

3 Hand-Built Forms

Hand-building techniques have remained unchanged for thousands of years. Today's clay artists often use the same methods as their predecessors. All one needs is an idea, some sketches, a few good tools, clay, and knowledge of how to join clay pieces together. The three methods of hand-building—pinch, coil, and slab—are the basis of most variations in clay construction.

You can use these methods, alone or in combination, to make simple tiles and elegant vessels. You can experiment with making musical instruments, masks, or lidded boxes. Or you might prefer to sculpt a fanciful horse, dragon, or bird. Clay hand-building offers a freedom that can lead you into sculptural expressions you may never have imagined you could explore.





Fig. 3–2. Pinching techniques offer the artist many expressive options. Surfaces may show finger marks or be scraped smooth. Shapes can be asymmetrical or balanced. How do you think these pinched cups were finished?

Japanese. *Sake cup and raku teacup.*

Glazed ceramic, 2" (5 cm) and 2½" (6.3 cm) diameter. Private collection.

Pinching

Using the **pinch** method, you hand-build forms by squeezing clay between thumb and fingers. Making a pinch pot may seem simple, but it is an art to hollow out a pot from a single piece of clay. Japanese ceramic art forms are ideal examples of this art, in which the form is perfected according to an acknowledged sense of beauty.

For example, each part of a tea bowl—its contours, rim, base, the feel and balance in the hand—amplifies its exquisite dignity. (For more about Japanese tea bowls, see page 51.)

To make a pinch pot, squeeze the clay between the thumb and fingers of one

hand while your other hand holds and turns the clay. Thin and increase the height of a pot by repeating this rhythmic action. The product usually has a natural or *organic* quality marked by variations in balance and shape. The walls can feature the textural repetitions of finger marks as part of the design, have a surface textured by some other method such as paddling, or be scraped smooth with a metal *rib*.

Fig. 3–3. What qualities of this closed form suggest that it was pinched? How does the title redirect your attention?

Ryan Thomas. *No Peeking.*

Raku, pinch pot, closed form with wire base, 5" (12.7 cm) high x 3½" (8.9 cm) diameter. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.



Note It Making a pinch pot is not just a beginner's method. Some of the world's most beautiful pottery has been created by pinching. The key to success lies in controlling the turning rhythm while keeping the amount of pressure even for each pinch.

Practice: Pinch Pot

To make a basic pinch pot, take a lump of clay about the size of a lemon. It should fit comfortably in your hand. Keep a damp sponge nearby to wet your hands.

- Press one thumb into the middle of the lump. The clay at the bottom will be the base of your pot, which should be roughly as thick as the walls. For this exercise, try to make the walls and the base about $\frac{1}{4}$ " (.6 cm) thick. As you develop your tactile sense, you will be able to tell if the clay is too thick or too thin.



Press clay with one thumb.

- With your thumb inside at the center of the base, begin pinching the clay gently between the thumb and fingers of one hand while you support it and slowly turn it with the other hand.



Pinch while turning.

- Use a gentle, even pressure for each pinch to maintain an even thickness in the walls.



Fig. 3-4. The organic form and asymmetrical line of the lip on this pinched piece are typical elements found in traditional tea bowls.

Irene Casey, *Untitled*, 1997.

Stoneware, slip decorated with cone 10 glaze. Photo by Maureen Mackey.

- Make a complete rotation for each row of finger pinches.
- After you've gone around once, move your pinching thumb and fingers up a bit and start a new rotation.



Move up, pinch, and turn.

- Each succeeding row of pinches should slightly overlap the row below.
- Press your thumb and pinching fingers onto the dampened sponge when you feel the clay drying out. Smooth over any cracks with your moistened fingers. As the walls become thinner, the clay can become too flexible and lose its shape. If that happens, let the clay dry a bit before you finish the pot. Set the pot on the table upside down for a few minutes to let it firm up, or set the pot upright inside something (a jar, a paper tube, mug, or a frozen juice container) to help support the walls.



Fig. 3-5. Pinch and slab methods are combined to form these whistles.

Tim Ballingham, *Whistles*, 1998.

Burnished clay, colored slips, pit-fired in saggar, 9/2 x 3" (24 x 7.6 cm). Courtesy of the artist.

Fig. 3-6. Paddle tools.



Smooth cracks with moistened fingers.

- After the clay has stiffened slightly, pinch the walls thinner and give the rim its final shape. You can either flare out the rim for a wider opening or gently ease the rim inward for a narrower opening.



Shape the rim.

You can change the appearance of your pinch pot after it has stiffened a bit:

- *Paddle* the walls to refine the form or change the shape.

- Add textures by impressing or carving.
- Add a *foot*, or base, to the pot to balance the form and help it to stand properly.
- Decide if you want the surface of the pot to be rough or smooth. You can leave finger marks on the surface for decoration or scrape the pot smooth with a metal rib when leather-hard.



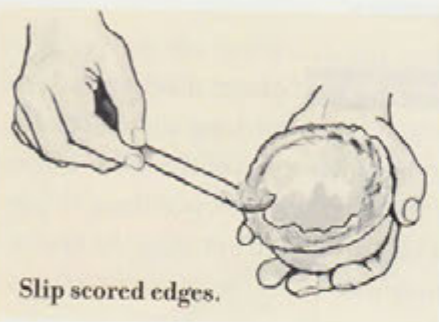
Scrape with rib.

Try It Make a few pinch pots with your eyes closed. You'll be surprised how easy it is to tell the thickness of the walls just by touching. Experience the process without visual distraction.

Join Two Pieces of Clay

Whether you're adding a foot to a pot, joining two pinch pots together, or assembling the pieces of a large clay sculpture, you need to know how to join pieces of clay securely before they dry out.

- 1 First, use an old fork or a rib with a serrated edge to score (scratch) the leather-hard clay surfaces you want to join.



Slip scored edges.

- 3 Roll out a coil (a long, thin piece of clay) and wrap it around the place where the edges are joined.



Apply coil to seam.

- 2 Use a paintbrush or wooden tool to coat the edges with slip (liquid clay). Then stick the two pieces together.



Join slipped pieces.

- 4 Using your fingers or a wooden tool, smooth the top of the coil over the top edge. Finish the join by smoothing the bottom of the coil over the bottom edge.



Smooth over edges.

Adding a Foot

Adding a "foot" to your pot not only balances the form but also gracefully lifts the entire pot. Be sure to add the foot before the pot dries out.

- Make sure your pot stands well by flattening the base slightly to keep it from rocking.
- Turn your pot upside down and mark the spot for the foot. (Try putting it just inside the edge of the base.)
- Draw a circle on the base of the pot and score its edges.



Score location of foot.

- Roll out a thin coil of clay and make a ring a little smaller than the base.
- Apply clay slip (liquid clay) to the base.
- Press the foot onto the pot and smooth the join with your finger or modeling tool.



Smooth the join.

- When the pot is dry, scrape and smooth the surface.

Safety Note Sponge down the table after you finish working and rinse off your tools at the end of the class. Collect clay fragments and recycle them to prevent clay dust from entering the studio atmosphere.

Variations on the Basic Pinch Pot

Now that you've made a basic pinch pot, you can experiment with the form, using other techniques or playing with scale (making a very large pinch pot, for example).

Using a Dowel

This is a simple way to produce a tall, narrow pot or vase.



Fig. 3-7. What are the main elements of this composition? Which parts do you think were constructed first?

Shawnda Sneed, *Pea Pods*.

Stoneware, slab construction with pinched "peas," cone 6 oxidation, 4 x 15 $\frac{3}{4}$ " (10.2 x 40 cm) each. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.

- Begin with a ball of clay about the size of a small orange.
- Push a dowel (about 1" diameter) (2.5 cm) into the center of the ball.



Push a dowel through clay.

- Gently rotate the dowel and clay against a cloth-covered surface to produce a thin-walled cylinder.



Pound and rotate to thin walls.

- Slip the pot off the dowel occasionally to feel how thick and even the walls are.
- Create a base for your pot: Pat a small amount of clay into a disk shape and join it to the bottom of the cylinder in the same way that you joined the foot to your pinch pot (score the edges, apply slip, and smooth the edges).

A square pot can be formed by using a square or rectangular piece of wood instead of a dowel.

Large Shapes

You can use the pinch technique to form large shapes. This is a useful way to create sections for sculptural work.

- Pat a large piece of clay into a round shape.
- Set the clay on a turntable or banding wheel.

- Use your fist to punch a hollow center in the ball of clay.
- Brace one hand against the inner wall of the form. Place the other hand on the outside directly opposite the inside hand. Press your hands together to thin the wall and draw it upward as you rotate the form on the turntable or banding wheel.



Forming large shapes.

- Allow the clay to stiffen slightly as you shape the form.
- If you are forming a vessel, you might wish to attach coils to finish the *neck* and *lip*.

The Hollow Sphere

Learning to make a hollow sphere of clay can help you create a variety of shapes—sculptures of animals or humans, abstract pieces, and so on.

- Make two pinch pots of roughly the same size and allow them to stiffen.
- Join the pots together and allow the join to stiffen.



Fig. 3–8. The rich luster of this raku form contrasts with the black matte surface of its coil-built stand.
Michelle Charles,
Untitled.

Raku pinch pot, closed form with coil stand, 3½" (8.9 cm) diameter x 8" (20.3 cm) high. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.

- You can modify the shape of the hollow clay sphere by gently tapping it with a wooden paddle. The trapped air inside will support the walls of the pot.

Try It Make your hollow sphere the basis for a sculpture of an animal or imaginary creature. Add clay cutouts or coils for its head, limbs, and other appendages. Join each piece to the body by scoring and slipping the surfaces to be joined and pressing the pieces together.

When you're satisfied with your creation, use a needle tool to make a hole in the bottom of the hollow body. This will prevent the clay from exploding when it is fired.

Making a Rattle

You can use hollow pinch pots to make a clay rattle. The ancient Mayans made rattles out of hollow clay forms filled with tiny pieces of clay.

For fun, create a rattle that might be used as an instrument by a band you enjoy listening to.

- In your sketchbook, design some distinctive pieces that could symbolize the band's name, theme, or character. Select one or two ideas to illustrate in clay.



Fig. 3-9. This humorous Mayan rattle uses a man's legs as the handle and an exaggerated pot belly for the sound-maker.

100 BC–900 AD, Classical Mayan Period.

Drawing based on a rattle in the collection of the Museo Nacional de Antropología e Historia, Mexico City.



Fig. 3-10. Do you think these were made for performing or for decoration? Nancy Baca makes rattles using both hand-built (pinch) and thrown techniques. What materials other than clay do you see in these two rattles? For other examples of mixed-media ceramic work see page 78.

Nancy Baca, *Rattles*, 1997.

Clay, mixed-media, 14" (35.5 cm) high, 4" (10.2 cm) diameter. Courtesy of the artist.

- Roll out a series of small clay balls and let them dry. Wrap them loosely in a piece of newspaper.
- Make two pinched bowl shapes of the same diameter.
- Place the paper package holding the dried clay balls inside one of the spheres before joining it to the other (score, slip, and coil the join).
- Add shapes that will further distinguish the final piece.
- Pierce the hollow form before firing.
- The newspaper will burn during the firing, releasing the balls.

- Select a decorative technique to finish the surface and complement the musical theme you wish to convey.
- Look carefully at your finished pinched forms. How can you tell they were made by the pinch method? Does the shape seem to lift up or does it appear low and squat? Is it lighter or heavier than you expected?
- Consider arranging a performance piece with your fellow students, using your rattles to accompany a favorite musical number.

Coiling

Like the pinch technique, coiling has existed since the beginning of ceramics. Coiling is a much more versatile technique than pinching. Contemporary arts and crafts potters as well as traditional African and Native American potters still use the technique.

Using the **coil** method, you hand-build forms by rolling clay into a long, thin piece like a snake or a rope. Potters usually use coils to build circular forms, adding the coils on top of one another. Coils can also be used to add straight lines or vertical elements to a pot.

Coiling's versatility makes it well-suited to building different types of pots. Coiling allows you to build a large pot fairly quickly—the only limit to the size of



Fig. 3-12. Although the coils used to make this vessel are clearly evident, some pots that are made using the coiled method have a perfectly smooth surface. Compare and contrast this artwork with the one shown in Fig. 3-14. Ryan Thomas, *The Burp*. Earthenware, coil construction, 11" (28 cm) high. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.



Fig. 3-13. What do you think may have been the purpose of these pots? Although these hand-built vessels were made using the coil technique, forms such as these can also be constructed using the pinch technique shown on page 49.

Pima, *Human Effigy Jars*, 1926. 8" (20 cm) high. Courtesy of Arizona State Museum.

a ceramic coiled piece is the size of the kiln used to fire it. Large pieces can be engineered with a network of inside coil supports that reinforce the outside walls of the form.

Making a Coiled Pot

To create a coiled pot, you will need the following tools: bat or banding wheel, modeling tools, sponge or brush, rib tool, knife or flexible hacksaw blade for smoothing, and a smooth stone or metal spoon.

Think about how you want to shape your pot. The shape of your base affects the ultimate shape of your pot. A wide, flaring base will support a wider pot. A narrow, high base will suit a pot that's a bottle or bud-vase shape. Make a sketch and keep the silhouette nearby as you proceed. Work on a *banding wheel* or bat (a round piece of wood) that can be easily turned.



A banding wheel.

Note It Potters usually start a coil pot by making a shallow bowl shape to support the base of the vessel. The size of the support doesn't limit the ultimate size of the pot—it keeps the weight of the coils from pressing down on the base and creating a squat shape.

To form the base of your pot:

- Take a piece of clay the size of a grapefruit and pinch it into a shallow bowl shape. Keep the walls fairly thick (about $\frac{5}{8}$ " (1.6 cm).



Form the base.

- Smooth and compress the inside wall of the base with a rib tool while your other hand supports the wall from the outside.



Smooth the inside; support the outside.

- Score the edge of the base.
- Moisten it with a wet brush or damp sponge.



Moisten scored edge.

Now you're ready to add coils to build the walls.



Fig. 3-14. At first glance, does this pot appear to be made using the coil technique?

Courtney Teschner, *Untitled*.

Coil formed, sawdust fired in saggar, 14 x 12" (35.5 x 30.5 cm). Spruce Creek High School, Port Orange, FL.

How to Make Coils

Coils should be of uniform shape and long enough to fit around the edge of your pot. As a rule, the coil diameter should be twice as thick as the walls of the pinch pot you've created for the base. Later, you can thin the walls to the width you desire when you finish the piece by smoothing and scraping its surface.

Squeeze a thick lump of clay into a snake shape, roll the clay on a smooth surface with the palms of your hands, or use an extruder.



Fig. 3-15. Paul Roge's drum is coiled and glazed at cone 6 electric. The drum is strung with goatskin and laced with $\frac{1}{4}$ " strips of goatskin.

Paul Roge, *Untitled*.

Coil-built, glazed at cone 6 electric. Bellarmine College Preparatory, San Jose, CA. Photo by Diane Levinson.

For Your Sketchbook

Sketching both silhouettes (outline shapes) and more detailed renderings that include surface treatment will help you decide what approach to take when planning a large or complex coil-built form. Draw several ideas and choose the best one before you begin working with clay.

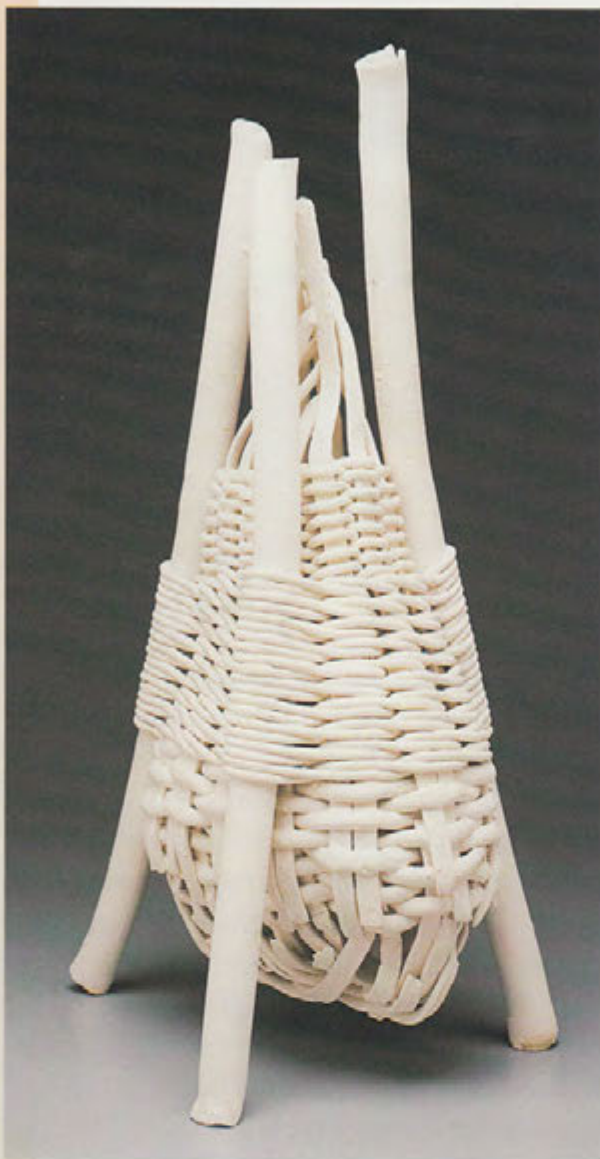


Fig. 3-16. Rina Peleg uses extruded coils to develop her basket forms.

Rina Peleg, *Nesting Structure*, 1983.

Clay, 3 1/8 x 1 7/8 x 1 3/8" (79 x 44 x 34 cm). Mint Museum of Craft & Design, Charlotte, NC. Allan Chassanoff Ceramics Collection.

Try It To make coils by hand, take a piece of clay and roll it into a snake shape, then lay it on a flat surface. Starting at the middle of the snake, roll the clay back and forth, keeping the palm and fingers flat while moving them lightly and gently to the outer edges of the coil.



Make a coil.

Fig. 3-17. Cynthia Villegas loads the extruder.



How to...

Extrude Clay

An **extruder** is a simple mechanical device that compresses clay and forces it into coils or hollow tubes of different sizes depending on the die you choose. You can make coiled or extruded forms that are symmetrical or asymmetrical, refined and smooth, or rough and primitive. Extruders are often used when many evenly-made coils are required, such as for a large sculptural work. (See Fig. 3-16.)

- 1 Prepare clay for extruding by wedging or kneading to the desired consistency.
- 2 Select and install a die for the shape you want, and load the extruder with clay.
- 3 Pull the handle down slowly and evenly.
- 4 Collect the clay and trim it to size.

Adding Coils to the Base

- Cut a coil the length of the base circumference and lay it in a ring onto the scored surface of the base.



Lay a coil on scored edge.

- To join the coil to the base, smooth the coil downward on the inside and smooth the base upward on the outside.



Join coil to base.

- Add a coil on top that matches the thickness of the one below it. The ends of the new coil should join to make a ring. If your coil is too long, cut off the excess; if it's too short, add in a shorter coil and join all the edges.



Join coil ends.

- Smooth the coils together. Join coils securely, so they won't crack or separate later.
- Continue to make new coils and increase the height of the walls. If the coils are soft enough, they may be joined without scoring the edges. If you have to leave your pot and come back



Fig. 3-18. Identify the base, body, shoulder, neck, and lip on this vessel. How did the artist maintain symmetry and balance?

Bryan Campbell, *Classic Elegance*.

Stoneware, coil-built, cone 6 oxidation, 19" (48.3 cm) high. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.

later, the clay may have dried. In this case, score the edges of the pot and the new coil and moisten them with a brush dipped in water or a damp sponge before pressing together.

If your clay is damp, the weight of the coils may cause the walls to sag. If this happens, let the walls stiffen to support additional coils by leaving your piece (uncovered) for about twenty minutes. Keep the top ring moist by covering it with plastic or a damp cloth. When you resume coiling, if the surface ring has stiffened, score and slip it before joining the first new coil.



Fig. 3-19. What areas of this sculpture do you consider to be dominant? How are they balanced?

Pam Berard, *Untitled*.

Coil built, low-fire, 11 x 7" (27.9 x 17.8 cm). Spruce Creek High School, Port Orange, FL. Photo by Timothy Ludwig.



Fig. 3-20. How does repetition of the triangle shape in form and design create unity in this teapot?

Jilian Davis, *Triangle Teapot*.

Earthenware, coil-built with underglazes, cone 04, 9" (22.8 cm) diameter, 10" (25.4 cm) high. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.

Note It Once formed, coils will dry out quickly because their large surface area comes into contact with air. Cover your coils with a piece of plastic or a moist cloth to keep them damp while you work.

As you continue, you can best control your pot's shape by following these hints:

- Start laying each new coil in a different place each time.
- Support the growing shape with both hands, one on the outside and the other inside, as you join and smooth each coil ring onto the one below.



Support pot and smooth coils inside.

- To change the wall's direction inward, attach the coil toward the inside of the rim. If you want the wall to flare out, place the coil toward the outer edge.
- Look at your pot from all angles, not just from above, as you construct it to see how the coiling is developing and adjust the shape.



Fig. 3-21. Consider the negative space as a design element. How does it contrast with the movement implied by the coil legs?

Shawnda Sneed, *Mingling*.

Stoneware, coil built, cone 10 reduction, 9 to 17" (22.8 to 43.2 cm) high. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.

Fig. 3-22. Observe how the profile of this cup and unusual "handle stand" imitate the shape of the teapot's body.

Linda Mruk, *Untitled*.

Coil built low-fire teapot with incised surface design, cone 04. Lancaster Central High School, Lancaster, NY. Photo by Anne Perry.



- Define the shape of your pot and compress the clay by gently tapping the surface with a wooden paddle when the walls are firm. Use light pressure when paddling.



Define shape and compress clay.

- Add the final coils to create the top edge of your pot.



Smooth top coils.

- Check the lip, or top edge, to make sure the angle and size balance and fit with your pot's character.
- Smooth the walls with a rib tool or scrape them with a flexible hacksaw blade when the pot is leather-hard.



Smooth walls when leather-hard.

Fig. 3-23. The organic coil forms and the vertical direction of curving, shiny, circulating surfaces give this composition a special rhythmic quality. What does the color suggest?

Kanessa Herron, *Bronzed Buds*.

Stoneware, slab with coil construction, cone 6 oxidation, 15½" (39.4 cm) high. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.



Safety Note Recycle clay so that it doesn't end up as dust and damage your lungs. Put a sheet of newspaper under your piece when you scrape or sand it to collect clay fragments and dust.



Scrape bottom of pot.

- Check to make sure that the weight is evenly distributed throughout the pot.
- Scrape the bottom with sandpaper or a rasp blade (a metal scraper) to even off the base if necessary.
- Allow your pot to dry slowly to avoid cracking.



Fig. 3–25. Would you agree that architectural clay forms lend themselves to slab-building techniques?

Duncan Warner, *Mosque*.

Saggar fired, cone 02, 12" (30.5 cm) wide. Spruce Creek High School, Port Orange, FL.

Slabs, Molds, and Tiles

A **slab** is nothing more than a flat piece of clay. Building with slabs offers new challenges and opportunities. With stiff clay slabs, you can fashion geometric shapes such as tiles or clay boxes. Using soft clay slabs, you can create everything from



Fig. 3–26. The playful composition and unlikely subject matter for this sculpture appeal to a viewer's sense of humor. What other expressive qualities does this artwork evoke?

Sarah Worman, *Frog on Wheels*.

Slab and sculpture, Whitmer High School, Toledo, OH.
Photo by Corey Gray.

Fig. 3–27. This decorative slab is meant to hang on a wall. The artist used a black glossy glaze design in the center with sponge accents, and a matte crater glaze on the border.

Marcy Wrenn, *Untitled*.

Low fire with porcelain slip, 16" (40.6 cm) wide.
Courtesy of the artist.



platters to wall pieces. Slabs are so versatile, you can use them to make a variety of sculptural pieces and expressive forms.

Note It When rolling slabs, and working with slabs in general, cover your work surface with a piece of canvas. The canvas absorbs moisture so the clay won't stick to the work area. The canvas also makes a sort of carrying sling for the slab—you can carry clay from one place to another, supporting part with one hand and draping part over your other arm without distorting the shape or thickness of the slab.

How to Make Slabs

You can make clay slabs using several different techniques and tools, including a mechanized roller. If a roller is unavailable, you can slam the clay down onto the floor or a table and repeat until you reach the desired thickness. Each time you lift the clay, turn and slam it on the alternate side. This forces the clay platelets closer together and strengthens the slab. The more compressed the clay becomes, the less likely it is to crack when fired.

A slab piece usually takes more clay that you would expect. Often, you will end up with a lot of unused clay from around the edges of cut pieces. You can wedge the excess clay and use it again before it dries out.

You can also form slabs by rolling clay by hand with a dowel or rolling pin. For the studio practice described in this book, you will roll out slabs.



Fig. 3–28. Slab rolling tools.



Fig. 3-29. Barbara Fransway uses a mechanical slab roller to quickly roll out a clay slab. She presses wedged clay evenly by hand to about 1" and places it on the roller atop a piece of canvas. Then she covers the clay with a second piece of canvas and turns the wheel.



Fig. 3-30. When the clay is flattened, she reverses the direction of the wheel and rolls it back over the clay until the roller clears the slab, then removes the top canvas. The bottom canvas functions as a sling for carrying the slab to a work table.

- Take a lump of wedged clay and level it first by pressing it to a flat, even thickness with the heel or palm of your hand.
- Turn the slab over and place it between two parallel guide sticks (wooden slats of equal thickness, about $\frac{3}{8}$ " (.7 cm). The slats help you to maintain the same thickness throughout the slab as you roll and flatten it. Using the dowel or rolling pin, roll slowly back and forth over the clay, and then roll diagonally to even out the corners.



Press clay flat.



Roll clay between guide sticks.

- Turn and reverse the flattened slab once or twice during the rolling process to help strengthen and compress it. Should



Fig. 3-31. The free-form edge of this geometric vase softens its shape and frames the garden painted on its walls. What other device does the artist use to frame the garden?

Lexy Durik, *Garden of Paradise*.

Slab vase with asymmetric lip. Whitmer High School, Toledo, OH. Photo by Corey Gray.

some air bubbles appear in the slab while you are rolling, pierce them with a needle tool and press the hole smooth with your finger. You can easily create textured slabs by rolling out your clay over a patterned surface such as lace, burlap, straw matting, or any other textured material.



Fig. 3-32. Simplicity of surface and form is this piece's defining characteristic. Where does the artist use emphasis?

Corey Bencsik, *Untitled*.

Soda fired, slab, 14 x 10" (35.5 x 25.4 cm). Spruce Creek High School, Port Orange, FL. Photo by Timothy Ludwig.

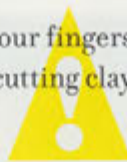
You can easily make small slabs by slicing them directly from a wedged lump of clay using a wire tool. Place several wooden slats of equal thickness on each side of the lump and use them as a horizontal guide for the cutting wire. Remove the slats gradually as you continue cutting slices from the lump. Small slabs can be pressed and joined together to make larger sheets if necessary.



Slicing slabs with wire.

Depending on your desired form, you can use slabs when they are soft and malleable, or you can let them stiffen to the leather-hard stage to make geometric creations such as boxes and tiles.

Safety Note Keep your fingers out of the way when you are cutting clay slabs.



Note It It's always better to use clay from the same source and roll out all your pieces simultaneously. This helps to maintain identical water content and minimizes distortion and cracking. Prepare as many slabs as you might need, and cover them with plastic to keep them moist.

Soft Slabs

Soft clay slabs are ideal for using with molds. While the clay is still flexible, it can be easily fashioned into a variety of shapes using simple molding techniques. Whether shaped in a sling, pressed into a mold, draped over a mold, or wrapped around a support, soft slabs are fun to work with.



Fig. 3-33. Lisette De Mars rolls a soft slab over a tube to make a cylindrical form.



Fig. 3-34. What elements do the forms in this series have in common? See page 166 for more about artworks in a series.

William Penn, *Geometry*.

Stoneware, slab construction, cone 6, 9 3/4" (24.76 cm) high. Stivers School for the Arts, Dayton, OH. Photo by Kim Megginson.

its shape. Decide how to hang the mask, perhaps by making holes in the clay to accommodate a wire or hook. Bisque fire, then finish with glaze or paint.



Fig. 3-44. The artist used stiff slabs to construct this piece. What shapes are dominant in the work, and how do they relate to each other?

Jenni McDonough, from *Pitcher Series*. Slab formed pitcher with lid, sawdust fired, 16 x 12" (40.6 x 30.5 cm). Spruce Creek High School. Photo by Timothy Ludwig.

Stiff Slabs

Throughout history, potters have used stiff slabs of clay to make boxes and geometrically shaped containers, tiles, and sculptural pieces. Both ancient and modern clay sculptures are made from stiff slabs in combination with other clay techniques. Stiff slabs may be cut and

assembled when leather-hard. Plan your piece carefully.

Note It When you work with stiff clay slabs, it helps to build a model. First sketch the idea and then put it together on a small scale. This process may reveal potential building or joining problems. You may decide to discard certain designs that prove unworkable. These preliminary clay sketches are called *maquettes*.

Follow this process when working with stiff clay slabs:

- Draw the form that you want to create.
- Construct a maquette to test the design.
- Cut out paper patterns for the shapes you want to use.
- Roll out your clay slab. Because clay shrinks as it dries, allow it to dry somewhat (until nearly leather-hard) before cutting it.
- Place patterns on top of slab and cut shapes from clay using a knife or needle tool.



Fig. 3-45. If you wanted to plan a series of clay dwellings, would you sketch them first? How could you make models, before cutting final, full-size slabs?

Michelle Charles, *The Village*.

Raku, tallest is 20" (50.8 cm) high. Stivers School for the Arts, Dayton, OH.



Fig. 3-46. Creating clay boxes may take some planning, but a well-made box is worth the effort. What expressive and technical qualities does this object reveal?

Maurice Grossman, *Shaman's Box*, 1993.
Raku, 26 x 10 x 7" (66 x 25.4 x 17.8 cm). Courtesy of the artist.

Safety Note Take care when you use sharp or pointed tools. Always cut away from yourself.



Merely joining four sides to the base as four walls creates a problem. Try it yourself and see what happens—the corners don't fit. The thickness of the clay wall is another dimension, which you must take into account. To make a successful clay box, prepare your wall pieces before joining them to the base and to each other.

Practice: Making a Clay Box

Because it takes time to attach the sides that form a box, be careful not to let the slabs dry out too much (stiff slabs will dry quickly). Keep unused pieces covered with plastic until you are ready to attach them.

- Cut out a 6 x 6" (15.2 cm) square of cardboard and a 6 x 10" (15.2 x 25.4 cm) rectangle of cardboard to use as templates.
- Place each cardboard cutout on a leather-hard clay slab and cut around it with a sharp knife or needle tool. Cut two 6 x 6" (15.2 cm) squares and four 6 x 10" (15.2 x 25.4 cm) rectangles. You now have four walls, a base, and a lid.

- Place a ruler about 1/4" (.6 cm) from the edge of a wall piece. Miter (cut at a 45° angle with a knife or needle tool) the two long (10") (25.4 cm) sides of each wall.



Miter side edges to 45°.

- Score and slip the mitered sides and the bottom edge of each wall.



Cutting slab with template.



Apply slip to scored edges.

- Lay your square base flat on the work surface. Position the wall pieces flat on the work surface next to the base.
- Score the base's surface where the walls will join and apply slip.
- Slip and join the walls and base together, one at a time. Press firmly into place.



The scored base ready for slip.



Press walls down onto base.

- Roll out four coils the length of the box sides.
- Reinforce each join on the inside with a soft coil. Smooth the coils into the sides and base.
- Clean the inside edges and pinch the outside edges smooth with your thumb and forefinger or with a wooden tool.



Reinforce joins with coils.

- Slip and score the edges of the remaining square piece. Also, slip and score the top edges of your box.
- Attach the square to the top and press firmly to attach it.
- When the clay is leather-hard, use your knife or needle tool to cut—at a 45° angle—through the clay a couple of inches below the top. Cut all around the box. Include a notch (like a puzzle piece) on each side. This not only adds visual interest but helps to secure the lid.



Pinch outside edges smoothly together.



Box with lid.

Fig. 3-48. How does this simple cover complete the form beneath? How does the artist utilize patterns in the form?

Marcy Wrenn, *Untitled*. Lidded and footed box, impressed design, saggar fired, 12 x 7 x 7" (30.5 x 17.8 x 17.8 cm). Courtesy of the artist.

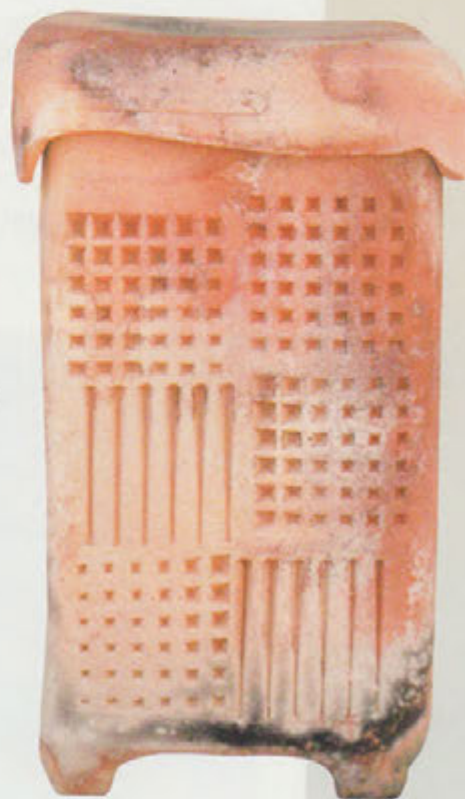


Fig. 3-47. Notice the different areas where repetition is used on this box. Do you think this is a functional or non-functional piece?

Kristie Martin, *Paisley Paradise*. Slab box with textured surface and hand-built additions. Whitmer High School, Toledo, OH. Photo by Corey Gray.



Adding a Knob

A knob is a solid piece of clay that makes it easier to lift a lid. Add a knob to your box:

- Remove the top from your box.
- Roll out a short coil or slab. Form it into whatever shape you want to create your knob.
- Score and slip the bottom edge of the knob as well as the area on the lid where you'll attach it.
- Press the knob onto the lid to attach firmly.
- Your box should be fired with the lid and knob in place.



Box with knob.

Making a Foot for Your Box

When the box has stiffened to leather-hard, you can add feet to your box. (See page 63 for foot-making instructions). Turn the box over and attach the feet in the corners.



Fig. 3-49. A box with a lid might be a house with a roof. What else might it be?

Jon DeVol, *The Fifth Wheeler*.

Lidded slab box with non-firing stain. Whitmer High School, Toledo, OH.

Alternatively, you can construct a rectangular foot. You'll essentially make another box on the bottom of the first box.

- Cut four strips of clay about 1 x 4" (2.5 x 10.2 cm).
- Gently turn your stiffened box upside down.

- Prepare and miter the four walls as you did above. Score and slip the surface of the base about 1" (2.5 cm) from the edge.
- Join the walls as before. Reinforce the joints with coils and allow them to stiffen.

You've just created an elegant box foot. If you like, you can decorate the walls of your box by carving into them or adding a slip design. See Chapter 5, Surface Decoration, for additional ideas.

Fig. 3-50. The relief on the front of this box conceals a drawer. Can you find the pull?

Lexy Durik, *Pandora's Box*.

Footed slab box. Whitmer High School, Toledo, OH. Photo by Corey Gray.



Fig. 3-51. The extensive use of tiles in architecture has endured for nearly 6,000 years. Turkey, Ottoman. 4 Tiles from Isnik, 16th–17th cent.

Glazed ceramic, 9½ x 9½" (24 x 24 cm) each. Private collection. Courtesy of Davis Art Slides.

Tile Making

It is difficult to consider the uses for flat slabs of clay without thinking of tiles. The tradition of tile making is quite old. The art form spread across Persia (Iran), Syria, and Turkey to Spain with the Moorish occupation in the eighth century. By the twelfth century, tiles were used in Portugal and Italy along the Mediterranean, and north to Holland and Germany. The Spanish brought the tradition with them to Mexico when they came to the New World in the 1500s.

Usually tiles embellished important buildings, such as castles, mosques, and cathedrals. Tiles are extremely versatile, able to withstand extremes in temperature, and always maintain their vibrant colors.

Due to these qualities, we still use tiles to beautify homes and public buildings.

Note It Handmade tiles tend to warp. To create successful tiles:

- Reduce shrinkage by using a clay body containing grog or sand.
- Cut grooves on the back ⅛" (.3 cm) deep and spaced about 1" (2.5 cm) apart for a good bonding surface.
- Dry tiles as slowly and evenly as possible. Place a flat board on top.
- Add relief at the leather-hard stage.
- Lay the dried tiles on flat kiln shelves sprinkled with a thin layer of sand to allow for movement as the tile shrinks.
- Increase kiln temperatures at a slow rate during early firing.



Fig. 3-52. Tell how the sensory qualities of this tile series are similar. How are they different?

by Archaubeau, *Mona Series*.

Use relief, stamps, and texture. Courtesy of the artist. Photo by Corey Gray.



Fig. 3-53. Do you think the creator of this tile meant to include it in a larger composition? Raquel Durik, *Synergy*. Silkscreen on clay. Whitmer High School, Toledo, OH. Photo by Matt Squibb.

Thinking About Tile Design

A grouping of tiles can form any number of designs. Or, a single tile can be a complete composition. This illustration shows the dominant feature located in the center of the tile design.



A tile design.

When the original tile is placed in a grid pattern, design elements at the tile's corners now become part of a new design. The central design feature of an individual tile becomes less dominant as it becomes part of an overall design scheme.



Repeating tiles—notice new designs.

How the parts relate to the whole depends on which design element is dominant and how it affects the balance of the arrangement. Tiles are not always set in rows, adjacent to one another. In a composition that is similar to a painting, tile shapes can be used in a freely composed design without a grid arrangement.

How to Make a Design with Clay Tiles

Sketch some square tile designs for individual and multiple arrangements. Select a design that you will produce on a clay tile.

Trace over the design with tracing paper, creating a paper stencil. Cut out the negative spaces around the dominant image. You may need to make more than one stencil depending on the design.



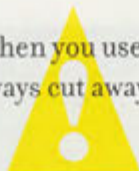
Fig. 3-54. Students from the Class of 2000 at Stivers School for the Arts designed and created a tile mural, which they installed and presented as a gift to the school.

Collaborative project, *Spirit of 2000*.

Earthenware, cone 04 glazes, 7' (2.13 m) high. Photo by Kim Megginson.

- Roll out a clay slab ($\frac{3}{8}$ " thick) (.7 cm) on a piece of canvas.
- Place the canvas and slab on a board.
- To smooth the surface of the clay, draw a rubber rib or plastic squeegee across the top.
- Let the clay stiffen slightly before cutting out the tile square.
- Cut around a 6 x 6" (15.2 cm) pattern using a sharp knife and a square rule to get the edges clean and straight. Handle the tile as little as possible.

Safety Note Take care when you use sharp or pointed tools. Always cut away from yourself.



- Place a second piece of wood on top of the tile and reverse both boards with the tile in between. Take off the top board and remove the canvas.
- Cut horizontal grooves about 1" (2.5 cm) apart on the tile. The grooves can be 1/8" (.3 cm) deep. (The grooves not only help the clay to dry but also provide a bonding surface for the adhesive to stick to when installing the tile.)
- Turn the tile over, smooth side up.
- Arrange your stencils on the tile, and use your fingers to gently press them into the clay.

- Paint background color(s) on the tile using underglazes or slips. (See pages 126, 128.)
- Carefully remove paper stencils and clean smudges with a flat tool or knife.
- In areas where stencils were removed, you can now paint details using underglaze.
- Let the tile dry slowly on a flat surface for several days.
- When the tile no longer feels cold (damp) it is ready for the first firing (known as the bisque firing).
- You can add more color and details with underglazes after the bisque firing.
- Finish the bisqued piece by dipping the tile face lightly in transparent glaze, and fire a second time.



Fig. 3-55. Stephen Farley was awarded a commission to create and install a monumental tile mural (this view shows one of four walls) commemorating everyday people from the 1930s–50s in Tucson, Arizona. Individual tiles appear as singular pieces of abstract art. The blacks, whites, and gray glazes are separated by thin lines that allow some terracotta-toned tile to show through, providing warmth and depth. When viewed as a whole, the collected tiles form murals that are lustrous, clear, and deep.

Stephen Farley, *Windows to the Past, Gateway to the Future*, 1999.
15,000 hand-glazed 6 x 6" (15.2 x 15.2 cm) tiles. Courtesy of the artist.

For Your Sketchbook

Draw some animals, people, scenes, or symbols that you think might work as a clay relief. When you have a variety to choose from, imagine actually creating a relief based on one of your sketches. Which kind of relief will you use? Can you combine several of your ideas into an interesting, balanced composition?



Fig. 3-56. Which elements of this design remind you of the view through a kaleidoscope?

Cassie Johnson, *Kaleidoscopic Clowns*.

Clay formed with molds, stamps; underglazes brushed, sprayed, spattered. Whitmer High School, Toledo, OH.

Relief

Relief is an image that has been carved, modeled, or molded onto a fixed background. It may be:

- High—projects from the surface and appears nearly three-dimensional.
- Low—is elevated but remains part of the surface.
- Flat—has only a very slight elevation.
- Intaglio (sunken)—the image is incised or carved into the surface.

Practice: Relief Panels

Make a tile wall piece that includes relief in its composition. Use coils, slabs, and pinched pads of clay to build up the relief forms. Use your fingers and modeling tools to shape the forms, complete details, and add texture. Plan a $\frac{1}{2}$ –2" (1.3–5 cm) border to frame your creation.

Make some drawings in your sketchbook of people, animals, scenes from nature, a dream, or an abstract design. Select one and think about how you would

Principles of Design

Unity

When parts of a design combine to create a sense of harmony and oneness, they display the design principle of unity. A potter might achieve a harmonious design in many ways, including the use of color, texture, and repetition of shapes or lines. A successfully unified design also contains some variety, because too much repetition can be monotonous or boring. Look at the work shown in Fig. 3-57. How did the artist achieve unity?



Glossary

A

aesthetics The branch of philosophy that deals with issues of beauty such as what is considered to be beautiful and what is considered to be art.

airbrushing Applying liquid colorants and glazes with an atomizer that uses compressed air to propel the spray.

alkaline glaze The earliest glaze developed in the Near East in which alkalies (base compounds of sodium, potassium, and the alkaline earths) are the fluxes.

alumina A primary ingredient in clay and glazes. It strengthens the clay, adds cohesion to a glaze, and reduces gloss to produce a matte surface.

armature A support or frame used when sculpting clay; usually removed before firing.

ash A glaze made with by-products of burned wood or vegetation.

atmosphere The mixture of gases in a kiln environment.

B

ball clay A plastic secondary clay that can withstand high temperatures and fires to white or off-white, also used as an ingredient in high firing glazes.

banding wheel A wheel head mounted on a pedestal base and turned by hand, used in the formation and decoration of pots.

bat A base for throwing, hand-building, or drying; usually made of plastic, pressboard, plywood, or plaster.

biscuit See bisque.

bisque (*bisk*) Ceramic ware that has gone through the first firing at a relatively low temperature (generally cone 010 to 05) and still maintains its porous state.

blisters Surface bubbles in a glaze caused by the release of impurities or gases that result when the firing process is too fast.

bloating Increase in porosity and pore size in a ceramic body that has been overfired.

bone dry Stage of drying when moisture in the clay body has evaporated so the clay surface no longer feels cold.

burnishing Polishing the surface of a leather-hard pot to compact it and produce and maintain a sheen at low firing temperatures. Objects such as a smooth stone or the back of a spoon are good burnishing tools.

C

calipers A hinged tool used for measuring diameters on the inside or outside of a three-dimensional form.

carbonates A compound containing carbon and other elements, used in making and coloring glazes or clay bodies.

celadon (*se-la-dan*) A category of green, gray, or blue-gray glazes for stoneware and porcelain; developed in China and Korea.

centering The process of applying pressure to a lump of clay on a spinning wheel head to position it for even rotation.

centrifugal force The tendency of matter to "flee from the center" when spun. Faster rotation creates stronger centrifugal force.

ceramics Objects made from clay that permanently retain their shape after they have been heated to specific temperatures.

chamber The enclosed portion of a kiln where pottery pieces are placed for firing.

chamois A very soft, pliant leather; used when wet to smooth the surface of wet clay.

chuck A clay shape used to secure leather-hard pieces in place for trimming on the wheel.

clay body A mixture of clay, minerals, and other ingredients that make up the composition of a clay type.

CMC gum An organic cellulose gum—carboxymethylcellulose—used as a thickener, suspending agent, glue, and binder.

cobalt carbonate A compound used as a blue colorant for slips and glazes.

cobalt oxide A very strong oxide used to produce blue in slips and glazes.

coiling Attaching rolls of clay together to form pottery.

collaring Squeezing the upper part of a thrown form as it rotates on the wheel, in order to decrease the size of its diameter.

colorant An element or compound that contributes color to a slip, glaze, or ceramic surface.

cone An object made of ceramic materials with a specific melting point, used to show the temperature in a kiln during the firing.

coning Part of the centering process; raising clay to form a cone as it spins on the wheel head.

copper A soft, common element known for its high conductivity and often used for green coloration.

crackle A type of glaze that incorporates crazing for decorative effect.

crawling A condition where molten glaze pulls away from portions of the surface to leave areas unglazed. This can be caused by grease or dust on the bisque ware.

crazing A network of fine lines in a glaze caused during cooling when tension between the clay body and glaze is uneven.

D

deflocculant A substance such as sodium silicate or sodium carbonate that causes the clay platelets to separate and remain in suspension when it is added with water to the clay.

dipping A method of applying glaze or slip to a piece by immersing it and quickly shaking off the excess liquid.

dome The result of successfully centering clay on the wheel. An opened dome is necessary to begin throwing vessels, pots, and plates.

downdraft kiln A kiln where the heat and flames are drawn downward and out through openings at the base of the kiln.

drape mold A support that holds a clay slab in a certain shape until it stiffens.

drying The elimination of water from clay pieces before firing.

dunting Types of cracking caused by cooling vessels too rapidly after firing.

E

earthenware Glazed pottery that remains porous when fired at low temperatures (below cone 2).

enamels Prepared low-firing colors, usually painted over higher fired glazed surfaces.

engobe A prepared slip usually containing colorants.

extruding The process of shaping moist clay by forcing it through a die.

F

faience (*fe-äns*) Term for low-fired pottery decorated with colored glazes over an opaque base glaze.

fettling knife A long tapered knife used for cutting and trimming clay.

firebox The enclosed section of a kiln where fuel is burned.

fireclay Clay that withstands high temperatures.

firecracking A network of fine cracks on the surface of an unglazed vessel caused by firing too fast.

firing Heating pottery or clay sculpture to a temperature high enough to render it hard and durable.

firing cone Pyrometric cone that will bend at the desired firing temperature.

flange A clay ridge that holds the lid of a pot, allowing it to rest securely. It can either be on the pot or the lid.

flue An opening within a kiln through which hot gases pass from the chamber to the chimney.

flux A material that promotes melting or increases the glass-making qualities of a glaze.

foot The base of a pot upon which it can stand.

frit A mixture of materials that has been fused by heating, reground into a fine powder, and used as an ingredient in a glaze.

G

glaze A coating of glass that is fused to the surface of a ceramic piece.

glost Glaze; also another term for glaze firing.

greenware Unfired pottery or sculpture.

grog Crushed fired clay used as an additive to clay body to reduce shrinkage.

guard cone Pyrometric cone one number hotter than the target firing temperature.

guide cone Pyrometric cone one number cooler than the target firing temperature.

H

hand-building Making clay forms by a non-mechanical process, such as pinching, coiling, and slab building.

high-fire Clay or glazes that are fired from cone 8 to cone 12.

hump mold Any object (plaster, foam, crumpled newspaper, etc.) over which a slab of clay can be laid to stiffen in that shape.

I

incise To remove clay by carving.

inclusion Any part of a fired clay piece, such as plant remains, rock fragments, and temper, that was not originally a clay mineral.

inlay To fill an incised or impressed area with contrasting colored clay.

K

kaolin (*kay-a-lin*) A pure clay used in white clay bodies such as porcelain. Sometimes called china clay.

kick wheel A wheel powered by the potter's foot rather than by electricity.

kiln A structure built to fire clay at high temperatures.

kiln furniture Heat resistant shelves and posts used to hold ware during firing.

kiln wash A mixture of kaolin and flint used to coat kiln shelves to protect them during firing.

kneading The process of mixing plastic clay to distribute minerals, organic materials, and water evenly throughout the body and to eliminate air bubbles.

L

leather-hard The stage between plastic and bone dry when clay has dried, but may still be carved or joined to other pieces.

levigation A method of refining clay in water where the heavy particles sink to the bottom and smaller particles are skimmed off the top.

lip The rim opening of a pot.

low-fire Clays or glazes that are fired within the kiln temperature range of cone 015 to cone 02.

low-mid fire Clay or glazes fired within the kiln temperature range of cone 01 to cone 3.

lug Handle-like projection on the side of pot.

luster A type of decoration made when metallic salts fired at low temperatures give a metallic sheen to a body or glaze surface.

M

majolica (*ma-yä-li-ka*) Earthenware covered with a tin glaze and painted with oxides. Also known as maiolica, faience, and delftware.

maquette (*ma-ket*) Small, quick preliminary sculptural "sketches" in clay.

matte or matt Dull surface, not shiny.

maturing temperature The temperature at which the clay body reaches the desired hardness or when a glaze fuses into the clay body.

melting point When a clay fuses and turns to a fluid glasslike substance during the firing.

mid fire Clay or glazes fired within the kiln temperature range of cone 4 to cone 7.

mishima A surface decoration technique whereby an impressed design is filled with a different colored clay slip.

mixed media Artwork made with a combination of materials or techniques.

mold Any form used to shape clay.

muffle The kiln chamber or wall that protects the pottery from the flame when being fired.

N

neck The part of a vessel between lip and shoulder.

negative space Areas of empty space defined by surrounding material; important in an overall design.

O

opacifier A chemical used to make a glaze non-transparent. Tin oxide is a common opacifier.

opening the dome Making a hollow in centered clay on the wheel, then creating a base and shaping the clay into its intended basic form (cylinder, bowl, etc.).

organic A shape or form that is curved or irregular, not geometric.

organic material Vegetable or animal material present in natural clay.

overfiring Increasing the temperature or length of firing beyond the ideal for a particular clay body or glaze.

overglaze A glaze designed to be applied and fired at a lower temperature after the first glaze firing.

oxidation Firing when the amount of oxygen present is more than is necessary to combust the fuel.

oxide A compound containing oxygen and other elements, used in making and coloring glazes or clay bodies.

P

paddling Beating clay with a flat stick to strengthen joints, thin walls, alter shape, or create texture.

paperclay Mix of clay, paper pulp, and water that is very strong and flexible and has an extremely low shrinkage rate.

peephole A hole in the door of the kiln through which the potter can view the progress of the firing.

pigment A mixture of minerals painted on clay ware before or after firing to produce color.

pinching A hand-building technique that involves squeezing the clay, usually between fingers and thumb.

pit firing A pre-industrial method of firing, still used, in which greenware is surrounded by combustible material and fired in a pit or on the ground.

plastic/plasticity The property of clay that allows it to change shape without tearing or breaking.

polymer clay A synthetic version of organic clay that is manufactured in various colors and baked in an oven rather than fired. It has only been in existence for a few decades.

porcelain A white high-firing clay body that is usually translucent.

porosity The amount of empty space in the structure of the fired clay that makes it capable of absorbing liquids.

preheating Heating ware prior to firing to remove traces of moisture.

press molding Making shapes by pressing clay slabs into or onto molds.

primary clay Clay that is of the same composition as the parent rock from which it was formed. Kaolin is a primary clay.

pulling Stroking plastic clay with the hand to shape handles for a pot.

pyrometer An instrument that measures the temperature of a kiln.

pyrometric cones Manufactured objects—made of ceramic materials and enclosed in a kiln during firing—that bend when specified temperatures are achieved.

R

raku (*rah-KOO*) A firing process in which porous or grogged ware is taken from the kiln when red hot (1470–1830°F). The ware is immediately placed in water or combustible material for reduction.

raw clay Unfired clay.

raw glazing Applying glaze to an unfired piece, then firing clay and glaze together.

reduction A firing in which there is insufficient air in the kiln for complete combustion. The metal oxides in the clay body and glaze release oxygen because there is not enough present in the atmosphere. This changes the color of the clay body and glaze.

refractory The quality of being able to withstand high temperatures without melting.

relief Sculptural or decorative forms that project from a flat background.

rib A flat curved tool made of wood, metal, or plastic used to refine shapes.

S

saggar A container made from fireproof material that protects ware from combustion gases during firing. It is also used to hold ware and fuming materials for separate reduction during firing.

salt glaze A glaze created by throwing salt into a kiln at stoneware temperatures. Vaporized sodium combines with silica in the clay body to form a sodium silicate glaze on the clay surface. Harmful vapors are also generated by this technique; soda glaze is recommended as a substitute.

scoring Scratching the edges of clay before joining them together.

secondary clay Clay that has moved from its original place of formation by erosion. It has combined with minerals and organic materials over time.

setting Arranging ware in a kiln for firing.

sgraffito (*sgrah FEE toe*) A decorating technique where a layer of slip applied to a clay body is scratched through to reveal the clay color.

shard A fragment of pottery.

shivering A glaze flaw; sections of glaze lift off a piece.

short clay Clay that is not plastic.

shrinkage The reduction in size of the clay mass that occurs when water in the clay evaporates during drying and firing.

silica A white or colorless crystalline compound occurring abundantly as quartz, sand, flint, agate, and many other minerals. It is the sparkly material in sand.

silk screen Fabric (often nylon) mesh used for printing an image onto a surface. Ink is forced through the screen with a squeegee.

slabbing Hand-building technique that involves shaping clay into a broad, flat, thick piece.

slab roller A mechanical device used to prepare clay slabs.

slip A fluid suspension of clay in water used in joining clay pieces and for surface decoration.

slip glaze A glaze that contains a high percentage of clay.

slip trailer A device, such as a rubber syringe or tube, used to apply lines of slip on clay as decoration.

slurry Clay that is like paste in consistency.

soaking The stage of firing when the temperature is kept steady for some time allowing the clay body and glazes to mature.

soda glaze A glaze created by spraying a solution containing sodium carbonate (soda ash) or sodium bicarbonate (baking soda) into the kiln while firing ware. Soda vapors react with the clay surface to form a glaze.

spray booth An enclosure with a vent that collects glaze vapors when a spray gun is in use.

spray gun A device that uses compressed air to vaporize liquid glaze. This tool is used to apply a fine, even coating of glaze.

sprig A decoration in relief, attached to greenware with slip.

stacking Loading a kiln efficiently for best use of space.

stains Commercial pigments used directly on clay bodies or for coloring glazes.

stoneware Dense, non-porous, hard pottery that matures from cone 5–11 (2200–2400°F).

T

template A pattern used to shape the profile of a piece.

terracotta An iron-bearing earthenware clay that fires to an earth red color.

terra sigillata (*TER-ra sij-jil-AH-tah*) A fine slip surface treatment used as a coating for burnishing or decoration.

throwing The process of shaping plastic clay on the potter's wheel.

toxic Any material that is poisonous or injurious to the health.

traditional pottery Hand-built ceramics, decorated with natural pigments and fired with organic fuel.

trailing Using a tube or slip trailer to squeeze lines of slip or glaze onto clay for decoration.

translucency A glaze quality that allows the passage of diffused light.

transparent glaze A clear glaze.

trimming The process of refining a leather-hard shape with cutting tools.

U

underfired A clay or glaze fired below its maturation point.

underglaze Any coloring element, such as oxides or commercial colorants, applied prior to glaze application.

updraft kiln A type of kiln where the heat is drawn through the kiln and exits through the top.

V

vitrification The stage during firing when a clay or glaze loses its porosity and transforms into a

hard, nonabsorbent, glasslike state.

volatilize To change under heat from a solid through liquid to a gaseous state.

W

ware A term for any ceramic.

warping Changes in a clay form usually resulting from uneven thickness of the walls, uneven drying, or stresses during firing caused by poor support or uneven heat.

water smoking The first part of the firing cycle when water is driven from the clay.

wax resist A decorative technique where liquid wax is applied to a fired or unfired clay body. The waxed portion resists the surface treatment (slip, stain, or glaze) leaving the raw clay exposed.

wedging A way of improving the workability of clay by reforming the mixture to make it homogeneous and even in texture while eliminating air bubbles.

wheelhead The flat circular revolving plate of the potter's wheel upon which the pot is formed.