



STUDENT HANDBOOK

CERAMICS

Revised 8/2021



WELCOME: Center for Community Arts – Ceramics

We welcome you to Ceramics of Center for Community Arts (CCA). It is a place for you and your family to explore and discover. This manual is offered as a beginner's guide to our ceramics studio and community.

History

Ceramics is one of the oldest programs at CCA and the ceramic studio is one of the oldest and largest in the Bay Area. Starting in 1964, the studio has operated in three different locations. The current studio was the old Walnut Festival building used as a theatre. The old box office window is still in place.

At a Glance

The goal of this studio is to offer an educational setting where participants can explore their creativity and learn techniques in ceramics. Beginning, intermediate and advanced students all participate in fostering an open learning environment while developing skills and techniques in ceramics.

Studio equipment includes: 20 electric potter's wheels, 4 cone 10 gas kilns, 2 electric kilns, a raku kiln, a soda kiln, 2 slab rollers, 2 extruders, fully equipped glaze room, and large work areas. Three-hour ceramic classes are offered with over 300 student enrollments per quarter. Regular classes include beginning, intermediate and advanced sections in throwing and hand-building, sculpture, raku and teen classes. The teaching artists are chosen based on ceramic expertise and teaching abilities/experience. Special classes include the Master Potter Series Workshops with distinguished guest artists. The studio also offers an Open Studio class (OS) allowing students extra time to work on their projects outside of their class time. The studio is managed by a Program Coordinator of the city of Walnut Creek and assisted by two staff members.

Introduction: Clay Arts Guild (CAG)

The Clay Arts Guild (CAG) is a 501(c)(3) non-profit consisting of students and supporters of Center for Community Arts for over 50 years. At present there are over 100 members in CAG. CAG members actively work to achieve goals consistent with the original and largely unchanged mission:

- To assist and encourage ceramics students to develop and improve their skills and understanding of the media.
- To contribute actively towards improving the programs of CCA through commappropriate financial and operational aid.

Benefits of your CAG membership

- Reduced registration fee for Open Studio and Master Potter Workshop registration
- Participation in CAG's two studio sales per year.
- Four members-only studio events per year.
- Access to CAG's large lending library of books and DVD's on ceramics.
- CAG's newsletter: Provides news such as events, studio operations, clay tips, and member profiles.

How you sign up

1. Fill out the membership envelope, located on the rack to the right of the studio manager's office door.
2. Enclose a check: amount dependent on quarter (see form).
3. Seal the envelope and give it to your instructor or studio manager.

Studio Courtesies and Policies:

The studio is an educational facility. Production of work for personal commercial gain is counter to the program's goals as well as being against city policy. All participants are expected to act respectful and responsible at all times - please refer to the Arts and Rec Code of Conduct found at the end of this handbook. These guidelines and the below studio policies are meant to support the studio, teaching artists and staff.

- Please learn how to help keep the studio organized and clean. Clean up your area including the floor, return clean studio tools to proper places and generally help keep the studio clean and orderly including the glaze room.
- Please take caution with others' work at every stage of the process, especially in the damp/dry rooms and the greenware and glaze carts. There are a lot of delicate pieces everywhere.
- Clearly mark your work with a name or initial. If not, others may mistakenly take your pieces
- Student clay must be purchased at the studio. The costs also help defray costs of glazes and firings
 - NO outside clay. NO low/mid temperature clay.
 - 2 bags per class per quarter (max) / 4 bags per quarter (max).
 - OS does not count as a class
- Only work originating from this studio will be fired.
- Lockers are assigned each class term, first come/first choice
- Plaster molds are not allowed in the damp room because they decompose over time and other classes during the week need to use them
- No unattended children or pets are allowed in the studio. Exceptions for appropriate service animals are allowed on a case by case basis.
- Safety Leads are on duty during OS hours.
- New students: Please feel free to ask for support and encouragement as this is the foundation of our studio.

Health Guidelines for the Ceramics Studio

- Avoid getting underglazes, glazes and other colorants on your skin. If you do, wash them off with soap & water.
- Avoid inhaling or creating any dust. Work with clay that is wet or leather hard. Avoid scraping or sanding dry clay. If you must sand dry clay, wear a mask and do the sanding outside the studio and clean up the dust.
- Avoid dry sweeping. Try to sponge all clay and glaze splatters, splashes and spills. Wet mop floors.
- Please be aware and protect yourself of potential physical concerns of back, eye and hand injury that can occur in the pottery studio.

Types of Clay

Clay is a naturally occurring substance, mainly silica and alumina, mined from deposits where geological weathering and action of vegetation have caused the breakdown of igneous rocks into a fine silt. Kaolin or china clay is a primary clay that has not seen a lot of action while it was forming. It is white and lacks impurities. It is not plastic. More common is secondary clay (ball, fire, stoneware...), which has had a lot of movement during its formation picking up such materials as iron that causes the color to become darker when fired.

Clay Bodies

A mixture of different clays, feldspars, and grogs or sand - usually following a recipe much like a cookie recipe. When fired high enough clay bodies fuse into a dense material not able to absorb water. This state of clay is called vitrification. The studio stocks 12-14 different clay bodies.

Stoneware - High temperature clay. These types of clay are usually light brown in color and fired to high temperatures or cone 10 (about 2350f). Its plasticity makes it great for pottery or sculpture. Clay bodies with grog or sand can aid in the drying and firing properties.

Brown Stoneware Soldate 60, XX, Sculpture 412, T2, Cinnamon, Black Mountain, Death Valley, Paper Clay,

White Stoneware B-Mix, B-mix w/grog, 6-Tile, Smooth Sculpture, Big Sur

Porcelain Babu

Porcelain - Is a smooth white or translucent clay able to withstand stoneware temperatures. Porcelain takes the glazes well, but is temperamental in the forming process and not usually recommended for beginners.

We DO NOT ALLOW earthenware or terracotta clay in the studio. Its low melting point is lower than the glazes used in the studio and when fired at the higher temperatures, it melts and causes damage to kiln shelves and other people's work.

Daily Clean up:

In order to maintain safe and clean working conditions, every student must clean up their space as well as all tools and equipment used. We ask all participants in classes and open studio to leave the studio cleaner than you found it.

- **Tables and Handbuilding tools:**

Table tops should be free of clay crumbs and drips. Stools should be put on top of table at the end of the night.

- **Wheels:**

Wheels should be returned the way found. Clean, power off, splash pan assembled, foot pedal off the floor and stool on the wheel.



- **Glaze Area:**

All surfaces need to be wiped down and free of drips splashes and film. Glaze buckets need to be returned to the proper place with the tiles facing outward. Stir sticks should be wiped down and all tools returned clean to their proper place.

PLEASE HELP KEEP OUR GLAZE ROOM HEALTHY



Keep bucket rims clean.

Underside of lid.



Top of lid.



Return buckets
tiles facing out.



Thank You!

Vocabulary

Greenware- describes unfired clay.

Leatherhard- Stiff but still moist clay, the strongest stage of unfired clay. Sometimes called “cheese hard”

Bone Dry- This is a stage of greenware where the clay is completely dried. At this stage, it is extremely fragile and must be handled with great care. Pieces that have been broken at this stage cannot be easily reattached.

Bisque Ware- An initial firing of clay which drives off the chemical water found in the clay molecule and permanently changes the clay. Bisqued ware cannot be slaked down and becomes hard. The bisque firing prepares work to be glazed. Work which has been bisque fired is also referred to as bisque.

Oxidation- A firing atmosphere in which sufficient oxygen is present for complete combustion to occur.

Reduction- A firing atmosphere in which insufficient oxygen is present for combustion. The burning fuel robs oxygen atoms from the molecules of the clay and glaze, reducing them to a form with less oxygen (for example, Fe_2O_3 becomes FeO). Most of our glazes were formulated for a reduction firing.

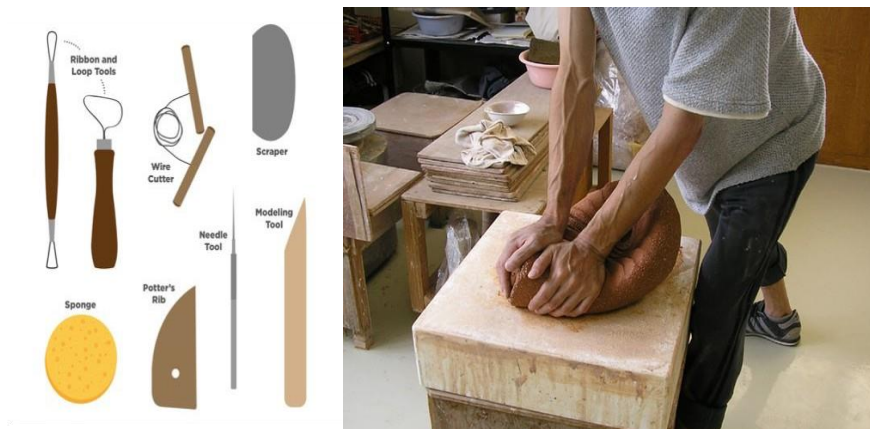
Vitrify- To become glass-like and dense when heated. Vitreous clay is hard and non-absorbent.

Finished Glazed Ware- Work that has been fired twice; once for bisque and one for the glaze.

Studio Tools

Tools are available for purchase in the ceramics studio from instructors or studio manager (cash only).

Tools are usually priced lower than market cost.



Wedging

Before hand-building or wheel throwing clay it is essential to wedge or knead it in order to eliminate air bubbles and make its parts more homogeneous. Clay hardens on the outside surfaces even while in plastic bags which is why wedging homogenizes the clay in preparation for work. Air bubbles within the clay will cause the piece to explode when fired. Learning the skill to wedge with the weight of your body and not just with your arms is a skill that makes the task less tiresome and can make wedging a meditative warm up exercise.

Please note that wedging is usually done on a plaster table. It is important to know that pieces of plaster in your clay causes problems during firing. It is also important to know not to soak the plaster table

with water as it absorbs water and takes a long time to dry and can result in cracking or destroying the table.

Hand-building Techniques

In the beginning it is best to sit with a bag of clay and play, discovering and exploring what you can do with it.

Pinching

Roll your clay into a ball, press in your thumb and you have your first pot. Continue squeezing the clay gently with your fingers rhythmically in circles, opening the hole further, thinning and evening out the walls. This is called making a “pinch-pot.”



Thickness of walls: Generally it is better to make things even-walled (about $\frac{1}{4}$ inch to $\frac{3}{8}$ inch). Larger and thicker (i.e. sculptural) pieces can be made successfully if they are thoroughly dried and fired very slowly. Trapped moisture in the walls is the main cause explosions in the kiln during the bisque firing, while uneven construction is one of the main causes of cracking.

Grog is pre-fired ground up clay that's added to the clay body (at the factory). These are added to the clay to lessen shrinkage which prevents cracks and warping. Poking holes into thicker areas can also help in the drying and bisque firing with cracking and warping.

Coiling

Refers to clay “worms” or ‘ropes’ of clay, which can be handmade or extruded. These can be layered into forms, used as handles, made into sculptures and/or become decorative additions.



When creating a vessel form, the coils can be smoothed together to form a solid wall. Unblended coils can create weak joints which lead to cracks and warping. Coils can also be combined with wheel thrown or hand built pots with interesting, decorative results.

Scoring and Slipping

When joining two pieces of clay, it's best to score and slip pieces before connecting (especially at the leather-hard stage). Scratch the surface to be joined with a sharp tool and apply liquid slip (clay mixed with water and/or a little vinegar).



Slabs

Slabs are sheets of clay that are rolled out with a rolling pin or pressed out with a slab roller. Our studio is fortunate to have a large slab roller. It is important to know how to use the roller, as misuse could necessitate costly repairs.

First, you must decide on the final thickness of the slab. The thickness can be controlled by adding or removing sheets of wood under the top canvas covered board on which you will lay your clay. Before you begin rolling the clay, lay down a piece of oil cloth or canvas flat on top of the slab roller. This will make lifting the slab easier after the rolling is completed.

Next, you must prepare the clay that you are going to roll out by flattening it to a thickness of no more than 2 inches. Place the clay on the bed of the roller and place the cover on top. Now you are ready to begin rolling. Turn the large wheel slowly and steadily to achieve a smooth slab. You will notice that the clay will not spread sideways during the rolling process, so prepare your clay accordingly.



You can also make a slab using a rolling pin and thickness sticks. Simply choose a desired thickness (sticks) and roll clay between the table and the top of the sticks. This is usually the easiest way to make small to medium slabs.

Whether you are using the slab roller or a rolling pin, strive for evenness and usually no more than 3/8 inch thickness. Slabs can be cut into shapes with a pin tool or knife and assembled into forms. Often it is better to wait until slabs have dried to the leather-hard state, which gives body strength before attaching. Scoring and slipping of slab seams is essential. In addition, a reinforcement coil can be attached with slip along the inner seams. Cutting edges at a beveled angle allows more surface to be joined offering more strength in the joint and less bulge. Slabs can also be stretched over plaster hump molds or pressed into press molds.

Wheel Work

Centering

Wheel throwing, in the beginning, involves time developing muscles and understanding the sense of being centered. Remember that it is a skill that takes patience and practice, so do not be discouraged if the clay “wins” for a while. It is important to study the different methods and postures of others in order to find the set of techniques and positions which work for your body weight and strengths.

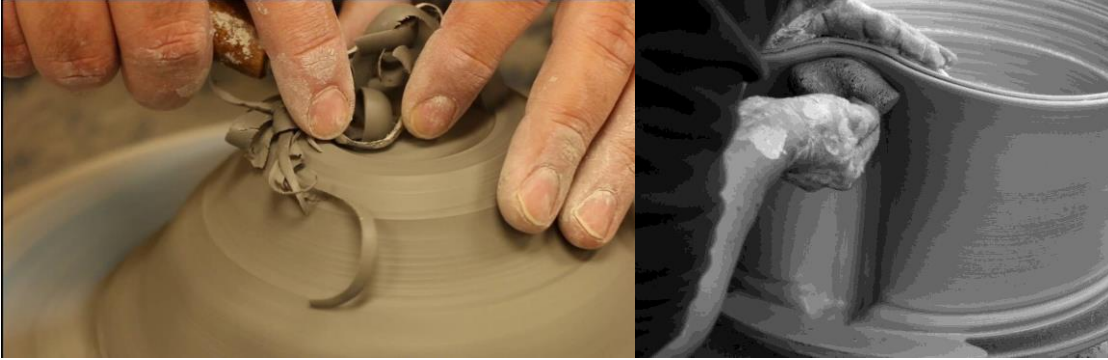


Throwing a Cylinder Diagrams



Trimming

When thrown forms have dried to a leather hard consistency, you can put them back on the wheel, upside down, and trim off excess clay. To do this, you must first anchor your piece on the wheel by gently pushing wads of soft clay around the base to hold it in place. After this has been done, you can trim excess clay off the sides and bottom and carve a foot. Afterwards the pot is ready to have handles attached.



Working With Clay- Altering and Attaching

Successfully altering the thrown form is an acquired skill, but even beginning potters can experience success with a little patience and guidance from the instructor. The illustrations on this page are just a few examples of how you might change the basic, symmetrically formed pot.

Attaching a Handle

If you make a mug, pitcher or lid of a pot, you will probably want to add a handle. There are several ways to do this. The simplest way is to roll out a coil or slab and cut a strip from it. Allow the handle to partially dry with the desired curve before attaching it.

Many potters like to “pull” a handle. This method takes some practice and requires you to imagine milking a cow. Begin by taking a fist-sized lump of clay and placing a pail of water near you. With a wet hand, start to pull on the clay in a downward motion with your fingers wrapped around the back side and your thumb in the front to guide the pulling motion. After each pull, you will need to dip your hand in water. Using the right amount of pressure each time is important. After the desired length is achieved, cut off the handle from the lump and drape it over a curved surface to partially dry.



To attach your handle, refer to the scoring and slipping directions on page 5.

Decorating Techniques - Greenware

Texturing can be rough or smooth. Rough texture can be done by scratching, drawing or pressing into wet or leatherhard clay surfaces with tools, fingers or textured materials such as cloth, woodcuts, shoe prints, lace, rubber letters, i.e. anything that has texture. You can also make designs such as a signature logo out of clay that has been bisqued and then use as a stamp. Clay texture can also be made more coarse or sandy by wedging grog (pre-fired ground up clay) and sand of varying meshes directly into the clay body, or pressing it into the damp surfaces. Colored clays can be bisqued and ground up to make colored grog.

Burnishing: Polishing a damp surface with a polished stone or silver spoon to create a shiny surface without glaze where the particles become tighter together on the clay body surface. It is primarily done on low-fire wares since the burnish diminishes the higher the clay is fired - see photo.

Terra Sig is a specially formulated slip used for pieces that will be fired without glazes. Its ultra-fine texture is ideal for buffing and burnishing - see photo.



Sprigging: Small pieces of clay pressed into decorative plaster or fired clay molds (such as seashells), can be added to larger pieces - see photo.

Slips and Engobes: Slip is simply clay in liquid form that contains colorants. The term engobe often is used interchangeably with slip, but sometimes defined as slip with other materials added. In either case, both are applied to wet or damp greenware for color decoration. All slips and engobes can be applied by brushing, dipping, pouring or spraying. Brushing sometimes leaves brush marks which may or may not be desirable. Some of the studio's slips are made with 6-tile porcelain as the base and are best applied on wet clay rather than on dry or bisqued pieces. To avoid chipping or peeling later on, apply slip to the piece when you first make it or when leather hard, but not completely dry or bisqued.

Slip Trailing: You can draw colored slip lines from the nozzle of a trailing tool, which can be made from an ear syringe, plastic squeeze bottle or hypodermic needle. On flat surfaces, such as a plate, it is possible to build up the slip to create a raised relief drawing. Slip trailing can also be done with glaze.

Sgraffito: Creating fine lines in a piece can be accomplished by scratching through an application of a slip to the surface of the clay - see photo. A reverse of this method can be achieved by painting a leather

hard piece with wax, scratching the design through the wax and then applying slip to the scratched area. The slip will wipe off the area that is covered with wax.



Mishima is a type of Korean inlay (originally white slip on brown clay) in which a scratched or gouged area is filled with another color clay slip. When dry, it is scraped away to reveal the incised design in another color -see photo.

Inlay: Building up colored slip in the indented portions of a clay piece is a way to achieve fairly clean distinct lines in a design. This is achieved either by scratching into clay and painting with slip, then scraping slip away from the surface, or by painting a leather hard piece with wax, then scratching through the wax and applying slip. Then wipe the slip off the wax. The slip will remain in the scratched places.

Neriagi: different colored clays that are cut and layered into blocks then cut and layered again to create patterns. Striped, checkerboard or marbled slabs can be made into forms and fired with no further color decoration needed other than a clear transparent glaze - see photo.



Stencils: images made out of paper, cardboard, wood, tape or painted on with wax and then covered with slip. Thicker materials like wood can be pressed into the clay to help create a relief impression - see photo.

Templates: A positive or negative paper template will form a design when you paint color over it and then remove the paper template before the slip completely dries. If the clay is leather hard, you are less likely to mark the surface.

Waxing Techniques: Wax resist or latex can be used in the glazing process in order to create layers of different color and/or to create with or without glaze.

Surface Techniques and Decorating - Sources of Color:

The sources of color in all ceramic materials are oxides, carbonates and stains.

Oxides and carbonates are different forms of metals but both fire the same color. The oxidized form of a carbonate is slightly stronger and usually a different color in its raw state. In fact, the confusing part of glazing is that the color of the raw colorant has little to do with how it fires out. To make it more interesting, some colorants fire entirely different colors in oxidation and reduction firing atmospheres. The most dramatic chameleon of the metals is copper which can be green or blue green as a result of an oxidation firing and pink, red or lustrous as a result of reduction firing.

Clay Colorants:

Metal	Raw State	In Oxidation	In Reduction
Iron oxide	drk rust or black plum	tans and browns	grey-greens, yellow-browns, red-browns, Black khaki, golden, specked gold, blue
Rutile	light khaki	khaki	khaki, golden, speckled gold, sometimes blue
Cobalt Carbonate	pink purple	blue	blue
Cobalt Oxide	black	always blue	blue
Copper Carbonate	green	blue green lusters at low temp (Raku)	pink, red at high temp
Copper Oxide	black/red	green	red, sometimes blue In Raku: copper luster
Chrome	forest green	green	green and grey; low fire- oranges

Stains:

Stains are chemically made colors that fire the same color that they are in powdered form. They sometimes provide colors that cannot be achieved with metallic oxides, especially at high temperatures (such as pinks, yellow and blue greens). Stains work well mixed with Cal Slip as an underglaze decoration.

High Fire Glazing:

A **glaze** is a combination of chemicals which form a glasslike surface when fired on clay. In the studio we have separate areas for stoneware, Raku and low fire oxidation glazes.

A glaze base formula is calculated to fit a clay body, mature at the same temperature as a clay and give the desired surface texture (shiny, matte, semi-matte...). Raku, for example, is a low temperature process which needs glazes to melt much sooner than cone-10 reduction temperatures. This is why it is very important to know which glaze is suitable for your firing method.

Glaze Applications: Glazes may be dripped, poured or sprayed on. Brushing on high fire glazes is not usually recommended unless brush marks are desired. Brushing, however, is the recommended way to apply Raku and electric-fired (low-fire) glazes.

Mix Glazes Well! Glazes are made up of many different chemicals. Some of these chemicals are heavier than others and settle out to the bottom of the bucket, It is essential to mix the glaze well just before you use it. If the glaze is not mixed properly then the formula is altered and the results are usually unfavorable. See photo



Spraying can be done with an automatic spray gun (not considered a beginner's skill) or with a less expensive sprayer (atomizer). If you are interested in learning how the sprayer operates, you must ask your instructor or an experienced student to show you how. See photo

Glaze Consistency: While glazes can vary somewhat in consistency, generally they should be half and half or heavy milk consistency. If a glaze seems too thick or thin after attempting to mix it well, please consult the studio manager.

Avoid Contamination! Oxides and colorants in colored glazes are very strong. A small amount can contaminate an entire batch especially of a light or white glaze. Keep unused glazes well covered and when layering glazes, always glaze the clear or white glazes first. Never dip or pour colored glazes in, on, or over the white or clear glaze buckets. If a drop of colored glaze or straight oxide should get into a white glaze, it must be carefully dipped out and removed.

Waxing:

Before glazing, some people brush wax on the bottoms and ¼ inch up the sides. Also on lids and rims where lids touch, or wherever the pieces comes in contact with the shelf or other areas of clay. The studio provides liquid wax and brushes. Spread out newspaper in the area where you are going to work. Allow the wax to dry thoroughly before glazing (up to one hour). Wipe off excess glaze beads from waxed areas.

WARNING: Try to avoid spilling or dripping wax onto areas that you intend to glaze. It is very difficult to remove the wax once it has been applied.

Surface Techniques and Decorating - Glaze Application Strategies:

The easiest way to glaze a piece that you plan to high-fire is to **dip** it into the glaze bucket of your choice. The method usually works well unless your piece is too wide to fit into the bucket (such as a plate).

If you are glazing a cup or a bowl with a narrow opening, you might choose to **pour** glaze into the interior part before dipping the outside.

For plates or other shapes too wide to fit into the glaze buckets, you will have to either pour the glaze over the piece or use the **spray** booth.

Before glazing, it is important to stir each glaze with one of the mixers or a stir stick.

Dipping: Hold your piece carefully on one side and dip the opposite side into the glaze. Hold it in the glaze for a count of five and then remove it. The glaze will dry quickly if the piece is dry to begin with. As soon as it appears dry, carefully grasp your piece on the glazed side and dip the unglazed side into the bucket. It is okay for the glaze to overlap; in most cases this will provide a color change that will improve the appearance of your piece and be consistent with the method you are using.



If all over color uniformity is desired, you might like to use a gripping device to hold your piece. By doing so, you should be able to dip the entire piece into the bucket at one time.

Many students like to dip their pieces in several different glazes, allowing an overlap of colors to achieve interesting effects. Experience is the best teacher here. Some glaze combinations produce desirable effects and others don't. Ask more experienced students for their suggestions and look at the samples to help you decide. Remember: too much glaze application can be disastrous.

Pouring: For pieces too large to fit into the bucket, you might consider pouring the glaze on, using a plastic pouring container. Be sure to hold your piece over the glaze bucket or some other large receptacle while you do this. Again, interesting effects can be achieved with the overlapping of glaze, plus the opportunity to use several glazes effectively.

Spraying: Before using studio spray booth, get instructions from your teacher or one of the experienced students. You will need to get a **spray gun**, stored in a locked cabinet under the display case in the main workroom. Ask your instructor or one of the monitors to help you. When you are ready, the **compressor switch**, found inside the booth, must be turned on and, when you start to spray, the **exhaust fan** must also be running. Attach the sprayer to the air hose (you may need help doing this the first time) and place your piece on the banding wheel. Apply an even coat of glaze while slowly turning the banding wheel. You will be done when the glaze takes on a velvet or fuzzy appearance. After you are finished spraying, be sure to wipe down the banding wheel and clean and return the sprayer to the cabinet.

Spraying Tip: if your piece has an underside, turn it upside down and glaze this area first. If it has a narrow opening at the top, consider pouring glaze into the inside before you start to spray as it is hard to glaze this area with the spray gun.



Brushing: After you have dipped, poured and/or sprayed, you might consider adding a colored oxide, slip or overglaze to your piece. Jars of oxides are kept in the center of the glazing table and Cal Slips are found in the main workroom. Oxides and slips can be sprayed or brushed on, with very effective results.

Oxides and slips can also be applied under a glaze, however they show up best under clear or a translucent glaze. Overglazes are formulated to be brushed onto a piece after it has been dipped in a glaze. If you have applied an oxide or slip under a glaze, allow your piece to dry completely before dipping it into the glaze bucket to avoid contamination.

All Raku glazes are designed to be brushed on. Because Raku is a low fire process, **ALL RAKU GLAZES ARE TO BE USED ONLY FOR RAKU** and should never be applied to high fired work. All Raku glazes are clearly marked. Do not confuse them with other glazes.

Salt glazes are to be used by students taking the salt class. If you are enrolled in this class, the instructor will tell you how they are to be used.

VERY IMPORTANT: Don't forget to remove all traces of glaze from the bottom of your pieces, even if you use wax.



Glaze Defects:

Blisters: Air in clay

Blotches on Glaze: Defective mixing and application of glaze; Transfer of colors from other wares.

Blow Holes in Bisque: If holes are clean, insufficient wedging; If holes are dirty, carbonaceous material, i.e. coal dust

Crack in Clay: May be due to poor support; Too plastic a clay – may need to add sand or grog; Inconsistency if clay – some part being wetter than others; unequal drying; Faulty setting in kiln; Dry article mishandled; Dull trimming tools that push instead of cut; Kiln opened too soon; Exposure to weather when insufficiently bisqued.

Cracking of Engobes: Commonly due to the engobe having a different expandability of the ware or shrinkage from that of the clay.

Cracking or crazing of the Glaze: Exceedingly difficult to prevent. Almost always due to glaze and clay contracting and expanding at different rates. Many of the cheaper articles on the market craze badly as they grow older. There may be a long delay before crazing begins. -May be due to change in the methods of work such as applying to green instead of to bisqueware where shrinkage is drastic, or applying too thick of a coat of glaze to the ware; Too much ball clay added will also cause crazing.

Changes of Color Due to Oxidation/Reduction: Most colored glazes are very sensitive to temperature change when near their melting point, and still more so to the composition of the atmosphere in which they are heated. Thus copper in an alkaline glaze at a moderate temperature with a plentiful air supply (oxidation) will produce a blue color; with a siliceous glaze under similar conditions this will be turned green; if heated in a strongly reducing atmosphere so that cuprous compounds are formed, red glazes will result; if the atmosphere varies between oxidizing and reducing, a combination of these colors may be found.

Dryness (and Dullness): Too little glaze on the goods; Placing the goods too near unglazed surfaces or to the use of unglazed saggars; Bisque being too high fired that it does not absorb sufficient glaze when work is dipped.

Dunting: A variety of cracking due to carelessness in making.

Efflorescence: Uneven coating of goods with a colored glaze or not making sufficient allowance for run of glaze.

Flakes: On the surface of glazed goods, flaking may be in the form of shelling or may be crazing. On unglazed articles it is due to the use of defective plaster mold leaving particles of plaster in the clay; When flakes are apparently produced in the kiln they may be considered “scum” or due to some form of lamination.

Lamination: This is the separation of the clay into thin plates or layers. These smooth layers do not bond as thoroughly as other parts of the clay. Addition of grog will help prevent lamination.

Parting (or Crawling): Too heavy glaze application; May be due to the difference in the relative expansion and contraction of the body and glaze so that an excess of either causes trouble. The surface tension of the melted glaze is so much greater than the force with which it adheres to the clay, that the glaze gathers itself into globules of various sizes; A little dust may cause this defect, by preventing the glaze from adhering firmly to the body.

Peeling (or Scaling): May be due to oil on the surface; Too high a polish on the surface of the clay; If the goods are glazed in the green state; Dust; Stones in the clay of which the goods are made, many cause peeling; Uneven mixing of two clays.

Pinholes: Too hard a glaze; Dust on ware which will not burn away leaving behind a certain amount of ash. Pinholes are likely to be formed where each particle of dust formerly rested; Grains of sand or inorganic materials; too much rutile in glaze.

Running of the Glaze: Too much glaze applied.

IF YOU HAVE A QUESTION... DON'T BE AFRAID TO ASK. Many people in the studio are experienced and they are happy to help you.

Kilns:

Electric Kilns are made from refractory materials lined with electrical elements (coils). Radiant heat from the elements is gradually increased until the desired temperature is reached. These generally are oxidation firings.



Natural Gas or Propane Kilns are made of refractory materials and have burners in which combustion is produced by natural or propane gas. They usually have chimneys and dampers with which to control the amount of reduction needed.



Salt Glazing: Salt is thrown into a specially-built, high temperature gas kiln where it vaporizes and combines with the silica in the clay body to form a hard glassy glaze with an orange peel texture. A separate kiln must be used for this method because the salt deposits build up in the kiln chamber and affect subsequent firings.

Raku is a Japanese term meaning enjoyment relating to the acceptance of the accidental and imperfect qualities of life. Raku ware was originally associated with the Japanese tea ceremony. This method of rapid firing and quick cooling has been adapted by contemporary ceramists who are attracted to its serendipity and spontaneity. After the ware is removed red-hot from the kiln, it is placed in combustible material such as pine needles, straw, newspaper, or sawdust, causing the clay to blacken and the glazes to reveal more colors.

Our studio provided opportunities to fire in all of the above kiln types; however, unless you have enrolled in a specific firing class, your pieces will be fired in the regular gas kilns.

Firing Methods: Stoneware, Cone 10

Oxidation: An oxidizing fire is one that is clean and clear with plenty of air intake where oxides remain unaltered and elements such as carbon find sufficient oxygen to oxidize freely. A blue gas flame and the electric kiln provide oxidizing atmospheres where combustion of fuel is complete. Results from electric firings are usually more predictable than gas or wood.

Reduction: A reduction atmosphere occurs when oxygen is reduced, forcing the fuel (gas) to steal oxygen from the clay and glazes to combust thereby creating chemical changes. The fuel can be gas, wood, kerosene, oil or dung. We reduce our gas kilns by closing the dampers and reducing the air intake.

It is important to know what kind of firing is being done in the studio where you work to eventually determine your own preference.

Temperature Firing Chart:

Firing a kiln involves precision temperature control. All glazes are formulated to mature at very specific temperature. Rather than relying on pyrometers, which often are not accurate, especially at high degrees, pyrometric cones are used. Cones are simply small cone-shaped pieces of clay that are manufactured and numbered according to their melting points. Cones above 01 are for high firings; 01 and below are for low-fireclay bodies

Cone #	Degrees F	Type of Ware and Glazes
15	2608	
14	2491	
13	2455	
12	2419	
11	2399	Porcelain/China
10	2381	
9	2336	
8	2305	Stoneware
7	2264	Salt Glazes
6	2232	
5	2185	
4	2167	China Glaze
3	2134	
2	2124	Semi-Vitreous Ware
1	2109	
01	2079	Earthenware
02	2048	
03	2014	
04	1940	Low Fire Earthenware
05	1915	Lead Glazes and
06	1830	Low Fire Fritted Glazes
07	1803	
08	1751	

09	1653	
010	1661	
011	1641	
012	1623	Lustre Glazes
013	1566	
014	1540	
015	1479	Chrome Red Glazes
016	1458	
017	1377	Overglaze Colors;
018	1323	Enamels and Lusters
019	1261	
020	1175	
021	1137	
022	1090	

Saggar Firing: The objects to be fired are placed inside a larger container (another clay pot) and then loaded into a gas-firing kiln. The saggar can either protect the ware from the flames and fumes of firing, or conversely it can contain combustible materials that cause surface effects on the piece inside.

Sawdust Firing: Ware is placed in sawdust inside a fireproof container, a metal drum or a small brick box, then covered with more sawdust that is set afire and allowed to smolder slowly. This may take as long as 24 hours. Objects, which are often burnished, should be bisqued first. The firing produces flashes of black, grays and browns.

Pit Firing is a primitive firing process in which combustible materials such as cow dung, sawdust and wood provide the fuels in combination with salt, copper oxides, seaweed, etc. to produce unevenly fumed surfaces. The pit can be a hole in the earth or an improvised container above ground.

Wood Burning Kilns are a traditional way of firing, dating back thousands of years. Wood is fed into the kiln fire-mouth over a period of up to several days until the desired temperature is reached. The wood ash and glaze action cause flashing, ash deposits and ash glazes. Japanese and korean “climbing kilns” are famous for these results.

Raku (aka California Flash Fire)

Raku is a low temperature firing process in which heated bisqueware is put into a hot kiln; fired rapidly, then removed with tongs and reduced with combustible material such as leaves or pine needles. It is a very exciting process, borrowed from an old Japanese tradition used in the making of ceremonial tea bowls.

20 Top Questions Asked by Our Beginning Artists

Can I make up a missed class?

Unfortunately not. We cannot facilitate make ups due to instructor's availability.

What do I do if I'm not enrolled in the next quarter but I have clay projects that haven't been fired by the end of my class?

Any work left to be fired by the last class will be fired over the break. You have two weeks to come back and pick up the ware into the next quarter. You must come during Open Studio hours and check in with the monitor.

What happens to my clay, tools and ceramic work if I don't pick them up by the end of the quarter?

The deadline for getting all work out of the studio is always well announced through email, signs and the studio white board. At the end of each quarter all lockers must also be emptied by your last class. Clay found in lockers is recycled for youth ceramics classes at Shadelands and tools are donated to the used tools for sale. Greenware waiting to be bisqued, or glazed ware waiting to be highfired will be available for two weeks into the new quarter, however you are responsible for putting your own work there.

Why do I have to buy all my clay at the studio?

The studio only allows high-fire clay to be used, as most of the firing done is at high (cone 10) temperatures. Clay purchased outside the studio may not be high-fire clay and its use in our kiln can result in disastrous melt-downs for which you will be responsible and charged accordingly. IT IS VERY IMPORTANT THAT YOU NEVER BRING OUTSIDE CLAY INTO THE STUDIO.

Why do I need to fire my piece twice?

After your piece is made and completely dried, it is very fragile. In order to make it easier to handle and enable you to glaze it properly, the piece must be "bisque-fired." In this firing, the chemical water is removed, thereby ensuring that the clay will not return to its natural state when exposed to water (such as in glazes). The piece will also be much stronger.

Why do my pots get S-cracks on the bottom?

It could be your wedging and/or a lack of compression on the bottom surfaces. As clay dries, it shrinks and will pull away from itself in areas that are less compressed. Your instructor will give you some tips on how to compress the bottoms of your pots.

Why did my handle fall off my piece after it dried?

Did you score and slip? Damp clay pieces often seem sticky enough to hold together, but will separate upon drying if they are not well attached. It is also important that the various parts that you are putting together be about the same degree of dryness-- usually the leatherhard stage is best.

Why can't I put a hump mold in the damp room?

The damp room is just that-- a very damp place. The hump molds, made of plaster or bisqued clay, will quickly absorb moisture, making them useless for others to use until they dry out-- sometimes as long as a week.

How can I identify my piece in the damp room?

Write your name on a scrap of paper and place it with your piece. Some people like to keep a log of each piece they make and make a notation of where in the damp room the piece has been left.

How do I find my bisqued pieces after they come out of the first firing?

You must mark your work with your name or initials. Many pieces look similar and you do not want to confuse yours with someone else's or vice versa. All bisqueware is stored on the rolling carts near the glaze area.

Why do I need to wax the bottoms of my pieces?

You don't. But you can't leave glaze on the bottom either. The wax will resist the applied glaze and helps you to avoid getting the glaze where you don't want it (any area that comes in contact with the kiln shelf). Even if you use wax, you still have to wipe the glaze off the wax before firing. You don't have to use wax, but you must wipe the glaze off with a sponge. Be careful not to get wax on any surface that you do wish to glaze.

Can I reglaze and refire a piece that has already been high-fired?

Yes, this is possible although often difficult to do successfully. Because the high-fired piece has lost all its porosity, additional glaze will not stick to the surface very easily. The piece is also susceptible to cracking upon reheating. Ask your instructor or manager for approval to do this.

How safe are the bowls and cups that I've made? Can I really use them to eat from?

All high-fired glazed ceramic pieces produced in this studio are perfectly safe to use with food. There is no lead or other materials in any of our glazes that are toxic after firing. Raku work, however, is not considered functional and should not come in contact with food and liquids. Some low-fire (electric) glazes carry warnings about lead content and also should not be used with food.

The parking lot signs say my car cannot be left there over three hours. How can I plan to stay all day and not get a ticket?

The Community Center office will give you a special sticker for your car as long as you are enrolled in a class. It's free and available anytime and must be renewed each January.

Health Concerns and Precautions

Back

Stresses on the back increase greatly as we sit at the wheel and strain doing the work. Do not overwork your back or ignore pain. Suggestions to protect your back while throwing include: Keeping you back straight (not hunched), exploring throwing on an elevated wheel. If continual pain occurs get professional attention.

Eye Protection - Kilns

Damage including formation of cataracts occurs when heat is absorbed by various tissues in the eye. To avoid damage, always use shaded eye protection and minimize time when looking in a kiln.

Ceramics Materials Precautions:

Certain potentially toxic ceramic materials can be handled and used with complete safety provided elementary precautions are observed.

The most significant health hazard in ceramics arises from the generation of dust containing free silica (includes flint, cristobalite and quartz) in ultrafine form (<5 microns). Larger silica dust can be seen filtered by nasal mucous membranes. As long as the pottery studio is kept clean and tidy with adequate ventilation then no problems from silica dust should arise. Spilled amounts of glaze and clay slips should be wiped or mopped up before they dry out. Avoid dry sweeping. Wet mopping/sponging or use of an

approved industrial type vacuum cleaner is best. Mixing of dry raw materials and extensive working on dry clay ware should only be done under proper vented conditions.

Coloring pigments, especially the oxides and carbonate washes, are the most toxic materials used in everyday ceramics. They must be kept in closed containers. Standards of basic hygiene and cleanliness (washing hands with soap and running water) with the insistence that no eating or drinking be permitted in glazing and color areas.

Other Community Partners

Classes:

Diablo Valley College
Los Medanos College
Chabot College
Contra Costa College
Laney College

Studios:

Red Ox Clay Studio
Richmond Art Center
Berkeley Potter's Studio
Berkeley Art Studio – ASUC Berkeley Potters Guild
Merritt Ceramics
Studio One
The Crucible

Ceramic Supplies:

Clay Planet, San Jose
Clay People, Richmond

Firing Services:

Clay People
Clay Planet
Berkeley Potter's Studio
Play with Clay Studios

Ceramics Galleries:

Trax Gallery, Berkeley
Epperson Gallery, Crockett
Natsoulas Gallery, Davis
Roscoe Ceramic Gallery, Oakland