shut off)	Mechanical switch
Freezer light	Mechanical switch
Flame sensor on gas oven	Electronic ignition
Steam iron with 15 minuet shut-off (tilt switch contains mercury)	Iron with non-mercury switch



## Art Classrooms

Item	Alternative
Cadmium vermillion red paint	Mercury-free and cadmium-free paint
Ceramic glazes	Lead and cadmium free glazes
Dyes (cold water and commercial)	Vegetable dyes
Inhalation hazards (e.g., clay in dry form, powdered pains, glazes, pigments, wheat paste, and aerosol products)	Wet or liquid non-aerosol products
Instant papier-mache	Papier-mache made from black and whit newspaper and library or white paste or flour and water paste
Solvent-based glues	Water-based glues
Solvent-based paints	Water-based paints
Permanent markers	Water-based markers
Polymer clay (designed to harden at conventional oven temperatures)	Paper-based, flour-based or wax-based clays
Low-temperature modeling clays (may contains glycol ethers or primary phthalate ethers)	Paper-based, flour-based or wax-based clays
True vermillion paint (contains mercury sulfide)	Mercury-free paint
Wood stains	Water-based wood stains
Moth repellants (for textiles)	Cedar chips, eucalyptus oil
Pigments used in printing inks, oils paints, and other media	Cadmium-free, lead-free and mercury-free alternatives are available
Solders for silver jewelry	Cadmium-free solder for silver jewelry
Stained-glass solders	Lead-free solder



## Medical Technology Classrooms and School Medical Offices

Item	Alternative
Fever thermometers	Digital, gallium-indium-tin thermometers, dot matrix thermometers, alcohol thermometers
Blood pressure devices	Digital or aneroid
Topical disinfectants containing mercurochrome or tincture of mercurate	Alcohol or hydrogen peroxide
Contact lens solution containing thimerosal, phenyl mercuric acetate or phenyl mercuric nitrate	Thimerosal-free, phenyl mercuric acetate-free or phenyl mercuric nitrate-free contact lens solution
Nasal sprays containing thimerosal, phenyl mercuric acetate or phenyl mercuric nitrate	Thimerosal-free phenyl mercuric acetate-free or phenyl mercuric nitrate-free nasal sprays

## Non-educational Items Containing Mercury



Item	Alternative
Thermostats	Air-controlled, reed switch, vapor-filled diaphragm, snap-switch and programmable electronic (digital)
Fluorescent lamps	No alternative; properly recycle
Mercury vapor lamps	No alternative; properly recycle
Metal halide lamps	No alternative; properly recycle
High-pressure vapor sodium lamps	No alternative; properly recycle
Mercury gauges	Electronic or aneroid gauges
Light switches (“silent” switches)	New light switches don’t contain mercury
Mercury switches and relays	Switches and relays with electronic ignition
Mercury thermostat probes and flame sensors	Hard-contact switches, inductive sensors, capacitive sensors, photoelectric sensors, and ultrasonic sensors
Old latex paint (purchased prior to 1992)	Properly dispose
Fungicides (purchased prior to 1994)	Properly dispose
Pesticides (purchased prior to 1994)	Properly dispose

*The content of this section was adapted from “Mercury-free Alternatives for Schools,” Illinois Environmental Protection Agency, November 2002. Doc #IEPA/OPP/11-2002.*