

GUIDE TO POTTERY SAFETY IN SCHOOLS

General information

Pottery presents some specific hazards that need to be assessed and handled properly to protect the health of staff and students.

Working with Clay

Crystalline silica, a substance that is present in clays and also some glazes and plasters, is one of the biggest health hazards to be aware of. When these products dry out, dust forms that can be breathed deeply into the lungs causing a wide range of health problems. Long-term (chronic) inhalation of silica dust may lead to serious health issues.



Depending on where they are mined, some clays and the talcs added to them may also contain asbestos, another serious inhalation hazard. Clay scraps on the floor, benches, pottery wheels, machines and other surfaces can dry, break and pulverize, producing dust. It is very important to **keep the dust as low as possible** by excellent management and damp cleaning of the pottery room.

Glazing

Glazes used to color or finish clay pieces may contain a wide range of hazardous chemicals such as lead, barium, lithium, chromium, cadmium, nickel, arsenic, antimony, cobalt, manganese, or vanadium, among others. Most of these chemicals are toxic and their dust presents an inhalation hazard; some are known or suspected human carcinogens.

Each color's composition is different, so a separate Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) is needed for each glaze to determine its specific hazards. Weighing and mixing dry glazes or letting liquid glazes dry out can result in dust formation, creating the potential for inhalation of toxic materials. Dipping, pouring, and brushing certain glazes may cause skin irritation or accidental ingestion of small amounts due to careless personal hygiene habits. Staff and students should wash their hands after working with glazes. A glaze labeled "lead-safe" means that the finished ware, if fired properly, will not release lead into food or drink. The actual glaze may still be hazardous to handle and fire, and may contain lead. Also, keep in mind that "lead free" does not mean that the glaze is also free of the other toxic heavy metals listed above.

Firing in a Kiln

Firing of pottery in a kiln may release a complex mix of potentially hazardous chemical vapors and fumes that change with the temperature. Highly toxic, potentially fatal carbon monoxide may form when organic material present in clay is burning out or when organic materials such as paper, branches, or leaves are added to the kiln for the raku process. Heat produced by even small electric kilns may produce burns or cause fires in the room in the presence of combustible materials or flammable liquids.

Besides general room ventilation, kilns must have proper, dedicated exhaust systems and it is strongly recommended that they be located in a separate room. Only properly trained adults should fire the kilns, and should do so when students are not present. All safety rules should be followed. The exhaust fan dedicated to the kiln area must be "on" at all times during firing and must exhaust the vapors and fumes outside the building, higher than the building's roof and away from air intakes. When exhaust fan is on, "fresh" make-up air needs to be introduced to the room. See our article on [Kiln Ventilation](#).

Leaching of Hazardous Chemicals

When used for eating or drinking, hazardous chemicals may leach from finished products into food or drink, especially acidic materials, such as orange juice. It is not enough to check glazes only for "lead free" signs, because other toxic heavy metals may also leach.

GUIDELINES FOR POTTERY SAFETY

It is strongly suggested that the following guidelines are discussed by administrators, teachers and custodians involved.

It needs to be clear what the responsibilities of each person are, for example classroom management, cleaning different areas, maintaining general ventilation and exhaust system or installing, checking on and maintaining carbon monoxide detectors.



Ordering, Storage, and Training

- **Inventory.** Keep an up-to-date inventory of all chemical products.
- **Labeling.** All containers must be properly labeled. The label has to show the name of the product, the components of the material, the hazards associated with it, and proper protection to be used. Never purchase clays, glazes, or any other chemicals that don't have proper labeling.
- **Material Safety Data Sheets (MSDS/SDS).** Every product needs to have a current MSDS/SDS on file and readily available in the pottery room. Staff should read the SDS before purchasing materials and choose only clays and glazes that present the lowest potential health hazards. Staff should protect themselves and students from the hazards as directed by these documents and by their districts. Labels and SDS need to comply with the [new GHS of hazard communication](#).
- **Clay.** Purchase only premixed wet clay slabs that don't contain asbestos and have the lowest crystalline silica content possible. Handling of wet clay is safe; the danger lies in the dust formed when the clay dries out and pulverizes.
- **Glazes.** Use only lead-free glazes. If the glaze does not state "lead-free" or "leadless" on the label, assume it contains lead. Be aware that "lead free" does not mean the glaze is also free of other hazardous chemicals. Try to use only glazes with calcium, magnesium, potassium, and sodium fluxes and minimize the amounts of toxic heavy metal colorants. (See the section on **Glazes** above.) Do not use flammable, solvent-based glazes. Use only premixed liquid glazes to avoid exposure to dust.
- **Storage.** Clay storage and mixing/recycling should take place in a separate room. Bags of clay and other pottery materials should be stacked on pallets or grids off the floor for easier clean-up. Watch for overhead storage. Nothing should be stored higher than eye level. Heavier or more hazardous items need to be stored on the lowest shelves. All containers and bags must be closed when not in use. Do not let liquid products dry out by leaving them in open containers.
- **Clay Scraps.** Store clay scraps in closed containers and prevent accumulation of scraps and smears on the floor, benches, tabletops, machines and other surfaces. Provide a sufficient number of containers so they are not overfilled, scraps don't fall off, and are not stored on the floor. Have lids and keep scrap containers closed. Immediately pick up pieces of clay.
- **Education and Training.** Employees who use or order chemicals, including art materials, need to go through proper chemical hazard communication training. Teachers need to provide regular safety training to the students, and consistently supervise them to ensure that the safety guides are followed.

Best Practices

- **Hygiene.** Teachers and students must practice good hygiene habits, such as: (1) not eating or drinking in the pottery shop, (2) keeping bags, backpacks, and coats in a designated area, separate from the pottery chemicals, and (3) practicing good hand washing habits, preferably including nail brushing to completely remove clay and glaze left over under fingernails.
- **Housekeeping.** Good housekeeping should prevent dust accumulation and tracking. Students need to carefully clean up after themselves at the end of each period. This includes picking up and putting away clay scraps into

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designated storage containers, and damp wiping the tables until they are truly clean and streak free. Wet mop and wet wipe surfaces daily. Keep recycling mixer machine clean and lid closed.

- **Spills.** Clean up spills immediately to reduce the risk of formation, inhalation or ingestion of dusts. Wet wipe or mop spilled powders.
- **Attire.** The teacher should wear separate work clothes while in the pottery room. Choose clothes made of material and design that won't trap dust. Wash these clothes weekly and separate from other laundry. At minimum wear a lab coat over regular clothes. Gloves should be worn while handling wet or dry glazes.
- **Allergies and Skin Irritation.** Avoid pottery work when skin is broken, irritated or other skin problems are present. Ask students about allergies, asthma, or skin problems and consider their condition when engaging them with pottery.
- **Ergonomics.** To prevent back problems, always lift with knees bent and request assistance with heavier items. Keep wrists in un-flexed position as much as possible to prevent strain.
- **Dry Sanding.** Don't do dry sanding of pottery pieces.

Kiln & Ventilation

- **Ventilation.** General ventilation must be "ON" at all times when the pottery room is used. It is the only source of fresh air for the room. Dust in the room can be moved around by a strong ventilation system. The solution is not to turn off the ventilation, but to manage the dust properly at the source.
- **Air Filtering.** If additional air filtering units are used, the filters need to be changed regularly, according to the manufacturer's suggestion. Otherwise the units are ineffective.
- **Pottery Firing.** It is strongly recommended that the pottery be fired by well-trained personnel when students are not present. Follow all safety rules, protect yourself from burns caused by the heat, and make sure that the general ventilation, as well as the designated exhaust and makeup ventilation for the kiln, is "on" and functional.
- **Carbon Monoxide.** Install a carbon monoxide detector in the kiln area. Make sure that it's regularly checked and maintained.

Disposal of Materials

- **Waste.** The majority of pottery materials are considered hazardous waste, so they can't be thrown into the garbage or put down the drain.
- **Drains.** Be aware that drains can easily be clogged by clay dust

Members of the Puget Sound Workers' Compensation Trust can contact our Industrial Hygiene Consultant for further support: ejakab@psed.org or (425) 917-7640.

The above information was generated based on materials from national and local art safety resources, the Washington Department of Occupational Safety and Health (DOSH or L&I) and the Washington State Department of Health.

Last update: December 2016