

When you hear the word *sculpture*, what image do you see? Maybe you think of the Statue of Liberty or Rodin's "The Thinker." Or maybe you think of the statue of a local historical figure in the town square.

Sculpture is all around us. We see it outdoors on the grounds of libraries, museums, and colleges as well as in gardens and cemeteries. We also see it indoors in art museums, government buildings, and homes.

Without realizing it, you probably have been introducing children to sculpture for as long as you have provided clay, block, and sand activities. Consider introducing sculpture in a more formal way, not only for its value as art but also to help children build a foundation in math.

What is sculpture?

The distinguishing feature of sculpture is that it's *three-dimensional*. That means it occupies space in three dimensions: *height*, *width*, and *depth*. As British playwright Tom Stoppard has said, "If it hangs on a wall, it's a painting, and if you can walk around it, it's a sculpture."

Much sculpture is *figurative* or *representational*, which means it depicts something easily recognizable such as a person, an animal, or a familiar object. But sculpture can also be *abstract*, consisting of geometric shapes, designs, or patterns. One example is "The Kiss" by Romanian sculptor Constantin Brancusi.

Brancusi went so far as to include architecture in the sculpture category, calling it "inhabited sculpture." Architecture has been classed as art for centuries. It's routinely included in art appreciation

INTRODUCE
SCULPTURE
AND BUILD MATH SKILLS





courses, and many great architects have also been painters and sculptors. Among the most famous was Michelangelo, who sculpted the famous “Pieta,” served for a time as architect of the Sistine Chapel, and painted “The Creation of Adam” on its ceiling.

Some modern architecture appears to be sculpture on a grand scale. Consider the whimsical shapes in Barcelona’s Park Guell designed by Antoni Gaudy and the curved walls of the Walt Disney Concert Hall designed by Frank Gehry.

Like buildings, sculpture can be created from a wide array of materials, including stone, metal, wood, cement, and glass. But unlike buildings, sculpture can also be made from clay, plaster, wax, plastic, and sand. Most sculpture is meant to be permanent, but other sculpture—that made of ice, for example—is not. Sculpture can also be made from natural materials such as sea shells and pine cones as well as found objects such as aluminum cans, wood scraps, buttons, and plastic tubing.

From that perspective, many early childhood learning activities—modeling with clay, creating papier-mâché, building with blocks, and making shapes in sand—can all be considered forms of sculpting.

Take a sculpture field trip

Begin your sculpture study by taking children on a field trip to see sculpture first-hand. Find a museum, library, or college with sculpture that children are allowed to touch and photograph.

Follow standard field trip procedures, such as obtaining written

permission from parents, packing a bag of emergency supplies, making a list of children’s emergency contacts, and getting an adult volunteer to go along.

Here’s what you need:

- photographs or postcards of sculpture, or a resource book such as *The Story of Sculpture: From Prehistory to the Present* by Francesca Romei (Peter Bedrick Books, 1995)
- camera
- measuring tape or knotted string
- pad and pencil

1. Before the field trip, show children the photographs.

Introduce the words *sculpture* and *sculptor*. Explain what you are going to see.

2. During the field trip, talk about the sculpture. Discuss the person or animal depicted, if any, as well as color and material (marble, bronze). Talk about the sculptor and how the piece might have been made, such as by carving or welding. Use the tape or string to measure how tall, how wide, and how thick the sculpture is.

3. Show the photographs again and ask how a photograph of sculpture is different from the real thing. You might ask questions such as those below. Let children dictate their answers as you write them.

- Which one is flat? Which one do we have to walk around to see it all?
- How tall is the picture? How tall is the sculpture?
- How wide is the picture? How wide is the sculpture from one side to the other? Note that the sculpture may have several

Dough clay recipes

Flour and salt clay

- 3 cups flour
- 1 cup salt
- 1 cup water
- food coloring (optional)

Mix ingredients together in a large bowl, and it’s ready to use—and re-use. This clay is not good for baking.

Cornstarch and baking soda

- 1 cup cornstarch
- 2 cups baking soda
- 1¼ cup water
- food coloring (optional)

Mix ingredients in a large saucepan and cook for five minutes, until it thickens to the consistency of oatmeal. Let cool. This clay is suitable for overnight air drying.

Sand and cornstarch

- 2 cups fine sand
- 1 cup cornstarch
- 1 cup water

Heat the water in a large saucepan, and add cornstarch and water. Cook for several minutes until it starts to thicken. Let cool. This clay can be baked. Place creations on a cookie sheet and bake at 275 degrees until dry.

Find more than a hundred pages of recipes for modeling mixtures in *Mudworks: Creative Clay, Dough, and Modeling Experiences* by Maryann F. Kohl (Bright Ring Publishing, 1989).

different widths—the neck versus the chest, for example.

- How thick is the picture? How thick is the sculpture? Note that the sculpture may have several different thicknesses.
- 4. Explain that the picture has two dimensions: *height* and *width*. The sculpture has three dimensions: *height*, *width*, and *thickness* or *depth*. Introduce the terms *2-D* for two-dimensional and *3-D* for three-dimensional.
- 5. Take a picture of the children with the sculpture.
- 6. Back in the classroom, place the photographs in the math and manipulatives center. Add unbreakable figurines and other decorative objects along with

measuring tape and string so children can explore on their own.

- 7. Invite children to make their own sculpture with dough clay at the art table.

Variations: If you can't take a field trip, invite a local artist to bring a piece of sculpture to your classroom and talk about it. Or take a walk around your neighborhood and point out yard art, such as cement birdbaths, gazing balls, and resin frogs, for example.

Getting started with clay

Dough clay is the standard in preschools because it's safe for children, inexpensive—especially if

you make it yourself—and cleans up easily. Dough clay is usually meant to be re-used, but some types can be air-dried or baked.

Other types of modeling clay are commercially available for artists and crafters. Art clay is used in elementary and high school art classes, and an earth-based type is used for making ceramics and pottery. Plasticine, a soft, oil-based clay that neither hardens nor dries, is used in making figures for animated films such as *The Subway Mouse*.

Many preschoolers will enjoy the simple pleasure of mixing, shaping, and reshaping clay. Most will come up with their own ideas for play, and they need plenty of free time to learn what they can do with it.

As children become accustomed to handling clay, you can gradually introduce some basic techniques that they can further develop into art objects and geometric shapes.

Sheet. Using a rolling pin, roll a lump of clay into a sheet like a pie crust. Provide plastic knives to cut out two-dimensional shapes, such as square tiles. Offer cookie cutters, jar lids, and kitchen utensils (potato masher, meat tenderizer tool) to make various shapes and designs.

Cord. Place a lump of clay between flattened hands and roll it back and forth to make a long cord or snake. The cord can be coiled into a bowl, pinched off to make an animal tail or tree trunk, or curled or braided into a pattern, for example.

Ball. Place a lump of clay between the hands and roll in a circular fashion. The ball can then be formed into a person's head or body, a building dome, or an apple, for example.

Guidelines for creating sculpture

- Provide only safe, nontoxic materials for children. If you buy clay and other art materials, look for the Approved Product seal of the Art & Creative Materials Institute (ACMI). For more information, see www.acminet.org.
- Choose age-appropriate materials. No small beads or pointed objects for toddlers, for example.
- Focus on the process, not the product. The goal is to introduce children to different materials, how they can be molded and shaped, and how they occupy space. Think of it as solving problems, learning about cause and effect, and the enjoyment of using one's hands creatively.
- Avoid showing samples of finished products made by adults or other children. Simply show them how to roll or squeeze a material, for example, and let them do the rest.
- Avoid asking "What is it?" Instead say, "Tell me about it" or reflect on their problem solving: "Tell me how you made this part stand up."
- Acknowledge effort ("You worked really hard on that.") instead of passing judgment ("That's beautiful.").
- Resist comparing one child's work to another child's or to another piece of sculpture.
- Use math vocabulary such as *sphere*, *cube*, *pyramid*, *cylinder*, *square*, *rectangle*, *triangle*, *square*, *height*, *width*, *depth*, *three-dimensional*, and *two-dimensional*.
- Invite children to measure their creations with knotted string, measuring tape, or rulers.
- Make cleanup part of the process. Don't pour clean-up water from earth-based clay down the drain because it can settle and clog pipes.
- Let children choose whether they want to name their creations and display their work.





Pancake. Make a ball first.

Use a large lid or plastic plate to press the ball down to the table surface, until the clay is fully flattened. One pancake can be a wheel, and several pancakes stacked on top of each other can make a tower.

Cube. Make a ball first. Flatten the top and bottom and then the sides into a cube, ending up with six equal sides. In similar fashion, make a rectangle or pyramid.

Cup or bowl. Press both thumbs into the center of a ball. Use fingers to pinch, poke, and pull out the clay into a cup or bowl.

Sculpture activities

Use the activities below to provide children with hands-on experience with sculpture and math. Invite school-age children to use encyclopedias and a search engine like Google™ on the Internet to see images of sculpture created by the artists mentioned in the activities. Enter the name of the sculpture and its artist. One general resource is <http://en.wikipedia.org/wiki/Sculpture>.

Rock sculpture

Many artists create sculpture from stone. Jesus Morales, for example, creates large-scale sculptures of granite, such as “Lapstrake,” a 64-ton dual-column structure across from the Museum of Modern Art in New York. Having children work with rocks provides a natural link to science.

Here’s what you need:

- assortment of rocks
- paint
- paper and fabric scraps (optional)
- wood scraps or cork (optional)
- glue
- wood or tile squares

1. Ask parents to help children collect small rocks from their yards or roadsides. Encourage them to look for an assortment of colors, sizes, shapes, and textures.
2. Invite children to create sculpture by gluing rocks on a wood or tile base. Children might choose to create a pattern, paint designs or faces on rocks, glue bits of paper or fabric to the rocks, or add wood scraps.

Sand casting

Sand casting requires an area that can be left undisturbed so the plaster can dry a half hour or more. This activity can be a collaborative project, either as an entire class or in small groups. If children want to make their own sand casts, you might work with three or four children an hour at a time.

Here’s what you need:

- natural objects such as sea shells, twigs, bark, half walnut shells
- assorted recycled objects such as plastic bottle caps, large beads, pencil stubs, bolts
- newspaper
- washtub or other large container of sand
- water
- plastic shovels or spoons
- plaster of Paris
- coffee can or butter tub
- wooden stirring stick
- large spoons

1. Wet the sand enough so that it sticks together. Have children dig a hole in the sand about an inch deep. The hole can be round or square, but it needs to be big enough to hold all the objects children have selected.

2. Have children select the objects and press them randomly or in a design face down in the hole.
3. Meanwhile, mix the plaster of Paris according to the package directions, and let it set for a few minutes to thicken. Have children pour or spoon it over the objects in the hole, taking care not to move the objects.
4. After the plaster has dried, children can dig out the cast and brush off the extra sand.

Variations: Instead of using objects, let children make a handprint or footprint in the plaster. Invite school-age children to look for images of *bas-relief* in an encyclopedia or by searching the Internet.

Definition: Bas-relief (bah-ree-LEAF)—a sculpture whose figures are carved or shaped against a flat surface and stick out a little; the back side is not meant to be seen

Aluminum foil sculpture

Metal, especially bronze, has been a favorite material for many sculptors. Frederic Remington is known for depicting small, realistic action figures, such as “Bronco Buster,” while Deborah Butterfield creates abstract horses that appear to be made of pieces of driftwood. Bronze casting, welding, and other metal working are complicated and hazardous, but children can use their imagination with aluminum foil.

Here’s what you need:

- aluminum foil
- newspaper
- cardboard or wood square scrap
- glue or thumb tacks

1. Invite children to make shapes with aluminum foil. For bulky parts of a sculpture, wad up the

- newspaper and cover with aluminum foil.
2. Glue the finished piece onto cardboard or tack it onto a wood square.

Block sculpture

Children who enjoy building with Lego® blocks may be interested to learn that the popular bricks have become a bona fide art medium. For examples, see the Lego sculptures of Nathan Sawaya at www.brickartist.com.

Whether you use plastic or wood blocks, consider expanding block play with sculptural elements.

Here's what you need:

- photographs of gargoyles, friezes, corbels, and other architectural embellishments, or a resource book such as *Architectural Details* by Marcia Reiss (Thunder Bay Press, 2004)
- photographs of monuments like the Lincoln Memorial and the Arc de Triomphe
- assorted materials such as small boxes, plastic eggs, tubing, pieces of pipe, wood scraps, plastic bottle caps, aluminum foil, cork, spools

1. Show children the photographs. Note how some buildings have artful decorations built into the structure.
2. Discuss the purpose of the architectural sculpture. For example, the sculpted work may be intended to beautify the building, honor a historical figure, serve as a reminder of a spiritual or moral quality, or celebrate an important event.
3. Invite children to incorporate art and sculpture in their constructions, using assorted materials or the sculptures they have made in other activities.

Definitions: Frieze (freeze)—a horizontal band of carved figures or designs that runs above doorways or windows.

Corbel—a bracket supporting a roof, ceiling, or beam.

Paper sculpture

If you've ever read a pop-up book, admired origami, made a box from paper, or used a piñata at a party, you're familiar with paper sculpture

Here's what you need:

- assortment of paper sheets and scraps, including construction paper, card stock, wrapping paper, paper plates, holiday greeting cards
- tape and glue
- scissors
- marker

1. Show children how to fold down one side of a sheet of paper into a half-inch tab. Fold the paper in half and then in half again. Open it up and reverse the fold farthest from the tab. Glue the tabbed side to the opposite side to form an open-ended box.
2. In similar fashion, demonstrate how to make a cylinder by rolling up a sheet of paper. Make a cone by cutting out a circle, cutting a slit along the *radius*, and overlapping and then gluing the edges.
3. Invite children to make shapes out of paper. Explain that they can decorate them with markers or glue several together to make a sculpture. For example, they might add a folded paper square as a roof to the box to make it a house. Or they might add four paper circles to the box to make it a train car.

Variation: Cut free-form shapes from card stock and snip a 1-inch slit into each side. Interlock the shapes along the slits to build a sculpture.

Sculpture from common objects

In the 1940s Pablo Picasso saw an old bicycle seat and handlebars and got the idea for a bull's head. He made the seat the bull's face, and the handlebars, the horns. He was one of a handful of artists in the early 20th century who began using commonplace items as material for sculpture. The idea caught on and influenced later artists such as Salvador Dali.

Here's what you need:

- assortment of objects familiar to children such as plastic spoons, butter tubs, balls, old bicycle

SCULPTURE IS THE ART OF THE HOLE AND THE LUMP.

AUGUSTE RODIN (PRONOUNCED roh-DAN)

parts, small cereal boxes, shoe-laces, discarded CDs, pencils, toothpicks

- art and craft materials such as craft sticks, pipe cleaners, fabric and ribbon scraps, felt, paper scraps, stickers, miniature tiles, buttons, glitter
- glue and tape
- markers and paint

1. Ask children to name each common object and describe its function. Explain how Picasso took two bicycle parts and made them into a bull's head. Discuss how changing the way something looks can change how it's used, including as art or decoration.
2. Invite children to select a few common objects and change them in some way by using the art and craft materials.

Junk sculpture

Today the objects used by many sculptors include recycled materials and even junk. But no one would think of Jim Gary's giant dinosaur sculptures made from discarded automobile parts as junk. Similarly, Tone Holman's "Polar Bears" made from plastic bags and Robert Bradford's "Patchwork Dog" made from miniature children's toys elevate junk into creations that inspire awe and delight.

Making sculpture from common or recycled objects is kin to *collage*. Note that *2-D collage* is made by gluing flat items such as photographs, newspaper clippings, paper or fabric scraps, and ribbon to a base. *Sculptural collage*, on the other hand, uses 3-D objects. Both are intended to be viewed from one side, like a painting. Of course, some works,

like Robert Rauschenberg's "Canyon," are a combination of the two.

Here's what you need:

- assortment of discarded items such as old jewelry, watch pieces, old toy parts, plastic tubing, bottle caps, clean egg cartons, tissue paper rolls, empty spoons
- polystyrene packing blocks, small cardboard boxes, and other bulky objects to be used as forms
- shoe box lids, one for each child
- glue
- paint or markers

1. Invite children to choose several discarded items from your collection and assemble them in any way they wish. They may simply glue the items to the shoe box lid (sculptural collage), or they may glue items to a form and then glue the form to the lid (sculpture).
2. Explain that they may paint or decorate the items before gluing them.

Make a mobile

Engineer-turned-artist Alexander Calder created many metal sculptures but is best known for inventing the mobile in 1931. He has been called "the man who made sculpture move" and led the way in the development of *kinetic art*.

Here's what you need:

- drinking straws
- paper clips
- construction paper
- pictures cut from magazines or junk mail
- scissors
- glue or tape

1. Invite children to cut several shapes out of construction paper or pictures from magazines.
2. Make the top unit of the mobile by sliding a straw through a paper clip. Move the paper clip to the middle of the straw. From this paper clip, make a chain of paper clips for hanging the mobile.
3. Make two chains to hang on each end of the straw. Insert a straw into each chain at unequal distances down each chain.
4. Make three more chains to hang from each additional straw. At the end of each chain, clip a shape or picture
5. Encourage children to hold up the mobile and figure out how to make it balance, such as by inserting a straw higher or lower in a chain, sliding a chain over on a straw, or adding or subtracting chains or pictures.
6. When a mobile is balanced, children can place a spot of glue or tape at the top of each chain.

Variations: Make a mobile to carry out a curriculum theme, such as animals or the alphabet. Instead of straws and paper clips, use twigs and string.