HAZARDOUS MATERIALS

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Ceramics

The hazards associated with ceramics have been recognized for hundreds of years. They are related to three aspects of the process: preparing and molding the clay, glazing, and firing the clay. Carefully review the Material Safety Data Sheet (MSDS) for the products your students will use, particularly glazing compounds, which often contain some highly toxic compounds. Identify the hazardous components in each product. Teach students how to protect themselves either by reviewing the information on the MSDS or by obtaining one of the references listed on page 9 and reviewing the specific information on the materials being used. The following table describes the potential hazards associated with different ceramic processes.

Activity	Material	Potential Hazard
Mixing dry clay	Dry clay	Clay contains crystalline silica, which if inhaled over the course of many years can lead to the debilitating lung disease silicosis. Loading and mixing dry clay in a clay mixer creates the most likely opportunity for exposure to the silica-containing clay dust.
Mixing dry clay	Talc	Talc added to clay may be contaminated with asbestos or "asbestos-like" fibers.
Mixing dry clay	Clay mixer, bulk materials	Like all mechanical equipment, clay mixers have moving parts that could catch your hand or arm if you reach into it while it is operating. Bags of dry clay and clay additives are heavy; repeated lifting can cause back injuries.
Handling wet clay	Wet clay, potter's wheel	Wet clay is a growth medium for mold and other microorganisms that can cause allergies and infections of the skin or nail beds. Mold can aggravate some pre-existing medical conditions such as asthma. Working with clay for extended periods of time on a potter's wheel can lead to a repetitive trauma disorder of the hand or wrist.
Glazing	Glaze	Glazes are mixtures of silica, alumina, metal fluxes (such as lead, barium, lithium, calcium, or sodium), and colorants. Some colorants contain highly toxic metals such as lead, cadmium, chromium, uranium, and arsenic. These metals should not be used in school programs if at all possible because safer substitutes are available. Many prepared glazes contain frits which are created by melting various glaze ingredients into a glass and grinding them into a powder. Frits containing toxic metals are hazardous and should be handled with caution since they can leach into the body over time and should not be used.
Firing Kiln	Clay	During the firing process, clay releases combustion products and gases whether using a fuel-fired or electric kiln. These emissions include carbon monoxide, formaldehyde, sulfur oxides, chlorine, fluorine, metal fume, and nitrogen oxides. Unless ventilation is excellent, metal fume particles such as lead and cadmium can settle and contaminate other ware and surfaces. In addition, fuel-fired kilns release the products of combustion from their fuel sources.
Firing Kiln	Clay	Infrared radiation emanates from hot (glowing) fired ceramics and can cause cataracts after long periods of exposure. Unloading hot objects from a kiln can cause burns.

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HAZARDOUS MATERIALS MANUAL HTTP://WWW.UDEL.EDU/EHS/RESEARCH/DOWNLOADS/HAZMATMAN.PDF

ONLINE MATERIAL DATA SHEETS HTTP://JR.CHEMWATCH.NET/CHEMWATCH.WEB/DASHBOARD