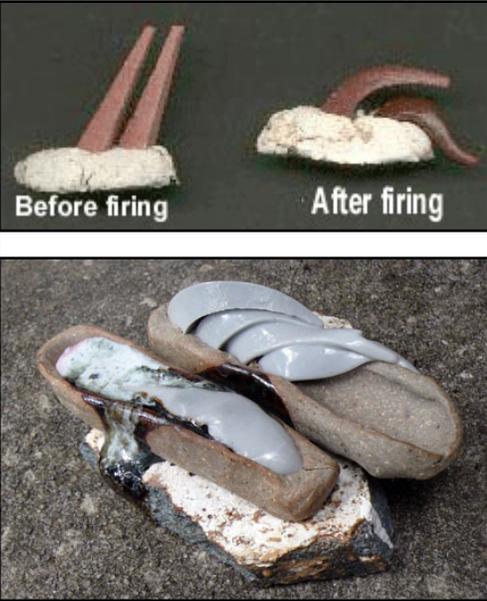


<b>212 degrees F</b>	Temperature where water turns to steam and there is potential for that steam to blow up greenware during too-rapid firing.
<b>451 degrees F</b>	Temperature where cristobalite inversion occurs, with a sudden change in size of 2%. Ceramic works, especially high-fired ware, should be cooled slowly through this point. 451 is the temperature where paper burns. If you put paper into the kiln peep hole, and it chars or bursts into flame, you're above 451 and it's too hot to open the kiln for faster cooling.
<b>1000 degrees F</b>	Visible red heat. Quartz inversion.
<b>bisque fire</b>	An initial firing of raw clay ware to burn out physical water, chemical water, and carbonaceous matter, and make the clay into a material that will not slake down in water and may more easily be glazed. Sometimes called "biscuit firing" in Europe.
<b>bisqueware</b>	Clay ware that has been fired once. Common studio practice is to bisque lower than the glaze maturity temperature to keep the body porous enough to accept glaze. Bisque ware will no longer slake down in water. Some commercial clay processes, especially fine porcelains, involve high bisque of supported ware, with a lower glaze firing.
<b>bone-dry</b>	Unfired clay with as much atmospheric water evaporated as relative humidity permits. The piece is dry, light in color, and very fragile. Clay in this state will slake down completely in water to an amorphous mass.
<b>centering</b>	Using your hand on the potters' wheel to move a dome of clay into a balanced position in the center of the wheel head or batt in preparation for raising a wall or other shaping.
<b>chemical water</b>	Water combined with other materials in molecules. The molecular bonds are broken during heating, and water vapor is given off between about 660-1470 degrees F. Clay contains about 14% chemical water by weight.
<b>clay</b>	Material formed from decomposed granitic rock. Clay particles have a flat, plate-like structure. Raw, wetted clay is plastic and has the ability to be formed through pressure. Raw, bone-dry clay will slake down if re-wetted and may be re-used. Once fired, the ceramic material is in a bisque state, where it is hard and will no longer slake down in water. Glaze is usually applied at this state, and the work fired again to the glaze maturity temperature. The formula for raw clay is $Al_2O_3 \bullet 2SiO_2 \bullet 2H_2O$
<b>clay body</b>	Mixture of various clays, fluxes, and fillers to have the desired color, working properties, and firing temperature.
<b>combing</b>	Slip decoration method of dragging a coarse toothed tool or fingers through damp slip.

<p><b>cone pack</b></p>		<p>A small pad of clay with visual cones to measure firing progress. A standard 3-cone pack has a <b>guide cone</b> (one cone before the desired cone), a <b>firing cone</b> (the desired cone), and a <b>guard cone</b> (one cone higher than the desired temperature). The cones are put in a low pad of clay, leaning 8 degrees (as the bottom of the cone leans), with the cone that melts first in front. The kiln in the kiln sitter produces a cone LOWER at 3 o'clock in a visual cone pack because the sitter cone is horizontal with a bar on it and melts sooner due to those conditions. An 03 cone in the sitter will produce an 04 cone bent at 3 o'clock.</p> <p>Small junior cones are used in kiln sitters and for electric firing. Large standard cones are used in gas firings, where the kilns generally have larger peep holes, and the large cones are easier to see in a hot kiln atmosphere.</p> <p>If you are firing more than a cone or 2 above the first cone, (common for high-fire reduction, left) you must make a <b>boat</b> at the end of your cone pack to catch the melted cone.</p>
<p><b>crawling</b></p>	<p>Condition where the glaze rolls back during firing and leaves bare patches on the body. May be caused by overly thick glaze, or dust, wax, or oil on the surface of the bisque ware.</p>	
<p><b>crazing</b></p>	<p>When a glaze shrinks more than the clay body it is on, causing cracks in the glaze. This is sometimes called crackle when done deliberately for decorative effect. Crazed glazes on a porous body (lowfire) will seep liquids.</p>	
<p><b>deflocculated</b></p>	<p>A condition where the clay particles have a negative charge and repel each other. This causes a parallel, "deck of cards" particle orientation. Good for brushing and slip-casting. Makes a solution containing clay liquid with less water. Settles into a compact mass in the bottom of the bucket. Runs off your hand to leave a very thin layer at normal glaze consistency. Materials used as deflocculants: sodium silicate, soda ash, Darvan. Materials in a glaze or slip that cause deflocculation: nepheline syenite, wood ash, lithium carbonate, some frits (notably 3110), soft water.</p>	
<p><b>dry foot</b></p>	<p>The practice of leaving the bottom of a ceramic piece unglazed so it may sit directly on the kiln shelf without sticking.</p>	
<p><b>dunting</b></p>	<p>Cracking thru the body and glaze during cooling due to the stresses between the body and the glaze and/or thermal shock cooling. Dunted pieces will have very sharp edges at the break.</p>	
<p><b>earthenware</b></p>	<p>Lowfire clay body that is not vitrified at maturity. May be white, buff, or red in color. Buff and red earthenware bodies occur naturally; white lowfire bodies are man-made.</p>	
<p><b>extrusion</b></p>	<p>Plastic clay that has been forced through a die to change its shape. May be solid or hollow.</p>	
<p><b>flocculated</b></p>	<p>a condition where the clay particles in a solution have a charge that attracts them end-to-middle, producing a "house of cards" open lattice. This is good for dipping glazes, and means that although glazes settle, they do not compact in the bucket. A flocculated glaze coats your hand well at normal glaze thickness. Epsom salt solution flocculates mixtures with clay in them.</p>	
<p><b>flux</b></p>	<p>A material that helps promote a melt of a mix of ceramic materials.</p>	

<p><b>glaze</b></p>	<p>Glassy melted coating fired on to ceramic object for visual or functional purposes. Glassformer + viscosity agent + <b>flux</b>. May be glossy, satin, or matte surface.</p>
<p><b>gloss</b></p>	<p>A shiny, glassy glaze surface that is highly reflective. This is a good surface for food ware because it is easily cleaned.</p>
<p><b>greenware</b></p>	<p>Shaped, unfired clay work – raw ware.</p>
<p><b>grog</b></p>	<p>Ingredient made of ground, bisque clay added to clay bodies to add texture (“tooth”), reduce shrinkage, and aid drying.</p>
<p><b>highfire</b></p>	<p>Clay work fired between cone 8-10.</p>
<p><b>kiln</b></p>	<p>Furnace for firing clay work through the application of heat. Combustible fuel (wood, gas, coal) or electrical resistance may be used to heat the chamber.</p>
<p><b>kiln-sitter</b></p>	<p>A device that uses the bending of a cone to lift a claw, drop a trip plate and disconnect the electricity to shut a kiln off at a specific cone.</p> <p><b>To set the sitter:</b>                  On the outside:                  - turn up the timer if the kiln has one                  -lift the trip plate                  -lower the claw and hold in place</p> <p>On the inside:- place the desired cone on the across the 2 flat rods with the round bar at the other end of the claw on top (bottom image)                  - center the cone in the holder, parallel to the kiln wall, flat side down. On the outside: - press in the button</p> <p>Remember to make sure you’re on the kiln calendar correctly. If you didn’t use all the kilns reserved, erase your class or name from the unused kilns. Fill out a kiln chart that tells what you’re firing to, any ramps set on a controller, placement of visual cones.</p>
<p><b>kiln wash</b></p>	<p>A mixture of kaolin and flint, often 50/50, applied to the TOP of the kiln shelf only so that glaze runs will not stick permanently and can be chipped off.</p>



<b>leather-hard</b>	State when clay holds enough moisture to still be dark in color, but is no longer plastic, is stable in form, and can be easily carved or trimmed. Leather-hard clay put in water becomes softer but does not completely dissolve the form.
<b>lowfire</b>	Clay work fired between cone 06-02
<b>Mat/matte</b>	Non-reflective surface in glaze. May be smooth or stony.
<b>maturity</b>	Clay fired to it's desired state. High-fire clays are often fired to vitrification, while lowfire pottery bodies are dense, but still porous. Sculpture bodies are often intentionally fired lower than they can actually stand to reduce shrinkage and stresses.
<b>midrange</b>	Clay work mature between cone 4-6
<b>mishima</b>	Slip decoration of inlaid slip developed in Korea. Leather-hard clay is incised, then the recesses filled with slip of a different color than the body. When all is again leather-hard, the surface is scraped down to reveal the colored lines.
<b>mold</b>	A form to support clay in a specific shape during the plastic state. Often made of plaster or other porous materials to assist drying. <b>Hump molds</b> are domed for clay to be applied over. <b>Slump molds</b> are hollow concave forms to clay to be draped into.
<b>overglaze enamel</b>	Very low- temperature colors applied to fired glaze ware, and then given a third firing to between cone 018 and 016 (1157-1355 deg. F). Also called <b>China paint</b> .
<b>oxidation</b>	Condition in firing where sufficient oxygen exists to allow clean burning of any combustible materials in the firing. Electric kiln firing is an oxidation atmosphere.
<b>peep hole/peep plug</b>	Hole or port in a kiln used to look inside the kiln during firing. Refractory plugs or bricks are used to plug them during firing.
<b>physical water</b>	Water between molecules in plastic clay that evaporates during drying and/or turns to steam at 212 degrees F
<b>plasticity/plastic clay stage</b>	State where clay responds to forming pressure. Plasticity is the ability of a material to respond to pressure and hold that form.
<b>porcelain</b>	White, fine-grained, high-fire clay body that is vitrified at maturity and translucent where thin. Fired typically between cone 10-11. There are mid-range white bodies that are also called "porcelain", although they are not fired to traditional temperatures.
<b>primary clay</b>	Clay created on the site of the parent rock. Very pure, unmixed, white, refractory.
<b>pyrometer</b>	Measure Temperature at a specific place and time
<b>pyrometric cone</b>	Measures work heat in a kiln (time and temperature)
<b>quartz inversion</b>	The point where silica in a clay body changes shape from alpha to beta, and become about 2% larger in heating. This is reversed in cooling. This happens around 1000 degrees F, which is about visible red heat. It is important to pass through this point evenly to prevent stress on the ware, so people generally fire ware slowly until past this point, and cool slowly through this point.

<b>red heat</b>	Temperature where there is a visible dark red glow in the kiln chamber. About 1000 degrees F.
<b>reduction</b>	A condition, usually in a fuel-burning kiln, where there is insufficient oxygen for complete combustion of the fuel in the kiln. This forms carbon monoxide, which takes loosely bonded oxygen from iron and copper materials, changing their molecular form and color.
<b>refractory</b>	Something is resistant to heat and melting.
<b>resist</b>	Material applied to protect a surface from something else being applied. Often wax, varnish, latex, or paper. In the case of paper and latex, the resist is usually removed before firing. With wax and varnish, the resist is fired off.
<b>satín</b>	Glaze surface that has a low, waxy sheen and is smooth in texture.
<b>scoring</b>	To scratch clay surfaces to provide extra surface area for a sturdy join. Also called luting.
<b>secondary clay</b>	Clays transported in forming. This allows for introduction of other materials that change maturing temperature and/or color, and may include processes that grind particles and/or sort for size.
<b>sgraffito</b>	To use a tool to scratch or draw through a layer of slip to show the clay below as a contrasting line.
<b>shivering</b>	When a glaze peels back from the edges of a pot. Caused by the clay shrinking more than the glaze
<b>short</b>	A clay that lacks plasticity and may crack easily upon bending.
<b>shrinkage</b>	Contraction of clay with resulting smaller size and stresses during drying and firing of clay objects. The loss of physical water causes shrinkage during drying. The loss of chemical water and burning out of carbonaceous matter, as well as the melting of fluxes, causes shrinkage in firing. Generally lowfire clays shrink less than high-fire clays in firing. Shrinkage for Resolute earthenware is about 9.5% at cone 03, Phoenix stoneware is 12% at cone 10, and Helios porcelain 13% at cone 10. Sculpture clays are formulated to shrink less. Nan's Sculpture Clay shrinks 8% at lowfire temperatures.
<b>slake</b>	To put dry unfired (greenware) clay in water and dissolve it into an amorphous state.
<b>slip</b>	A mixture of clay and water, which can be colored with oxides or stains and used for decoration. Some people use engobe as a synonymous term.
<b>slip application methods</b>	Brush, dip, marble, feather, mishima, sgraffito, stencil, comb.
<b>stencil</b>	To use a cut-out of a resist of paper or other flat material, adhered to clay (usually wet paper to leatherhard clay) for the application of slip in a specific shape or area.
<b>stilt</b>	Tripod of refractory clay with high-temperature wire points used to support clay objects glazed on the bottom.
<b>stoneware</b>	Highfire clay body that is vitrified at maturity, fired to cone 8-10. Contains iron. Classic stoneware fires to a toasty orange-brown color in reduction and is grey under a clear glaze. It is possible to formulate white stoneware bodies that are off-white and between a porcelain and stoneware body.
<b>terra sigillata</b>	Very fine clay particles suspended in water, applied to bone-dry clay to help seal the surface and provide a waxy finish. Terra sigillata can be made from red clay or white clays, and may have colorants added.

	Literally means “earth seal”.
<b>terra cotta</b>	Earthenware clay body that is generally red in color. Matures between cone 06 and cone 03.
<b>throwing</b>	Using the potters’ wheel to produce clay forms in plastic clay.
<b>viscosity</b>	The thickness of a melted glaze that controls amount a glaze moves in firing. A viscous glaze would be one that doesn’t move much in firing. The opposite would be a runny glaze.
<b>visual cones</b>	A pyrometric <b>cone pack</b> placed in front of a kiln peep hole to monitor firing. In our shop, use of visual cones is required for all firing.
<b>vitrification</b>	Fired state where clay is hard, dense, non porous and will hold water w/o glaze
<b>volatilize</b>	To turn a solid or liquid into a gas under the influence of heat.
<b>underglaze</b>	A commercial product that is like a finely ground slip of colored clay that usually requires a glaze on top. Traditional underglaze calls for 3 coats. There are one-coat products as well, that are often fluxed enough to produce a low sheen.
<b>warping</b>	The distortion of clay ware that occurs in drying or firing. This can be due to gravitational stress, uneven drying, clay body formulation issues, or over-firing.
<b>wedge</b>	Kneading of clay in the plastic state to homogenize the consistency.