

Textural Glass Slumping

Carve a textured mold out of clay to use again and again

No one knows exactly when the technique of fusing glass began. There is evidence that the Egyptians knew how to fuse glass as early as 2000 BCE, but some argue that the Romans were better and more prolific glassworkers.

During this period, bowls and plates were produced by forming a glass sheet over a mold or form. The resulting pieces were rough, but were then polished to create a smooth exterior. Another method involved using a tool to impress ribs on the sheet of glass before slumping. This created a bowl with a ribbed exterior. Sometimes horizontal lines were cut on the inside for added decoration.

For about 2,000 years, fusing was the most widely used method for making small glass objects. Then the glassblowing pipe was invented. After that, glassblowing became used almost exclusively because it was much more efficient and functional. There was a renewed interest in glass fusing in the U.S. during the 1960s, and it's still very popular today! Fused glass techniques are generally used to create beads, glass tiles, or art glass pieces. Slumping techniques also allow the creation of larger, functional pieces such as bowls or plates.

This lesson plan combines the allure of glass with the receptiveness of clay. A clay "texture mat" is carved into the student's own design, bisque-fired, and then used as a mold to slump glass into. Using clear glass allows the texture to be seen more clearly, although any transparent colored glass can be used.

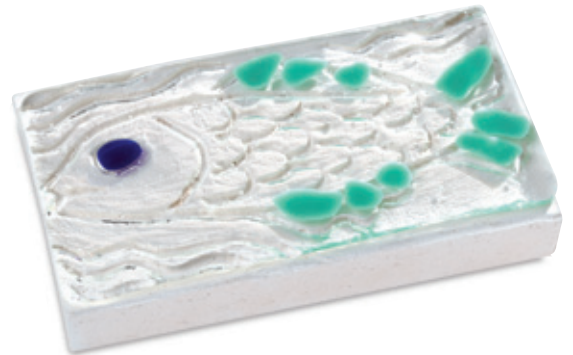
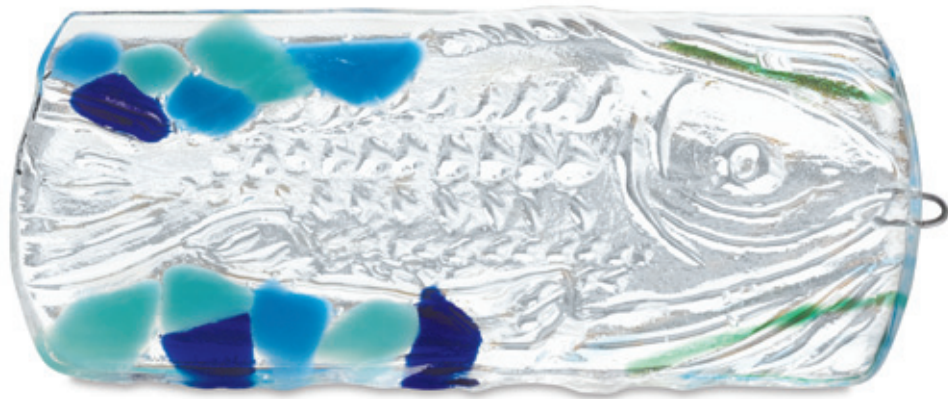
GRADES 3-12 Note: instructions and materials are based upon a class size of 25 students. Adjust as needed.

Preparation

1. Cover tables with canvas.
2. Provide rolling pins to share, along with various carving tools.
3. Give each student 2 lbs of raku clay.

Process

1. Roll a slab about 2" thick and as flat as possible.



Materials

Amaco[®] No. 27 White Sculpture Raku Clay, 50-lb (30509-1027); 2 lbs per student

Wooden Rolling Pins, 8" (30345-1008); share five among class

Amaco[®] Clear Glass Sheets, 6" x 6" (34104-1606); one per student

Amaco[®] Kiln Wash Powder, 1-lb box (32922-0001); share one among class

Mini Ribbon Clay Tools, set of 6 (30321-1009); share four sets among class

Fletcher[®] Designer II Glass Cutter, (57437-0000); share two among class

Blick[®] Broadline Water-Based Markers, Blue (21224-5001); share five among class

Blick[®] Safety Goggles, (62952-1002); share five pairs among class

Soft White Cotton Gloves, package of 4 (04701-1004); share two packages among class

Optional Materials

Amaco[®] Clear Glass Squares, 3" x 3" (34958-1603); one per student

Amaco[®] Glass Stringers, Mardi Gras colors, tube of 90 assorted (34103-5930)

Amaco[®] Glass Mosaic Chunks, 3-oz assorted colors (33598-)

Elmer's[®] Glue-All, 1.25-oz (23886-1003)

Weldbond[®] Universal Adhesive, 4-oz (23819-1004)

Armature Wire, 16 gauge, 32-ft coil (33400-1632)

Jewelry Making Wire, 28 gauge, 72-ft spool (61524-9330)



Process, continued

2. Leave slab overnight, lightly covered with plastic, to set up to a soft, leather-hard consistency. If time is of the essence, allow at least an hour for the slab to set up, depending on the level of humidity in the work area. Leather-hard is defined as clay that is still visibly damp but has dried enough to be able to be handled without deformation.
3. For students who will be cutting a 6" x 6" sheet of glass in half, cut slabs into a 3-1/2" x 6-1/2" rectangle. For younger students (or if cutting the glass is not possible), the clay should be cut into a square measuring approximately 3-1/2" x 3-1/2".
4. Using various carving and/or loop tools, carve into the surface of the tile, making sure to avoid undercuts. (An undercut might happen if the carving is so deep that it leaves a portion overhanging.) Reminding students to visualize the glass flowing freely into the carving may help them avoid undercutting.
5. As a final step, the tile should be turned to the back and several holes poked into it with a needle tool to allow steam to escape during firing. Allow the carvings to air dry, flipping them occasionally to avoid warping.
6. Bisque fire to cone 2, or 2174°F.
7. Apply two thin coats of kiln wash to the bisque-fired tile.
8. Place one sheet of clear glass on top of the carved tile. For a thicker final piece, a second clear sheet of glass can be used over the first. Place the tile in a glass kiln or a ceramic kiln.
9. Program the kiln to heat quickly to 1200°F, and hold that temperature for 30 minutes. Continue to heat to 1480°F and hold for 15 minutes. Cool to 950°F and hold for 30 minutes, then allow normal cool.
10. Any rough edges of the piece can be smoothed with sandpaper, and any residual kiln wash will easily wash off.



Step 1: Carve into leather-hard clay to create textured mold.



Step 2: After the mold is bisque-fired, apply two thin coats of kiln wash.

About cutting glass: Always wear eye protection!

Wash and thoroughly dry the uncut glass to remove any adhesives, fingerprints, or anything that might impede the wheel of the glass cutter. Using a watersoluble marker, measure and mark the line of the cut.

Position the glass cutter on the surface of the glass, with the cutting wheel directly perpendicular to the surface. Use smooth, even pressure to scribe along the marked line. You can hear a scribe being made. This is a good way to know that you are doing it right, by listening to the scribe. Make sure that the scribed line runs from one edge of the glass all the way to the other edge. Turn the sheet of glass over, and tap the cut line with the butt of the glass cutter.



Step 3: Cut clear glass to fit the size of the mold.

Basic Glass Fusing Process:

Many modern fusing methods involve stacking or layering thin sheets of glass, often using different colors to create patterns or simple images. The stack is then placed inside the kiln and then heated through a series of ramps (rapid heating cycles) and soaks (holding the temperature at a specific point) until the individual pieces begin to bond together. When the piece is held at the highest temperature for a period of time, the glass will fuse and the edges of the glass pieces will soften and round slightly. After the maximum temperature is held for a period of time, the kiln temperature will be brought down quickly to around 1000°F. After this point, the piece is then allowed to cool slowly to room temperature to prevent the glass from breaking.



Step 4: Place a sheet of clear glass over the mold. Add glass stringers or mosaic chunks, if desired.



FULL FUSE

1: 6" X 6" or 12" X 12" up to 1/2" thick

Step	1	2	3	4
Rate	400	600	9999	150
Temp	1200	1480	950	750
Hold	30mn	15mn	30mn	0
Time	3hr18mn	42mn	1hr30mn	1hr18mn

6hr54mn

Options

1. If desired, add color using glass stringers or mosaic chunks, using Elmer's Glue to hold the pieces in place until firing.
2. After glass has cooled, use armature or jewelry wire to create wire-wrapped pendant or glue wire or ribbon to the back of glass using Weldbond® Adhesive.

NOTE: Do not put armature or jewelry wire in the kiln.

National Standards for Visual Arts Education

Content Standard #1 — Understanding and applying media, techniques and processes.

K-4 Students know the differences between materials, techniques, and processes.

5-8 Students intentionally take advantage of the qualities and characteristics of art media, techniques, and processes to enhance communication of their experiences and ideas.

9-12 Students apply media, techniques, and processes with sufficient skill, confidence, and sensitivity that their intentions are carried out in their artworks.

Content Standard #2 — Using knowledge of structures and functions

K-4 Students use visual structures and functions of art to communicate ideas.

5-8 Students select and use the qualities of structures and functions of art to improve communication of their ideas.

9-12 Students evaluate the effectiveness of artworks in terms of organizational structures and functions.

Content Standard #4 Understanding the visual arts in relation to history and cultures

K-4 Students know that the visual arts have both a history and specific relationships to various cultures.

5-8 Students know and compare the characteristics of artworks in various eras and cultures.

9-12 Students differentiate among a variety of historical and cultural contexts in terms of characteristics and purposes of works of art.

