

Activity: Exploring Bronze Sculpture

PASS Objectives Addressed

Grade 4- The Arts

Standard 1: Language of Visual Art - The student will identify visual art terms (e.g., architecture, contour, medium, mixed media, perspective, symbol).

1. Know how works of art are made with respect to the materials, media, techniques, and sources of ideas.
2. Describe and use the principles of design: rhythm, balance, contrast, movement, variety, center of interest (emphasis), and repetition in works of art.
3. Describe and use the elements of art: line, color, form, shape, texture, value (light and dark), and space in works of art.
4. Discuss observations of visual and expressive features seen in the environment (such as colors, textures, shapes).

Standard 2: Visual Art History and Culture - The student will recognize the development of visual art from an historical and cultural perspective.

3. Demonstrate a basic knowledge of several fields of art such as painting, sculpture, drawing, computer graphics, printmaking, architecture, and fiber arts.

Standard 3: Visual Art Expression - The student will observe, select, and utilize a variety of ideas and subject matter in creating original works of art.

1. Make original works of art using a variety of materials (media), and techniques (skills), and sources for ideas.
2. Use observation, memory and imagination in making original works of art.
3. Apply knowledge of a basic art vocabulary through experiences in making original works of art.

High School- The Arts

Standard 1: Language of Visual Art - The student will identify visual art terms (e.g., content, engraving, foreshortening, mosaic, perspective)

1. Identify and apply knowledge of the principles of design: rhythm, balance (symmetrical, asymmetrical, radial) contrast, movement, variety, center of interest (emphasis), and repetition in personal artwork, and the artwork of others.
2. Identify and apply the elements of art: line, color, form, shape, texture, value (light and dark), and space in works of art. Discriminate between types of shape (geometric and organic), colors (primary, secondary, complementary, intermediates, neutrals, tints, tones, shades, and values), lines (characteristics, quality), textures (tactile and visual), and space (background, middleground, foreground, placement, one-, two-, and three-point perspective, overlap, negative, positive, size, color) in personal artwork, and the art work of others.

Standard 3: Visual Art Expression - The student will observe, select, and utilize a variety of ideas and subject matter in creating original works of art.

1. Create original two- and three-dimensional works of art from observation, memory and imagination using a variety of art media

3. Develop and apply skills and techniques using a variety of art media, and processes in making two- and three-dimensional works of art:

Sculpture or media: paper, papier-mâché, clay, plaster, cardboard, wood, Architecture found objects, beads, sand, wire

processes: carving, constructing, and assembling

4. Demonstrate safe and proper use, care, and storage of media, materials, and equipment.

Standard 4: Visual Art Appreciation - The student will appreciate visual art as a vehicle of human expression.

2. Demonstrate respect for their work and the work of others.

Part 1: Bronze Sculpture Vocabulary

3-Dimensional Art – having depth, width, and height

Additive – building up or adding to a sculpture in order to create a form

Bronze – an alloy (combination) of copper and tin; known for being a very strong and sturdy metal

Cast – to reproduce a piece of sculpture by use of a mold; the original piece is generally made of a less durable material than the cast

Maquette – a small model usually in wax or clay of a larger sculpture work; a maquette is used to propose a large or monumental work to the client for approval before the large work is started

Mold – A hollow or negative container that gives its form to a substance poured into it; the substance, such as bronze, is allowed to harden to create a sculpture; a typical mold is made by coating an original clay or wax sculpture with plaster and removing the dry plaster piece; the mold is put back together and a substance such as bronze is poured into the whole mold

Negative Form – in sculpture it is the empty space around and between sculptural elements

Patina – a film or incrustation, usually green, that forms on copper and bronze after a certain amount of weathering and time; it is usually a result of the oxidation (exposure to oxygen) of the copper but is also sometimes intentionally applied

Positive Form – in sculpture it is the solid form of the sculpture

Realism – style or type of work which attempts to create or re-create something that we know or recognize as real

Subtractive – to take substance (clay or wax) away or carving from in order to create a form

Part 2: Bronze Sculpture Process

There are many practiced ways to create bronze sculptures. The following is a summation of the steps taken in the Lost-Wax method, which is the most widely used method.

The Lost-Wax process makes use of five alternating positive and negative forms. For example, your hand is a positive form. If you pressed your hand into clay and made an imprint, the imprint would be a negative form.

- First, a small sculpture is made from clay. By use of carving tools and molding techniques, the clay is shaped into the desired form. The carving process calls for the use of subtractive techniques as the artist carves and takes away from the mass of clay. Additive techniques may be used as well to add more clay to the lump for features such as noses and ears (if the artist is sculpting a person).
- The completed clay sculpture is called the maquette. This is the first positive form in the Lost-Wax process.
- The maquette is now coated with several layers of liquid rubber. The artist will pay great attention to detail to ensure the rubber is evenly coated to capture all the tiny details in the maquette.
- Allow the rubber to dry and harden. Once completely hardened, the artist will cut the rubber into two pieces so that the maquette can be removed from the rubber. Then, the artist reattaches the two rubber pieces and ties them together with string or twine. This is now a mold of the maquette and is the first negative form in the Lost-Wax process.
- Molten wax is now poured into the mold and spread around the inside of the mold. About three coats of wax are needed to evenly coat the inside of the mold. The wax should form a skin of about 1/8 of an inch thick inside the mold.
- Allow the wax to cool and harden and then remove the hollow wax form by separating the rubber mold again. The wax should be a replica of the original maquette. This is the second positive form in the Lost-Wax process.
- At this point, any imperfections on the wax form may be corrected with carving tools or heat to smooth the wax.
- Now, the wax form should be dipped into a large container of a plaster and sand mixture or liquid clay to coat the outside of the wax form. Dipping the form and then allowing it to dry before dipping it again will allow the coating to dry evenly and create the proper skin. Six to 12 coats should be plenty. The coating is creating the second negative form in the Lost-Wax process.
- The ceramic mold with the wax form still inside should now be heated in a kiln, or oven for ceramics. The heat will allow the ceramic to fully harden and also melt the wax and allow it to pour out of the shell. This is where the name Lost-Wax comes from because the wax form is destroyed and cannot be used again.

- After the kiln process, the ceramic negative form should be filled with molten bronze. The bronze will slowly cool and harden while capturing all the details in the ceramic mold.
- After about an hour, the ceramic mold should be chiseled away to reveal the final positive form in the process. The bronze form can now be smoothed and polished to perfection.
- The final step is to apply the patina to the bronze sculpture by brushing or spraying the chemicals which will produce color on the bronze.
- The bronze sculpture is now complete.

Part 3: Plaster Cast Hands

This activity will familiarize your students with the concept of positive and negative forms. Students will also achieve a greater understanding of the cast and mold process.

Materials:

32 oz Styrofoam cups (one per student)

Mixing bowl

Molding gel powder or dental alginate (found at art supply stores or dental supply companies)

Plaster of Paris

Acrylic spray or paint as desired

Steps:

1. In a mixing bowl, combine 8 oz. alginate with 8 oz. water and mix thoroughly. You may add a little extra water to achieve a smoother consistency.
2. Pour approximately one inch of the alginate mixture in the 32 oz. Styrofoam cup. Student should place their hand in the cup without touching the bottom or sides of the cup.
3. Pour the alginate mixture evenly around the hand and leave about one inch of space at the top of the cup. Gently tap the sides of the cup to release any air bubbles from the alginate.
4. Students should be sure to not move their hands while the alginate is setting.
5. Allow 10 to 15 minutes for the alginate to set. During this time the teacher can mix the plaster of paris according to the package directions.
6. After 10 to 15 minutes, students may slowly and carefully remove their hands.
7. Immediately pour in the plaster, filling the cup to the rim.
8. Again, gently tap the sides of the cup to release air bubbles.
9. Allow the casts to dry over night.

10. When the plaster is dry, gently turn the cup upside down. Slit the Styrofoam cup on one side and begin peeling away the cup.
11. Peel away all the alginate from the plaster. The hands will begin to emerge as the alginate is removed.
12. Notice all the fine detail the alginate was able to capture.
13. Students may seal with acrylic spray or paint their hand statues any way they would like.
14. Discuss the bronze sculpture process and compare the similarities with the molding process.
15. Discuss positive and negative forms and identify each (hand is positive, mold is negative, plaster is positive).