

Life Taking Shape

The Bronzes of Stella Elkins Tyler



Traveling throughout Bucks County
October 2005–June 2006

ARTMOBILE, the outreach museum of the Department of the Arts at Bucks County Community College, is celebrating its twenty-ninth year of bringing the arts to the school children and adults of Bucks County through its visits to schools and public sites.

THIS MANUAL was developed to help teachers incorporate the Artmobile experience into their curricula by providing background information and classroom activities related to the exhibition. It is intended to serve as a resource both in conjunction with and apart from the exhibition.



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For more information on Artmobile and its programs, please call 215-504-8531 or visit www.bucks.edu/artmobile.

Cover: Stella Elkins Tyler in her studio, undated photograph, ca.1941–45.

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Contents

Acknowledgements 2

Introduction to the Exhibition 3

The Creative Life of Stella Elkins Tyler 4

The Process of Making Bronze Sculpture 5–7

Classroom Activities

Pre-visit Activities 9–10

Post-visit Activities 11–12

Glossaries

Making Bronze Sculpture 13–14

Talking About Sculpture 15–16

Appendix A 17

Richard Serra's Verb List Compilation

Appendix B 18–19

Class Hand-Out



Stella Elkins Tyler

Acknowledgements

WHILE EVERY EXHIBITION demands the dedication of many gifted and committed individuals, this exhibition required more than most. Therefore, it is with utmost gratitude that I offer my deep and heartfelt thanks to all those who helped to make this exhibition a success, especially:

Jon Burns, Bucks County Community College art faculty and sculptor, for his considerable talent, time, humor, and hard work co-curating and installing this exhibition. His vast knowledge of the technical and creative process of making bronze sculpture was invaluable. Jon also contributed excellent ideas for classroom activities drawn from his many years as an educator.

Evelyn King, BCCC student and sculptor, for not only allowing us to use her sculpture "Artifact" and its mold in the process section of the exhibition, but for fastidiously creating replicas to demonstrate every step of the process.

Linda Stauffer, BCCC student and sculptor, for her excellent video that brings the excitement of a bronze pour alive for our visitors.

John Everett, Artmobile's first director in 1976, for his valuable help with the installation and for supporting Jon's involvement in this project.

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And finally to our Artmobile Educators for this exhibition—*Ron Benek, Carole Cunliffe and Lisa Kidos*—whose professionalism, knowledge, and enthusiasm will bring *LIFE TAKING SHAPE: The Bronzes of Stella Elkins Tyler* alive for more than 20,000 visitors at 37 schools and 5 public sites over the course of its nine-month tour of Bucks County.

FRAN ORLANDO
Director of Exhibitions and Artmobile
Bucks County Community College
Newtown, PA

Introduction to the Exhibition

BUCKS COUNTY COMMUNITY COLLEGE was founded in 1964 on the former estate of George and Stella Elkins Tyler, a property in Newtown, Pennsylvania, of grand architectural designs and formal gardens. At that time, many of Stella Tyler's bronze sculptures remained on the site and thus became part of the College's art collection.

In celebration of the 40th anniversary of the College, a major exhibition of sculpture by Stella Elkins Tyler was presented through Hicks Art Center Gallery. *STELLA ELKINS TYLER: A Legacy Born of Bronze* was curated by Fran Orlando and was accompanied by a full-color catalogue authored by Dr. Roberta A. Mayer. The exhibition took place from September 1–November 20, 2004 in three different venues across the campus. A collection of both small and large bronzes, some privately owned, was on view at the Hicks Art Center Gallery. At the Library, the process of making bronze sculpture was presented along with several of Tyler's plaster models and some fascinating primary documents that were discovered during the research process. Finally, Tyler's large outdoor bronzes owned by the College were, and continue to be, on permanent display in the gardens and in front of the Gateway Center.

Artemobile's exhibition, *LIFE TAKING SHAPE: The Bronzes of Stella Elkins Tyler*, represents about one third of the College's collection. It features Tyler's statuettes as well as a major war memorial. Additionally, the exhibition presents the process of making bronze sculpture, a display of the gear used, and a video of a bronze pour. We are delighted to be able to bring this exhibition to our community through our traveling museum and hope that you will visit our campus to see the remainder on permanent display.

Tyler had always had strong connections to the cultural life of Philadelphia and New York, and, as an heiress of Gilded-Age fortune, she also had the means to pursue her interests. It was, however, not until after she began to create sculpture that she thought about becoming a philanthropist. Ultimately, Tyler donated two of her estates with the intention of creating educational institutions. In 1935, her first home in Elkins Park, known as Georgian Terrace, became the Stella Elkins Tyler School of Fine Arts of Temple University. Upon her death, her second home in Newtown, christened Indian Council Rock, was willed to Temple University. This property was quickly sold and laid the foundations for the opening of Bucks County Community College in 1964. The purpose and pleasure that Tyler found in her sculpture has had its most powerful legacy in the tens of thousands of students who have been able to discover their own creative abilities as a result of her generosity. And that legacy promises to continue.

The 80-page full color catalogue for *STELLA ELKINS TYLER: A Legacy Born of Bronze* is available at Hicks Art Center, Bucks County Community College or by mail. For more information, call 215-504-8531 or visit http://www.bucks.edu/gallery/stella_tyler.html.

The Creative Life of Stella Elkins Tyler

STELLA ELKINS TYLER (1884–1963) was almost fifty years old when she began to work as a serious sculptor in the early 1930s. Her mentor was Boris Blai (1898?–1985), a former student of the famous French sculptor, Auguste Rodin. Between 1935, when Tyler had her first solo exhibition at the Grand Central Art Galleries, and 1959, the year that the Woodmere Art Gallery hosted her third such show, Tyler displayed approximately one-hundred-and-fifty different sculptural designs, most relatively small, but some close to life-size. By the end of her life, just about all of her known compositions were cast into bronze by the Roman Bronze Works, a major foundry located in Corona, New York. Most of her pieces were single castings—in other words, her bronze sculptures are typically one of a kind.

Today, the largest extant collection of Tyler’s work—29 bronze sculptures, two intact plaster models, and several plaster fragments—survives at Bucks County Community College. This is because the College was founded in 1964 on the grounds of the Tyler estate on the outskirts of Newtown, Pennsylvania. Many of her pieces remained with the property.

Although this exhibition has emphasized the College’s collection, it should be noted that Tyler’s sculpture is also represented in the collections of the Philadelphia Museum of Art and Westminster Choir College in Princeton, New Jersey. Likewise, a number of pieces are now owned by private collectors or by Tyler family descendents.

Tyler consistently favored the figure, whether she was working on religious pieces, war memorials, or garden statuary. Some of her allegorical and mythological subjects were drawn from sculptural tradition, an observation consistent with the fact that she had received formal training with Blai. She also looked to popular culture, finding ideas in contemporary dance, music, film, photographs, celebrities, international exhibitions, and politics. The subjects and titles that Tyler selected for her pieces establish a wide range of influences.

In addition, some of Tyler’s compositions reveal her keen awareness of the major women sculptors in the United States in the 1930s, including Anna Coleman Watts Ladd (1878–1939), Anna Hyatt Huntington (1876–1973), Gertrude Vanderbilt Whitney (1875–1942), Malvina Hoffman (1887–1966), Beatrice Fenton (1887–1983), Harriet Whitney Frishmuth (1880–1980), and Bessie Potter Vonnoh (1872–1955). We now know that Tyler was familiar with all of these artists and knew some of them personally. Of particular interest, a number of these sculptors were also her social peers.

Working for almost three decades, Tyler in her dedication to sculpture did not blaze new trails for women. To the contrary, some of her work emulated that of her female contemporaries. She was, however, never a simple copyist. Rather, her approach to sculpture indicated that she was willing and able to learn from those who preceded her. By making visual references to well known pieces by successful women artists, Tyler celebrated their accomplishments and considered them as role models. In turn, her homage to the best women sculptors of the early-twentieth century gave her own work a sense of legitimacy that was recognized by the art critics.

Tyler’s work reflects the positive strides made by women sculptors in the early part of the twentieth century, but it also tells another poignant story, one that was largely private until Tyler’s eldest son, Sidney F. Tyler, published his memoir, *A Joyful Odyssey* (ca. 1990). Sidney notes that, by the 1920s, Tyler began to experience periods of hyper-elation followed by depression. Sidney never mentions Boris Blai or his mother’s sculpture, but his memoir does much to explain the circumstances that brought Tyler and Blai together as student and teacher. Thus, Stella Tyler’s bronze figures also tell the story of an older woman finding new meaning in life by fully embracing the creation of art. The process of making sculpture brought contentment, which, ironically, was a state of mind that this heiress of Gilded-Age fortune could not simply buy. She had to do the work.

ROBERTA MAYER, Ph.D.

*Boris Blai’s year of birth is recorded differently in different sources, with dates of 1893, 1897, 1898, and 1890. See Boris Blai Papers, Temple University Special Collections.

**A special acknowledgement is owed to Lucy D. Rosenfeld for generously sharing her research on the Roman Bronze Works and transcribing the 131 entries for “Mrs. G. F. Tyler” from March 31, 1934, to May 14, 1940, that she was able to cull from her files. In addition, the archival documents of the Roman Bronze Works that are now owned by the Amon Carter Museum record an additional 19 entries for Stella Elkins Tyler that span from 1932 to 1960.

The Process of Creating Bronze Sculpture

THERE ARE MANY STEPS involved in creating a bronze sculpture; this multi-step procedure is called “lost wax” investment casting. The following process is very similar to the one used to produce Stella Elkins Tyler’s sculpture in the early 1930’s through 1960.

The Drawing

The artist must begin with a concept or idea of what she wants to create. Drawing ideas on paper can help her develop her concept, focus, and choose the subject which she will cast into a bronze sculpture.

The Clay Sculpture

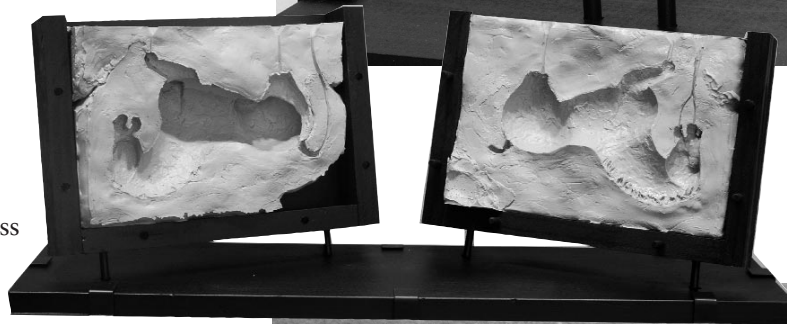
After the artist has developed her idea, she will construct the original artwork in clay or plasticine, which is a mixture of clay and oil. The clay is molded over a steel armature to help stabilize the work for the future mold-making process.

The Flexible Mold

Once the sculptural design in clay is complete, the next step is for a mold to be made of the piece. In the process of making this mold, the original clay sculpture is destroyed. This mold is made of a flexible rubber material that could be supported with an exterior plaster layer that is called the “mother mold.” It is a durable mold meaning it can be used over and over again. Any acceptable liquid material could be poured into this mold, allowed to solidify and a new piece is created which is identical to the original clay piece.

The Plaster Model

From the mold, a plaster model can be created. The plaster model and the flexible mold can then be safely transported and delivered to a bronze foundry. The plaster model replicates the original clay sculpture, but is more durable and would be used at the foundry to communicate the artist’s original conception.





The Wax Model with Gates and Sprues

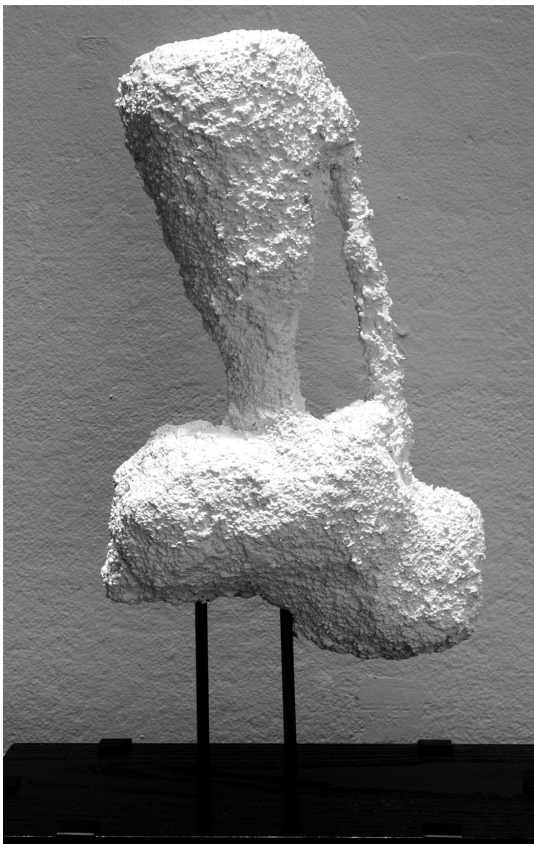
It is at the foundry that the casting will be done. Here the mold is used to create a wax model. Foundry wax is a microcrystalline material that has an excellent tensile strength. As a result, it can be used to make a thin model that captures fine details of the artist's composition. After the wax model is executed, several cylindrical pieces of wax are applied to its surface. Later on, these elongated forms will serve as the pour cup, the gate, and the sprues for the molten bronze. The gate is the major vertical pathway through which the molten bronze is poured, and the sprues are the minor pathways and vents.

The Ceramic Shell or Investment

Once the wax model is made, a half-inch thick ceramic-shell mold is built up over the wax. The ceramic shell is made from approximately ten coats of a colloidal silica solution, and several intermediate layers of stucco are used to reinforce and strengthen the shell. Because each coat of the silica solution requires at least three hours of drying time, this procedure may take several days to complete.

Melting the Wax

Small holes are drilled in the thick ceramic shell for the melting wax to drip from, then it is then placed in a kiln. At 1500° Fahrenheit, the wax melts out of the shell and any carbon contaminating the mold is burned away. The ceramic shell is then removed from the oven and immediately used as a mold for the molten bronze.



Pouring the Molten Bronze

The holes in the ceramic-shell mold are quickly plugged and the hot mold is placed in a sand pit. At this point, 2000° F molten bronze is poured into the ceramic-shell mold. Bronze is an alloy of copper, tin, and silicon. There are many different formulae for the smelting of bronze alloys. Today, silicon bronze is preferred for statuary castings due to its ease of pouring and chasing, and it appears that Tyler's pieces were also cast in silicon bronze.



Divesting the Ceramic Shell

After the bronze has solidified and cooled, the ceramic shell or investment can be chipped off and discarded. This process is known as divesting.



The Unfinished Bronze

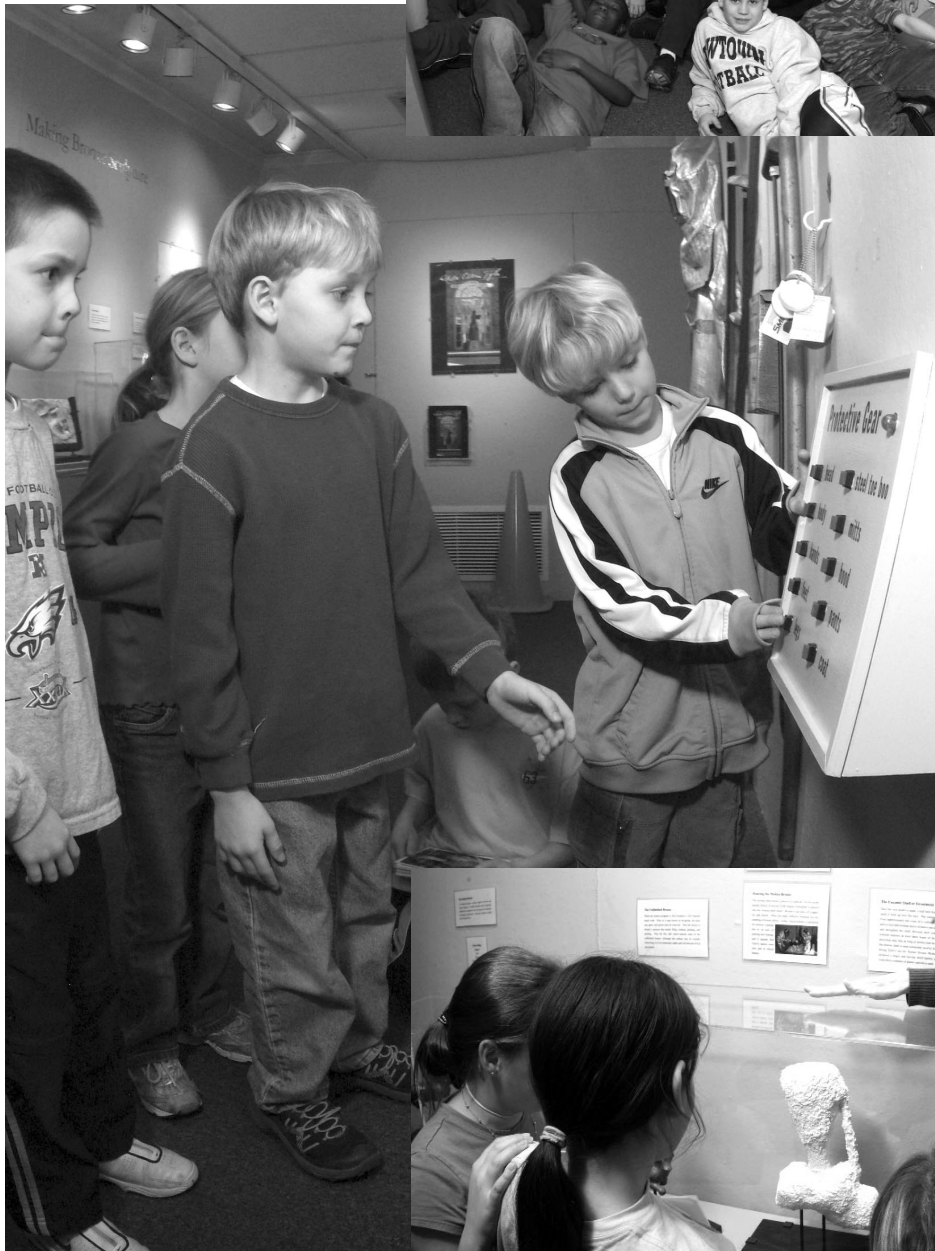
When the bronze sculpture is first revealed, it still requires much work. The first step is known as de-gating. The pour cup, gates, and sprues must be removed. Then the bronze is chased, a process that entails filing, welding, grinding, and sanding. The resulting unfinished bronze has a dull yellow-salmon color. Although this surface may be visually interesting, it is not chemically stable and will discolor if it is not treated.



The Finished Bronze

To complete the piece, a patina is applied with heat and various chemicals. A traditional bronze patina is generally reddish brown, though the colors can range from pale green to dark green to dark brown. Finally, the sculpture is sealed with a clear paste wax.





Classroom Activities

The following activities and discussions can be conducted as written here or used as a springboard for other activities and discussion.

PRE-VISIT: What is Sculpture?

Vocabulary:

Sculpture: a three-dimensional work of art

Relief: a mode of sculpture in which forms/ figures are raised on a surface

Medium/ Media: the material(s) of which a work of art is made.

Process: the method that an artist used to create an artwork.

Positive form/ space: the area in an artwork occupied by a form(s).

Negative form/ space: the space around the form(s) in an artwork.

Representational: depicting a person, place, or thing in a realistic manner.

Abstract: having only intrinsic form; does not attempt a realistic depiction.

Additive: the process of making a sculpture by joining components together.

Subtractive: the process of making a sculpture by taking matter away.

Brainstorm!

Ask students if they have seen sculptures before and to describe them. Keep a record on the blackboard. Where did they see it? What did it look like? Was it big or small, inside or outside? Was it abstract or representational? What media were used? How do they think the artist made the sculpture? Was it an additive or subtractive process?

Ask students about different materials they think can be used to make sculpture.

What have they used to make a sculpture?

Examples include: wood, stone, metal, fabric, paper, plastic, rubber, concrete, wax, glass, light (projection), pipe cleaners, clay, ice, sand, snow...JELLO!

Ask the students to think of different processes an artist can use to make a sculpture. How many action words [verbs] can they think of? What process have they used

to make a sculpture? Examples include: gluing (materials together), twisting (materials together), stacking, carving, melting, fabricating, mold-making, sewing, weaving . . . [See Appendix A: Sculptor Richard Serra's "Verb Compilation List."] Can they group these into additive and subtractive processes? For example, carving is subtractive and welding is additive.

Activity One: Mold-making with Jello

MATERIALS: Jello mix, paper cups (other cups or hollow forms may be substituted), water, bowl and spoon (for mixing).

PROCESS: Mix Jello according to package. Pour into cup. Refrigerate according to package directions.

DISCUSSION TOPICS: The paper cup is a pre-made mold. A mold is a hollow space that can be filled with a material to make another object. The mold is a negative form because it is hollow. The form that is made is a positive. Molds can be made for any form. Often an artist makes their own mold. Molds can be filled with many materials: Jello, water, wax, metal, plastic, rubber, or juice. The process remains the same.

Discuss states of matter: Jello went from a liquid to a solid when cooled. Can students think of similarities between all the materials that can be used to fill a mold? They all go from liquid from solid (at different temperatures). This is the same process that Stella Elkins Tyler used to make her bronze sculptures.

Today molds are made to make many things other than sculpture. Can students think of things at home or at school that were made using a mold?

ALTERNATE: On a warm day or mid-winter summer festival: Popsicle making in ice-cube trays (or other container).

Activity Two: Soap Carving

MATERIALS: Bars of soap, metal spoon or butter knife (or other carving tool), sandpaper or emery board (optional).

PROCESS: Each student carves a small sculpture. Remind students that a sculpture is three-dimensional and needs to be carved on all sides!

DISCUSSION TOPICS: Carving is a subtractive process by which artists make sculpture. Discuss the properties of soap. Is it hard, soft, somewhere in the middle? Harder than...softer than...? Did they ever think of soap as an art material?

ALTERNATE: Have each student bring in two materials of their choice from home. Ask students to compare and contrast the materials either orally or in their notebooks. For example, each student could think of five or ten adjectives for each material. Then have them choose which material they would prefer to use to make a sculpture. Combining the materials could be another approach. Why did they choose that material? What process will they use?

Activity Three: A Pendant Relief Necklace

MATERIALS: An oven cureable polymer clay (a “femo clay,” such as Sculpey), string or cord, pencil, toothpick or wooden skewer, and a coin.

PROCESS: Roll and press a small amount of clay into a slab approximately 3/16" thick. Press a coin into the slab to leave a negative imprint. Using the toothpick or other implement, pierce a hole from which to string a cord. Bake the femo clay (in an oven or toaster oven according to package directions. Note: A microwave will not work. Allow to cool. Insert string or cord.

DISCUSSION: The coin is a positive form, when it is pressed into the clay it leaves a negative. Why do people wear pendants? Compare and contrast the difference between a relief and a sculpture?

ALTERNATIVE: Have students form geometrical shapes or other forms to be turned into pendants.

ALTERNATIVE: Have students make small abstract sculptures with clay by making five geometrical shapes and putting the shapes together. Why did they arrange them the way they did? Where is the positive and negative space? Does their abstract form remind them of anything?

Activity Four: Found Object Sculpture

MATERIALS: Found objects (can be natural objects found on a nature walk, bought objects, such as paper cups, plates, pipe cleaners, etc. or brought from home), glue (hot glue recommended) or other means of putting together.

PROCESS: Have students assemble sculptures. Next students will create drawings from their sculptures. *Drawing One:* draw the object. *Drawing Two:* draw the negative space, etc.

DISCUSSION: How does the form and meaning of an object change when it is put together with others? Look at them as a group. Are there any similarities/ differences that stand out?

ALTERNATE: Ask each student to bring in one or two found objects. In small groups or as a class, have students arrange their objects together to form a sculpture. At any stage of this process drawing from the objects can be integrated.

Activity Five: Press-mold Masks

MATERIALS: Heavy duty aluminum foil. Optional materials such as paper, sequins, feathers or fabric, and glue can be used to decorate the mask.

PROCESS: Group students into pairs. Give each student a sheet of foil slightly larger than their face. Working one at a time, have the students carefully form the foil to their partners face and head. Note: These are most successful when the forehead and chin are molded along with the face.

DISCUSSION: Consider facial expression. What mood does each convey? Consider material. Do students think that the material affects their interpretation of the masks?

ALTERNATE: Students can make a press mold of a hand or foot, a portrait bust, or any other object.

POST-VISIT: Learning from Sculpture

Brainstorm!

Discuss Stella Elkins Tyler's sculptures. Can students describe the materials and process that Tyler used? Can students describe Tyler's influences? What did they like or dislike? Why? Which one did they think was the best idea? If there was one piece they could have in their home, which would it be? Where would they put it? Why? Which sculpture do they think cost the most to make? Why? This will be a factor of size. You may refer to the *STELLA ELKINS TYLER: A Legacy Born of Bronze* exhibition catalogue donated to your school library with your Artmobile visit.

Activity One: Figure Sculptures

MATERIALS: clay (There are many types of clay, please purchase one that best suits your individual needs, e.g. there are non-hardening clays which can be reused, self-hardening clays which dry when left out, and clays that harden when heated. Sculpey is a popular brand name of this type.)

PROCESS: Read package directions on clay thoroughly. Allow students to form clay into small figures. Drying process will vary.

TIPS: Don't forget about drying time!

DISCUSSION: Stella Elkins Tyler made sculptures of figures. Encourage students to discuss why they made certain decisions while sculpting. Why do the arms go up? Etc.

OPTIONS: Group figures together for display. How does the context change the meaning of the sculpture?

Activity Two: Viscosity—the property of resistance to flow in a fluid or semi-fluid

MATERIALS: Dixie cups, vegetable oil, small plastic funnel (available at craft stores).

PROCESS: Fill Dixie cups with vegetable oil. Place half of the filled cups in a refrigerator overnight. Leave the other half at room-temperature. Using a stopwatch have students record the length of time to pour the room-temperature through the funnel. Then have students record the length of time to pour the chilled oil through the funnel. Students can then compute the average differ-

ence between the times. This will determine the difference in viscosity.

DISCUSSION: What is the difference in viscosity? Why do materials change states? What other materials can students think of that change states? The vegetable oil becomes thicker when chilled. A solid metal becomes more fluid as it is heated. Wax is another material that is solid when at room temperature and liquid when heated. In the Artmobile we discussed the temperatures at which various materials change from solid to liquid. Do students remember any of the temperatures? Ice —33° F, Chocolate—98° F, Wax—165° F, Aluminum—1220° F, Bronze—1895° F. Can students think of reasons why materials change states at various temperatures? Can students think of any patterns?

ALTERNATE: This project could be done with older students using a double boiler and wax. Wax goes from a solid to liquid when heated. Wax could then be poured into molds or cups.

Activity Three: Bronze Sculpture Research

MATERIALS: drawing materials (limitations can be given as needed).

PROCESS: Have students research, online or in the library, about bronze sculptures. Each student should choose one sculpture and print or photocopy an image of it. The student will use the image to create a drawing of the sculpture. Have students write a paper pertaining to the sculpture and present it to the class. Some ideas might be to tell about the artist who made it. Discuss the sculpture in the context of the time or civilization in which it was made. For what purpose does the student think it was created? What information have they found to support their hypothesis? Does the sculpture still fulfill its original function? Can they explain the psychological and aesthetic components? Can they identify the formal elements and principles of the sculpture? (i.e. qualities of color, form, light, positive and negative space, line, shape, surface, texture, etc.)

DISCUSSION: Allow each student to present a summary of their papers. Time restrictions will vary upon grade level and classroom obligations. Then encourage students to ask the presenter questions about their topic.

ALTERNATE: Have students each research one of Stella Elkins Tyler's sculptures. What were influences? Why do they think she made this sculpture? Where is it now?

OPTIONS: Students can work on this project in small groups.

Activity Four: Mapping

MATERIALS: map, drawing materials

PROCESS: Use a map to show students where bronze was created in ancient times. Ask students to research early bronze sculptures from Mesopotamia, Egypt, Greece, Rome, etc. Have students choose a sculpture and make a drawing of it. Create a timeline and have students organize their reproductions on it chronologically. Have students indicate on the map the specific place where the sculpture they chose came from.

DISCUSSION: What did students discover about the origins of bronze? What comparisons can students make between these ancient sculptures and Stella Elkins Tyler's? Where can the sculpture they drew be found today? Why can a sculpture that originated in Egypt be found today in the United States? What reasons can students think of that sculptures move around the world? What do students think about this?

Activity Six: Math Word Problems

QUESTION: Bronze is three times heavier than aluminum. The crucible (the pot that holds the bronze in a foundry) holds 90 lbs. of bronze. How much aluminum can the same size crucible hold?

ANSWER: 30 lbs.

QUESTION: Bronze is 10 times heavier than wax. If Stella Elkins Tyler's large Joan of Arc weighed 50 lbs. in wax, how much does it weigh when cast in bronze?

ANSWER: 500 lbs.

Making Bronze Sculpture

Alloy. A metallic material formed by mixing two or more chemical elements. Usually possess properties different from those of the components.

Armature. A framework for supporting the clay or other plastic material in modeling. Armatures are often made of metal or wood. Lead pipes are commonly used in armatures for clay models. Metal framework or reinforcement in plaster molds and models may also be loosely referred to as armatures.

Bronze. Alloy of copper and tin with usually small amounts of other elements such as gold, silver, zinc, aluminum or lead. First appearing in western Asia in the 4th millennium BC, bronze has been used throughout the world for weapons, coins, and a diverse range of utilitarian household items, owing to its strength, hardness, and durability. Its fluidity when molten makes it one of the most suitable mediums for casting sculpture and decorative objects.

<http://www.gotheborg.com/glossary/glossaryindex.htm>
<http://www.gotheborg.com/glossary/data/bronze.shtml>

Burnout. This occurs when the dried ceramic shell, still containing the wax pattern, is placed with its opening down into a hot kiln. As the temperature rises, the wax melts and flows out of the shell leaving a cavity in the form of the artwork

Casting. In the process of creating a bronze sculpture, a wax reproduction of the original clay sculpture is covered in a rock-hard ceramic casting shell or “investment.” When the wax has been melted out, the shell will serve as a mold for the molten bronze. When the bronze has hardened the shell is carefully broken away and cleaned from the casting. Channels through which the bronze was poured, called “sprues,” are cut off and all parts are sandblasted to prepare for reassembly.

Ceramic Shell Casting method. A recent innovation in bronze casting technology which employs a thin ceramic shell mold. The model is repeatedly dipped into a liquid ceramic solution which dries rock hard. The mold is

then heated to melt the wax, which runs out of the mold. This one-piece investment leaves no mold marks thus reducing the amount of cold work necessary.

Chasing. A method of finishing bronze casts by removing small imperfections and smoothing rough spots. Often, the metal surfaces are embossed, hollowed, or engraved with steel tools to recreate the artist's subtle surface texture

Clay. A malleable mudlike substance in which the sculptor first gives form to his creation. Natural clay was used in sculpture until about 1900, when a synthetic (oil-based) clay was developed. The natural water-based clay was susceptible to drying out, cracking, and freezing. The synthetic clay is oil-based and thus is less likely to dry out. The most common trade names for oil-based clay are plastilene, plastilina, and plasticene.

Clay Model. The original sculpture made by the artist. Can be made of oil-based clay or water-based clay.

Coldwork, Chasing, or Finishing. Work to the hard, cold, cast bronze sculpture. Files, hammers, chisels, and abrasives are used to remove the sprue, gates, vents, and risers and to work the bronze in order to remove unwanted imperfections or to add detail lost in the casting process. Certain textural effects can also be created on the surface.

Crucible. A ceramic pot or receptacle of graphite-clay, clay, or other refractory material in which metal is melted. This term sometimes applied to pots of cast, iron or cast or wrought steel.

Crucible furnace. Furnace in which metal is melted in crucibles.

Firebrick. Brick made of refractory clay or other material which resists high temperatures.

Fluidity. Ability of molten metal to flow readily; usually measured by the length of a standard spiral casting.

Gating/Spruing. The finished wax version of a sculpture is prepared for ceramic investment by attaching a plumbing system of wax called “gates” or “sprues.” The gates and sprues form the channels through which the melted bronze will travel to the artwork. This reduces air pockets and also lets the person, who is pouring, know when the mold is full of molten metal. Later in the casting process, the space occupied by the gates and sprues become runways through which the metal flows and trapped gas escapes.

Investment. The process of building a ceramic shell around a wax replica of an original clay sculpture by dipping the sculpture into a pancake batter-like mixture of slurry and sand. Between coats the shells are suspended in drying racks in environmentally controlled rooms. The process is repeated up to a dozen times, beginning with fine slurry and fine sand to capture surface detail and graduating to coarser coats for strength.

Lost Wax Process. A casting wax process using a wax model that is encased in a molding material, such as sand or plaster, then melted away, leaving a hollow mold into which the molten metal is poured.

Melting range. Pure metals melt at one definite temperature, but constituents of alloys melt at different temperatures, and the variation from the lowest to the highest is called the melting range.

Mold. The form containing the cavity into which molten metal is poured to make the casting.

Mold Making. A mold allows wax replicas to be made of an original clay sculpture and makes possible the casting of limited editions. To construct the mold, a molding compound is painted or troweled onto the original and built up until it is a thickness that is durable yet retaining flexibility. Molds are usually made of flexible rubber or silicone and can be used for the entire limited edition. A rigid support of plaster or fiberglass called the mother mold is built over the finished rubber mold. The outer mold helps the rubber retain its shape and position and allows the mold to be handled.

Mother Mold. A plaster shell or mold constructed around a rubber inner mold or used as a backing for support of flexible materials. Rubber molds are generally stored in the mother mold.

Patina. A chemical coating that adds a colorful finish to metal sculpture. This is a particularly effective treatment for bronze, which can be given a wide variety of attractive green, brown, blue, and black patinas.

Plaster. A pasty mixture, of lime or gypsum, sand, and water, which hardens upon drying. Since plaster dries through crystallization it does not shrink. This makes it perfect for mold-making.

Plaster Model. The plaster likeness of the original clay model. Also called the plaster original model, it is used to create the fire resistant mold to cast in bronze, aluminum, or other metal.

Plasticine. A synthetic clay which has an oil base. Plasticine will not dry out like the older water-based natural modeling clay. Also known as plastilene or plastilina.

Pyrometer. An instrument for determining elevated temperatures.

Sand blast. Sand driven by a blast of compressed air (or steam). It is used to clean castings, to cut, polish, or decorate glass or other hard substances, and also to clean building fronts, etc.

Skimmer. A device or tool for removing slag and dross from the surface of molten metal.

Slag. A nonmetallic covering on molten metal as the result of the combining of impurities contained in the original charge, such as ash from the fuel, and any silica and clay eroded from the refractory lining. Except in bottom pour ladles, it is skimmed off prior to pouring the metal.

Slurry. Thin watery mixture such as the gypsum mixture for plaster molding, the molding medium used in investment molding, core dips, and mold washes.

Surface finish. Condition or appearance of the surface of a casting.

Tongs. Metal instrument with two legs joined by a hinge for grasping and holding things, e.g., crucible tongs.

Vent. An opening in a mold or core to permit escape of steam and gases; it is also called a vent hole.

Viscosity. Resistance of a fluid substance to flowing. A measurable characteristic for an individual substance at a given temperature and under definite conditions.

Wax. Common waxes are beeswax, bayberry, paraffin wax, ozokerite, ceresin, and carnauba. Their mixtures are formed into rods and sheets and used for forming vents in cores and molds, repairing patterns, etc.

Welding/Finishing. Larger sculptures are often cast in a number of sections then reassembled by welding the pieces together. The welds are ground down and textured to match the surrounding surfaces making the seams unnoticeable. In the finishing stage, artisans and metal workers use a variety of hand and power tools to achieve or refine final surfaces and accentuate textures.

SOURCES:

<http://www.detmersstudios.com/fineartbronzesculpture.htm>

<http://www.wynndanzur.com/glossary.htm>

<http://www.svsu.edu/mfsm/educational/glosstrmhs.html>

Talking About Sculpture

SCULPTURE. three-dimensional art made by one of four basic processes. These are carving (in stone, wood, ivory or bone); modeling in clay; modeling (in clay or wax) and then casting the model in bronze; constructing (a twentieth-century development).

<http://www.tate.org.uk/collections/glossary/definition.jsp?entryId=267>

Aesthetic. A theory or concept dealing with the nature of beauty, art, and taste, and with the creation and appreciation of beauty.

Abstract. Alters the view of the world we see and retains only the essence of a thing or an idea.

Additive Sculpture. A sculpting method in which the form is developed by building up, adding, or joining materials or media to the three-dimensional representation. Some examples are clay (subtractive also) and assemblage work.

Balance. Two types of balance are symmetrical balance and asymmetrical balance.

Symmetrical Balance. A visual balance in which shapes, forms, colors, etc., are equally distributed left and right of a center line in a composition.

Asymmetrical Balance. A visual balance in which forms, shapes, colors, etc., are unequally distributed on either side of a center line in a composition.

Base. The bottom of a piece of sculpture or the display item that a piece of sculpture is mounted on for display. Some materials that bases can be made from include micarta, wood, stone, or marble.

Cast. A sculptural object made by pouring a fluid or molten material into a hollow form/mold and allowing that material to harden.

Colossal. Many times life size.

Gesture. Movement of body or hands to express thought in a non-verbal manner.

Heroic Scale. Larger than life-size but less than colossal.

In-the-round or Free Standing. A three-dimensional artwork or sculpture, having length, width, and depth. It can be viewed from all angles.

Kinetic Sculpture. Assemblage or sculpture made of parts designed to be set in motion by an internal mechanism or external stimulus, such as light or air. Simply stated, artwork that involves motion or movement.

Monument. A structure, such as a building or sculpture, erected as a memorial to a person or event.

Motif. A recurring thematic element in a work of art or a single or repeated design or color.

Negative. The hollow cavity of the mold to assist in easier separation of a cast from the mold.

Negative Space. In figurative sculpture, it is generally referred to as the space around the object or form.

Non-objective Art/Non-representational Art. Depicts no recognizable object or clear reference to the world we see.

Obverse. The side, as of a coin or medal, bearing the main design and the date. Opposite of reverse.

Positive. A piece or cast taken from a negative mold. A positive is cast into a negative to create the final piece.

Positive Space. In figurative sculpture, it is generally referred to as the shape or form of the figure.

Public Sculpture. Sculpture generally placed in high public visibility areas. They include monuments, memorials, architectural sculpture, cemetery monuments, etc.

Relief. The projection of figures and forms from a flat surface, so that they stand partly free.

Bas-relief. Sculpture in which forms are carved or modeled on a flat surface so that they project slightly from the background.

High Relief. Sculpture in which forms are carved or modeled on a flat surface so that they project greatly from the back surface. High reliefs have deep undercuts behind some figures. The figures may be nearly free-standing.

Incised Relief. Sculpture in which forms are carved or modeled on a flat surface so that they are recessed below the flat, planar surface.

Representational Art. Reproduces the world we see with minimal change from the appearance of things in everyday life.

Reverse. The back or rear of something; specifically the side, as of a coin or medal, that does not have the main design. Opposite of obverse.

Space. The area around within or between images or elements.

Stylized. To represent or design according to a style or stylistic pattern rather than according to nature.

Subtractive Sculpture. A sculpting method in which the form is developed by removal of the material or media from a three-dimensional representation. An example is wood or stone carving.

Texture. The actual or visual quality of a surface; tree bark, animal fur, cement, and sand are examples of different textures. Textures can be actual or implied.

Three-dimensional. Having length, width, and depth.

Two-dimensional. Having length and width and giving the illusion of a three-dimensional object or space.

Visual Artist. A visual artist is a person who transforms materials with her/his rich imagination and design skills; he/she illuminates those materials with a keen intellect and elevates those materials into a new dimension. Experts call this new dimension art.

SOURCE:

<http://www.svsu.edu/mfsm/educational/glosstrmhs.html>

Appendix A

Richard Serra, “Verb List Compilation: Actions to Relate to Oneself” (1967–68)

The following is a partial list:

to roll	to flow	to surround
to crease	to curve	to encircle
to fold	to lift	to cover
to bend	to inlay	to wrap
to shorten	to impress	to tie
to twist	to smear	to bind
to crumble	to rotate	to weave
to shave	to swirl	to join
to tear	to support	to match
to chip	to hook	to laminate
to split	to suspend	to bond
to cut	to spread	to hinge
to sever	to hang	to mark
to drop	to collect	to expand
to remove	to grasp	to dilute
to disarrange	to tighten	to light
to open	to bundle	to stretch
to mix	to heap	to bounce
to splash	to gather	to erase
to knot	to scatter	to spray
to spill	to arrange	
to droop	to enclose	

Appendix B

Classroom Hand-out

Answers:

1. Music, Dance, War, Current Events, Popular Culture.
2. Auguste Rodin, through his student, Boris Blai who became Tyler's mentor.
3. Bronze is durable and will last many years.
Bronze has a long history that sculptors may want to be a part of.

Name _____

Date _____

Life Taking Shape

The Bronzes of Stella Elkins Tyler

1. What were some of the sources of Stella Elkins Tyler's inspiration?

2. What famous sculptor influenced Stella Elkins Tyler?

3. Why would a sculptor choose to work in bronze?

4. What part of the process of making a bronze sculpture was most interesting to you?

5. What was your favorite sculpture in Artmobile? Why?



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