

Materials in Practice

Ceramics

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video series here



Materials

- Clay
- Cutting wire
- Knife
- Rolling pin
- Newspaper
- Vinegar
- Toothbrush
- Sponge
- Plastic bags or wrap

Optional

- Plastic tubs
- Banding wheel
- Guide sticks
- Textured rollers or found objects
- Underglaze and gloss glaze
- Glazing brushes
- Potter's ribs

Techniques

Pinch pots: begin with a ball of clay. Press down into the centre of the ball with your thumb to gently pinch and shape the interior while supporting the outside of the form with your fingers. Rotate the piece to maintain an even thickness (about 1 cm). Allow pots to firm up before joining them to ensure they don't collapse. To join 2 pinch pots, flatten the rims for a better fit. Score the rims with a toothbrush and apply vinegar to ensure adhesion. Sealing the join with a coil will strengthen the structure and help fill in any gaps. The air trapped inside will help maintain the form during shaping; however, the form cannot be significantly altered once the airlock is broken. Remember to pierce a hole in any airlocked structure prior to drying and bisque firing.

Coil building: shape a lump of clay into a sausage shape and roll the clay into even coils using your whole hand, from fingertips to palm. Starting at the centre and moving outward with even pressure as you roll will help you maintain an even coil. Construction coils should be at least 1 cm thick for strength. Score coils with a toothbrush and apply vinegar to coils before joining.

Slab construction: cut a flat piece of clay using a cutting wire and place it on a sheet of dry newspaper. Use a rolling pin to gently roll a slab, flipping and rotating each time you roll to prevent sticking and ensure even distribution of the clay. Students can maintain an even thickness by placing guide sticks on either side of the slab to support the rolling pin. Slabs need to firm up slightly before joining. To join slabs, score along the edge of both slabs using a toothbrush. Apply vinegar and hold slabs in place to ensure a firm and secure join. Reinforce slab joins with thin coils by pressing and smoothing them into the inside.

Safety

- Clay tools should be free from clay dust when stored.
- Wipe surfaces with a damp sponge instead of dry sweeping.
- After handling clay and glazes, wash hands with soap and water.
- The kiln should not be opened until it reaches 40°C.



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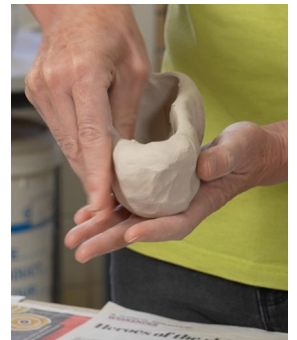
Processes

The clay life cycle begins with **plastic clay**, which is soft, malleable, and ideal for shaping. As it dries, it becomes **leather hard**, a firmer yet still bendable stage where pieces can be joined. Once fully dried, it reaches the **bone-dry** stage, at this point, breakages cannot be repaired. Clay must be **bone-dry** before it is fired as any excess moisture will boil in a kiln, which can damage the pieces or the kiln equipment.

The first firing, **bisque firing**, at 1000°C hardens the clay while keeping it **porous** for glaze application. The kiln temperature should be increased at approximately 100°C per hour. This incremental rise in temperature helps prevent the clay from cracking. After reaching 1000°C the kiln gradually cools. The cooling process takes about 11 to 15 hours so, it is important that the kiln remains closed until it reaches 40°C for safety.

The **glaze firing** at 1200°C follows, sealing and **vitrifying** the clay, making it watertight and durable, though some **shrinkage** occurs.

Clay pieces must not touch each other in the kiln as the **glaze** will melt and fuse at high temperatures. The temperature should be increased at about 150°C per hour since the clay has already undergone chemical changes. Cooling takes longer than a bisque firing, and pieces should only be removed when the kiln reaches 40°C.



Pinch pot



Rolling a slab using guides



Constructing with coils



Building with slabs

Top tips

- Use newspaper on work surfaces to prevent clay from sticking and to make clean-up easier.
- Plastic tubs are helpful for keeping them moist and protected.
- Clay is easier to join when it is at the plastic or leather hard stage. To ensure a tight seal and secure join, 'wiggle and jiggle' the clay as you press 2 pieces together.
- When joining slabs, place any walls on top of the base rather than on the side of the base.
- Smoothing tools such as damp sponges and potter's ribs can be used to achieve a polished finish.

Vocabulary list

Ceramics

Term	Definition
Airlocked form	When air is sealed inside an airtight clay form.
Bisque firing	Bisque firing is the first firing, which converts bone-dry, fragile clay into a more durable and porous ceramic material. A bisque firing reaches 1000°C.
Bone-dry	Clay that has completely dried and is ready to be fired. Bone-dry clay is fragile and non-plastic.
Ceramic glaze	Ceramic glaze is a glassy coating on ceramics. It is used for decoration and protective purposes.
Coil	Clay that has been rolled on a flat surface to form a slender rope-like shape.
Glaze firing	Glaze firing is a process used in ceramics to create a glass-like surface on pottery or ceramic objects.
Grogged clay	Grog is a term used to describe crushed brick aggregate that is added to sculpture and structural clays to improve structural properties.
Guide sticks	Flat strips of wood used to ensure even thickness when rolling out clay slabs. They are placed on either side of a piece of clay, allowing a rolling pin to glide over them, maintaining a consistent thickness throughout the slab.
Leather hard	Clay that has partially dried but can be easily carved. Leather-hard clay can keep its shape and is still plastic however it is prone to crack when manipulated.
Pinch pots	Clay that has been shaped into a vessel by pinching and drawing the clay upwards by repeatedly squeezing the clay between the thumb and fingers.
Plastic clay	Soft, malleable clay fresh from the bag that is cool to touch and can be easily manipulated.
Porous	Porous clay can absorb and retain water due to tiny openings in its structure.
Potter's rib	Potter's ribs are rubber, wooden or metal-shaped forms used to create smooth surfaces. Artists refine and smooth clay by gently pressing and dragging ribs across surfaces.
Score	A technique where shallow cuts and groves are made on the clay surface to increase surface area and improve the bond when joining pieces.
Slab	An even sheet of clay that has been flattened with a rolling pin. Slabs are useful for creating walls in clay forms.
Shrinkage	Shrinkage in ceramics refers to the contraction of wet clay during the drying and firing stages. As clay loses water, it shrinks until after the bisque firing.
Vitrifying	The term 'vitrify' means transforming a material into a glass-like state. Vitrification occurs at high temperatures and creates durable clay bodies.