Walnut Acres Elementary
Art Awareness Program

Use of Clay and the Kiln

Why Work with Clay?
Clay is fascinating and it will lend itself to every skill level. While trying a clay project for the first time may be daunting, the rewarding experience you are providing is well worth the effort. There is always more to explore, more to try out, as well as more to create. Clay is never boring!

Starting the lesson: Working with clay is fun but messy. If you are using the classroom, make sure your teacher has agreed to allow clay – using the Art Room (C-4) is ideal for clay projects. Allow time for clean up after the lesson. Plastic mats or plywood boards are excellent surfaces for the students to work on.

Amount of clay: A class of 30 children may use almost two 25 pound blocks of clay. You can cut the clay with a wire cutter into the appropriate size for the lesson. Kindergarten classes typically use a lemon to orange size of clay per student. Older students typically use clay the size of an orange to a grapefruit for a mask.

Some Tools to Use When Working with Clay:

- fingers
- rolling pins
- garlic press
- sponges
- plastic forks, knives and spoons
- popsicle sticks
- toothpicks
- cookie cutters
- plastic bags
- Spray bottles of water (make sure you control this as the students can make the clay too wet which will lead to cracks). A light mist if the pieces are drying out to fast is all that's needed.
- a clay cutter (use fishing line or a very thin wire)
- anything else you can get your hands on that will create texture in the clay.

Simple is Key: Don't get ornate! Simple, achievable projects will provide the greatest rates of success and satisfaction for the kids. Small pieces often break off while drying or in the kiln. A good measure of thickness is $\frac{1}{2}$ inch.

Plan for Breakage: Making a few extra pieces during the class is a good safeguard against breakage or explosions. That way, every student will have something to glaze at stage two of the project. Students who are absent during stage one of the project will especially benefit from the extras you make.

Some Terms to Know When Working with Clay:

Slab: Slab is exactly what you think it is. You use a wire cutting tool to cut a slab of clay off of the block; sort of like cutting a very large piece of cheese.

Wedging: This is what you do to get all of the air bubbles out of your clay. Basically you roll the clay around on a flat surface "pushing" and "pulling" the clay so all of the air comes out. You can instruct the students to throw their clay blocks down onto the table (they love this) a few times and pound on it a bit before they begin. This will get really noisy but is an important step in preventing explosions at the kiln stage. *When the pounding noise is at its peak, you'll know it's time to move on to the next step of the lesson.*

Slip: This is liquid clay ... clay with a lot of water added to it. It is used as a sort of glue to hold clay pieces together. You need to use slip to "fasten" pieces of clay together so that they don't fall apart in the kiln. Clay shrinks as it dries so if you haven't made sure that your clay pieces are firmly attached, they will separate in the kiln. It isn't enough to simply "pile" one piece of clay on the next. Use watered down clay as your glue.

Scoring: Scoring clay is also a method potters use to adhere two pieces of clay together. Simply use any pointed utensils, like a pen, pencil, toothpick, or clay tools to make X shaped marks into the clay where you will be adhering another piece. This step is critical to hold two pieces of clay together while you work. It breaks up the surface area of the clay, which is needed for a good adhesion between the two pieces.

Leather-Hard: This is what we call clay that has dried for a few hours. It should feel slightly cool to the touch. Leather-hard clay is not dry enough for firing in a kiln ... If a piece of clay is put into the kiln while it is still wet, it could explode. Visualize what water does when it gets hot ... it boils right? Well, your pottery piece will literally "blow up" if it contains water or moisture that boils when it gets hot in the kiln. This is the perfect stage to carve the student's first name or initials into the bottom of the piece – pencil and pen will burn away in the kiln so engraving is best.

Drying: This is the tough part. You need to have the clay pieces dry as slowly as possible. The best thing to do is place the finished pieces on a wood board. Spray mist the finished clay pieces with water for 4-5 days and cover the pieces with dry cleaners plastic. Let the clay dry in a safe place away from the sunlight and heaters. You will need to babysit the pieces as they dry to mend breaks and mist occasionally for the first week. *Beware of long holiday breaks when your clay is drying.*

Greenware: When clay has dried sufficiently and is ready to be fired in a kiln, it is referred to as greenware. It takes about 2-3 weeks to air dry the clay (weather dependent). The clay is dry when it is no longer cold or moist and is a significantly lighter color. Now you are ready to bisque fire in the kiln.

Kiln: This is a large, hot oven that is used to fire the clay. A kiln can reach temperatures 2500 degrees and higher. Your oven at home maybe reaches 500 degrees. You need to fire your clay in a kiln in order for it to be permanent. Once clay has been fired, it can be dipped in water and never disintegrate. See instructions on the next page.

Bisque: Clay is usually fired in a kiln twice. Once at a lower temperature (the bisque firing). After a piece is bisqued, it can be glazed. The clay then goes in the kiln for a second firing at a higher temperature.

Glaze: This is used to decorate clay. It is essentially "liquid glass" or glass particles (mixed with colors or pigments) that have been ground down. Glaze melts at a high temperature and turns into the coatings that you see on a finished pottery piece. *Glaze will cause pieces to fuse together in the kiln so be sure to provide adequate spaces between pieces.* Examine all glazed pieces and remove glaze from the bottom of pieces that will sit on the kiln shelves (otherwise, they will be forever fused to shelf during the firing process).

KILN USE

Schedule firing days on the calendar in the Kiln Room (located next to the Janitor's room). Remember, load the kiln first thing in the morning at 8:00 a.m.

- ***Bisque*** firing is a 24 process.
- ***Glaze*** firing is a 48 hour process.

The first clay or bisque firing:

1. Let the school custodian know that you are going to use the kiln that morning. They can unlock the door for you and will turn the electricity on and off again at the end of the school day.

   If you do not know how to install the firing cone, STOP HERE. Please contact an experienced Art Awareness volunteer or one of the Art Awareness Chairs if you need assistance with your first firing

2. Install the firing cone into the prongs on the side of the kiln. **You must always use a cone!** The cone rests flat side down on the prongs. The cones MUST be loaded properly to ensure the kiln shuts off after firing.

3. Load in your unbaked clay pieces. Remember to use the shelf stacking blocks or risers to maximize your space use – select the best height to safely fire the most pieces you can at one time.

4. Pull out all air vent plugs in front of the kiln. This allows moisture to escape from the clay as it bakes.

5. Close the top of the kiln upon a 1 inch spacer so the top is partially open. This also allows the smells and moisture to escape.

6. Push in the start button on the side of the kiln. If you cone has been loaded correctly this will work. If not, either your cone is loaded incorrectly or the custodian has shut off the power to the kiln.

7. Set the kiln temperature at LOW for 1 hour.

8. After 1 hour, turn the kiln heat to 4.5, remove the spacer propping the lid open and CLOSE the lid of the kin. USE GLOVES.

9. Check the kiln again at the end of the school day. Remind the custodian that the kiln is on so he will shut if off at the breaker box when he leaves school for the day.

10. On day #2 at 8:00 a.m., open the kiln and remove your fired bisque clay pieces.

The second firing or glaze firing:

1. Let the school custodian know that you are going to use the kiln that morning. They can unlock the door for you and will turn the electricity on and off again at the end of the school day.

   If you do not know how to install the firing cone, STOP HERE. Please contact an experienced Art Awareness volunteer or one of the Art Awareness Chairs if you need assistance with your first firing

2. Install the firing cone into the prongs on the side of the kiln. **You must always use a cone!** The cone rests flat side down on the prongs. The cones MUST be loaded properly to ensure the kiln shuts off after firing.

3. Load in your bisque baked and glazed pieces into the kiln. Remember to use the shelf stacking blocks or risers to maximize your space use – select the best height to safely fire the most pieces you can at one time. **Remember, glazed pieces cannot touch one another**!

4. Put in all air vent plugs in front of the kiln.

5. Close the top of the kiln and push in the start button on the side of the kiln. If you cone has been loaded correctly this will work. If not, either your cone is loaded incorrectly or the custodian has shut off the power to the kiln. *You may need to ask him to throw the breakers.*

6. Set the kiln temperature to 5 for the day.

7. Check the kiln again at the end of the school day. Remind the custodian that the kiln is on so he will shut if off at the breaker box when he leaves school for the day.

8. Take your pieces out of the kiln 2 days after firing.

Projects

Pinch Pots

Created from a single lump of clay, these are often the first forms created when beginning to work in clay. Pinch pots are easily accessible to nearly everyone, including young children. You can easily learn to make a pinch pot in less than an hour.

Due to the building technique's limitations, most pinch pots are fairly small, holding perhaps one cup to one and a half cups by volume. Begin with a lump of clay half as large as or slightly smaller than your closed fist. Form it into a firm, compact ball. *Keep any clay you aren't working with covered with plastic.* If the clay is too wet and sticky, wedge or knead it until it dries slightly.

Hold the ball of clay firmly in one hand. Use the thumb of your other hand to push an opening into the ball. This opening should end about a half to a quarter of an inch from the other side of the ball; be careful not to push your thumb all the way through.
If the hole does end up going all the way through, simply compress the ball back together and begin again.

Using your thumb, push against your fingers in a pinching motion. This will thin the clay out to create the pot's floor and walls. Do not try to thin the clay too much with one pinch. Instead, use a series of smaller pinches to work the clay upwards more than outwards as it thins.

Work to make the floor and walls as uniform in thickness as possible. This will help keep the pot from cracking as it dries or during firing.

Part of the charm of the pinched pot may be the rustic look it has when the top edges are left uneven. You can, however, also choose to trim the upper edge to give the pot a more refined look.

Coiled Pots

Have you ever rolled a worm or snake out of clay? Then you were on the road that leads to coiled pottery. Using coils, forms are built up into the desired size and shape. Coiled pots can take on any number of forms, and can be tiny or huge. The coils may or may not be completely welded together, depending on the desired surface effect.

Compress a wad of clay into a ball. Flatten the ball on a canvas working surface, making the thickness as even as possible. This wafer should be about 1/4 to 3/8 of an inch thick. Trim away the outer edges. For most beginners, a bottom that is no more than 2 to 2 1/2 inches in diameter is ideal.

Carefully lift the pot's bottom in order to release it from the working surface. Smooth the edges by lightly rolling it, as if it were a wheel, on your working surface.

Compress another wad of clay into a ball of about 2 inches in diameter. Roll this ball between your palms to create a cylinder. Place the cylinder on your working surface. Using light, even pressure, begin to roll the cylinder at one end while moving your hand down the length to the other end. You will see your cylinder thinning and growing longer. Aim for a coil approximately 1/4 inch in diameter. You may need to roll your coil again, if it is still too thick after your first pass, being sure to keep the coil's thickness as even as possible.

Use your coils as soon as you roll each one. Do not roll coils before you are ready to use them, as the clay may dry out quickly.

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Place one end of your coil on top of (not at the side of) your pot's bottom. Position it so that outer edge of the coil is flush with the outer edge of the bottom. Support the outer surface with the fingers of one hand while using your thumb to smooth and weld the inner surface of the coil to the bottom of the pot. Guiding the coil with your other hand, continue laying and welding the coil around the top of the outer circumference of the pot's bottom.

When it comes full circle, simply continue on in the same manner on the top of your first coiled row. When your first coil runs out, repeat and roll your next coil.

Clay coils stack up to build the walls of your pot. After rolling your next coil, place one end directly against the end of your first coil. Using your thumb (and supporting the clay with your fingers), smooth and weld the pot's inner surface where the two coils abut each other. Guide the new coil into place with one hand, and continue the same welding of upper coil to lower coil with your other hand.. Continue rolling and applying coils until your pot reaches the height that you desire. For beginners, keep the pot relatively short, no more than twice as tall as it is wide.

When you have coiled your pot to just about where you would like it, height-wise, you will want to roll a finishing coil. This coil should be a bit thinner than your other coils, and one end should taper off gradually to a point. Beginning with the thicker end, place and weld it

onto the wall of your pot, just as you have been doing. Continue guiding and welding the coil until it runs out.

The tapered end should give you a fairly smooth transition when the final coil is completed. Weld the top of the last coil's end to the coil below it, as well as its interior side.

To give your pot added security against cracking and breaking apart, you may want to weld the outer surface, as well as the interior, of the joint between the pot's bottom and first coil. Gently supporting your pot at an angle to your work surface, lightly roll the bottom edge of your pot to help smooth it and create a slightly beveled slope where the pot will rest on a table. (This slight bevel gives the pot a visual lift, which is more pleasing to the eye.)

If your pot's upper edge has any cracks or slight imperfections, you can smooth it by wetting your finger tips with a bit of water or slurry (dry clay dissolved in water) and gently running your moistened fingertips across the upper edge. If a crack is serious enough to need welding, be certain to support the clay with one hand as you apply pressure with the other.

Slab or Tile

Basically, a rolled out, flat piece of clay with relief or carving. Students can create a scene with a hill and wildlife on it, carve an animal or fish into a slab, use texture to decorate it. Slip and scoring are critical skill to use with a relief tile or slab project.