# Mimbres-inspired coil bowls

## Art Curriculum Matrix: K - 6

| Project                  | Mimbres-inspired coil bowls  
|--------------------------|-------------------------------
|                          | (Note: Could adapt lesson and substitute coil construction for slab bowl made from slumping round slab into supporting bowl form) |
| Grade                    | K-6                           |
| Content/theme            | Positive/negative space through pattern design |
| Objectives               | • Create coil bowl forms  
|                          | • Create black and white decorative surface using slip/underglaze  
|                          | • Understand concept of positive and negative space  
|                          | • Consider decorative elements in relationship to bowl form |
| Essential Questions      | • What is positive space?  
|                          | • What is negative space?  
|                          | • What are geometric shapes? |
| Demos/Skills             | Coil bowl  
|                          | Smooth exterior and interior  
|                          | Paint background white slip  
|                          | Spritz water to stick paper stencil on slip  
|                          | Paint black slip/underglaze  
|                          | Optional- Burnish outside of bowl with spoon |
| Vocabulary               | Coil  
|                          | Score and slip  
|                          | Pattern  
|                          | Geometric  
|                          | Positive/negative space  
|                          | Abstraction  
|                          | Inside/outside  
|                          | Parts of a bowl: foot, body, rim, interior, exterior  
|                          | Optional - Burnish |
| Artist/Culture References| Mimbres pottery (Wesiman Collection) |
| Materials                | Clay (2 pounds per student), preferably low-fire, red earthenware  
|                          | Plastic bowls as supports or (preferably fired bisque supports)  
|                          | Scoring tools (metal forks or serrated ribs)  
|                          | White slip  
|                          | Black slip or black underglaze  
|                          | Pencils  
|                          | Construction paper  
|                          | Markers  
|                          | Scissors  
|                          | Spray bottles (1 per 4 students)  
|                          | Metal, wooden, rubber (Sherrill) Ribs  
|                          | Optional - Hand rasp  
|                          | Pin tools  
|                          | Soft brushes (1” to 2” flat or Hake brushes are ideal) for applying slip  
|                          | Optional - Small metal spoons (1 per student)  
|                          | Optional - hair dryers to speed slip setting  
|                          | Plastic for covering bowls to keep wet |
### Process

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<th>Construction</th>
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<tr>
<td><strong>Activity</strong></td>
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</table>
| 1 | Forming base | 1. Take small “plum” size ball of clay  
2. Shape into sphere by rolling in your hands, patting back and forth  
3. Pound sphere into round pancake disk about 1/4-1/2” thick  
4. Place pancake in base of supporting bisque form | Note: If don’t have supporting bisque form, can leave disk flat on table, however, this makes it harder to have open bowl form and you may have to modify lesson so imagery is on exterior. You could also experiment with creating a donut of support from foam or crumpled paper. |
| 2 | Rolling coils | Using wet-ish clay, roll three coils about 1/2-1” thick | Tips for even coils:  
• Spread fingertips wide  
• Do big rolls that flip coil over on itself several times (rather than rocking back and forth in same spot)  
• Even pressure  
• Don’t make coils too thin! |
| 3 | Adding coils | 1. Score top edge of pancake  
2. Take one coil and add layer around top edge of pancake  
3. Merge the coils on both the inside and outside, using thumb to press coil down and join with base  
4. Smooth joins  
5. Repeat with 2nd and 3rd coil  
6. Use fingers (pinching) and ribs to thin and smooth walls. Rasps are also useful in smoothing the exterior. | Note: When creating coil pot, use soft clay. This way, you don’t need to score and slip much since slip or water often weakens the coil pot structure. You may want to have students score slightly and eliminate any water/slip. |
| 4 | Smoothing | After pot has set up slightly, take bowl out of support and finish smoothing exterior with ribs (rasp also work well) or burnish with spoon | Describe the texture of the Mimbres pots.  
What tools do you think they used to make the surfaces smooth?  
What modern tools could we use to smooth the surface? |
| 5 | White slip | 1. Using soft brush, apply white slip to interior surface of bowl  
2. Let slip set up until it is dry to touch  
3. Cover to keep bowls leather hard | Note: To get a uniform/opaque surface, you might have students put second coat of white slip on bowl after first layer has dried to the touch |
| 6 | Discuss geometric shapes as abstract representations | 1. Pick 3 geometric shapes and draw them on construction paper  
2. Cut out shapes | What geometric shapes do you see in these Native American Mimbres bowls?  
Do shapes ever remind you of other things—like, what shape would you use to represent a mountain? Water? Lightning?  
What could a spiral represent?  
What’s the difference between a symbol and a picture?  
What does “abstract” mean? |
| 7 | Cut geometric shapes out of paper | 1. Pick 3 geometric shapes and draw them on construction paper  
2. Cut out shapes | What is a positive shape?  
What is a negative shape?  
When you cut shapes out of paper, which is the positive and which is the negative? |
<table>
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<tr>
<th>Activity</th>
<th>Steps</th>
<th>Dialogue</th>
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</thead>
</table>
| 8 Composition          | Arrange paper shapes in interior of bowl                              | • Looking at some of the Mimbres pots we looked at earlier, how did those potters organize/place the geometric shapes in their bowls? Around the rim? Around the center? Mirrored?  
• How are you going to arrange your shapes in the interior of your bowl?  
• As you arrange them, can you see the negative spaces around the positive shapes? How can you move your paper so that the negative spaces are just as interesting as the positive ones?  
• What makes a space interesting?                                                                 |
| 9 Dark slip/underglaze application | 1. Once paper is arranged, lightly spray paper with water in spray bottle  
2. Let dry until surface is not shiny  
3. Press down edges of paper to seal  
4. Paint black slip/underglaze over entire interior surface  
5. Let black set up until there is no sheen on the surface  
6. Use a pin tool to get under edges, peel up paper, and discard |                                                                                                                                                                                                          |
| 10 Fire                | Once bowls are bone dry, fire to cone 06-04                           | • Note: Traditionally, Mimbres pots were unglazed, but can glaze interior with clear if desire functional surface                                                                                                                                                   |
| 11 Reflection          |                                                                          | • What is positive space? Negative space?  
• How did you use the Mimbres bowl examples to create positive and negative space in your bowl design?  
• Why is it useful to be able to see negative space in an artwork?  
• How did your arrangement of designs change the feeling of your bowl? What parts of the bowl are emphasized?  
• How does a bowl with surface decoration feel different from a plain bowl? Why might the Mimbres people have placed decorated bowls in graves instead of plain ones? |
Bowl Forms & Feet Types

Japan

Types of Foot
Common Trimming Faults

Problems generally arise from trying to turn pots while the clay is in an inappropriate condition. If it is too soft, the process will cause the form to distort badly. If too dry, the pots will tend to be dislodged by the force needed to cut into the clay, ending up cracked or spoiled.

A classic example is illustrated below: the curve of the outside wall (A) does not follow the line of the interior. This creates an uneven thickness (B) and a weak point (C), where the pot may be cut through or left so thin that it may crack or slump in the kiln. The thickness and weight of the foot-ring make it too square (D) and bulky (E) in relation to the bowl’s size. Inside the foot-ring, the base has been trimmed too flat, again failing to follow the interior shape and causing a distortion (F).

Mark the base and outer wall of your bowl for trimming away excess clay to create the turning a foot-ring.
Bowl & Rim Profiles
Late Iron Age, Roman Pottery

Area L
Roman New Forms Intrinsics continued
## Decorative Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
<th>Decorative techniques</th>
<th>Stage applied</th>
<th>Can combine with...</th>
<th>Source</th>
<th>Advantages</th>
<th>Low/Mid/High Fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slip</td>
<td>Colored liquid clay that is decoratively applied to the surface of a pot</td>
<td>• Slip trailing&lt;br&gt;• Mishima/inlay&lt;br&gt;• Paper resist/stencils&lt;br&gt;• Sgraffito</td>
<td>leather hard</td>
<td>• underglazes&lt;br&gt;• washes/stains</td>
<td>Commercial or individually mixed</td>
<td>Changes the color of the pot; used with many decorative techniques</td>
<td>Low/Mid/High Fire</td>
</tr>
<tr>
<td>Engobe</td>
<td>Similar to slip but has more flux (melter). “Engobe” often used as synonym of “slip.”</td>
<td>• Same applications as slip</td>
<td></td>
<td></td>
<td>Commercial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underglaze</td>
<td>Can be used under clear glaze; can be used like slip; can be used on top of texture and wiped off</td>
<td>• Brush on wipe-off stamps/impressions&lt;br&gt;• Paper resist/stencils&lt;br&gt;• Brush onto bisque surface (under the glaze)</td>
<td>leather hard, bone dry, or bisque</td>
<td>• washes/stains&lt;br&gt;• slip</td>
<td>Commercial</td>
<td>Consistent; commercially available; bright colors</td>
<td>Low/Mid/High Fire</td>
</tr>
<tr>
<td>Washes/Stains</td>
<td>Metallic oxide or Mason stain combined with flux + water</td>
<td>• Brush on wipe-off stamps/impressions&lt;br&gt;• Brush on top of raw glaze (over the glaze)&lt;br&gt;• Brush onto bisque surface (under the glaze)</td>
<td>bisque; can be applied to bone dry work but takes more skill</td>
<td>• slip&lt;br&gt;• underglazes</td>
<td>Individually mixed in 1:1 ratio of Flux:oxide/Mason stain + water</td>
<td>emphasizes texture/impressions; strong color that will impact glaze color</td>
<td>Any temperature</td>
</tr>
<tr>
<td>Terra Sigillata</td>
<td>Finest particles of clay applied in layers and burnished to get glossy sheen</td>
<td>Good for raku, pit firing</td>
<td>bone dry</td>
<td>• slip can be applied over terra sigillata so glossy/matte contrast like Maria Martinez</td>
<td>Individually mixed</td>
<td>Lightly seals surface; glossy sheen and doesn’t cover up clay; historic connection</td>
<td>Low-fire only</td>
</tr>
</tbody>
</table>
Decorative Surface Material Definitions

Slip/Engobe

Material: A homogenous mixture of clay and water. Decorative slip differs from slurry used for joining pieces or produced in the process of throwing. Decorative slips are usually mixed from a recipe and have more flux (melter) than a slurry-slip which is just clay + water. They also often have a colorant added. "Engobe" is often used synonymously with "slip," but technically, an engobe has more flux than a slip as sits between a slip and a glaze. Slip recipes are designed for specific temperatures (low, mid, high-fire) so that they melt in-unison with the clay body. Therefore, it is important to make sure you choose a slip that corresponds to your clay body and firing temperature.

Source: Slips are commercially available pre-mixed or in powdered format. Casting slips are different from decorative slips in they have a deflocculant added which makes the slip behave differently. While it is possible to use a casting slip to decorate, it can cause problems, and it is probably best to purchase only a true decorative slip for classroom use. It is much cheaper to mix a slip by measuring recipe of dry chemicals than to purchase it pre-mixed. This is easy if you have a gram scale, and there are many recipes online for decorative slips at every temperature.

Mixing: Slips can be the same color as a clay body or they can be colored with oxides or Mason Stains to create a color that contrasts with the clay body. The most often used slip is a white slip to cover a red, low-fire, terra-cotta clay body in order to get a white ground. To mix a slip, measure ingredients, add water, sieve, let stand for 24 hours for full water saturation. To mix colored slips, start with a white slip recipe and add Mason Stains or metallic oxides to the slip base. To get light pastel color, add 5% Mason Stains. To get a more saturated color, add up to 20% Mason Stains. Metallic oxides can also be added to color slip, however, the percentages vary from oxide to oxide. In general, oxides are much stronger than Mason Stains and should be used from 2-6% in slips.

Use: Slips are used with a variety of decorative techniques, including sgraffito, slip trailing, paper resist/stenciling, and inlay/mishima.

Application: Slip is usually applied to leather-hard ware before it is bisque fired. There are slips recipes designed to be applied to bisque ware, but they have to be specially formulated for shrinkage. Common examples of these are “flashing slips” applied to bisque ware for wood firing.

Artists often manipulate the consistency of slip through adding a deflocculant or flocculant. This will affect the look of the slip after it is applied. A few drops of saturated solution of epsom salts and water can be added to a slip to flocculate or thicken it. Darvan 7 or Sodium Silicate can be added to a slip recipe when it is initially mixed to deflocculate it or make it appear fluid without adding a lot of water.

Wash/Stain

Material: A solution of a metal oxide and water. Often a flux is added to this mixture to help with melting and adhering to clay body.

Source: Not commercially available, but easy to mix by hand.

Mixing: Mixed by measuring 50/50 by volume (1 tsp./1 tsp.) of metallic oxide/Mason Stain to flux. For a flux, most people use Gerstley Borate, Gillespie Borate or Frit 3124. Water is added to the powdered chemicals until it is fluid and brushable.

Use: Can be used to highlight impressed designs and create color contrast. Wash/stain is brushed on surface and sponged off so it remains only in recessed areas. Also used in combination with glazes to create color variation or used with brush to paint an image. Washes/stains are very strong concentrations of colorants and in many ways can be used as a very strong underglaze. Washes/stains can also be used over glazes. A common technique is brushing a rutile stain over Tenmoku (iron saturate glaze) to create an amber line.

Application: May be used under or over a glaze. Usually used on bisque ware but can be used on green ware if careful. Washes are very strong and concentrated. If used too heavily, all washes/stains will look black regardless of the color. Because the metallic oxides are very concentrated, you should always use gloves when handling washes/stains.
**Underglaze**

*Material:* Underglazes are an oxide(s) combined with a small amount of flux (melter) that binds them to the clay body and integrates them with the glaze. Underglazes also have gums added to them which make them very brushable. Underglazes gain their full color with the ‘wetting’ action of the covering glaze.

*Source:* Commercially available. Purchased wet-mixed in 4 or 16 oz. bottles from ceramic supplier.

*Use:* Underglazes are used for their intensity, a wide range of color, and stability of that color. They are most often used as low temperatures (cone 04), but some colors (darker colors with cobalt, chrome, copper as dominant oxide) are still effective at cone 10 temperatures. Underglazes are used much like slips to add color to a ceramic surface. They can also be used instead of stains/washes to highlight impressed designs. They can also be used in a painterly way and combined with other colors (although it is often hard to tell the intensity and hue of the color before firing).

*Application:* Underglaze can be applied to pieces before or after bisque firing. They should be applied under a glaze (not on top). They are a very uniform and stable decorative material and the raw color you see is dull but similar to the fired color. Often, several layers of brushed underglaze are needed to get an opaque and uniform color. Underglazes are often used in classroom settings because they are commercially available, easy to use, come in a broad range of colors, provide an intense saturated color, can be applied to both green and bisque ware, and are easy to clean up. However, they are expensive!!

**Terra Sigillata**

*Material:* A liquid suspension of the finest particles of clay that is applied to a bone dry pot. If polished or burnished just after application, may give a high gloss. Acts as a seal or porous clay, making it less prone to absorb moisture. All ancient Greek red-black pottery, Roman red wares, and most Native American pieces were finished with terra sigillata, without the use of glaze. Many contemporary potters who work in earthenware use terra sigillata to seal the foot of their pots.

*Source:* Individually mixed. Not available commercial. To mix = deflocculant + wet + dry materials, blunge, let sit for 2-3 days, siphon off fine-particle mixture. The color of the terra sigillata is determined by the color of the clay used. Most terra sigillata are red, buff or white. However, white terra sigillata (mixed from EPK or OM4 ball clay) can be tinted by adding Mason Stains.

*Use:* Does not make a piece food safe nor vitreous. Does not work above cone 04 since the molecular structure changes at high fire, destroying the glossy sheen. Does not work under a glaze but will be dissolved by glaze over it. Terra sigillata works very well with pit/sawdust firing techniques.

*Application:* Apply to bone dry clay. Usually 3+ coats are needed. Often burnished with a rock, spoon or cloth to help get sheen. Burns out at cone 04 and above.