Sculpture – Materials & Methods

Guide to Looking and Visiting the Nasher Sculpture Center

Enjoy learning about the sculpture on view at the Center and explore materials and methods in the making of sculpture.

This packet includes information on the Nasher Collection suitable for school tours and suggested activities for a self-guided visit to the Center.

Pre-visit and post-visit classroom lesson plans and activities are also included.

Nasher Sculpture Center
2001 Flora Street, Dallas, Texas 75201
Education Department: 214.242.5170

Table of Contents

Sculpture Materials ……. 3

Sculpture Methods

- Assembling ……. 4
- Carving ……. 5
- Modeling ……. 6
- Casting ……. 7

Pre-Visit Activities

- Classroom Discussion …….. 12
- Online Scavenger Hunt ……. 13

Visiting the Center

- Policies and Scheduling a Tour ……. 14
- Location and Parking ……. 16
- TEKS Addressed in Visiting the Center …….. 17
- Suggested Activities for Self-Guided Tours ……. 20

Post-Visit Activities

- Sand Casting ……. 22
- Reductive Sculpture ……. 24
- Found Object Sculpture …….. 25
- Relief Sculpture ……... 26

Appendix A: Glossary of Materials and Methods ……. 28

Appendix B: Materials in the Nasher Collection …….. 32

Appendix C: Activity Worksheets to Use on a Self-Guided Visit …… 34

Evaluation …….. 37

Packet produced by the Nasher Sculpture Center Education Department
with casting graphics and content written by intern Karen Jacobi.

Sculpture Materials and Methods

Sculpture Materials

There are many different materials used in the creation of sculpture, both natural and man-made. The Nasher Collection contains examples of sculpture created from:

- Metal
  - Bronze
  - Steel (Cor-Ten, stainless)
  - Aluminum
  - Iron
  - Lead
  - Copper
  - Wire and Sheet Metal
  - Painted metal
- Plaster
- Plastics and Urethane
- Stone
- Wood
- Found objects

Claes Oldenburg in his studio at Ray Gun Manufacturing Co., 1961

Sculpture can also transform physical spaces into art. *Tending, (Blue)* by James Turrell is an example of a sculpture that transforms physical space, combining architecture and the use of light. The use of light, a non-tangible material, is important in this sculpture by Turrell.

View of exterior door
James Turrell's Tending, (Blue)

Appendix A includes a glossary of terms on materials and methods.

Appendix B includes a complete list of materials used to create sculpture in the Nasher Collection.

Sculpture Methods

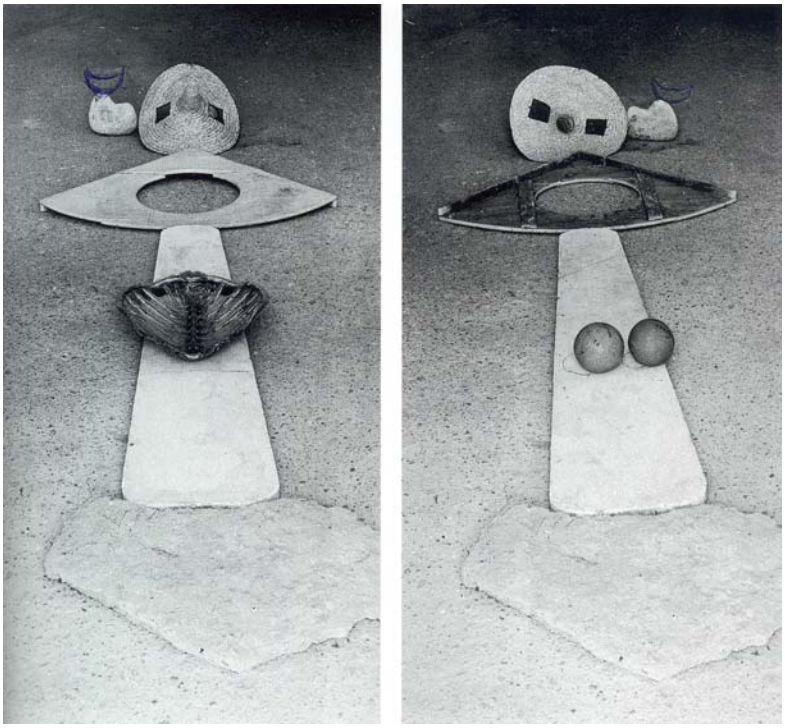
There are many ways to create sculpture, including assembling, carving, modeling, and casting.

Discuss with your students the processes of creating sculpture looking at examples from the Nasher Collection.

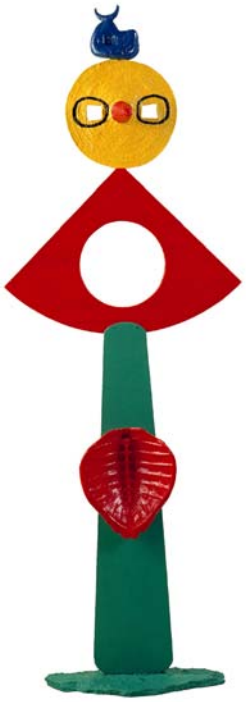
Assembling

Creating a composition made of various materials such as found objects, paper, wood, and/or textiles.

In *Caress of a Bird*, Joan Miró (*pronounced Jwan Me-ro*) transforms common objects found around his studio in the Catalan countryside. The artist assembled an ironing board, an outhouse seat, a donkey's straw hat, a tortoise shell, and two miniature soccer balls to create this sculpture. Miró was known to arrange found objects on his studio floor when planning a sculpture. In this instance, the artist had casts made in bronze of the found objects and painted the bronze casts with bright colors, adding to the whimsical nature of the sculpture.



Caress of a Bird being assembled. Photograph Casa Planas, retouched by Joan Miró



Joan Miró, *Caress of a Bird*, 1967, painted bronze

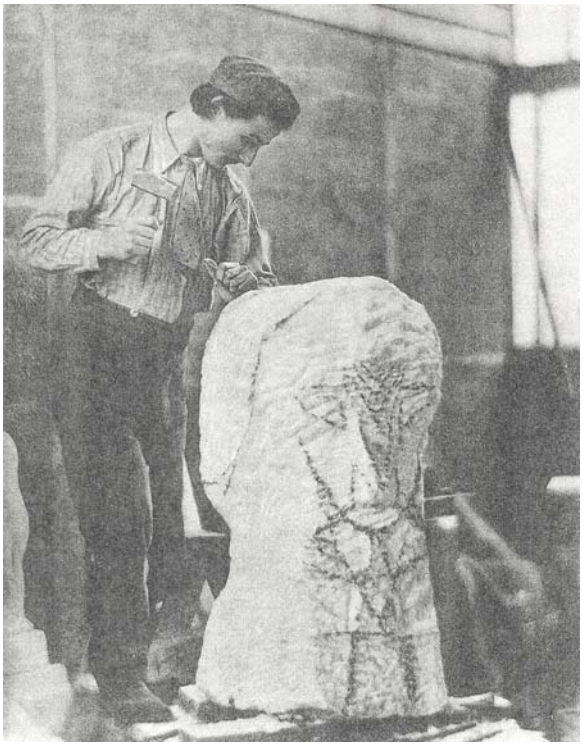
Carving

A subtractive sculpture technique in which material is removed, revealing the final form. Carving tools might include a chisel, adze, drove, gouge, and graver.

Adze

Chisels

Poet and critic Ezra Pound commissioned the artist Henri Gaudier-Brzeska (*pronounced On-ree Go-deeay Bresh-ka*) to create this portrait. Gaudier-Brzeska worked on this sculpture for two months, creating one of his largest stone carvings.



Henri Gaudier-Brzeska carving the *Hieratic Head of Ezra Pound*, 1914

Henri Gaudier-Brzeska, *Hieratic Head of Ezra Pound*, 1914, marble

Modeling

An additive sculpture process in which material is built up into the final form, often over an armature. The material must be pliable, such as clay, wax, or plaster, and the sculptor uses his/her hands to build up the form.

Alberto Giacometti (*pronounced Ja-co-met-ee)* was a prolific painter and sculptor, even sometimes painting directly on bronze sculptures. He spent many years creating portrait busts of his brother, Diego, his long-time studio assistant. The sculpture *Bust of Diego* was first created by modeling the form in clay. One can see how the sculptor modeled the clay with his hands in the indentions left on the surface. The composition was then cast in bronze, and the artist painted the surface of this version now in the Nasher Collection.

Alberto Giacometti
modeling a figure
in his studio

Alberto Giacometti, *Bust of Diego*, 1954

Casting

The act of making a work of art from a hollow mold by pouring molten metal, liquid plaster, or other material into the mold to let it harden.

Constantin Brancusi, *The Kiss*, 1907-08, cast before 1914

This is one of six known plaster casts that Brancusi made at an early date from the first version of *The Kiss*, his first true masterpiece. The first version of *The Kiss* was carved in stone. Casting multiple versions allowed him to make more works available for public exhibition.

There are different casting methods. See Appendix A glossary for terminology.

Bronze sculpture is often created through the lost-wax method of casting. Bronze is composed of various alloys of copper and tin, sometimes with other metals. A work cast in bronze is sometimes referred to as a bronze. The Victoria and Albert Museum provides an excellent five-minute video on lost-wax bronze casting on their website: www.vam.ac.uk/collections/sculpture/bayes/video_bronze.

Using the sculpture *Night* by Auguste Maillol (*pronounced My-yol)* as a silhouette, the different steps of lost-wax casting are illustrated. Please note that this is a simplified illustration of a very complex process.

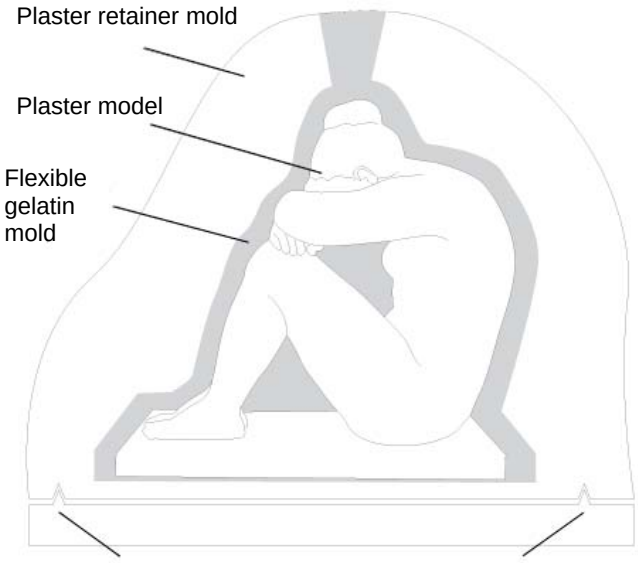
Aristide Maillol, Night, ca.1902-07, (cast 1960)

Artists first sculpt a model in clay or plaster. The surface of the model is coated with a protective coating, such as lacquer.

The model is then placed within a plaster retainer mold into which liquid elastic gelatin or latex is poured. Figure 1.

The flexible gelatin mold gives the most accurate representation of the details of the model because of the fluidity and flexibility of the material.

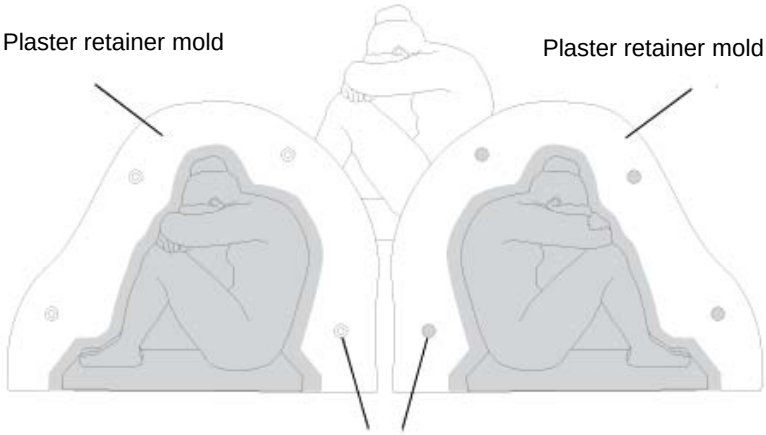
Figure 1



Plaster retainer mold held together with registration keys

When the flexible mold solidifies, it is gently pulled from the surface of the model in two equal sections revealing a negative impression. Figure 2.

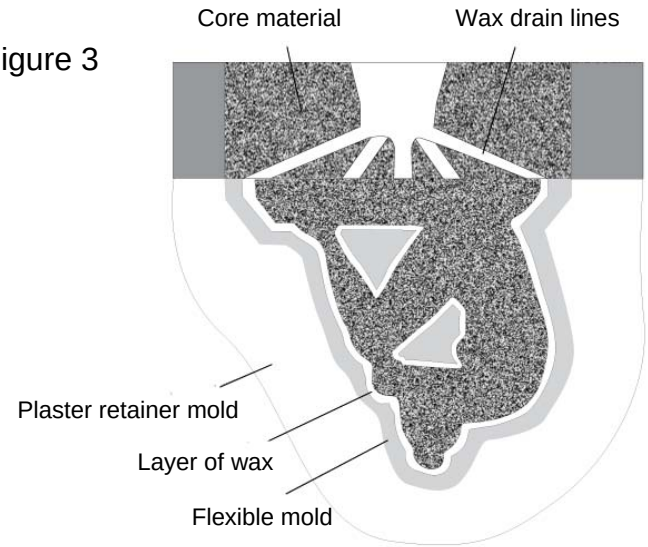
Figure 2



Retainer register keys

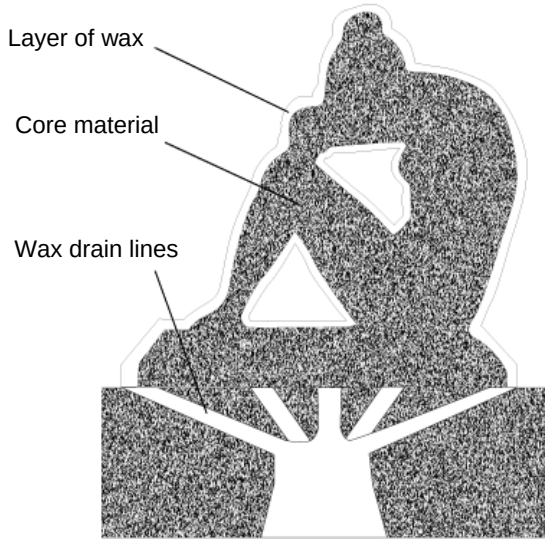
Melted wax is then applied to the inside of the flexible mold. The thickness of the wax determines the thickness of the finished bronze. When the wax solidifies, a core of investment material is poured. Figure 3.

Figure 3



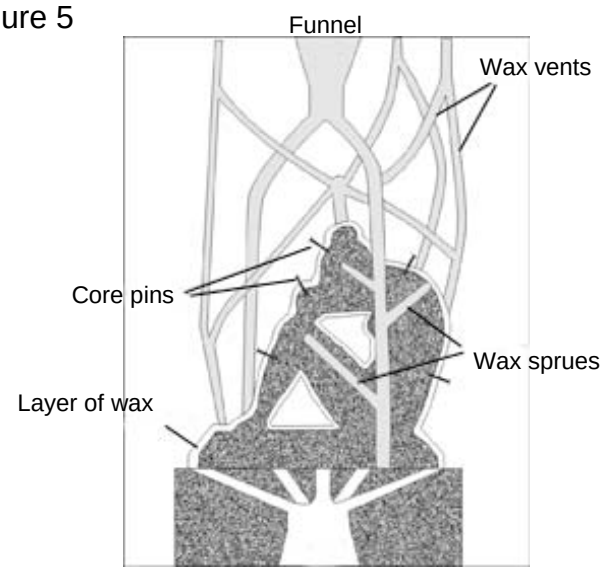
After the core solidifies, the two halves of the flexible mold with the outer plaster retainer molds are removed to reveal the wax "positive." The artist can make adjustments at this point, hand finishing the wax positive to the desired level of completion before the bronze casting. Figure 4. This is the point at which the artist signs the work and an edition number and a foundry seal are added.

Figure 4



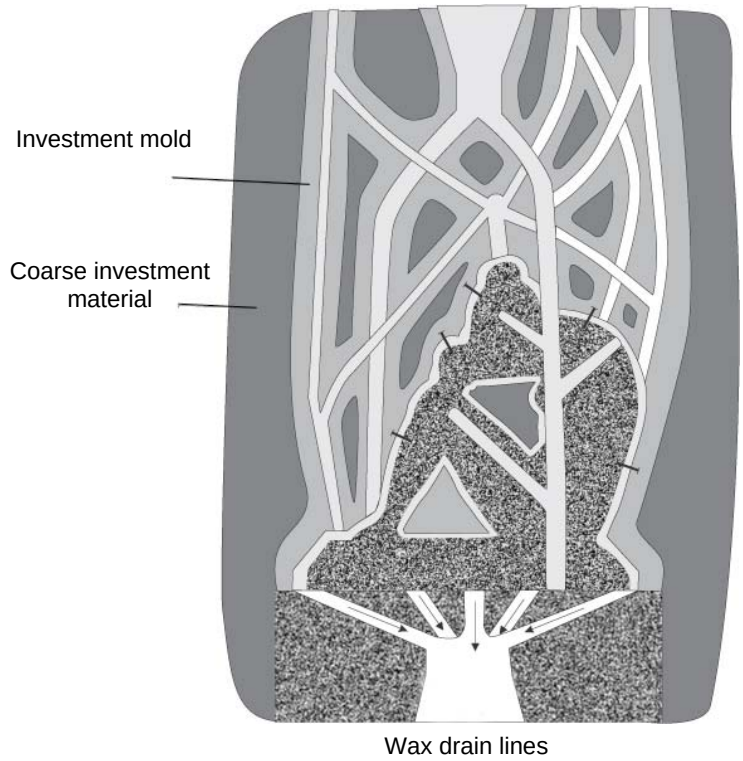
Wax runners, sprues and risers (air vents) are attached to the wax positive. These will act as channels for the bronze to fill the spaces left behind from the melted wax and for the air to escape. Core pins are inserted through the wax to the investment core. These pins maintain the distance between the core and the outer mold once the wax is gone. Figure 5.

Figure 5



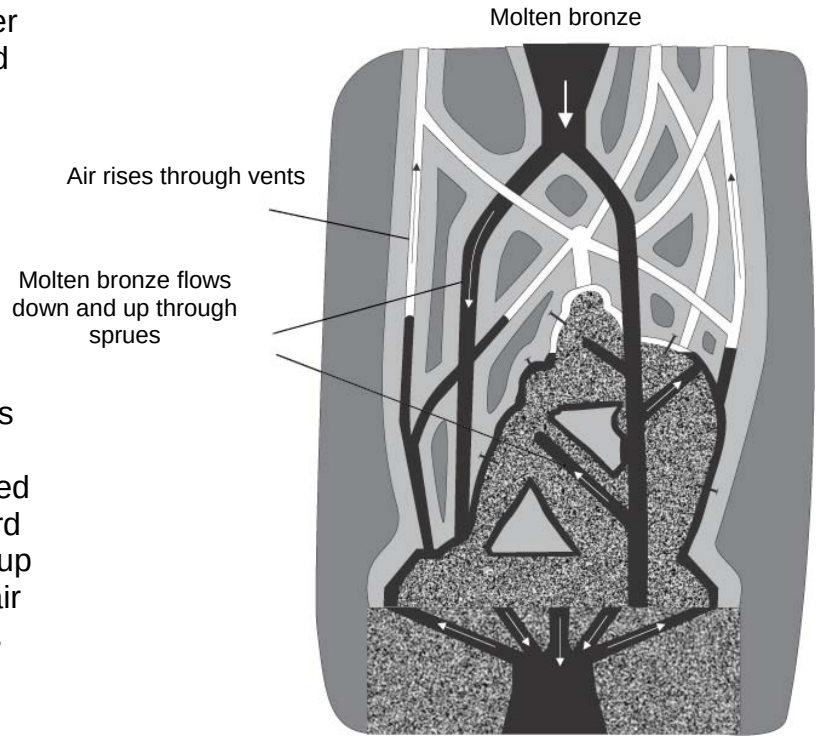
A fine grade ceramic investment material is applied to the wax positive and runners to make an outer “investment mold.” A coarser investment material is added on the outside, filling all the spaces in between as a protective cradle. The core pins will bind the wax positive and the core to the investment mold. Figure 6.

Figure 6



The investment mold is fired in a kiln to make the mold solid and to melt the wax from the inside; hence the name, “lost-wax” process. The wax escapes out of the drain lines at the bottom of the mold creating air spaces between the core and the outer investment mold, which is held in place by the core pins.

Figure 7



When the investment mold has been sufficiently fired and cooled, molten bronze is poured into the mold flowing downward through the runners and then up through the sprues filling the air spaces left by the melted wax. Figure 7.

Figure 8

When the bronze is cooled, the outer investment mold is chipped away and the rough bronze is ready for finishing. Figure 8.

Rough bronze cast with outer molds broken away.

Figure 9

The runners, sprues and vents are removed, chiseled and filed so that no trace of them remains. This process is called “chasing.” The core is removed from inside of the bronze leaving the finished shell. Figure 9.

When the chasing is complete, a thin layer of corrosive oxides are applied to the surface of the bronze giving it a “patina” which is slightly brown, green, or blue in color.

Pre-Visit Activities

Classroom Discussion

Review the materials and methods information presented above with your students, showing illustrations of each sculpture.

Discussion Questions:

- Some sculpture is “additive” and some is “subtractive.” What do you think this means? Are there other ways to think about this “building and taking away” process? Consider sandcastles: you first build up large shapes (additive) and then carve details in the sand (subtractive.)

- How does the subtractive process occur in nature? (Think of erosion.)

- How does the additive process occur in nature? (Think of sand dunes, or how a bird builds a nest.)

- Can you name materials that you have used to create sculpture? How would you use any found objects or unusual materials?

- Think about your reaction to looking at a sculpture. Does the surface appearance of the material influence your thoughts or feelings? For example, do you respond differently to a smooth or rough texture? Does the smoothness of a polished marble or the roughness of unpolished stone affect your interpretation?

- Does “casting” take place in nature? How? (Think of fossils.)

- Look around the classroom. Can you identify objects that have been cast in molds? (Think of office supplies, such as trash cans, pencil sharpeners, your computer mouse and keyboard, cups, plastic bottles, etc. These objects were created using a casting process.)

- Light-weight materials like paper, medium-weight materials such as fiberglass, urethane and plastic, and heavy metals can all be cast. Consider the limitations as well as the advantages of each as it relates to the casting process, the longevity of the cast, and the look and feel of the object.

- In your hand, compare an equal size of these common materials: paper, plastic, and lead. Compare the weight, size, and scale of these objects.

Online Scavenger Hunt

Use the Center website, www.NasherSculptureCenter.org. By visiting the Collection section of the website, students can search the Nasher Collection by artist and/or materials (media.) Each object has a photograph and information posted on the website. Students can print pictures or download pictures into other documents for their assignment.

Suggested activities:

- Ask students to select 1-3 sculptures from the Center web site and have them write a critique on each. Have them focus on the material, the method used to create the sculpture (if known), and their response to the object in relation to the material.

- Have students choose their favorite sculpture, describe it in detail including the reason for their preference. When you assemble as a group have students compare their responses. In conjunction with a visit to the Center, the students can have the opportunity to respond to seeing the sculpture in person and have the opportunity to revise their comments.

- Assign student groups or individuals a particular medium, such as wood, stone or bronze. Using the Center website, have the students determine:

    - How many examples of that material are in the Nasher Collection
    - How many individual artists work in that material
    - The time span of objects created in that material

As an extension to the topic of materials and methods, students can use the website to search the Collection to identify figures, faces, shapes, and colors. Design the search topic based upon the level of your students.

Visiting the Center

Located in the heart of the Dallas Arts District, the Nasher Sculpture Center houses one of the finest collections of modern and contemporary sculpture in the world including masterpieces by Calder, Giacometti, Hepworth, Matisse, Miró, Moore, Picasso and Rodin, among many. The Center features a 55,000-square-foot building and a one-and-a-half acre sculpture garden designed by world-renowned architect Renzo Piano in collaboration with landscape architect Peter Walker.

School Tours

The Center offers highlight tours that include: information about the history of the collection, building, garden, and a docent-selected discussion of works from the collection. School tours are open to all disciplines, and tours can be tailored to suit your particular classroom content.

The Center offers two types of tours by reservation: *docent-guided* and *self-guided*.

Docent-guided visits are available on Tuesdays and Thursdays at 10:00 – 11:00 am and 11:00 am – 12:00 pm. The maximum group size for docent-guided tours is 60, including chaperones. Three docents are available for these tours, and each docent can lead a maximum of 20 students. The tours are approximately 1 hour in length. To book a docent-guided tour, the minimum number of students and chaperones is 10 per tour.

Self-guided visits for teachers wishing to conduct their own tours are available Tuesday through Friday beginning at 11:00 am. The maximum group size for self-guided tours is 60, including chaperones. Informational maps and materials are available.

All school tours booked in advance are free of charge for students and chaperones.

Free admission will be granted to the required number of adult chaperones. Additional chaperones must pay regular admission.

Visits not booked in advance are subject to the following admission fees: Adults, $10.00; Senior Citizens 65 & over, $7.00; Students with ID, $5.00; Children 12 & under, free.

Chaperone Requirements

The following chaperone/student ratios are required for all school tours:

Kindergarten – 8th grade: 1 adult chaperone per 5 students
9th grade – 12th grade: 1 adult chaperone per 10 students

Chaperones must supervise students at all times and all groups must stay together.

Before your trip to the Nasher Sculpture Center, please review these rules and regulations with your adult chaperones.

- Your behavior provides a model for students to follow. Students are expected to exercise appropriate behavior in the museum and in the garden.
- Food, drinks, and chewing gum are prohibited.
- Sculpture should never be touched.

Groups larger than 60 students and chaperones will need to either schedule multiple visits on different days, or divide the students into smaller groups that visit at separate times on the same day.

Sketching

Sketching with pencil, crayon, pastel and charcoal is permitted throughout the Center and in most special exhibitions. Groups that would like to sketch at the Center must be led by an instructor and schedule an appointment with the Education Coordinator three weeks prior to their visit. The use of ink, fountain pen, felt tip, ballpoint, watercolor, acrylic or oil is prohibited. Gallery walls, floors or pedestals may not be used to support sketch pads.

Teacher Materials and Preview Visit

Nasher Sculpture Center Documentary Check-Out
Educators may check-out a copy of the 30 minute documentary, *Nasher Sculpture Center: a Gift to Dallas* that originally aired on WFAA and was produced and directed by Judy Kelly. The documentary is available in both VHS and DVD formats, and may be checked out for two weeks (depending on availability). Please contact the Education Coordinator and leave your name, school's name, preferred video format, and shipping address.

Preview Visit
After booking a tour at the Center, teachers may preview the museum to prepare an activity for the class visit. This visit, if scheduled in advance, will be free of charge. Please keep in mind the Center is open until 9:00 pm on Thursdays and 11:00 am – 5:00 pm on weekdays and weekends.

Location and Parking

The Nasher Sculpture Center is located at 2001 Flora Street in the Dallas Arts District.

Parking is available at privately-owned pay lots on Olive Street and Ross Avenue, and in the Arts District and Dallas Museum of Art garages.

Bus parking is available on Harwood Street, between Woodall Rodgers Freeway and Flora Street.

Contact Information

To schedule a school tour, please contact the Education Coordinator at SchoolTours@NasherSculptureCenter.org or call 214.242.5170.

TEKS Objectives and Visiting the Nasher Sculpture Center

Visual Art

Perception

Glean information from the environment using the five senses (K)
Identify colors, textures, form, line, and subjects in the environment (K, 1)
Identify similarities, differences and variations among subjects (1)
Identify variations in objects from the environment using the senses (2)
Identify art elements such as color, texture, form, line and space and art principles such as emphasis, pattern and rhythm (2)
Identify sensory knowledge and life experiences as sources for ideas about visual symbols, self, and life events (3)
Identify color, texture, form, line, space, and value art principles (3)
Communicate ideas about self, family, school and community using sensory knowledge and life experiences (4, 5)
Choose appropriate vocabulary to discuss the use of art elements and art principles (4)
Identify in artwork basic art elements and principles (5)
Analyze and form generalizations about the interdependence of the art elements and principles (6)
Compare and contrast the use of art elements and principles (7, Level I)
Define a variety of concepts directly related to the art elements and principles (8)
Interpret visual parallels between the structures of natural and human-made environments (Level II)
Compare the suitability of art materials and processes to express specific ideas relating to visual themes (Level II)
Analyze visual qualities and characteristics to express the meaning of images and symbols (Level III)
Make subtle discriminations in analyzing complex visual relationships and content (Level IV)

Creative Expression

Identify simple subjects expressed in artworks (K)
Identify simple ideas expressed in artworks (1)
Express ideas and feelings in artwork (2)
Create effective compositions (2)
Identify and practice skills needed for producing drawings, paintings, prints, constructions, and modeled forms using a variety of materials (2)
Combine information from direct observation, experience, and imagination to express ideas about self, family and community (5)
Compare relationships between design and everyday life (5)
Express a variety of ideas based on personal experience and direct observations (6)
Describe in detail a variety of personal applications for design ideas (6)
Create artworks based on direct observations, personal experience and imagination (7, 8)

Create visual solutions by elaborating on direct observation, experiences, and imagination (Level I)
Formulate multiple solutions to expand personal themes that demonstrate intent (Level II)
Solve visual problems and develop multiple solutions for designing ideas (Level III)
Evaluate and justify design ideas and concepts for use in personal artworks (Level IV)

Historical/ Cultural Heritage

Share ideas about personal artwork and work of others, demonstrating a respect for differing opinions (K)
Relate art to everyday life (K, 1)
Select artworks that show families and groups (1)
Identify stories and constructions in artworks (2)
Compare ways people are depicted in artworks (2)
Identify different kinds of jobs in art (2)
Compare content in artworks from the past and present for various purposes (3)
Relate art to different jobs in everyday life (3)
Identify simple main ideas expressed in art (4)
Compare and contrast selected artworks from a variety of cultural settings (4)
Identify the roles of art in American society (4)
Compare cultural themes honoring history and traditions in American and other artworks (5)
Identify the use of art skills in a variety of jobs (5)
Identify in artworks the influence of historical and political events (6)
Compare specific artworks from a variety of cultures (6)
Compare career and avocational opportunities in art (6)
Analyze ways that international, historical and political issues influence art and determine cultural contexts (7, 8)
Compare and contrast historical and contemporary styles, identifying general themes and trends. (Level I)
Study a selected historical period or style of art (Level II, III)
Trace influences of various cultures on contemporary artworks (Level III)
Identify and illustrate art history as a major source of interpretation (Level IV)
Analyze and evaluate the influence of contemporary cultures on artworks (Level IV)

Response/ Evaluation

Express ideas about personal artwork (K, 1)
Express ideas about original artworks, portfolios, and exhibitions by peers and artists (K, 1)
Define reasons for preferences in personal artworks (2)
Identify ideas in original artworks, portfolios, and exhibitions by peers and artists (2)
Identify general intent and expressive qualities in personal artwork (3)
Apply simple criteria to identify main ideas in original artworks, portfolios, and exhibitions by peers and major artists (3)

Describe intent and form conclusions about personal artwork (4)
Interpret ideas and moods in original artworks, portfolios and exhibitions by peers and others (4)
Analyze personal artwork to interpret meaning (5)
Analyze original artworks, portfolios, and exhibitions by peers and others to form conclusions about properties (5)
Analyze original artworks, portfolios, and exhibitions by peers and others to form conclusions about properties and historical and cultural contexts (6)
Analyze and compare relationships, such as function and meaning, in personal artworks and form conclusions about formal properties, historical and cultural contexts, intents, and meanings (7, 8)
Analyze original artworks to form conclusions about formal properties, historical and cultural contexts, intents and meanings (7, 8, Level I, Level III, Level IV)
Select and critique original artworks and exhibitions (Level II)

Suggested Activities for Self-Guided Tours

If your students visit as a self-guided group, consider the following activities to enhance the experience.

Scavenger Hunt for Materials and/or Methods

- Send the students to find as many different examples of materials and methods. Prepare a worksheet for the students to complete. See Appendix C for an example.

- How many different colors of bronze can you find in the garden and the galleries? This coloration is referred to as “patina”.

Materials in Sculpture Critique

- Have students write a response to sculpture made of different materials. Ask students to think about the surface and appearance of materials and how this affects their response to an object. Consider the light and reflections on the surface. See Appendix C for an example.

- A particular material can have different appearances. Compare the bronze Claes Oldenburg, *Clothespin* with the bronze Giacometti, *Diego in a Cloak*. Both sculptures are cast bronze; however, the material has a very different appearance. Ask students to describe the differences and find other examples.

- Have students select a sculpture that best describes each of the following characteristics. Ask them to explain their choice in writing.

    - Delicate
    - Balanced
    - Strong
    - Dark or depressing
    - Whimsical, fun
    - Energetic
    - Peaceful

Sketching the Collection

- The Center encourages use of the collection for sketching by groups and individuals. (Sketching policy on page 15.) Students in advanced grades might consider sketching an object and then creating a three-dimensional version in the classroom, connecting the Center and classroom experience.

- Through sketching, students are better able to connect to sculpture by carefully examining its 3-dimensional form.

- By giving clear directions and narrowing the focus of sketching (contour lines drawings, chiaroscuro shading or white highlights on dark paper) students are more likely to remain on task and be successful.

- Pre-select a few sculptures and assign small student groups to sketch from those selected. Instructors or chaperones should be in the vicinity of each group making sure that guidelines are followed.

Tip: When preparing assignments for your Center visit, please check the website to verify if an object will be on view during your visit. There is a “search the Collection by location” section on the Collection section of the website. Please also feel free to contact the Education Department to verify whether or not a specific sculpture will be on view, 214.242.5170.

Post-Visit Activities

Students should now be acquainted with various processes in the creation of sculpture and specific works of art from the Nasher Collection. The following lessons reinforce the learning experience. Most lessons can be adapted to any grade level.

Lesson One: Sand Casting

Reference Object:
Pablo Picasso's *Head of a Woman*,
concrete and gravel

This was Picasso's first monumental concrete sculpture. Norwegian artist Carl Nesjar introduced Picasso to an innovative concrete engraving technique known as Betograve. Betograve involves first pouring concrete into a form tightly packed with gravel, and, once set, precisely sand-blasting the surface of the concrete to expose the gravel beneath it.

By simplifying these principles, your students can create their own modified Betograve.

Materials needed:

- Styrofoam take-out containers
- Plaster of Paris
- Spray bottle of water
- Pencils
- Spoons
- Empty disposable containers such as coffee cans and milk jugs
- Small stones, mirrors or tiles
- Objects that will make an indented shape (cups, game pieces, bottle tops)
- Small pieces of wire

Sand should fill half of one side of a Styrofoam take-out container and be sprayed with water so that it is damp enough for making clean imprints, yet firm enough so that the sides do not collapse. Students will "draw" their design into the damp sand. Sand will be removed with a spoon to form the desired shape. The empty end of the Styrofoam container is handy for discarded sand. Objects may be pressed into the sand to imprint design patterns. Stones, mirrors and tiles may be left in place (face down!) so that they remain in the final product.

Plaster is mixed and poured into the sand molds. Gently tap the container on the tabletop to dislodge air bubbles in the plaster. Once the plaster begins to set (within a few minutes) a piece of wire may be twisted into a loop to be used as a hanger and inserted into the plaster.

Once the plaster is completely set, the castings can be removed from the take-out containers, washed and gently brushed to reveal the designs. Sand may be used again.

Project modified from: Cynthia Cox Farris, *Arts & Activities Magazine*, Volume 137, No. 5, June 2005.

Lesson Two: Reductive Sculpture

Reference Objects:
Tahitian Girl by Paul Gauguin
(pronounced Go-gan) in wood;
Hieratic Head of Ezra Pound
by Henri Gaudier-Brzeska in stone

Discuss the differences between reductive and additive sculpture with your students.

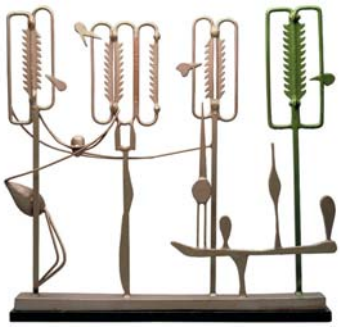
Materials needed:

- Empty milk cartons, liter soda bottles or other disposable containers
- Plaster of Paris
- Ventilation masks
- Vermiculite (from a garden or home improvement store)
- Water
- Tempera Paint or India Ink to tint plaster mixture
- Large Plastic Container for mixing
- Various types of plastic or metal carving tools
- Varnish or Glaze
- Old paint brushes

Mix 3 parts vermiculite, 2 parts plaster in large container. Make sure that dry mixture is thoroughly mixed and should look a bit clumpy. Add 2 parts water and let mixture sit until it stops bubbling. Stir mixture until smooth then add paint or ink if desired. Once the paint or ink is added, the mixture will begin to clump so you need to do this part quickly. Pour mixture into disposable containers and tap on table to settle mixture. Set in secure area and let dry.

As the plaster mixture dries it will begin to lighten both in color and feel. Dry plaster should be cool to the touch, not damp, and also hard to the surface. Peel away the container. Use plastic carving tools to carve image into the plaster and use a brush to gently dust away loose plaster on the surface and in between the image. **CAUTION** students to **not blow** away dust or particles from the plaster. Place newspaper under the plaster before carving to catch dust. Do not carve into wet plaster as this will crumple under the pressure of the plastic carving tools. When students are done carving their image they should apply varnish or glaze to seal the plaster.

Lesson Three: Found Object Sculpture



Reference Objects:
The Forest by David Smith, Ivan Puni's *Construction Relief*, John Chamberlain's *Zaar*, and Joan Miró's *Caress of a Bird*.

At first glance, these pieces seem to have little in common. Puni's work *(pronounced Poo-nee)* rises from a two-dimensional base and is typical of Cubist constructions of the period in which it was created (1915-1916.) Smith's found objects are not immediately apparent as they are well integrated into the sculpture (1950.) Chamberlain's sculpture (1959) is formed of twisted metal that seems to have been culled from a salvage yard.

Notice the various colors and textures. Chamberlain's sculpture embodies the gestural energy that was characteristic of 1950's action painting. Miró's found objects; straw hat, turtle shell, soccer balls and outhouse seat, have been cast in bronze and painted bright colors to create a whimsical figure (1967.)

At the beginning of a found object sculpture lesson, you may want to introduce parameters so that students can focus the subject of their composition. Some suggestions are:

- A narrative (descriptive of culture, family, history)
- Functional objects (chair, clock, vessel such as a vase or pitcher)
- Portrait (choose objects that represent self, family, hero or villain)
- Issues based (artwork that relates to an issue such as environmental degradation, prejudice, war, animal rights, etc.)

Have students create compositions from found objects collected from home or the schoolyard. Younger students can focus on magazine clippings, scraps of paper, etc. Older students can actually glue or tie larger objects together.

Lesson Four: Relief Sculpture

In this lesson, students will develop a greater understanding of three distinct ways in which sculpture is created as well as three dimensions: height, width, and depth. The student will understand the relationship between the positive and negative relationship between clay, plaster, and handmade paper by completing the steps in the creation of the final product: cast handmade paper. Students will sculpt a bas-relief design inside a small cardboard box. From the clay sculpture, a plaster mold will be made. Paper pulp will be cast from the plaster mold.

Materials:

- Styrofoam take-out containers
- Clay
- Plaster
- Bucket
- Pre-packaged paper pulp or torn newsprint
- Shellac (Floor wax works too)
- X-acto knife
- Release agent (WD-40 - Pam cooking spray works, too)
- Sponges

Step 1: Create 3-D Clay Image

1. Press clay into the bottom of a Styrofoam container (1/2 " or less).
   Build up a 3-D image inside of the container with clay. There should be no undercuts in the clay image. The clay image should be at least 1/2" below the top edge of container.

Step 2: Pour Plaster Mold

1. Mix plaster according to directions in a large bucket.
2. Pour plaster quickly over clay image in container. Plaster should reach top edge of box.
3. Tap container to release air bubbles within the plaster.
4. Plaster will set up within several hours.

Step 3: Clean up Plaster Mold

1. Remove and discard Styrofoam container and clay from plaster. Clay can be saved to be used with this lesson again. Keep this clay away from clay used for ceramics.

2. Use X-acto knife to remove all bits of clay from image in plaster. Also, remove any over-hanging edges of plaster.
3. Cover plaster mold with one or two coats of shellac. Allow shellac to dry completely.

   Note: Floor wax can be substituted for Shellac.

Step 4: Paper Pulp

1. Mix pre-packaged paper pulp according to directions or tear newsprint into fingernail sized pieces and soak in a bucket of water. Tinting the paper pulp or using colored newsprint aids younger students by allowing them to see the white plaster beneath the pulp assuring adequate coverage.
2. Spray plaster mold with release agent, such as WD-40 (Pam cooking spray also works)
3. Press wet paper pulp into plaster mold. Use a sponge to remove as much water as possible.
4. Paper pulp should dry for approximately 48 hours. A fan aids the drying process.

Step 5: Cast Paper

1. Loosen the edges of the paper pulp. Carefully remove the paper pulp from the plaster mold.
2. Cast paper may be painted with watercolors. Advanced students may want to try air brushing.

Modified from project: Incredible Art Department at
http://www.princetonol.com/groups/iad/lessons/middle/Susan-paper.htm.
Lesson submitted by Susan Ingram, Jackson Academy, Jackson, Mississippi.

Appendix A: Glossary of Materials and Methods

Adze – A tool used in wood carving to rough out a form. It is similar to an ax, but the blade is set horizontally in the handle, sloping downwards. It is used for much the same purpose as a wood chisel and often for detailed work.

Anodized aluminum - An electrolytic process in which aluminum is coated with a protective or decorative oxide. This also greatly increases aluminum's ability to permanently hold paints and other coating materials.

Armature - A skeleton-like framework to give rigid internal support to a sculpture modeled in soft materials such as clay or wax. Wire used to build an armature is available in various gauges. A basic linear form in wire can be made with poultry screen padded with wood or paper if appropriate. The soft material is modeled directly onto the armature.

Assemblage - A three-dimensional composition made of various materials such as found *objects*, paper, wood, and textiles.

Benday - In printmaking, a process using screens of various dot patterns to mechanically produce shading effects. This process was invented by Benjamin Day (1839-1916). Artist Roy Lichtenstein (American, 1923-1997) included benday dots as one of the elements in his paintings and sculpture. (See Lichtenstein's *Head with Blue Shadow* in the Nasher Collection.)

Bronze - Any of various alloys of copper and tin, sometimes with tin or other metals. It has been used in casting for millennia. A work cast in bronze is sometimes referred to as a bronze. It may also refer to the color of bronze, a moderate yellowish to olive brown.

Carving – A subtractive sculptural technique in which material is removed (carved) to determine the final form. A sculpture created using this technique can also be called a carving.

Cast - To form a three-dimensional shape by filling a mold; or something formed by this means. Also, an impression formed in a *mold* or matrix. Also see *lost-wax casting*, *sand casting*, *posthumous*, and *statue*.

Ciseau - A chisel that cuts or engraves the surface of metal.

Corrosion – A state of deterioration in metals caused by oxidation or chemical action. The effects are sometimes desired by sculptors.

Cor-Ten steel - A type of steel that oxidizes naturally over time, giving it an orange-brown color and a rough texture. It has a very high tensile strength, and in spite of its rusted appearance it is actually more resistant to damaging corrosion than standard forms of carbon steel. It has been used by many contemporary sculptors and architects.

Drove - In carving stone, a flat chisel with a broad head generally used only for rough hewing.

Edition - A number of like or identical items issued or produced as a set, sometimes numbered and signed, created under the supervision of the artist or artist's estate.

Found object - An image, material, or object, not originally intended as a work of art, that is obtained, selected, and exhibited by an artist, often without being altered in any way. The cubists, dadaists, and surrealists originated the use of found images / materials / objects. Although it can be either a natural or manufactured image / material / object, the term readymade refers only to those which were manufactured.

Gouge - A beveled chisel with a rounded, troughlike cutting edge, generally for carving wood. There are numerous types of gouges, including a V-tool for engraving the surface of wood. Many gouges are designed to be pushed by hand rather than by the hit of a mallet. To gouge is to make a scooping or digging action, as with such a chisel. A typical gouge has an edge sharpened with a 10% bevel on both inside and outside edges.

Graver - A tool used in engraving metal, wood, or stone. A knob-like wooden handle which holds a metal shaft having a sharp beveled point with one size of several possible shapes, either flat, round, multiple, or elliptical.

Kinetic – Of or relating to the motion of material bodies and the forces of energy associated therewith. In art, kinetic refers to sculpture that moves, such as a mobile.

Lost–Wax Casting – A traditional casting technique in which the sculpture composition is first made in wax. A *mold* is made by covering the wax sculpture in a refractory. (A material that can withstand temperatures up to 600 degrees c.) When the mold is heated, the wax composition melts away, so that molten metal can replace it, reproducing exactly the wax sculpture. In the direct method, the wax is modeled directly onto a preformed core; in the indirect method, the wax is pressed or poured into a piece mold made from the first wax composition.

Maquette - A small sculpture made as a preparatory study or model for a full-scale work.

Media - The plural form of *Medium*.

Medium - The material or technique used by an artist to produce a work of art. Medium can also refer to what carries a paint's pigments, and is also called a vehicle or a base. The medium is what determines what kind of paint is produced. A painter can mix a medium with its solvents, pigments and other substances in order to make paint and control its consistency. A variety of mediums are available that provide a matte, semi-gloss, or glossy finish.

Mixed Media - A technique involving the use of two or more artistic media, such as aluminum and crayon or painting and collage, that are combined in a single composition or sculpture.

Modeling – An additive sculptural process in which material is built up into the final form, often over an armature. The material must be pliable, such as clay, wax, or plaster. Because of the fragility of these materials, an extra step is often performed such as firing clay or creating a *mold* of the sculpture for casting, to make the sculpture more durable.

Mold - A hollow form for shaping (casting) a fluid medium, such as clay, plaster, plastic or molten metal.

Negative space – In a sculpture, empty space that is defined, surrounded, or enclosed by the sculptural frame.

Patina - A surface coloration. In metal sculpture, particularly bronze, this is achieved by intentionally applying acids to the metal to change its color or by the naturally occurring process of oxidation and corrosion over time.

Plaster or plaster of Paris - The term plaster usually refers to plaster of Paris (also called gesso) -- a mixture of powdered and heat-treated gypsum, which can be mixed with water (about 2 parts plaster to each part water), hardening to a smooth solid which does not shrink or lose volume because it hardens before all the water can evaporate. Though heated in its manufacture, it needs no heat to mature the way ceramic clays do. A common building material as well as a versatile medium in sculpture, plaster can be either the material cast in a mold or the material of a mold, a material to be modeled, or carved, or attached to something else. Plaster can be painted when dry, or mixed with pigments while still wet, as in fresco painting. The surface of a plaster sculpture must be sealed to keep dirt from building up in its pores -- commonly with wax, shellac or linseed oil.

Posthumous - Happening or continuing after one's death. When applied to a work of art, posthumous might indicate works that are printed or cast after an artist's death, as with a posthumous edition. It might refer to works completed by others that were left unfinished at the artist's death, or to changes in thinking (art criticism or art historical re-assessments, praising or otherwise, changes in the market value, etc.) about an artist's work after the artist's death. It might also refer to a representation of a person produced by an artist after that person's death. This word is derived from the Latin word *postumus*, literally meaning "after the burial."

Relief sculpture - A type of sculpture in which form projects from a background.

Sand casting - A method of casting in metal in which a mold is made by firmly packing layers of very fine, damp sand around a sculpture. When the original is removed an exact impression is left in the sand.

Stabiles – A word coined to describe the standing biomorphic sculptures of Alexander Calder.

Stainless steel - An alloy of iron and carbon capable of being tempered to many degrees of hardness. Stainless steel, which was developed in England, has a high tensile strength and resists abrasion and corrosion because of its high chromium content.

Statue - A three-dimensional form of a person or animal sculpted, carved, modeled, or cast in any material, usually an entire figure, and especially when done in the round rather than in relief. "Statue" is not a synonym for "sculpture." Many three-dimensional forms are considered sculptures, but not statues. A "statuette" is a small statue. "Statuary" is a collective term for statues; a group of statues. It can refer to the art of making statues.

Stone - Rock. Examples of stone carved into sculpture are marble, granite, limestone, alabaster, sandstone, schist, and soapstone.

Welded constructions – Art in which the sculpture is built by an artist using a welding torch to attach metal parts to each other.

Wood - Wood can be cut (sawn), carved (chiseled, drilled, routered, turned, planed, filed, sanded, buffed and polished), joined (nailed, screwed, bolted, glued, etc.) by artists and craftsmen using special tools. Wood is commonly classified as either hardwood or softwood. The wood from conifers (e.g., firs and pines) is called softwood, and the wood from broad-leaved trees (e.g., oak, cherry, walnut, mahogany) is called hardwood. This classification can be misleading, because some hardwoods (e.g., balsa) are actually softer than most softwoods.

Sources:

Nasher Sculpture Center, www.NasherSculptureCenter.org

ArtLex Art Dictionary, www.artlex.com

Looking at European Sculpture: A Guide to Technical Terms by Jane Bassett and Peggy Fogelman, 1997.

WordNet ® 2.0, © 2003 Princeton University, http://wordnet.princeton.edu/perl/webwn

Appendix B: Materials in the Nasher Collection

(Selected works – images for most on www.NasherSculptureCenter.org, under "Collection")

Iron

- Alain Kirili, *Generations*
- David Smith, *Head*

Lead

- Jasper Johns, *Lead Reliefs*

Silver

- David Smith, *Tower Eight*

Steel

- Naum Gabo, *Constructed Head No. 2* (stainless steel)
- Anthony Gormley, *Quantum Cloud XX* (stainless steel bar)
- Jeff Koons, *Louis XIV* (stainless steel)
- Sol LeWitt, *Modular Cube/Base*
- Richard Serra, *My Curves Are Not Mad*
- David Smith, *Voltri VI*

Bronze

- Constantin Brancusi, *Head of a Boy*
- Raymond Duchamp-Villon, *Large Horse*
- Alberto Giacometti, *Diego in a Cloak*
- Julio González, *Woman with a Mirror*
- Barbara Hepworth, *Squares With Two Circles*
- Gaston Lachaise, *Elevation (Standing Woman)*
- Joan Miró, *Moonbird*
- Henry Moore, *Working Model for Three Piece No. 3: Vertabrae*
- Isamu Noguchi, *Gregory*
- Claes Oldenburg, *Clothespin*
- Auguste Rodin, *Eve*

Cast Urethane

- Jonathan Borofsky, *White Flying Figure*

Wood

- Jonathan Borofsky, *Running Man*
- Richard Deacon, *Like a Bird*
- Paul Gauguin, *Tahitian Girl*

Aluminum

- Carl Andre, *Al Rectagrate*
- Adolph Gottlieb, *Wall*
- Donald Judd, *Untitled (Progression)*
- Claes Oldenburg, *Typewriter Eraser*
- Frank Stella, *Pau*

Stone

- Henri Gaudier-Brzeska, *Hieratic Head of Ezra Pound*
- Jacques Lipchitz, *Seated Woman*
- Scott Burton, *Schist Furniture Group*
- Tony Smith, *For Dolores (Flowers for the Dead)*

Wire and Sheet Metal

- Alexander Calder, *Spider*
- Alexander Calder, *10 – 5 – 4*

Found Materials

- John Chamberlain, *Zaar*
- Tony Cragg, *Glass Instruments*
- Donald Lipski, *Building Steam*
- Ivan Puni, *Construction Relief*
- David Smith, *The Forest*

Ceramic

- Roy Lichtenstein, *Head with Blue Shadow*
- Paul Gauguin, *Torso of a Woman*

Plaster

- Pablo Picasso, *Head of a Woman (Fernande)*
- Raymond Duchamp-Villon, *Baudelaire*
- Constantin Brancusi, *The Kiss*
- Auguste Rodin, *The Age of Bronze*

Wax and Plaster

- Medardo Rosso, *Behold the Child*

Gravel and Concrete

- Pablo Picasso, *Head of a Woman*

Appendix C: Activity Worksheet to Use on a Self-Guided Visit – Scavenger Hunt

Have students find sculptures made from each material. Ask students to write down the artist, title of the sculpture, and their observations about the material (color, surface appearance, etc.)

Bronze

_____

_____

_____

Wood

_____

_____

_____

Stone

_____

_____

_____

Plaster

_____

_____

_____

Found Object Assemblage

_____

_____

_____

_____

_____

_____

Environmental Space or Natural Materials

_____

_____

_____

_____

_____

_____

Appendix C: Activity Worksheet to Use on a Self-Guided Visit – Sculpture Critique

Have students choose one sculpture to write a one-page critique.

Student Name _____

Artist and Title of Sculpture _____

Material Used and Method (if known) _____

Be sure to look closely at the surface of the sculpture. Remember to walk around the sculpture and view it from all angles.

Does the surface appearance affect your response to the sculpture? Is there a smooth or rough texture? Is there color, or an absence of color? How about the effects of light and the surroundings? Can you see evidence of the artist's hands in the surface? Does any of this affect your mood, thoughts, or feelings?

_____

_____

_____

_____

_____

_____

Think about the method that might have been used to create this sculpture.

Was the sculpture created using an additive or subtractive method?

_____

Consider the size of the sculpture. How long do you think it would have taken to complete it and why?

_____

_____

Appendix C: Activity Worksheet to Use on a Self-Guided Visit – Creative Writing

Have students choose one sculpture to explore mood and response to looking at object(s).

Student Name _____

Consider how an object conveys a "mood" and how an object can influence the viewer's response. Choose 1-2 sculptures to express the moods described by one or more of these words:

- Delicate
- Balanced
- Strong
- Dark or depressing
- Whimsical, fun
- Energetic
- Peaceful

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Evaluation - Materials and Methods Guide to Looking

We want to hear from you. Please send us your comments and feedback to using this guide, suggested activities, and your visit to the Center.

Please fill out this form, print and return to: Education Department, Nasher Sculpture Center, 2001 Flora Street, Dallas, Texas 75201, or fax 214.242.5179.

Please also feel free to send an email to: SchoolTours@NasherSculptureCenter.org.

Sculpture Materials and Methods Section – please comment on content

_____

_____

Pre-Visit Activities – please comment on activity suggestions

_____

_____

Visiting the Center – please comment on content and your visit to the Center

_____

_____

_____

Post-Visit Activities – please comment on activities

_____

_____

_____