

# Introduction to Clay

Clay....Is a part of the **earth**...Is made workable with **water**...Is dried by the **air**...Is made durable with **fire**

Clay is the most important single material used in ceramics.

Potteries first developed alongside river banks where the action of the stream exposed clay beds. Although we will be using clay to make pieces of artwork, clay is also used industrially in the United States to create such items as bricks, building and drainage tiles, plumbing fixtures (toilets and sinks), electrical insulators, and linings for steel and glass furnaces.

Seldom can one successfully use clay just as it is dug from the ground. Depending upon its origin, clay usually contains large impurities such as vegetation matter or rocky debris. Although our clay is purchased ready-to-use in a plastic bag, it is important to know the process by which it arrived in this form:

- 1) Dig up a lump of clay and let it dry completely.
- 2) Pound with a mallet into a coarse powder.
- 3) Sift through a mesh screen to remove large pebbles, roots and impurities.
- 4) Pour the powdered clay into a bucket of water. Let set until clay has soaked up the water.
- 5) Stir occasionally until all lumps disappear. This may take several days.
- 6) Strain the clay through a 14 to 16 mesh sieve. The clay should be in slip (soupy, watery form) form for this process.
- 7) Allow the clay to settle, siphon the water off the top. Place the clay on plaster bats to absorb excess water.

## Stages of clay

We use a recycling process for our clay. There are several stages of wet(recyclable) clay. **Slip** is wet and mushy clay. The clay particles are mixed with a lot of water and are far apart. We put the slip on large bats to dry. As the water evaporates we get workable clay. This is a consistency that is not too sticky so that the clay that

can be easily wedged, thrown, rolled or coiled. As the clay starts to dry some more it becomes leather hard. **Leather hard** is the stage where the clay is slightly flexible and can be scratched easily. This is the best time for adding pieces on such as handles or trimming a foot. As soon as the clay loses its flexibility other pieces may not be attached. It will start to change color slightly. Pieces can be re-moistened sometimes by covering with wet paper towel and plastic. **Bone dry** clay is hard yet fragile (can snap easily) dry clay. When clay starts to turn to a lighter grayish color it is no longer possible to attach other clay such as handles it will crack as the softer clay shrinks as it dries. All clay that has not been fired yet may be recycled and used again.

The process of making something out of clay can be extremely simple as well as very complicated. Even though the clay can take any shape given to it, because of stress, improper balance of weight, incorrect methods of joining, or improperly constructed walls, it may not always hold.

Even if you do get a piece to hold and dry in the desired form, you have to make sure you haven't sealed any air inside. All hollow spaces must have a hole to the outside so air can flow in and out during the firing process and explosions can be prevented. It is also extremely important that you don't make any portion of your work thicker than 1". That dense of a piece of clay will not be able to withstand the extreme temperature in the kiln and will explode. All rounded objects must be made hollow with a small hole allowing passage of air in and out of the hollow space.

### **Clay Bodies**

Clay body refers to the make up and properties of clays. There are several main types of clay bodies. **Stoneware**, the type of clay we use in class is a mid to high (cone 6-12) clay and is especially good for wheel throwing. It will shrink about 12% from the wet stage to glaze fire it is typically buff colored. **Earthenware** comes in a broader color range from white to red (also called terra cotta) and is a low to mid fire clay (cone 05-6). It shrinks 8% and is especially good for hand building. **Porcelain** is a white clay body that has a smooth creamy texture. It is more plastic and therefore touchy to

work with. It will shrink 18-20% fully fired.

### **Clay Methods**

There are three common methods to creating basic constructions: pinch, coil and slab. To make a **pinch pot**, make a small ball of clay the size of a tennis ball or less, and stick your thumb in the center, making a hole. Then apply pressure with your fingers on the outside and thumb on the inside, creating a rounded bowl shape. You can easily join two of these shapes together to create a spherical form that could be the body or head of an animal figurine, bird house, etc. Creating a **coil pot or coil structure** is repetitious, slow and tedious, but the results can be extremely pleasing and original. To make one, create a coil by carefully rolling a lump of clay with all 8 fingers so that it is a nice and even thickness. Coil it upon itself to create the bottom of the pot. Make another coil of the same thickness and attach it to the end of the first coil, carefully smoothing them together. Finish the bottom of the pot if necessary, then allow the coils to go on top of one another. The closer in you go, the more the pot will taper in. Putting the coils more towards the outside will make the pot expand outwards. You can create some interesting effects by making the coils go in and out in this manner. If you desire a smooth look, you can smooth the coils as you go. You could choose to smooth just the inside and leave the coil appearance on the outside. The **slab method** allows for the most variation of creations. One can make just about anything out of a slab. A slab is made by rolling the clay with a rolling pin to an even thickness. It works best to have guides of the same thickness that the clay is to be. The rolling pin rolls over the guides with the clay in between and keeps all the clay the same thickness, preventing you from pushing too hard with the rolling pin. If the clay is sticking to the rolling pin, it is too moist. Work it into a piece of canvas to get some of the moisture out. Also make sure that no clay has accumulated on the rolling pin before you begin. Your clay slab will stick to these pieces. When constructing slabs, it is best to have them slightly dry because moist slabs will not hold up and will wobble and droop. It is also best to join clay that is the same consistency to prevent warping and

cracking as they dry at different rates.

When joining slabs you must add a small amount of water(**slip**) and **score** the surfaces of the pieces to be joined. This means to make some scratches in them to roughen them up, making the surfaces stick together more readily. And **weld**(push the pieces together with a slight twist and smoothen the cracks.

Once the main body of the slab structure is assembled, it can be paddled, shaped, cut into, twisted, or otherwise formed into the final concept. Other appendages, handles, spouts, decorative clay forms, wads of clay, coils, decorations and textures can then be added if desired.

The main constuction method of this class will be **wheel throwing**. Wheel throwing consists of centering the clay, pulling the walls and shaping. Kick wheels have been in existance for thousands of years. We are fortunate to have electric wheels.

### **Surface design**

Impressed designs can be made by **pressing** textured objects into the clay. Objects such as pencil erasers, forks, shells, bottle caps, fabrics, etc. can be used to create interesting textures and patterns. The texture should be applied when the clay is soft enough to take an imprint, yet not so soft as to stick to the texturing device. Letter and other stamps are available in the clay mixing room or the red tool cart.

Other interesting textures can be created by **carving** into leather-hard clay. It is important that the clay has dried partially and is no longer pliable. This way, you can make deep cuts and even holes in the surface that won't affect the stability of the piece. You can use a paperclip loop to scoop out clay and make unique textures.

Small shapes may be formed or rolled out and attached to a leather hard (flexible but slightly dry) surface. Whenever shapes are attached remember to slip, score and weld. Larger additions such as handles may be propped up to maintain thier shape while they dry.

## **Firing**

The clay must dry for several days to a complete bone dry state before firing for the first time to create bisqueware. If the clay contains water while entering the kiln, it will explode as the water will expand with the heat. The kiln heats the clay pieces to a temperature of about 1870 degrees Fahrenheit for a bisque firing (cone 05-06). A cone refers to the temperature of which something is fired to. This makes the clay durable and fuses small appendages to the main construction more permanently. Low fire pieces are glaze fired at about the same range. Mid fired pieces(ours) are glazed at 2100 degrees (cone 5-6) and high fired pieces reach 2300 degrees (cone 10). Over firing of pieces will cause slouching or a complete melt down of the clay. Because the molecules of clay will become more compacted, your final project will be about 94% of the size it was before it went in for stoneware and more for porcelain. Once the clay has been bisque fired you will now be able to touch small pieces and use handles without worry of damage.

## **Glazing**

If you want your clay piece to be protected from water, you will want to apply a glaze. This is a mixture that contains small pieces of glass that when heated, the glass crystals to melt and fuse together, forming a glassy coating. Any depressions in the clay from the textures you created will have a deeper color because the molten glass will settle in these areas.

There are several methods for applying glaze. Once the glaze is applied the piece will need to be fired again. The glaze must be stirred or shaken well before application. It is important to always use clean brushes, tools or hands when applying glaze as the colors if mixed can become contaminated and ruined. Test tiles are displayed to show you the colors that the glaze will be after the firing. The color of the glaze is rarely the color it will be once it is fired. Colors may be overlapped for varied (often interesting, mystery) results. Some glazes are more transparent and some are more opaque. It is important to consider your surface decoration in choosing the glaze as some glazes will cover up the design. Make sure not to have any glaze on the bottom of your piece or you risk

having it stick to the kiln shelf. Always check and wipe the bottom before placing on the cart. The only way of removal is destroying the piece.

There are several methods for applying glaze to bisqueware. For painting on glaze use the bottled glazes found in the clay mixing room on the shelves to the left you will need to paint 2-3 coats using the brushes also found in the clay mixing room. The underglazes are simple colorants that do not have silica(glass) in them. They are located in the clay mixing room on the right hand side. These will appear close to the color you see and will not be shiny. They can be mixed in small amounts on the palletes. For best results cover with several coats of the "paint on" clear glaze when finished. The dip clear glaze may also be used but is touchy with thickness. Brushes should be washed and returned brush up when you are done.

The large buckets of glaze can be used for the dipping method of glazing. First apply wax to the bottom of the piece and up 1/4 inch on the side to allow the glaze to melt and run. Stir the glaze well with your hand or a clean large wisk. Test the glaze for consistency. It should be creamy and you should be able to see the definition of your fingernail without the folds of your knuckles. If the glaze seems too thick a small amount of water can be added. (Ask for help the first time) If the glaze is too runny we will have to let it sit and skim some water off of the top. Glaze should be about a thickness of a no 2 pencil lead. If any of the clay can be seen through the glaze it is too thin. Dip again when it is dry to cover better.

Pieces can be:

- single dipped in one color
- single dipped fully and splattered on top of
- single dipped fully and other colors poured on top with a cup
- single dipped and painted on top
- single dipped and use wax to create a design- dip again
- dipped on one side - overlapped with a second color
- poured with several overlapping colors
- double dipped just along the rim
- one color inside by pouring and one color out by dipping