

Ceramics Notes

Ceramics is the art of making pottery or working with clay. **Clay** is naturally formed by the erosion or breaking down of the earth's surface. Found worldwide it is primarily made up of hydrated silicates of alumina. This is why raw clay can be found in creek beds and wet areas. Clay is plastic in nature and can easily be molded into forms. Blended clays are known as clay bodies.

In choosing a clay body, there are three basic considerations: Firing Temperature, Texture, and Color & Glaze Response.

Firing Temperature

The basic factor in choosing a clay body is your kiln. Determine what temperature you can fire at and then choose a clay body that will mature at that temperature. There are three basic temperature ranges for clay bodies:

Earthenware Clay bodies —Cone 06–3 1850-2000°F/1000-1160°C

Mid Range Clay bodies —Cone 4–7 2160–2260°F/1160–1225°C

High Fire Clay bodies —Cone 6–10 2200–2400°F/1200–1300°C

Texture

Texture refers to the “feel” or “tooth” of the clay, which is achieved by the addition of coarse ground fireclays, sand, or grog. Potter’s usually prefer their wheel throwing clay to be smoother than their sculpture clay. This is simply a matter of preference, as wheel and sculpture clay can be used interchangeably by many potters.

Color & Glaze Response

Terra Cotta has a beautiful natural reddish-brown color, which is often times left unglazed. Other clays, such as porcelain, can be colored by adding oxides or stains. Every colored clay will cause a different glaze response. If you are looking for the truest color response from a glaze, choose a white firing clay.

STAGES OF CLAY:

Before you can have a finished clay project, the body of clay must go through the following 5 stages slowly to mature the clay.

STAGE #1- GREENWARE:

Clay that has not been fired. In this stage clay can always be melted down and re-worked for usable clay. In the greenware stage as clay begins to dry out it goes through 3 stages before the clay body can be fired.

Wet Clay:

In this stage clay can be easily manipulated and formed.

Leatherhard:

In this stage the clay begins to dry out, leaving the body flexible and tough. As the clay dries out, you will notice the color turn lighter. You can't easily smooth pieces of clay together, however you may use the slip and score method. It may be easier to work with larger pieces once they have dried out a little.

Bone Dry:

In this stage, clay is much more fragile as the moisture is drawn out of the clay body. Piece can easily break, especially if not properly attached. You will not be able to attach pieces back together once the piece is completely dried out. When the clay piece feels room temperature it is ready for the first fire.

Once your piece is bone dry follow this procedure: Sand or smooth your piece as well as sign or initial it. Place it on the table by the kiln to be fired.

STAGE #2 - BISQUE FIRE:

The first fire your piece will go through, roughly about 1900 degrees at the hottest point it will mature and harden the clay body. This fire takes roughly 24 hours from start to finish as it slowly heats and cools your piece.

STAGE #3 - BISQUE WARE:

Ware that has been bisque fired and ready to be painted or glazed. Once your piece has been fired, paint it with acrylic paint to be finished or glaze it to be fire again. Acrylic painted ware does not get re-fired, the piece is done once the paint dries. Be sure to follow all glazing and painting procedures.

STAGE #4 - GLAZE FIRE:

The second and last fire your glazed piece will need to go through. This fire is a little cooler, about 1600 degrees yet still hot enough to melt and fuse the glass silicates in the glaze. This fire also takes about 2 days before the ware is cool enough to safely unload the kiln.

STAGE #5 - GLAZE WARE:

Fired glazed ware.

OTHER TOOLS AND SUPPLIES:

Kiln:

We currently have is a Skutt Kiln that is electrically operated. I will be firing every piece of work you create. Once the school years gets going and artwork is created I usually run 1 bisque fire and 1 glaze fire a week. Because there are certain firing guidelines, you must make sure each piece you create has met the guidelines in order for me to fire it. Refer to signs posted if you forget. The firing range that we use includes temperatures up to about 2000 degrees. Under no circumstance is any individual to put anything through the peepholes, open, or unload the kiln without my permission and help. Kiln furniture, made from fireclay, is very fragile and expensive to replace. These include: kiln posts, kiln shelves, etc.

Wedging Board:

We use canvas covers to allow clay to be wedged on. The canvas absorbs some of the moisture out of the clay during the wedging process, so it is a good idea to wedge clay that is a little moister than you would like to use. A metal wire is used to cut the clay in half to check for air bubbles.

Scrap-buckets:

Scraps of “Unfired” clay only go into the scrap buckets. Do not put any other materials (paper towels, pencils, clay tools, etc) into the scrap bucket, as scraps will be made into workable clay. Bone-dry clay will melt down in the watery slip. If you ever need any clay slip, this would be a good place to get some.

Smaller Clay Tools

Needle Tool: The sharp needle is firmly set in aluminum handle, which is finely textured to provide a firm grip for wet hands. This tool may be used to cut heavy clay strips, to cut designs in clay, and to put holes in clay.

Cut off wires or Toggle Cutters:

This tool is used for slicing and cutting lump clay. It also works well for cutting pots and other items off of the bat after thrown on the wheel. Harwood 3” toggle handles are firmly fastened to approximately 18” of fine quality stainless steel.

Metal Scraper or Rib:

This tool is used for shaping, smoothing, and trimming pottery shapes. These are made from thin, flexible spring stainless steel.

Wooden Rib:

This tool is made from smooth-finished, imported hardwood. This type of tool is used to employ the basic shapes required for opening, shaping, curving, smoothing, and trimming wet clay on the potter's wheel.

Modeling Tools:

Handcrafted tools are made from wood where as molded ones are made out of plastic. They are used for cutting, slicing, smoothing, contouring and pattern decorating in soft clay.

Ribbon Tools:

These tools come in different shapes and sizes for light cutting trimming, and slicing. The ends are formed from clock-spring steel and are firmly attached to the handles with brass ferrules.

Ribbon Sculpting Tool Set:

These miniature sculpting tools are made of fine ribbon steel treated for maximum strength and are just the answer for fine sculpting, detailing, and trimming.

Loop Tools:

These tools are used to remove larger controlled amounts and shapes of clay from wheel thrown pieces and clay sculpture pieces. The shaped cutting heads are made from heavy stainless steel ribbon with sharpened edges. Rugged hardwood handles provide a sure grip and allow easy manipulation of these tools in wet clay or leather-hard clay. to smooth and get into tiny spaces on your wet clay or leather-hard clay piece.

Rolling Pin or Clay Rollers:

Clay is quickly and easily rolled to the proper thickness with this tool. Made with either 2 wooden handles on both sides or one metal handle, both rollers are made from smooth hardwood.

Wood Strips:

Clay thickness strips for rolling uniform thickness slabs of clay. Strips made from kiln dried wood. 24 inches long strips vary in size thickness from 1/8", 1/4", 3/8", and 1/2".

Camelhair Brush:

This tool is made out of natural fine camel hair and used for the application of glaze on a

bisque fired clay piece.

Fan Brush:

This brush allows you to put a lot of glaze on evenly on your piece at one time before it dries.

Plastic Bag:

Used to wrap your project in to avoid drying out or to put your finished ware in to take home. Drape loosely around your piece to allow wet projects to slowly dry out. Wrap projects tightly to insure ware from drying out and to allow for future work to be done on the piece.

Paper Towels:

These work well for cleaning up messes as well as useful to keep a piece moist. To prevent a piece from drying out over a longer weekend dampen paper towels and wrap around your project before you wrap a plastic bag around.

Water Spray Bottle

This is a useful tool to help keep your project moist. To prevent your project from drying out or to add extra moisture to your piece, spray your project with water, wrap wet paper towels around the piece, and put a plastic bag tightly around the piece.

Sponges:

There are many different types of sponges from man made synthetic sponges to natural sponges grown in the ocean. We will use different types of sponges in Ceramics class. Some will more useful in helping with cleaning up, others for wheel throwing or applying glaze.

Bat:

This round plate fits on the wheel head to allow for the potter to throw a pot and easily remove the piece without distorting it.

General Clay Techniques:

Joining pieces together: When joining pieces together in the leather-hard clay stage always remember to score (scratch up the surface) and apply slip (watery clay). Pieces may fall off if not properly attached. Make sure to smooth clay all around joined pieces. When a piece is complete, let the piece slowly dry out to avoid cracking. You may want to cover the piece with a loose plastic bag for a day or so first. Then remove the bag to let it finish drying out.

To prevent warping and pieces from blowing up try to get all areas the same thickness of

no more than 1/2 inch. Try to keep from making air pockets as you put clay pieces together. If you are wheel throwing- wedge clay first to get air bubbles out. If a piece dries out more than you wanted it to, you have a couple options: Either spray the project with water and wrap lots of wet paper towels around the piece for 1-3 days or scrap the project and start again if you don't have days to wait. Make sure you plan ahead, if you want to keep working on a project, keep it wet and wrapped up.

Glaze:

- A liquid suspension of finely ground materials that is applied by brushing, dipping, pouring, sponging, or spraying the surface of a bisque fired ceramic piece. Once done the piece needs to be fired to the temperature at which the glaze ingredients will melt together to form a glassy surface coating. Glazing the surface makes it water tight, adds color, and creates a functional piece you can eat out of. All of the glazed you will be using in Ceramics are lead-free.

Glazing Procedures- for brushing method:

1. After your piece has been bisque fired sponge clean water on to your piece or rinse out.
2. Shake or stir the glaze you want to use (make sure the lid is on tight).
3. Using a paintbrush or sponge add glaze to your piece. Usually you will need a min. of 1 thick coat or two thin coats, depending on the glaze. Do NOT paint the bottom of the piece or any piece that will be resting on the kiln shelf when firing.
4. When done take a clean sponge and wipe off the bottom to ensure that there isn't any glaze on the bottom.
5. Clean up... your area and supplies. Put materials back where you got them. Rinse out all glaze cups and brushes.