nontoxicprint

Health in the Arts

LASER-CUTTING-SAFETY 3D PRINTING

Safer Substitutes in Art

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Waste Reduction

Artists work with many materials to create art. Certain art materials can be hazardous both to the user and to the environment. The best way of eliminating waste art materials is through source reduction - the elimination of hazardous or non-hazardous wastes before they are created. Reuse and recycling are also good methods of reducing waste. Several ways that art students and teachers can address this issue are listed below:

Substitute art materials that are less toxic to the environment - and also less toxic to the students;
Completely use up art materials. Purchase in container sizes that do not leave lots of residue.
Reuse or recycle art materials whenever possible.
Treat hazardous waste art materials by neutralization (see photography section) or other methods when possible to reduce the toxicity of the waste stream.
Understand that substitutions may involve using alternative art materials and techniques. It may take a little time to get used to these alterations. Also, remember that the safety of all recycled materials should be determined before use.
This poster contains general and specific recommendations for safer substitutes in art.

Elementary School Students

Some art materials are dangerous for young children to use. Basically, young children should only use art materials that are non-toxic. This poster recommends that young children use art materials that do not have any warning labels and carry the statement "Conforms to ASTM D-4236" or similar wording. Products that have been approved by a toxicologist and carry the Certified Product (CP) or Approved Product (AP) seal of the Arts and Crafts Materials Institute are generally approved for young children.

This poster shows safe art materials that can be SUBSTITUTED for the more hazardous ones in elementary school

classes. Young children should not use any processes discussed under secondary schools unless also approved for elementary school students, at the top of each arts category.

Secondary School Students

Art materials used in the junior and senior high school levels are often more toxic. This poster shows safe and less toxic art materials that can be used to replace more hazardous materials. Please remember that sometimes the substitute materials can still be hazardous - just less so! Make sure that the label carries the statement "Conforms to ASTM D-4236" or similar wording, indicating that the warning label conforms to the requirements of the Labeling of Hazardous Art Materials Act of 1988.

Since many art materials recommended here still might be hazardous, although to a lesser degree, secondary school students and teachers may still need to take health and safety precautions when using art products. These precautions may include types of ventilation, gloves, respirators (face masks), and other safety precautions. Remember to take the right safety precautions! (See references.)

Ceramics

Elementary School Students

Clays *Use only wet, pre-mixed clays. White Clays
*Use only talc-free clays.
Glazes

*Paint finished pieces with acrylics or tempera instead of glazing.

*Use CP/AP lead-free liquid glazes

Secondary School Children Through Adult

Clays *Use only talc-free, pre-mixed clays. Glazes *Use only lead-free glazes. Colorants *Use glazes that do not contain carcinogenic nickel, cadmium, uranium, chromates, or talc.
Waste Clay
*Cut into small pieces and place in a barrel of water for recycling. Waste glazes
*Combine residual glazes and reuse.

Painting and Drawing

Elementary School Students

Paints *Use CP/AP water colors, tempera, and acrylic paints, not adult paints. Scented markers
*Do not use because they teach children to smell and eat art materials. Permanent markers
*Use CP/AP water-based markers. Pastels, chalks *Use CP/AP oil sticks, crayons, chalks, and colored pencils.
Spray Fixatives
*Use CP/AP clear acrylic emulsion to fix drawings.
Rubber Cement
*Use glue sticks or double-sided tape.

Secondary School Students

Painting

Pigments

*Use pigments that do not contain lead, cadmium, mercury, arsenic, chromates.
*Use pre-mixed paints.

Oil Paints

*Use water-based paints.
*Replace turpentine washes with acrylic underpainting.

Spray Paints
*Brush or spatter paints.
Solvent Cleaning
*Use baby, vegetable, or mineral oil instead of solvents to clean hands and brushes.
Turpentine*Use turpenoid, oderless paint thinner, or odorless mineral spirits.
Waste Solvents
*Reuse solvents by allowing to settle, then filtering or decanting.
Drawing Pastels
*Use oil pastels instead of dry pastels.
Drawing Inks
*Use water-based inks, not solvent-based inks.
Permanent Markers

*Use CP/AP water-based markers.
*Use alcohol-based markers instead of markers based on toluene or methyl isobutyl ketone.

Commercial Art

Elementary School Students

Scented Markers *Do not use because they teach children to smell and eat art materials. Permanent Markers
*Use CP/AP water-based markers. Rubber Cement *Use glue sticks or double-sided tape. Glues *Use CP/AP glues for collage.

Secondary School Students

Painting/Drawing materials *Use water-based paint and inks instead of solvent-based ones.
Airbrushing *Use a tooth brush to spatter paint. Don't airbrush solvent-based inks or dyes. Permanent Markers
* Use water or alcohol-based markers instead of markers based on toluene or methyl isobutyl ketone.Rubber Cement

* Use waxers or double-sided tape instead of rubber cement or spray adhesives.
* Use kneaded eraser to remove wax from mechanicals.
* Use heptane-based adhesives instead of hexane-base types.

Photography

Elementary School Students

Photochemicals
*Use polaroid cameras without transfer manipulation.
*Send film out to be developed.
*Do sungrams with blueprint paper and sunlight.

*Do photocopier art.

Secondary School Students

Black and White Processing

Developer *Use only Metol/hydroquinone developers or the less toxic phenidone/hydroquinone developers.
*Use replenishment solutions to reuse chemicals.
*Neutralize with stop bath or citric acid before disposal.
Stop bath
*Use water only, instead of acetic acid.
Fixers

*Use low acid fixers instead of high sulphur dioxide rapid fixers.
*Recover silver from fixer if using large amounts.

Reducers*use only Farmer's reducer (potassium ferricyanide)
Intensifiers*Do not use intensifiers because of their high toxicity.
Toners*Do not use toners because of their high toxicity.
Hypo eliminators
*Use water or hypo clearing agents for washing.

Color Processing

Color Developers *Do not use phenylene diamine developers. Solvents *Use only low solvent color processes.
Formaldehyde*Do not use formaldehyde stabilizers.

Blue Printing

Fixer *Use dilute hydrogen peroxide instead of dichromates for fixing.

Metal Working

Elementary School Students

Jewelry *Bend metal wire instead of soldering. Stained glass
*use colored cellophane and black paper to imitate colored glass and lead came.

Secondary School Students

Jewelry

Silver solder *Use cadmium-free silver solder. Fluxes*Use borax instead of fluoride-based fluxes. Pickling baths
*Use sodium hydrogen sulfate (Sparex) instead of sulfuric acid.
*Neutralize bath with baking soda (sodium bicarbonate) before pouring down the sink with lots of water. Test with pH paper.

Enameling

Enamels *Use only lead-free enamels. Enamel colorants
*Use enamels that do not contain nickel, cadmium, uranium, arsenic or chromates. Waste enamels
*Combine and reuse.

Metal Casting

Lead *Do not cast lead or lead-containing metals. Sand blasting
*Use glass beads or alumina instead of silica sand. Asbestos*Use asbestos-free insulation. SIlica investment
*Use plaster and sand mixture.

Stained glass

Lead Came *Use copper foil technique. Lead solders
*Use lead and antimony-free solders. Fluxes*Use acid-free an rosin-free fluxes. Glass paints
*Use colored glass or lead-free paints.

Welding

Metals *Weld metals like mild steel that are not galvanized, or do not contain lead, nickel, chromium, or cadmium.
*Use only found metals of known composition.
*Do not use metals coated with lead paint.
Fluxes*Do not use fluoride fluxes.
Degreasing*Degrease metals with detergents or odorless mineral spirits instead of chlorinated hydrocarbons.

Printmaking

Elementary School Students

Screen printing

*Use CP/AP water-based inks.
*Use cut paper stencils

Relief printing
*Use linoleum cuts instead of woodcuts.
*Use CP/AP water-based inks.

Secondary School Students

General

Pigments *Use pigments that do not contain lead, cadmium, mercury, chromates or arsenic.
*Use pre-mixed inks.
Cleaning solvents

*Use odorless mineral spirits instead of turpentine, kerosene, or gasoline.
Screen printing

Inks *Use water-based inks instead of solvent-based inks. Stencils*Use cut paper, contact paper, etc. instead of laquer stencils.

Screen mounting
*Use staples or tape instead of solvent-based glues.
Photoemulsions*Use diazo photoemulsions or presensitized photo film.

Intaglio

Acids *Use ferric chloride (iron perchloride) instead of Dutch mordant. Dutch Mordant

*Neutralize nitric acid baths with baking soda before pouring down sink. Test with pH paper.
Cleaning Solvents
*Scrape inking slab and press with palette knife to reduce amount of ink, remove remaining ink with vegetable, baby, or mineral oil, and wipe oil film with cotton ball and rubbing alcohol for cleanup.
Photoetching*Use pre-sensitized plates or xerox transfer/screen process instead of techniques that use highly toxic solvents.

Lithography

Acids *Use pre-mixed gum etches instead of using concentrated acids.
Vinyl laquers
*Do not use because of high toxicity.
Dichromates* Use fountain solutions based on water and gum arabic.
*Use citric acid as counter-etch.
Hydrofluoric acid
*Do not use because of extreme toxicity.
Talc*Use asbestos-free talcs (e.g. baby powder).
Phenol*Use mechanical cleaning of stones.
Photolithography*Use positive/negative re-sensitized offset plates.

Woodworking

Elementary School Students

Woods *Use only common soft woods. Glues*Use CP/AP glues.
Paints*Use CP/AP water-based paints.

Secondary School Students

Preserved *Do not use woods treated with chromated wood copper arsenate (CCA), pentachlorophenol, or creosote.
*Use ordinary woods.
Particle board
*Use ordinary woods to avoid and plywood.
Tropical woods
*Use non-allergenic and non-irritating woods.
Leftover wood
*Recycle into new projects.
Glues*Use white glues, hide glues, and other water-based glues instead of epoxy, formaldehyde, or solvent-based glues.
*Use small containers to minimize drying out of glue.
Paints and Coatings
*Use water-bawsed products instead of solvent based ones.
*Use lead and mercury-free paints.
Shellac*Use shellacs containing denatured alcohol, not methyl alcohol.
Oil & Solvent
*Recycle by drying or sending to a recycling soaked rags laundry.

Sculpture

Elementary School Students

Modeling clays *Use pre-mixed clay or CP/AP modeling materials. Papier mache *Use black and white newspaper with

CP/AP pastes or CP/AP instant papier maches made from cellulose.

Secondary School Students

Clay *See Ceramics

Plastics

Plastic resins *Do not use polyester, epoxy, acrylic, or polyeurethane resins because of high toxicity. Solid plastics
*Use saws instead of hot wire or torches.

Stone

Soapstone or seatite Carve alabaster or cast plaster.

Wax

Waxes Use beeswax or petroleum waxes, not chlorinated waxes.

Textile and Fiber Arts

Elementary School Students

Synthetic Dyes *Use vegetable dyes (spinach, tea, onoin skins, etc.) or food dyes. Synthetic Fibers
*Use fibers that have not been treated with formaldehyde sizings.
Textile remnants
*Left-over textile scraps can be used for stuffing pillows or soft sculture projects.

Secondary School Students

Fibers

Animal fibers *Use hair and wool not imported from the Middle or Far East because of anthrax.

Dyeing

Mordants *Use non-dichromate mordants. Fiber-reactive dyes
*Use liquid fiber-reactives, not powders.
French dyes
*Use water-based dyes. Leather dyes
*Use leather dyes containing denatured alcohol rather than other solvents.

Batik

Wax *See Sculpture, wax Dyes*See Dyeing Solvents*Boil out or iron out wax instead of using solvents.

Papermaking

Woods, plants *Use non-allergenic and non-irritating materials.
*Recycle used paper and cardboard, or use rotten or mulched plant material to about boiling in alkalai.
Lye*Use soda ash (sodium carbonate) not lye.
Dyes and Pigments
*Use liquid dyes and pigments instead of powders. See also Dyeing.

References

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