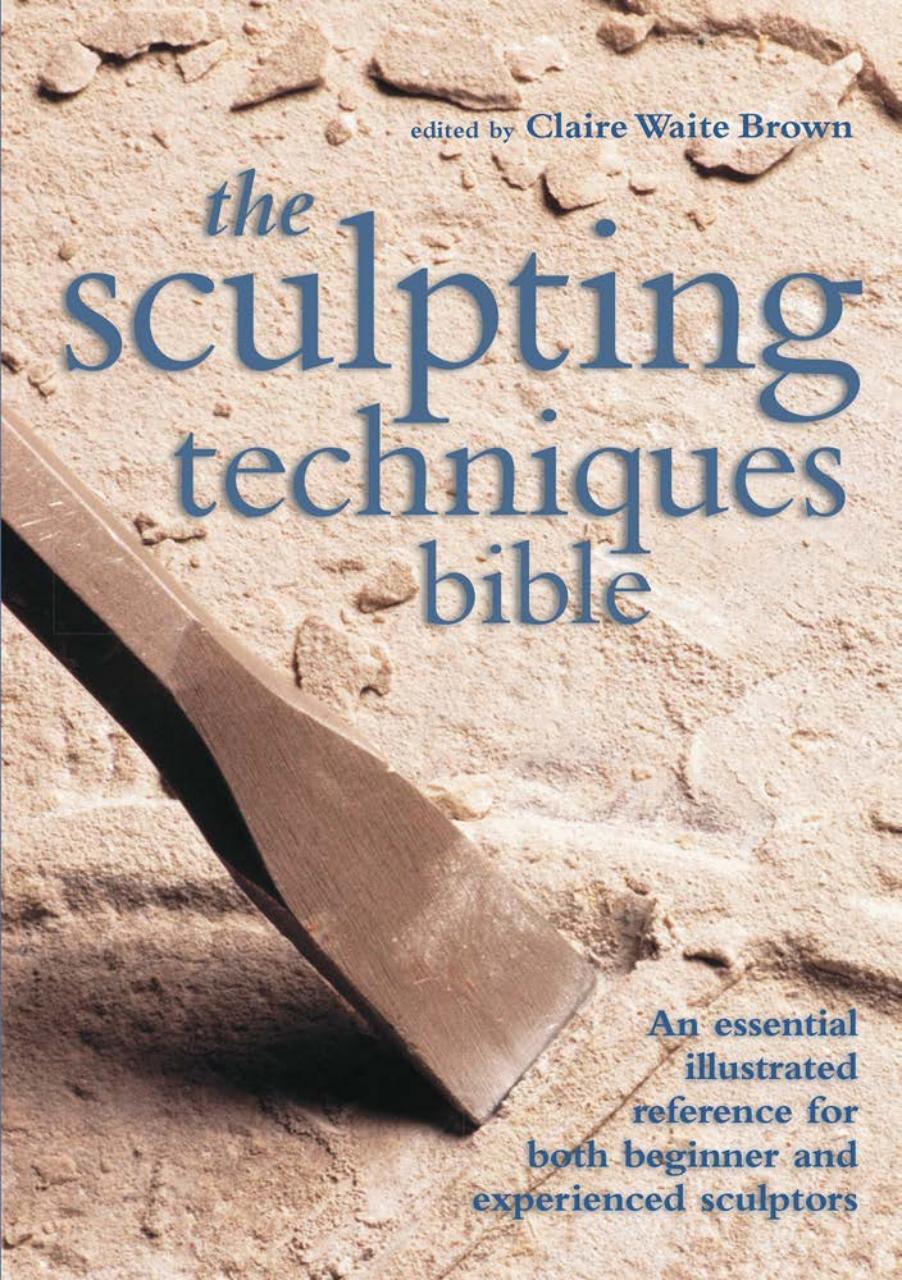

edited by Claire Waite Brown
the
sculpting
techniques
bible
An essential
illustrated
reference for
both beginner and
experienced sculptors

The Sculpting Techniques Bible

The Sculpting Techniques Bible

An essential illustrated reference for both beginner and experienced sculptors

Edited by
Claire Waite Brown

CHARTWELL BOOKS, INC.

Contents

Introduction

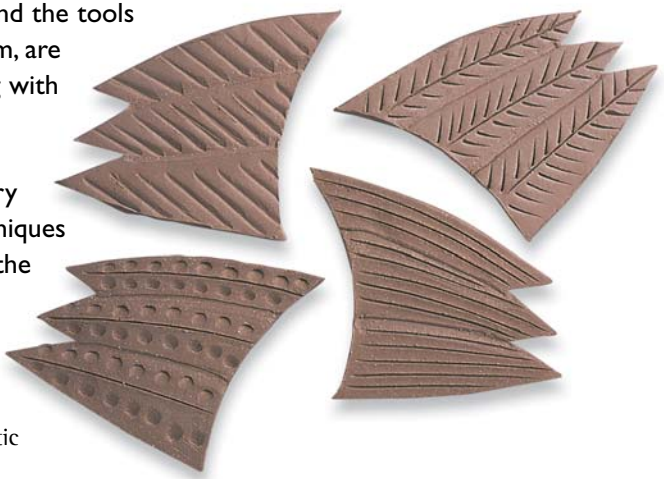
Making sculpture—the art of manipulating material to create three-dimensional form—is an extremely pleasurable, intense, and rewarding experience. It is an activity that is intrinsic to human nature, dating from prehistoric times when stone was first carved.

Build a collection of tools

Carving and modeling are the traditional techniques used in sculpture. However, with the evolution of new materials and techniques, the range of possibilities available to the sculptor has greatly expanded.

The techniques described in this book will provide the novice or practicing sculptor with a solid foundation on which to build a repertoire of sculpting skills. It illustrates the fundamental techniques of sculpting and shows you how to use basic materials. If you have never made a sculpture before, you will undoubtedly find in the following pages a technique you can use to start you off, while more experienced sculptors will discover the possibilities that lie with untried techniques or materials.

The book begins with a section aimed at arming you with all the information you need to get started. The various sculpting materials, and the tools needed to work them, are discussed here, along with relevant safety information and any necessary preparatory techniques. The techniques section then covers the practical aspects of sculpting, including modeling with clay



Discover the characteristic properties of materials

Learn from the work of professional artists

and plaster, making molds and casts from various materials, and carving and construction techniques. There are also examples of finishes you can apply to the surface of your sculpture, and a look at suitable bases you may choose to show your work off to its full potential.

The final section is designed to help you learn by example, and features the work of many and varied sculptors. While the best thing about being a sculptor is enjoying what you do and experimenting with your own style, looking at how other artists work can help you to discover your own interests.

Developing skills is important, but what matters even more is that you take pleasure in what you do, so treat this book as a springboard to launch you into the exciting world of sculpture.

Discover how to handle tools with confidence

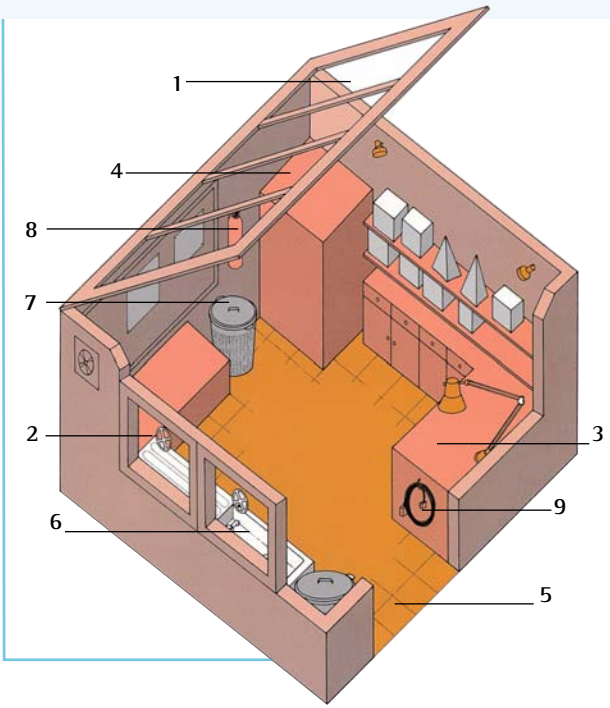
Chapter One

GETTING STARTED

Studio guidelines

Having a designated studio space will make your sculpting experience all the more enjoyable, and allows you to close the door on your work if it ever gets frustrating. A garage, attic, basement, spare room in the house, or disused warehouse can all be equipped to provide just such a space. The basic necessities are good lighting, storage space for tools, materials, and finished work, plenty of work surface space, and access to running water for mixing materials and cleaning up.

It is important that you keep the studio as tidy as possible. Tools and equipment stored neatly on shelves or in a cupboard are more likely to stay in prime condition and can be quickly found when needed. It is also vital that different types of material are kept apart—for example, clay should be kept well away from chips of stone, and plaster, which needs to be kept dry, must be stored away from clay, which has to remain damp.



Studio layout
Important factors in working out the design for a studio are good light (**1**), both natural and artificial, and ventilation (**2**), as much work surface as possible (**3**), secure storage facilities (**4**), and clear floor space (**5**). It is also vital to have a sink and running water close at hand (**6**), large garbage cans (**7**), a fire extinguisher (**8**), and plenty of electric wall sockets (**9**).

Essential tools

It can be useful to keep a few pieces of equipment in the studio that are not specific to working with a particular medium. These include scissors (**1**) and paintbrushes (**2**) that are reserved for sculpting work only, calipers (**3**) for measuring dimensions, a bradawl (**4**) for making holes, a general-purpose craft knife (**5**), clamps (**6**) for fixing work to the work surface, and cloths (**7**) and wire wool (**8**) for polishing.

Modeling stand

A modeling stand is not an essential piece of kit, but if you find you enjoy working on portraits or life figures, you may choose to invest in one. The height is adjustable so that you can work more easily on different sections of the sculpture.

Cleaning up

It is essential that the studio is kept clean, so be meticulous and always clean up after every session. A good vacuum cleaner is indispensable for cleaning up dust.

Clay

Clay is one of the most commonly available sculpting materials, and you can even dig your own. However, few naturally occurring deposits yield clay that is sufficiently uniform and plastic for sculpture purposes, so most sculptors buy their clay from potters' suppliers.

In sculpting terms there are two uses for clay. It can be used as a material in its own right, which is fired to become the finished piece, or used to make models for moldmaking, where the final piece is cast using other materials, or repeats are cast in clay, then fired.

Clays can be smooth or rough, depending on whether or not they contain sand and grog—clay that has been fired and ground up. The smoother varieties are better for small, finely detailed work, whereas grogged clays have a ruggedness and resistance in handling that smooth clays lack, so are most useful for making large sculptures.

Types of clay

If you are using clay as a transitional medium —to make a model for moldmaking— choose a gray (**1**) or natural (**3**) clay of a suitable texture and plasticity to be worked into the required form. Terra cotta (**2**) makes a good clay for firing, although ceramic sculpture can also be made using any of the earthenware or stoneware clays. Air-drying clay (**4**) hardens without firing.

Clay slip

A mix of clay and water, known as clay slip, is used to aid the adhesion of joined pieces of soft clay.

Storing clay

Unused clay needs to be kept in an airtight container. Large amounts can be kept for a long time in a garbage can, covered with a damp sack and polythene, and a tight-fitting lid to keep the can airtight.

Once you begin working with the clay, you need to keep it damp for it to remain workable. Dampen it and then seal in a large plastic bag (see page 68).

Health and safety considerations

◆ Wet clay is not particularly dangerous, but if you have sensitive skin you may choose to wear protective gloves or rub a barrier cream into your hands.

◆ Dry clay can form dust if it is crushed underfoot or collects on surfaces. Clay dust contains silica, which if breathed in can cause, over time, silicosis of the lungs. If you plan to sand dry or bisque-fire sculptures, you must wear a respirator with a suitable filter. However, the best way to ensure you don't breathe in clay dust is to avoid making it in the first place by following these basic rules.

• Always wash down preparation surfaces straight after use, while they are still damp.

• Never sweep the floor, instead use a vacuum cleaner with an absolute filter on a dry floor, or clean it with a wet mop.

• Wear protective clothing, but try not to wipe dirty hands on an apron because the dry wipings will flake off and cause dust.

Modeling tools

Modeling tools are extensions of the hands and fingers. A rolling pin (**1**) and wooden spoons (**2**) are useful in the early stages of establishing shape, while specific modeling tools, whether plastic (**3**) or wooden (**4**), allow you to shape and define the sculpture in finer detail. The variety of tools to be found in craft stores can be overwhelming, and many sculptors use only one or two to perform a variety of functions. A plant mister (**5**) is vital for maintaining the moisture of the clay during the modeling process.

Modeling wax

When cool, modeling wax is relatively hard, but when it has been warmed by kneading in the hands, it becomes soft and pliable. In this state it has a similar consistency to clay and can be modeled in the same way.

Hollowing tool
A wire-loop tool like this is used to hollow out a sculpture before firing.

Kitchen knife
A standard kitchen knife is useful for cutting through small pieces of clay and, along with a kitchen fork, this can also be used to score soft clay where pieces are to be joined together.

Cutting wire
A wire is used to cut through larger pieces of clay, whether during the wedging process or when releasing an armature from a clay model. The wire can be metal or plastic, but should have wooden toggles on either end for you to grip onto.

Plaster bat
Clay for modeling should be sufficiently plastic to be modeled easily, but not so wet that it becomes sticky. A plaster slab, of the type used by potters, can help to maintain clay in this condition. The porosity of the bat will soon dry out any overwet clay that is kneaded and left in contact with it. Check the clay on the bat from time to time, because it can firm up quite quickly. If the clay can be rolled and bent between the fingers without cracking, it is ready for use.

Kneading

Wherever you obtain your clay supply, it will need to be thoroughly prepared before use. Clay that arrives in plastic bags may seem even and ready to use, but the plastic draws water to the edges of the block of clay, leaving it drier in the middle and wetter around the edges. Kneading will create a smooth lump of clay with an even consistency throughout, and is also important for removing air bubbles. As illustrated here, this technique can also be used to mix together two types of clay.

1 Place your hands on either side of a lump of clay. Using both hands, push the clay forcibly downward and away from your body. Your hands will dig into the clay a little on either side.

2 Roll the clay back toward you and move your hands slightly forward on the clay. Repeat the downward pushing and forward motion from Step 1. Try not to fold the clay because this may trap air rather than remove it.

3 From where you are standing, the clay will now resemble an ox or ram's head. Repeat the action of pulling the clay toward you, so that the "ram's head" stands on its "nose,"then push and rock the clay forward at least 30 times to thoroughly mix the clay and remove all air bubbles. As you knead you should hear the air bubbles bursting with a crackling sound.

Wedging

Wedging is a method of kneading or mixing a large amount of clay to make sure that it has the same consistency throughout. The process is not worth the effort for clay weighing less than 10 lb (4.5kg), in which case kneading on its own would be sufficient. Wedging is best done on a very sturdy table, because it will have to withstand a lot of force, and ideally the table should be below waist height so the clay has further to fall.

1 Hold the clay above your head with both hands, then slam it down onto the work surface to remove any pockets of air.

2 Draw a cutting wire through the clay loaf to cut it in half. Pick up the top half and turn it over.

3 Lift the top half and throw it down on top of the other half. The two halves should combine so the whole mass is flattened to its previous size. Repeat the cutting and slamming process until the clay is thoroughly mixed, and all lumps, inconsistencies, and air bubbles are eliminated.

Rolling

These rolled shapes are quick and easy to make, and can be used to reinforce seams where clay pieces are joined, as elements of a model or sculpture—such as legs or arms—or to provide detailing on modeled forms. Use the palm of your hand, with fingertips turned upward, to roll a lump of clay into a sausage shape. Aim to use a long, smooth rolling action.

Pinching

Simple hollow forms can be made by pinching a clay ball into a bowl shape.

1 Shape a lump of clay into a ball by patting and rolling it between both hands. Insert one thumb into the center of the ball and press down firmly.

2 Support the pot in one hand and draw the walls out and up with the thumb and fingers of the other hand.

Leather hard

At the leather-hard stage a sculpture can be carefully handled, without the shape or surface texture being affected. The leather-hard stage is a point somewhere between soft, malleable clay, and completely dry clay. In this state the clay has lost a good deal of moisture and become stiff, but has not yet hardened completely and become rigid.

Making slabs

Slabs of clay of an even thickness can be used to build various forms, such as hollow body shapes.

1 Cover a plaster bat or flat work surface with burlap or scrim, to stop the clay sticking. Draw out a lump of kneaded clay into a long thick roll and flatten it with the side of the hand. Work over the clay with a rolling pin.

2 Place a wooden batten of the required depth on each side of the clay. Roll the rolling pin over the clay and the battens to ensure an even depth of slab.

3 Cut the clay slab using a sharp knife guided along a straight edge.

4 When making repeated forms, cardboard or paper templates can be used to cut shapes from a large rolled slab, to ensure absolutely that all elements are of the same depth.

Plaster

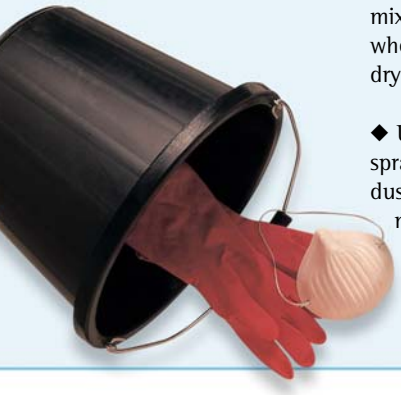
Plaster, made from gypsum, is suitable for making molds, casting, direct modeling onto an armature, and carving, and has a very long history of being associated with sculpture.

Plaster is supplied as a powder, which, when mixed with water, goes through an exothermic chemical reaction, which gives off heat. As the plaster starts to go off (set), it becomes warm to the touch. When it has cooled down you know that the reaction has finished and the plaster has set, and can be safely handled. However, it will still take some time to dry out completely.

Plaster and plaster bandage

Plaster (**1**) is a powder that mixes with water to a smooth, creamy consistency. Fine mesh scrim dipped in the liquid plaster (**2**) is useful when direct modeling, and can also be bought as a ready-made product known as plaster bandage. Making colored plaster is very easy, with the addition of powder paint (**3**), and is useful when making waste molds.

Health and safety considerations



◆ Always wear a dust mask when mixing plaster and when working with dry plaster.

◆ Use a water spray to keep dust levels to a minimum when carving dry plaster.

◆ Work in a well-ventilated area.

◆ If you have sensitive skin, wear gloves or use a barrier cream whenever you handle plaster.

◆ Never pour plaster down the sink, because it will eventually block the drain. Instead, keep a bucket of water beside you to rinse your hands and tools. When work has finished, pour away the excess water, then dispose of the plaster sludge in the garbage.

Modeling and carving tools

Plaster modeling tools (**1**) can be found in a myriad of shapes and sizes. Other useful tools include flat (**2**) and claw (**3**) chisels—used with a mallet (**4**)—a knife (**5**), plaster (**6**) and surform (**7**) rasps, a wire brush (**8**), and a saw (**9**). It is important that all tools are cleaned well after use; none should be left clogged with plaster.

Rifflers

These small rasps are perfect for smoothing and shaping small areas of a sculpture.

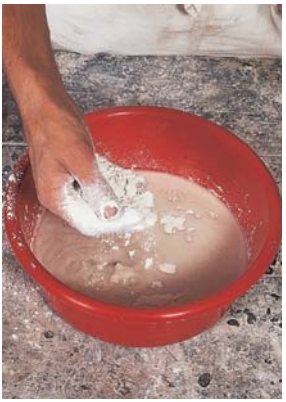
Moldmaking and casting

Plaster is the main material used to make molds. As well as the usual plasterwork tools and materials, you may also need extra clay, to build a wall to enclose the liquid plaster, and brass fencing (**1**) to separate two sections of a mold. Soft soap makes a good release agent, preventing a plaster, cement, or cement fondue cast bonding to a plaster mold, while a specialist water-soluble release agent (**2**) is used when casting with polyester resin.

Mixing plaster

Plaster is always added to water, and the amount of water you start with is determined by the job in hand. You can expect the volume of mixed plaster to be about half as much again as the amount of water. Remember that plaster goes off very quickly, so only mix up an amount that can be used before this happens—it is better to mix less than more.

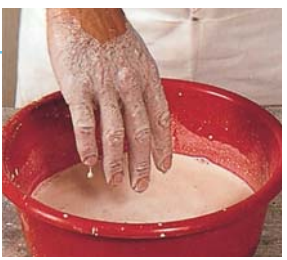
1 Pour some water into a plastic bowl. If you use a flexible plastic bowl, any surplus plaster can be left to set and will be relatively easy to crack out. Sprinkle a handful of plaster evenly onto the surface of the water. Do not let the plaster drop down in one place—this will impede its ability to break up and disperse in the water.



2 Keep adding the plaster a handful at a time and it will start to rise and form peaks above the surface of the water. Let the plaster settle, and if the peaks remain you have added enough. If not, add more.

3 Mix the plaster well in with the water, making sure that all lumps are broken up.

4 The correct consistency should be smooth and creamy. To test that you have a good mix, dip your fingers into the plaster and bring them up to the surface. The plaster should be opaque and move slowly down your fingers.



5 If insufficient plaster has been added, the mix will be transparent and fall quickly off the fingers. Do not try to rectify the problem by adding more plaster. Instead, put this mix to one side (letting it go off) and make a fresh batch of plaster.

Coloring plaster

A colored plaster mix is easily achieved using powder paints. Simply mix the powder paint with the water before adding the plaster in the usual way. Here three colored plaster mixes—white, yellow, and red-brown—have been alternately poured into a box lined with plastic to create a marbled effect. When the plaster sets the marbled block can be turned out of the box for carving.

Papier mâché

Papier mâché is made by mixing strips of newspaper with wallpaper paste, and is used in a similar way to plaster for direct modeling, with craft glue used to fix it to the armature.

Mix up the wallpaper paste in a bucket and add small pieces of newspaper. Leave for 24–48 hours, until the paper is well soaked and starting to disintegrate. Use a food mixer to break up and combine the mixture to produce a pulp ready for modeling.

Cement and cement fondue

Cement and cement fondue are strong and durable, and suitable for casting or working directly. The cement in question is the standard Portland cement, mixed with sand and used in the building trade. Cement fondue has a high alumina content, is weatherproof, and sets extremely hard.

A sand and cement mix, available ready-mixed in bags, can be poured into a small mold to make a solid cast. However, it will not pick up very fine detail from the surface of the mold. Cement fondue, on the other hand, is able to replicate the very finest detail from a mold and is highly recommended when making a cast of a finely textured surface. Cement fondue can be cast solid, but it is better as a hollow cast, in which case it is extremely light.

Sand and cement and cement fondue

A ratio of one part cement (**1**) to three parts sand (**2**) is a good mix for casting, although you can also buy a ready-mixed variety. The same ratio also works for cement fondue (**3**) and sand. Water is added to this mix until the necessary consistency is achieved. Fiberglass matting (**4**) is used to reinforce cement fondue when making a hollow cast.

Mixing cement

Pour one part cement to three parts sand, or some ready-mixed sand and cement, into a bucket, then add water and mix well. The mix must reach the consistency of cottage cheese, not too runny and not too dry.

Tools

The tools you are likely to need when using cement or cement fondue are the same as those used with plaster (see page 21).

Mixing cement fondue

1 Make a mix of one part cement fondue to three parts sand.

2 Add water to the mix, making sure that you do not add too much. The mix needs to be moist enough, so that when you squeeze it water starts to leak out, but the body of the mix stays firm and does not disintegrate.

Health and safety considerations

◆ Work in a well-ventilated area.

◆ Wear a dust mask when mixing cement fondue.

◆ Always wear protective gloves when working with cement or cement fondue, and when handling fiberglass matting.

Polyester resin

Polyester resin is strong and lightweight, and is an ideal casting material. A range of colored pigments can be added to it, negating the need to color the sculpture after it has been cast. More significantly, polyester resin has the capability of mimicking other materials by the addition of fillers prior to application. Many fillers are available, including bronze, copper, brass, aluminum, iron, marble, and slate, and a sculpture cast with polyester resin and bronze filler will be indistinguishable from a sculpture cast in bronze—except, that is, for the weight, since the resin cast is much lighter.

Resin materials

A liquid hardener (**4**) or catalyst is added to polyester resin (**1**) to enable it to cure, and accurate measurements of both resin and hardener are essential for the success of the mix. Fine particles of metal filler (**3**) or colored pigment can be added to the resin for the first coat of the cast. Subsequent coats of ordinary resin mix are used with fiberglass matting (**2**) to reinforce the casting material.

Health and safety considerations

Polyester resin is highly flammable and its fumes are harmful in excess. However, if used sensibly and safely you should have no problems.

◆ Follow the manufacturer's instructions and specific safety advice.

◆ Always work in a well-ventilated area, and if you plan to do a lot of work with polyester resin, invest in an efficient extractor fan.

◆ Wear a respirator mask and clear goggles when working with polyester resin.

◆ Wear protective gloves whenever you are working with polyester resin and fiberglass matting.

◆ Discard containers that have been used to mix resin.

◆ Clean brushes using the cleaner recommended by the resin manufacturer.

◆ Store resin and hardener in a cool, dark place.

Tools The tools you are likely to need when casting with polyester resin are the same as those used with plaster (see page 21).

Mixing polyester resin

Immediately before setting, the resin and hardener mix starts to gel—it takes on the consistency of Jell-O—and it is essential that you finish working with it before it gets to this state. Therefore, it is a good idea to mix up only a small amount of resin and hardener at one time.

The first colored layer of resin used in a cast is known as the gel coat. When mixing this you need to mix together the quantity of resin and pigment or filler needed for the whole job to ensure there are no discrepancies in the coloring of the cast.

1 On weighing scales, measure out the amount of polyester resin required for the gel coat.

2 Add the amount of filler or pigment as recommended by the resin manufacturer, and mix thoroughly.

3 To make sure the gel coat does not cure before you have had time to use it all, only add hardener to resin in small batches. Weigh out half the amount of colored resin and add the recommended amount of hardener. Mix well. Only add hardener to the next batch of resin when you are ready to use it. To mix the uncolored resin for reinforcing the cast, simply add hardener to small, weighed-out amounts of resin, without the addition of filler or pigment.

Stone

The three main types of stone—igneous (hard), sedimentary (medium), and metamorphic (soft)—have evolved over millions of years of the earth's existence. Igneous stone was formed deep below the earth's surface, as the intense heat from volcanic action cooled over the years. Sedimentary stone was formed by a buildup of organic matter—plants, insects, and sea creatures—in low-lying areas. Over time, due to a buildup of pressure, the layers of sediment hardened. Metamorphic rock was formed through the effects of pressure, great heat, or chemical action—processes that transformed the basic structure of igneous or sedimentary stones.

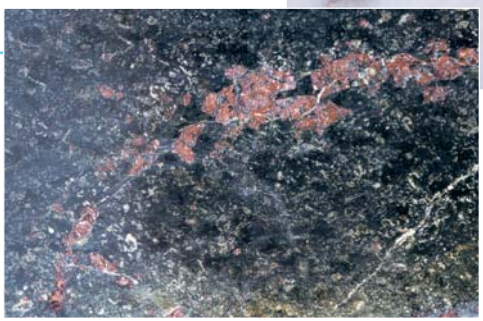
The features of each type of stone determine how easy or difficult they are to carve.

Soft stone

Metamorphic stone is the softest and a good choice for novice carvers. Marble (**1**) and slate are the metamorphic stones most frequently used in sculpture, and alabaster (**2**) and soapstone (**3**) are both very soft stones recommended for those new to carving.

1

2



3

Medium stone

Limestone (**1**) and sandstone (**2**) are popular choices of sedimentary rock for sculptors, limestone being the softer of the two. Sedimentary rocks are more porous than the harder igneous rocks and are easier to carve.

1

2

Hard stone

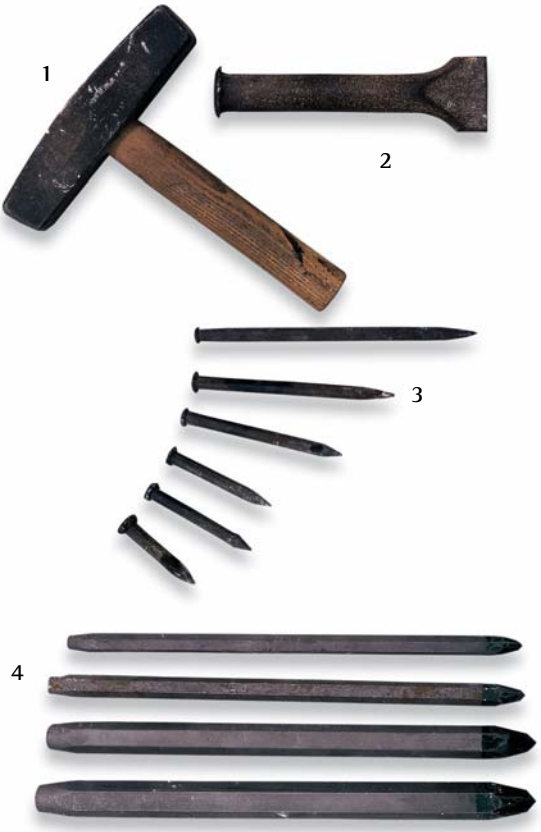
The best known type of igneous rock is granite. As a general rule, this type of stone is very hard to work and best left to experienced sculptors.

Aerated concrete

Used in the construction of buildings, aerated concrete is an extremely lightweight material that can be carved to make sculptures resembling those made from stone. The advantage of this material is that it can be easily cut with a saw and shaped with surform rasps.

Roughing-out tools

Roughing out is the process of removing waste material and carving the basic shape of the sculpture without any fine detail. The basic tools for roughing out stone are the pitching tool and the punch, both normally hit by suitable hammers. The pitching tool (**2**) is of value in removing large fragments during the early stages of blocking out the initial form. When the heavy hammer (**1**) is used with the pitching tool and applied with force, the blows can remove considerable amounts of stone. Punches (**3**) vary in length and width, and are drawn out for softer stone and shorter for use with granite, and are used with the same hammer. The varied point widths of marble punches (**4**) are used in the different stages of roughing out marble.



Carving tools

Stone-carving hammers vary in weight depending on their size. A small lead dummy mallet (**1**), a small lead hammer (**2**), and a slightly larger dummy mallet (**3**) are used to good effect with a range of fine claw (**4**) and flat chisels (**5**). Chisels may also have a broadened, rounded hitting end, and the cutting ends can be tempered steel or tungsten.

Finishing tools

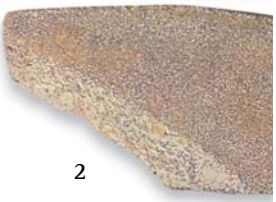
Stone rasps and files are abrasive metal tools used for finishing and fining down stone surfaces. The dreadnought file (**1**) is used initially for clarifying form, followed by a stone rasp (**2**), and the very small and delicate rifflers (**3**).

Polishing tools

Abrasive stones, usually Carborundum grit in a range of thicknesses and bonded in shellac, are available in various grades of hardness. Begin with the coarsest stone (**1**), continue with the medium grade (**2**), and use the smoothest grade (**3**) for final smoothing.

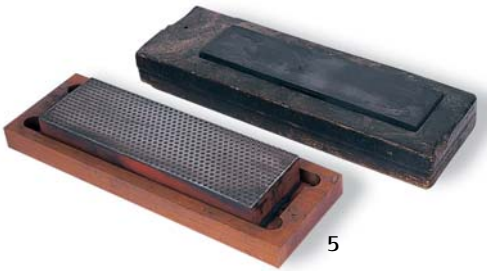
Alternatively, working through grades of wet and dry (silicon carbide) abrasive paper (**4**), from coarse to fine, will polish up the stone's surface, and diamond hand pads (**5**) can also be used in the same way.

1

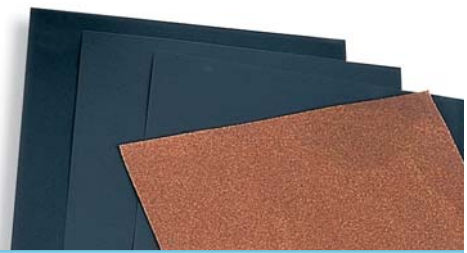


2

3



5



4

Health and safety considerations

◆ When carving stone, always work in a well-ventilated area.

◆ Carving stone is a dusty business, so always wear a dust mask to ensure you don't breathe in dust, and safety goggles to protect your eyes from dust and flying particles.

◆ Use a water spray to keep dust levels to a minimum.

Wood

Many woods are suitable for carving, and when choosing a wood it is important to consider the type of sculpture you are planning. For example, a distinctive grain may be a suitable choice for large or simple forms, whereas a wood with little visible grain might be better for a more detailed or intricate carving. Whatever wood you choose, look for an even grain without knots, avoid the central heartwood and the sapwood—the wood between the inner bark and the heartwood—and look out for sunken areas, which may indicate a knot or other blemish below the surface.

Most sculptors will want to avoid using woods that have become scarce as a result of indiscriminate cutting, and many also prefer to use local woods wherever practical.

Types of wood

Lumberyards, woodworking stores, cabinetmakers, craft shops, and even your own garage are all possible sources of useful pieces of wood. The woods featured here are just a small sample of the wide range available, but you will inevitably find your own favorites.

Jarrah (Eucalyptus marginata)
Jarrah is an Australian wood that is both dense and hard, but carves well. It resembles mahogany in color.

Jelutong (Dyera costulata)
This fine-textured, close-grained, yellow wood is comparatively light in weight, and very easy to cut and shape. It is an ideal carving wood.

Lime/basswood (Tilia vulgaria/americana)
This close-grained wood has virtually no grain pattern, and is easy to carve and good for detail and texture.

Mahogany (Swietenia spp.)
The structure of each variety of mahogany varies, so some carve well while others have a cross or interlocking grain that makes them difficult to carve.

Oak (Quercus spp.)
Species of oak range in color from pale fawn to brown. They are all hard but rewarding to carve, although they are not good for fine detail.

Quebec yellow pine (Pinus strobus)
This soft, yellowish wood is excellent to carve, but needs very sharp tools with longer bevels than those used for hardwoods.

Sweet chestnut (Castanea sativa)
Sweet chestnut is similar to oak in appearance but without obvious medullary rays, and not as hard. This wood carves well.

Walnut (Juglans spp.)
A beautiful wood that carves well, in colors varying from the grayish-brown European variety to the dark brown American walnut. Italian and American walnut are the most prized for carving.

Roughing-out tools

The main shape of a woodcarving can be cut out using a handsaw (**1**). A coping saw (**2**) is especially useful for sawing around the outline of complex shapes, because the blade can be altered in relation to its frame.

Carving tools

Gouges, chisels, and a mallet are the essential tools for carving wood. Gouges (**1**) are curved, whereas chisels (**2**) have flat cross-sections. The term "straight," when applied to gouges and chisels, means that the sides are parallel nearly to the shoulder, and they are straight when viewed from the side. Curved gouges (**3**), in profile, are curved for most of their length, and used for hollow shapes where straight gouges might dig in. Although carving can be done with two hands on the gouge or chisel, it can be more effective to tap the tool gently with a mallet. A carver's mallet (**4**) is round and traditionally made from beech or lignum vitae, and especially useful when carving large pieces and roughing out. A dummy mallet (**5**) has a small metal head and is useful for fine work.

Holding work

Depending on the size and shape of the sculpture you are carving, you may choose to use a vise (**1**) and/or clamps (**2**) to hold the work in position while you carve.


1


2

Finishing tools

For the final stages of refining detail and smoothing the surface, start with rifflers (**1**), which are small, variously shaped rasps. Rasps (**2**) are more likely to be used on large sculptures. Rifflers and rasps leave the wood rough, so it must be sanded by working through the various grades of sandpaper (**3**), from coarse to fine.

1

2

3

Health and safety considerations

◆ Work in a well-ventilated area when carving wood.

◆ Carving wood can throw up a lot of dust, so always wear a dust mask to ensure you don't breathe it in, and safety glasses or goggles to protect your eyes.

◆ Using a water spray will help keep dust levels to a minimum.

Equipment for sharpening tools

It is vitally important that gouges and chisels are kept sharp, because blunt tools will not achieve the effects you desire. To sharpen your carving tools you will need an oilstone (**1**), oil (**2**), and a slipstone (**3**).

1 2 3

Sharpening tools

Sharpening your carving tools is an essential activity that also puts you in touch with the "edge" of the tool. A sound edge will last for some time and can be kept by the occasional run on an oilstone.

1 Lubricate an oilstone with a trail of oil.

2 Sharpen a gouge by working in a figure-of-eight motion on the stone, rocking the blade from side to side around the curves.

3 Finish the gouge by removing the burr from inside the blade with a slipstone.

4 To sharpen a flat chisel hold it with the honed angle of the blade flat on the oilstone. Push it up and down the stone surface. A burr will form on the edge of the chisel, and breaking off this burr creates the sharp cutting edge. Turn the chisel over and move it once up the stone, holding it flat down on the stone. Then continue as before, alternating the procedures until the burr breaks off. Work all over the stone to avoid wearing a groove in the middle.

Construction equipment

Construction is a sculpting discipline that allows you to experiment with all kinds of materials and methods of joining them together. Sheet metal, paper art straws, coat-hanger wire, cardboard, and nails are just some of the materials you may be looking at in a new light once you begin researching methods of constructing sculptures.

Health and safety considerations

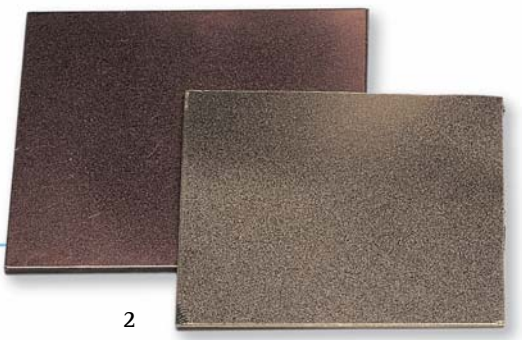
The precautions you need to take in this instance will depend on the material you are working with, so use your common sense to decide how you may need to protect yourself.

◆ It is always a good idea to work in a well-ventilated area.

◆ Wear protective gloves and safety glasses to protect your hands and eyes when cutting metal or wire.

Sheet metal

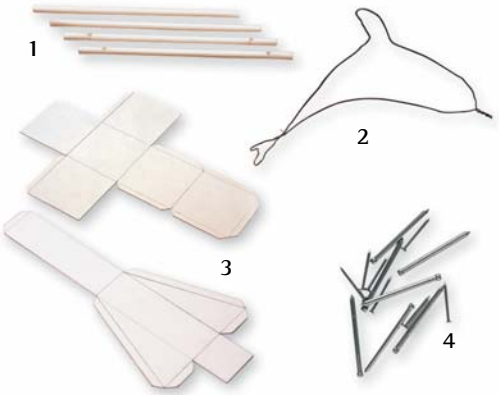
The metals that are available in sheet form and are not excessively expensive include copper (**1**), brass (**2**), and aluminum. Steel and tin are also popular choices. Copper is very malleable and therefore ideal for beating into shape and riveting.



1 2

Tools for metal sculpture

Most of the work involved in metal construction encompasses cutting and bending or shaping. Tin snips (**6**) will cut the thinner sheet metals, which can also be shaped with hammers (**1**, **2**). Sheet metal can be permanently joined using rivets and a pop riveter (**4**), and the rivets are available in various lengths, suitable for varying thicknesses of material. You will also need to use a punch (**3**) and drill (**5**) to make the initial holes for the rivets.



Anything goes

Construction sculpture allows you to be adventurous, and explore the possibilities of a range of materials. Paper art straws (**1**), coat-hanger wire (**2**), cardboard (**3**), and household nails (**4**) can all be used creatively to form three-dimensional forms, as can any number of other everyday materials.

Putting it all together

The way you construct your sculpture will depend to a large degree on the materials you are using. Craft glue (**1**) may be all you need to join cardboard or paper shapes. Wire cutters (**2**), pliers (**3**), binding wire (**4**), and netting staples (**5**) will be of use if you are working with wire. Many of the tools detailed in the various sections of this book can also be useful when you are constructing sculptures.

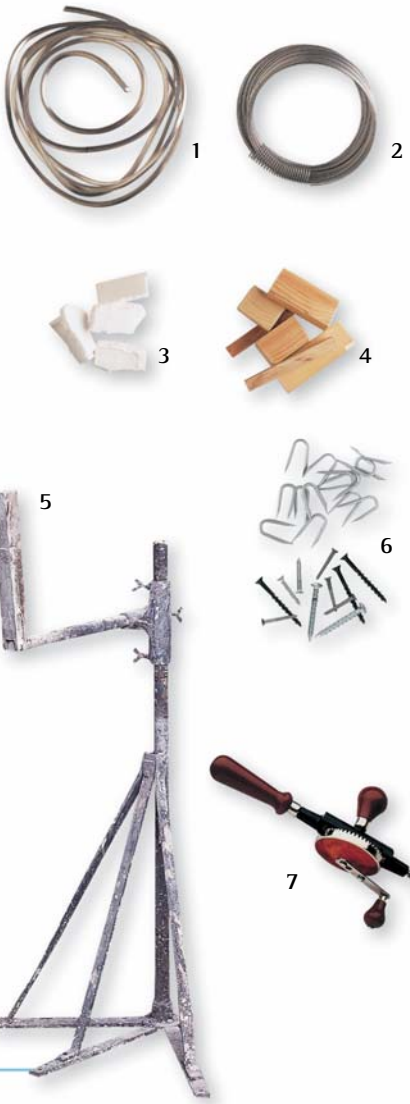
Making armatures

An armature provides a rigid support inside a modeled sculpture. It can simply take the form of a found object, or it can be made to your own specifications.

Armature equipment

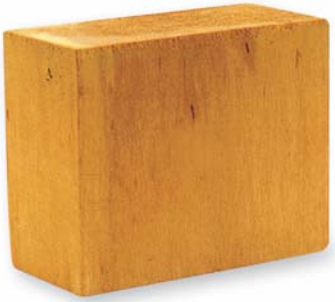
Aluminum wire (**1**) is easy to bend into the required shapes for making armatures, and be fixed into particular shapes using binding wire (**2**), or secured to a wooden post. Chicken wire can also be used, and polystyrene foam (**3**) or scraps of wood (**4**) may also be necessary to fill out the form of the armature. A figure armature can be attached with binding wire to a fixed iron support (**5**), also known as a back iron, for extra stability.

Screws and netting staples (**6**) are used to fix the armature to a base, such as a plywood or wood board. A drill, whether hand (**7**) or electric, is useful for making starter holes in the base, and a hammer (**8**) is needed to press in the netting staples. Use wire cutters (**9**) to cut aluminum wire, and pliers (**10**) to tightly secure binding wire around armature-wire joins.



Making bases

Some sculptures provide their own supports, while others need a form of base to show them off.



1

Support equipment

A block of wood (**1**) makes a good base for most sculptures. A hole is drilled (**2**) into the base and piping, doweling, or coat-hanger wire used to fix the sculpture to the base.

Decorating and car body fillers (**3**) are used to fill the hole or gap in the sculpture that the pipe or doweling is inserted into, while two-part epoxy resin glue (**4**) will securely stick the pipe or doweling into the hole in the base.

2

3

4

Health and safety considerations

◆ Work in a well-ventilated area when using fillers and strong glues.

◆ If you have sensitive skin you may want to wear protective gloves when working with fillers.

Finishing materials

The finishing materials featured in this book are all easy to use and widely available from hardware or craft stores. The same materials can often be used equally well on a range of sculpting materials, so making them reasonably inexpensive to use.

Glazes

Glazes—used on bisque-fired clay—consist of glass-forming materials combined with other ingredients that control the quality of the finish, such as gloss or matte and shade of color. Ready-mixed brush-on glazes are the easiest to use and are available from potters' suppliers in a wide range of colors and textures. The glaze mix itself will give little indication of the final fired color or texture, so always refer to the supplier's catalog colors and fire your own test samples before applying a glaze to the whole sculpture.

1

2

Craft glue and shellac

Porous surfaces, such as plaster, papier mâché, cement, and cement fondue, will absorb the finish you apply, so should be sealed first with either a coat of dilute craft glue (**1**), if you plan to apply a water-based finish such as acrylic paint or varnish, or shellac (**2**), if you intend to use an oil-based finish such as oil paint or polyurethane varnish.

Paints

Paints can be used on fired clay and sealed plaster, papier mâché, cement, and cement fondue. The type of paint you use will depend on the desired finish and personal preference.

Artists' acrylic (**1**) and oil (**2**) paints are available from art suppliers in tubes, jars, and bottles. If used neat they are opaque, but acrylic paints can be thinned with water and oil paints with turpentine for a more translucent effect. The various colors can also be mixed together to create your own shades and tints.

In your local hardware or craft store you will also find an infinite variety of specialist paints (**3**), including metallic, opalescent, and spray paints.

1


2


3

Inks

Acrylic inks can be used in similar ways to paint.

Varnishes

Varnishes are transparent or near-transparent coatings that protect a sculpture and give it a matte, semi-gloss, or gloss finish. They can be used on fired clay, sealed plaster, cement, and cement fondue, and on wood. They can be water-, oil-, or resin-based, and are available as spray or brush-on mediums.

Polyurethane varnishes (**1**) are oil-based and are more robust than their acrylic equivalent, although they can yellow over time. Shellacs (**2**) are resin-based and available in a number of shades, including French, button, and white polish. Acrylic varnishes (**3**) are water-based and so quick-drying. Each type of varnish will give a different finish to your sculpture, so it is a good idea to carry out your own experiments to find which type suits your work.


1

2

3

Waxes

Waxes, like varnishes, are transparent and will give your work a degree of protection. They can be applied to the same sculpting materials as varnishes, using a cloth or wire wool, before buffing up to a soft sheen.

Antiquing wax (**1**) creates a warm, antique look, while clear wax (**2**) affords transparent protection. Beeswax (**3**) is a traditional wax that adds a luster, and gilding wax (**4**) gives a metallic finish. Liming wax (**5**) imitates bleached wood by leaving a film of white in the grain, and other colored waxes are also available. As with all finishing materials, it is worth experimenting with the different waxes to discover which you want to use.

Boot polish

Boot polish can be applied to sculptures made from clay, plaster, cement, or cement fondue, using a shoe brush, and polished with a cloth to enliven the surface.

Iron paste

This product is used ostensibly to revitalize cast-iron fireplaces and cooking ranges, and is available under a variety of brand names. It is an extremely useful coloring material for sculptures made from clay, plaster, cement, or cement fondue, and produces an interesting matt sheen.

Polyester resin pigments and fillers

The color of a sculpture made from polyester resin is dependent on the specialty pigment or filler mixed into the resin for the gel coat. There is a good range of transparent and opaque colored pigments available, and fillers include metal and stone varieties, such as copper, brass, and bronze, and marble, onyx, and slate.

Oil

Finishing oils—including tung oil, Danish oil, and teak oil—are colorless, protective finishes for wood. They are generally applied using a cloth, and a wood sculpture will benefit from further applications from time to time.

Wood stain

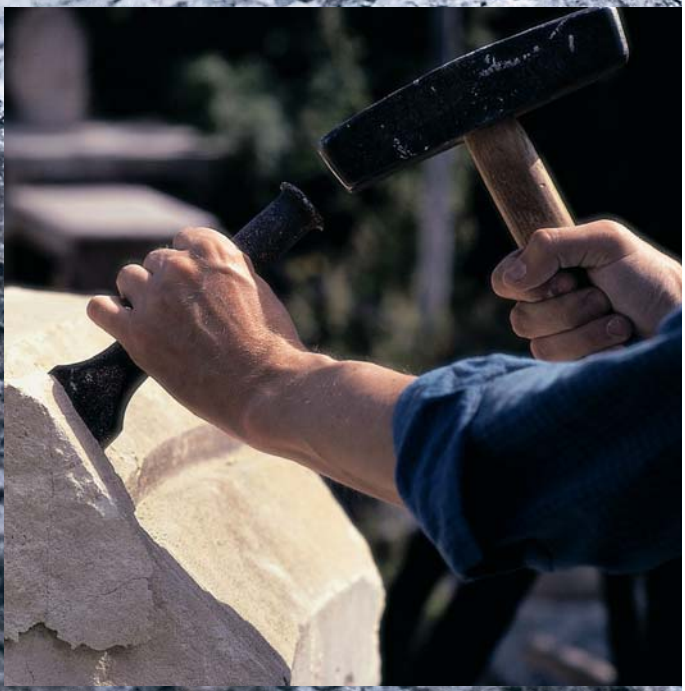
Wood stains are absorbed by the wood to a certain degree, and so enhance the grain. They are available in a range of colors, from traditional wood shades to brighter hues such as blues and greens.

Thinners

Thinners are used to adjust the consistency of oil-based paints and varnishes, as well as for cleaning up. They include mineral spirits (**1**), denatured alcohol (**2**), linseed oil (**3**), and turpentine (**4**).

Finishing tools

The tools you need to apply your surface finishes depend on the mediums used. Artists' and household paintbrushes (**1**) may be all you need, although a varnishing brush (**2**) can be a useful investment. A good-quality soft brush (**3**) must be used for glazing. A toothbrush (**4**) will enable you to push the finishing medium into awkward places, and wire brushes (**5**) make a good application tool when using boot polish. For waxes and wood stains, use a lint-free cloth (**6**).



Chapter Two

TECHNIQUES

Preliminary planning

Knowing where to begin is a common problem faced by sculptors, but there are ways to help you get started. Some decisions need to be preplanned, while in other instances the technique itself determines the final form. You may prefer to start a sculpture by simply manipulating your material, an activity that can be a catalyst to generating ideas.

Inspiration

Sources of inspiration for sculpture are many and varied, from naturally occurring phenomena to other people's work. Study the items that inspire you in terms of shape, texture, possible meanings, and expression of emotions, and you will soon be able to adapt an existing concept to fulfill your sculptural aims.

Sketches

Sketches are, of course, two-dimensional, where sculpture is three-dimensional. However, they can be used to help you understand and develop the form you wish to sculpt. Sketches of the human form will help you to understand poses and various body parts, and if you always carry a sketchbook, you can make an instant record of objects or events that present sculptural possibilities for you.

Drawings

Detailed drawings of the proposed sculpture can be extremely useful in terms of planning its various forms and the way they relate to each other, and in order to view the intended work from various angles. Carving is an especially problematic technique in terms of getting started, and back, front, and profile drawings of the sculpture will help you to visualize how a shape will fit into the block of material to be carved. They can also be transferred to the faces of the block to guide the carving process.

Maquettes

A maquette is a small-scale model of the final sculpture, which can be turned around and viewed from top, bottom, and sides as you work on the final piece. A maquette does not need to be an exact model of the final work, since its main job is to keep the form in your mind's eye and serve as a visual aid to modeling or carving. Although maquettes are usually modeled from clay, you can make one using any material that you feel represents the final sculpture.

Lay figure

An essential item for any artist interested in sculpting the human form is a lay figure. It provides a constant reference to the basic proportions of the human body, and can be manipulated into any number of poses and viewed from all angles.

Solid modeling

Modeling is an additive process, in which the form of the sculpture is developed by molding and adding material. Small models or sculptures can be modeled from solid lumps of a malleable material, such as clay or modeling wax, using the hands and fingers to manipulate it into the desired shapes, and a modeling tool to define those shapes. The aim is to work within the confines and limitations of the material, choosing a shape that is easy to model and self-supportive.

Solid modeling with clay

In this example, air-drying clay is used, so the sculpture does not need firing. Small solidly formed clay sculptures can be fired, but it is important to ensure that the clay has been thoroughly kneaded to remove all air bubbles, and that the elements used are all of a roughly similar thickness, to ensure that cracking does not occur as the clay dries.

1 Roughly pummel a lump of clay into a cube and consolidate the shape by dropping each side alternately onto the work surface.

2 Roll out a slab of clay to form the base. To join the two clay elements, first use a knife or fork to score the underside of the cube and an area of the base. Moisten both areas with water or clay slip.

See also
Clay, *pages 12–19*

3 Push the cube down onto the base and twist it round so that excess water is pushed out. Run a modeling tool around the junction of the cube and base to blend the edges together.

4 Use the palm of your hand to roll two sausages of clay for the model's legs. Bend the legs at right angles at the knees and bend a segment at right angles for each foot. Use the scoring and wetting method to join the feet to the clay base and the top of the legs to the cube.

5 Join a cylinder of clay to the top of the legs and the cube seat to form the torso. Bend it slightly forward.

6 Use a modeling tool to shape the rounded forms of the legs, and add small pieces of clay to model the buttocks.

7 Use the modeling tools to shape the front of the torso and add rolled clay for the arms. Take a ball of clay for the head and use your hands to mold it into a basic oval shape. Join this to the torso and cover with a thin slab of clay for the hair.

8 Use the modeling tool to finalize the shape of the sculpture. Reduce the clay around the legs by slicing it away, and model a simple foot shape. Here a book has also been added.

9 Blend the clay in the hair by smoothing over with the modeling tool. Add small pieces of clay to give more shape to the shoulders and arms.

10 When you are happy with the results, leave the sculpture to dry out, following the clay manufacturer's advice. You can now use a knife to cut away small lumps of clay or inconsistencies in the surface.

Solid modeling with modeling wax

Modeling wax is like clay in the way it handles. The block it comes in looks hard and brittle, but it is easily cut with a knife and requires only the heat from your hands to knead it into a malleable modeling material. Left alone, it quickly cools and acquires an inherent strength. Modeling wax has the ability to retain the marks and impressions of the modeling process, which can be useful when conveying expression and emotion.

1 Use a kitchen knife to cut off thin slabs of wax from the main block, then start to knead the slabs in your hands. The heat from your hands quickly makes the wax soft and very easy to manipulate.

2 Using your hands, model the wax into a basic head shape and roll out sausages to make the arms and legs. Form the torso, using more wax here than with the other elements. Gently knead the areas of wax to be joined until they become soft, then push them together and blend the wax until the pieces join.

3 Add small pieces of wax where needed to give the figure more of an identity. Pinch the end of each leg, let the wax soften, and bend it at right angles to create feet.

4 Model the chest, arm, and leg muscles. As you turn the figure around in your hands the wax will become especially responsive to your touch, and can be easily shaped and manipulated.

Hollow modeling

Hollow modeling is a technique for making clay sculpture that is hollow throughout, using slabs of clay or pinched pots. Working with a hollow rather than solid form is necessary when a clay sculpture is so large that drying out would take too long or cause cracking.

It is important that all elements of a hollow sculpture are kept at the same degree of dampness for each stage of work, and no part of the sculpture should be allowed to dry out before any other. The sculptor should also bear in mind that uniform wall thickness is the key to minimizing stresses in the clay during drying and firing.

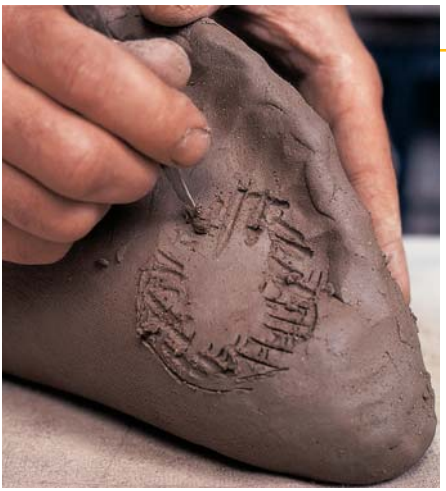
1 Roll out a slab of clay. Curl the slab up to form a hollow tube and pinch the edges together to form a seam.

2 Hold the tube upright and draw it down with your other hand to narrow and lengthen it into the required shape—in this case a leg.

See also
Clay, *pages 12–19*

3 Make all sections of the sculpture in the same way and leave them to dry to the leather-hard stage.

4 Hold the pieces in place and make marks on the clay with a knife to locate the joints.



5 Roughen the clay surface at all the joints by scoring with a knife or fork to provide a key for adhesion.

6 Paint clay slip over the roughened surfaces to act as an adhesive.

7 Lay a small roll of clay along the marked joint. This can be used to model around the seam lines.

8 Press the preformed shapes into place and smooth clay over the joint to secure the sections.

9 Fit all the pieces together in the same way to construct the basic shape of the model.

10 Use your fingers and modeling tools to seal over all the cracks and smooth the surface joints, adding small amounts of clay where necessary.

Help with shaping and supporting

To make a uniform hollow shape you can wrap your slab of clay around a tube, such as some pipe or doweling (**1**), while newspaper (**2**) stuffed into the hollow will barrel out and support the shape until it is ready to be joined to the other elements.

1

2

Pinched forms

These seedpod sculptures have each been modeled by joining together two pinched pots, followed by a little shaping with hands and modeling tools.

Surface modeling

Surface and texture in sculpture are as important as shape and form, and the way a surface is defined determines how well the viewer can make sense of the sculpture's form.

Modeling texture on the surface of clay sculptures can involve using modeling tools, the hands, or found objects, and building up a collection of objects with interesting surfaces, textures, or shapes will prove useful when you come to plan your work. It can also be useful to collect examples or pictures of your subjects so that you can study particular textures.

Using fingers

A particular texture can be built up by applying clay additions, which need to be thoroughly smoothed into the main body of the sculpture.

1 Here small rolls of clay are added to the wing tips of a model to form the primary feathers. Overlap the rolls and flatten them with your fingers to form feathered edges.

2 To create the downy feathers on the shoulder edge of the wing, add small pads of clay and gently press them in with your thumb.

See also

Clay, *pages 12–19*

Using modeling tools

The various shapes and sizes of modeling tools can be used to make any number of marks and indentations in soft clay.

1 Here a modeling tool is being used to mark the spiral rings on the surface of a shell form and indent the ridges.

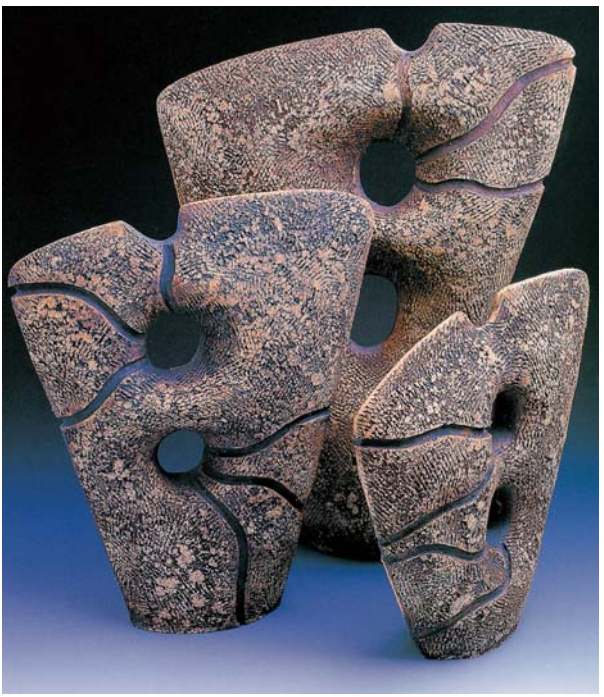
2 Work across the spiral ridges with another tool to create indentations.

Texturing with cloth

The texture of a horse's hide can be made by placing a piece of damp, coarse scrim or open-weave cloth on the soft clay and rubbing it with fingers.

Using homemade tools

Clay forms, such as these wing samples (right), can be textured using a variety of tools, including found objects and commercial or homemade stamps made from bisque-fired clay.



Using a fork

The form of these hollow-built garden sculptures is visually strong, so the surface decoration has been kept simple. Channel lines radiating out from the holes were carved into the clay using a modeling tool, while a forked tool was pulled through the clay in varying directions to texture the surface.

Armatures

Common modeling materials, such as clay, plaster, or papier mâché, lack any inherent structural strength, which limits the size and form of sculpture you are able to make with them, unless you use an armature. In sculpture, the armature supports an outer covering of a malleable medium, performing the same function as bones in a body.

An armature can be used as a temporary or permanent support structure. A temporary structure, such as a balloon armature in a clay bust, must be removed before the sculpture can be fired, whereas an armature as a permanent fixture remains inside the finished sculpture—for example, if plaster or papier mâché has been directly modeled onto it.

A close relationship exists between the armature and the final sculpture, so it is especially important that you plan it carefully.

Making a balloon armature

This configuration holds together the mass of clay that forms the basis of a head.

1 Screw two small slats of wood on opposite sides of the bottom of a wood or plywood board. Raising the base board up in this way allows you to move the armature easily. Drill a hole in the center of the board to take a long, sturdy screw.

2 Use wire cutters to cut two pieces of aluminum armature wire about 12 in. (30cm) long. Using a hammer and netting staples, fix one end of one length of wire to the end of a wooden post.

See also
Making armatures *page 40*

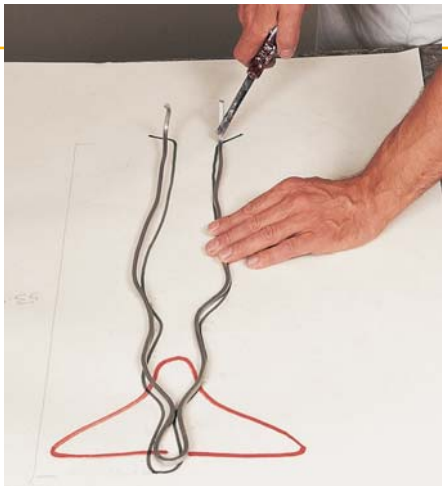
3 Bend the wire around in an even curve and use more netting staples to fix the other end to the post.

4 Fix the second length of wire to the post in the same way at right angles to the first.

5 Drill a hole in the center of the base of the post, slightly smaller than the hole drilled into the center of the base board, and screw the post to the upper side of the board using a large screw. If the clay is likely to come into contact with the base board, it should be treated with three coats of shellac, allowing time to dry between coats. This prevents the board from drawing water out of the clay, causing it to crack.

Making a figure armature

For small-scale, complex sculptures, aluminum wire can be bent into shape to make a good framework on which to build.



1 Using a sketch if preferred, bend the aluminum wire into the proposed design. It is useful to remember that the fewer joins there are, the stronger the armature will be, so aim to use a minimal number of lengths of wire.

2 Use binding wire to fix the joins of aluminum wire. Holding the two pieces of armature wire securely in position, wrap a short piece of binding wire around them. Twist the wire round once with your fingers, then, using pliers, grab the two ends of the binding wire and pull and twist both pieces as tightly as possible. This produces a very secure fixing.

3 Screw a fixed iron support—also known as a back iron—securely to the base board. Use binding wire and the twisting technique to attach the armature to the support, making sure the base of the wire armature is at least ½ in. (1.5cm) above the base board.

4 Use wood or polystyrene to pad out and strengthen the armature where necessary, securing it in place by wrapping binding wire tightly around it. Wood works well as a filler when modeling with clay because it absorbs water from the clay and expands, exerting an outward pressure on it.

5 Finally, wrap binding wire loosely around the entire armature to help the clay grip. The wooden base here has been treated with three coats of shellac, allowing each coat to dry before applying the next. This stops the board drawing water out of the clay, which causes it to crack.

Armatures for direct modeling

With direct modeling the armature remains in the finished sculpture, so you don't want a fixed iron support sticking out. A wire armature can be fixed to its wooden base using netting staples, and if it needs extra support glue doweling or bamboo cane to the base and fix the armature to the support using binding wire.

Modeling clay on an armature

Clay that is modeled on an armature can be used to make a mold for further casting, or it can be carefully cut when leather hard and the armature removed, before the clay is hollowed out, ready for firing.

Learning to model with clay on an armature can be frustrating, because the clay has no resistant form of its own and has a tendency to sag, which leads to distortions. One of the keys to developing control of the clay is to practice building outward from the armature with fairly definitely shaped rolls, strips, or blocks of clay, working toward the final surface gradually and all over.

1 If you are planning on firing the sculpture, rather than using it as a model for moldmaking, cover the armature with plastic wrap or a plastic bag. This not only stops the clay from sticking to the armature, making it easier to remove later, but also prevents the wood of the armature absorbing water from the clay and drying it out, which can lead to cracking.

2 Build out from the armature with large lumps of clay, pressing firmly around the stem and filling in the rounded shape.

See also
Clay, *pages 12–19*
Armatures, *pages 61–64*
Firing, *page 69–71*
Moldmaking, *pages 72–78*

3 Give the model volume and basic form by patting on thick rolls of clay, rounding out the shape.

4 Work over the surface with your fingers, drawing the clay rolls together into a single mass. Continue to rough out the model with your fingers before adding detail. Aim to develop the rhythm and contour of the form.

5 Add more clay to the surface and start to define the features, using your hands and modeling tools. Use a modeling tool to work into particular areas, adjusting the forms by scraping off or adding clay.

6 Draw into the clay surface with a modeling tool to develop texture, observing the subject closely as you work.

7 Work continuously over the whole form, adding detail and bringing up characteristic lines and shapes.

8 Details can be developed by adding small rolls or dabs of clay and modeling them into the surface. Keep the texture active without losing coherence in the form.

9 Continue in this way, working over the piece as a whole, until you are satisfied with the results. There are no hard-and-fast rules in clay modeling. The skills are best acquired with practice, adapting techniques to suit the result you want to achieve.

Work in progress

If an unfinished model is to be left for a long period of time it needs to be kept damp in order to remain workable.

1 Begin by using a plant mister to spray the model all over with water.

2 Wrap a damp towel around the model, taking care not to damage any of your hard work.

3 Cover the whole thing with a large plastic bag and tie it tightly around the base.

Firing

Once a clay sculpture has been allowed to dry thoroughly—which can take weeks—it will keep its shape, but it is still brittle, and if soaked in water it will collapse back into a liquid slip. To make a clay form permanent it must be fired, which means baking to a high temperature in a kiln. The firing heat removes all water from the clay and converts it into a form of stone. The higher the firing temperature, the more stone-like the clay becomes.

Not all clays are capable of withstanding very high firing temperatures, so always check the advice given by your clay supplier.

Kilns

The techniques of firing are many and varied, and the equipment expensive. From a sculptor's viewpoint, cultivating the friendship of an experienced potter is an excellent approach, otherwise you may be able to hire kiln time at a local craft center or college.

If you find that you are doing a lot of firing, it may be more cost-effective to buy a kiln. Think carefully about the size of pieces you usually fire, and how often you do so, then select a kiln that is neither too large nor too small for the required amount of use.

See also
Clay, *pages 12-19*

Bisque firing

It is not unusual for clay to be fired in two stages. The first stage is the bisque firing, also known as biscuit firing. Bisque firing releases the chemical water from the clay and so hardens it. The technique strengthens the clay, making it hard enough to glaze, paint, polish, or wax without damaging it. The key to bisque firing is slow heating, and, of course, being aware of the firing range of your clay.

1 After bisque firing, prominent features may appear darker than recessed areas. This is because the iron in the clay has been worked to the surface by the action of the hands and modeling tools.

2 The darker features will be eradicated when color is applied. Here, a red tile polish gives an excellent finish to smooth terra cotta.

Hollowing in preparation for firing

An armature cannot be left inside a clay form during firing, and large, solid clay forms will be heavy and take a lifetime to dry out enough to fire. Therefore, once the form has been satisfactorily modeled, it is left to dry to leather hard, before being carefully hollowed out.

1 When the model is leather hard, use a knife to mark a seam line that will allow you to cut it into two sections. If the clay has been modeled up to the base, use the knife to cut it loose here.

2 Use a cutting wire to cut through the solid clay model, following the seam line marked in Step 1. Pull the two sections apart and away from the armature, and place them on a wooden board or some upholstery foam for cushioning. Use a wire-loop tool to hollow out the inside of each section.

3 The remaining clay wall for each section should be of the same thickness, about 1–1½ in. (2.5–3.5cm).

4 Use the knife or a fork to roughen the seam lines, and paint on some clay slip.

5 Press the two sections together, matching the seams exactly. Wipe away any surplus slip and model fresh clay over the seam to conceal it.

Moldmaking

Many sculptures are made by modeling the form in clay, then casting it in a more durable material. To make the cast you first need to make a mold.

A mold is a negative impression of the original sculpture, which enables you to produce another positive—the cast.

Two types of mold, both made using plaster, are illustrated here. Reusable molds are used for making repeats of simplified forms, while waste molds are necessary when the complexities of the form or the material to be cast mean that the mold has to be broken to release it.

Making a two-piece reusable mold

A reusable mold can be used to make multiple repeats of a single form in clay. However, to make a plaster reusable mold the form does need to be kept simple. This mold uses a human hand as the model, but the technique is exactly the same for a clay model.

1 In this case a hand has been greased with petroleum jelly and embedded in a slab of clay. If you are using a clay model, allow it to dry to leather hard and position it on a smooth work surface. To keep the liquid plaster enclosed while it sets, build a clay wall around the model. Smooth rolls of clay around the base of the wall to make sure the wall is fixed securely to the work surface.

2 Mix up some plaster and drop it over the model to form a smooth coating.

See also
Plaster, *pages 20-23*
Casting, *pages 79-87*

3 Build up the mold with more plaster to completely cover the model and fill the area inside the clay wall. Allow the plaster to set.

4 Strip away the clay wall and check that the model can be released from the mold. Use a knife, chisel, or modeling tool to cut location keys into the set plaster, between the wall position and the model position.

5 Return the model to the mold and turn it over. Rebuild the clay wall and apply a clay slip to the exposed plaster to ensure that the mold halves will come apart easily.

6 Build up the second half of the plaster mold in the same way as the first half.

7 When the whole mold is set, gently tap along the seam line with a chisel to separate the two halves.

8 The finished mold contains a highly detailed impression of the original model, with location keys to aid alignment of the mold when casting. Because you have made a reusable mold, the plaster must now be allowed to dry out completely.

Supporting a clay model

Here, a clay wall has been attached all around a clay model, similar to the technique of using brass fencing (see Making a Two-piece Waste Mold, opposite). Clay is used to fix the model to a wooden base, and a clay support holds it horizontally. Plaster can now be dropped onto the model and the process of making a two-part reusable mold continued as usual (see above), removing the clay wall before turning the model over to make the second part of the mold.

Making a two-piece waste mold

A waste mold can only be used once, because it is broken up during the process of releasing the cast. This is the type of mold you will need to use if your sculpture is fairly complex, or if you plan to cast with polyester resin, cement, or cement fondue.

1 Use a knife to mark a dividing line at the halfway point all around your clay model. Cut brass fencing into shims of about 2 x 1 in. (5 x 2.5cm). Insert the shims into the cut line so that they rise by about ¾ in. (2cm) above the surface of the clay, making sure they overlap slightly so there are no gaps between them.

2 To make registration points for lining up the two halves of the mold, bend three shims into "V" shapes and position these along the line, one on top of the model and one on either side.

3 Continue inserting shims all around the model, using slimmer shims where necessary to move around curved shapes. Trim the shims with scissors to establish a consistent height of ¾ in. (2cm) above the surface all around the model.

4 Mix a small quantity of colored plaster. When you are breaking down the mold with a cast in it, this colored layer, immediately adjacent to the surface of the cast, will tell you that you are getting close, and so warn you to go carefully. To apply a reasonably thin coat, flick the plaster onto the surface quickly, before it sets, using a hard flicking gesture to ensure no air pockets form.

5 Cover one whole side of the model with the colored plaster. In any areas inaccessible for flicking, pat the plaster on tightly. Plaster can be blown into areas that are particularly hard to reach. Now apply a thin, colored coat of plaster to the other side of the model, and clean off any plaster from the tops of the scrims before it has a chance to set.

6 Using an uncolored mix of plaster now, start to build up the mold case. The thickness is determined by the height of the shims and must be consistent throughout, including on high points.

7 While the plaster is still wet, work over the details of the model, making sure there is no trapped air in the plaster that could weaken the mold.

8 As the plaster starts to set it will stiffen, and you can apply larger amounts, building up the thickness of the mold more quickly.

9 Compact the plaster onto the surface to prevent air traps, and push plaster up to the shims without covering the tops. Then quickly add more plaster, compacting it tightly and moving away from the shims, continuing around the model and maintaining an even thickness.

10 With one half of the mold complete, and while the plaster is still not set, use a knife to scrape carefully along the tops of the shims and mold case, so that the top edges of the shims are revealed.

11 An even thickness of the mold case gives it a consistency of strength. Now add plaster to the other side of the model, making sure it is well compacted and of a consistent thickness.

12 When both sides of the mold are complete, scrape along the seam that separates the two halves to reveal the top edge of the shims. Now use a knife to cut a bevel in the plaster on either side of the shims, all around the mold.

13 Use pliers to carefully pull out the shims, gripping them firmly while pulling at the same time. The shims should come out relatively easily.

14 Place the mold under a running faucet, directing the water so that it runs down the slight gap left by the extracted shims. Turn the mold occasionally so that water runs evenly around it. Soon the mold will start to separate, and as it does so, gently pry the two halves apart. Take care not to apply too much pressure.

15 Clean out the clay from inside the mold, using a wire-loop tool as you get closer to the inside surface of the mold, and a toothbrush, where necessary, to remove pieces of clay lodged in awkward crevices. Depending on the material you will be casting in, a waste mold can be used in its current, still-wet state, or completely dry. Use a wet mold with cement, cement fondue, and plaster, and a dry mold with polyester resin.

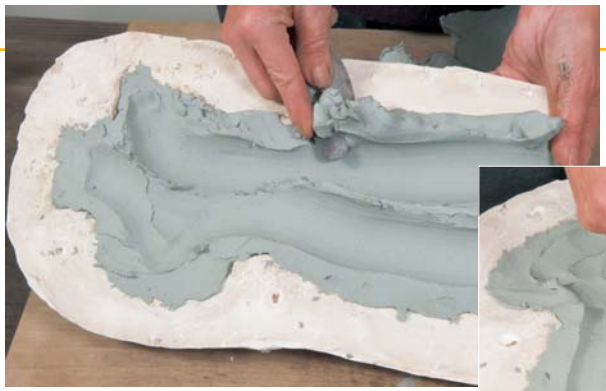
Casting

The casting process makes copies of a sculpture, and relies on the use of a mold. Usually the sculpture is modeled in clay, then cast in a more durable material. Alternatively, a reusable mold can be made to cast the same form in clay multiple times.

The following pages show you how to make casts using clay, cement fondue, and polyester resin. For advice on using plaster and cement, refer to the Relief section on pages 104–115.

Casting clay in a reusable mold

Casting clay in a mold allows you to produce a hollow sculpture suitable for firing. Remember that a reusable plaster mold should be allowed to dry out fully before casting.



1 Firmly press soft slices of clay, about ⅜ in. (1cm) thick into one half of the mold, making sure it is not too thin over any ridges. Use a modeling tool to level the clay at the edges of the mold. Repeat the process with the other half of the mold.

2 Use a fork or knife to roughen the clay seam edges, then wet them ready for joining.

See also
Clay, *pages 12-19*
Moldmaking, *pages 72-78*

3 Place the two halves of the mold together, aligning the registration points, and press together well. Secure the mold by tying around it with string, and leave overnight to allow the clay to become leather hard.

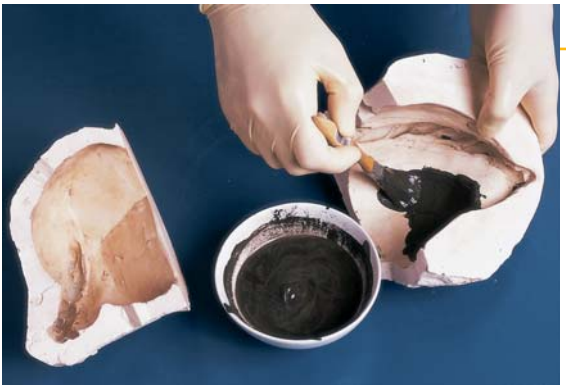
4 Untie the string and remove the cast from the mold. To reinforce the seam, scratch and wet it, then smooth on a small roll of clay.

Casting cement fondue in a waste mold

Using a laminating technique with cement fondue and fiberglass matting, you can produce a hollow cast that is lightweight but extremely strong. Due to the nature of the casting material, the mold must be broken down to release the sculpture.

1 Soak a two-piece plaster waste mold in water, or use it soon after making it, while the plaster is still wet. A dry plaster mold will suck water from the cement fondue, preventing it from setting properly. Mix a generous teaspoon of soft soap in a small amount of water and brush this into the surface of the mold, working it up into a lather. Leave to dry, then apply a second layer.

See also
Cement and cement fondue, *pages 24-25*
Moldmaking, *pages 72–78*



2 Mix up the required amount of cement fondue. Take a small amount of the mixture and add more water to it to produce a slurry with a creamy consistency. Using even strokes, paint the slurry onto the interior surface of the mold, keeping the seams of the mold clean.

3 Take up a thumb-size lump of the first cement-fondue mix. Starting from the edge of the mold, place it on top of the slurry and push it firmly down, so that a small mound of slurry is pushed out in front of the mix.

4 Continue in the same way to cover the whole surface of the mold to a depth of ⅛ in. (3mm). Use a chisel to trim off the cement fondue along the seam of the mold.

5 Use a damp sponge to clean the edges of the mold, making sure that no cement fondue is left on the seam. Repeat the whole process with the other half of the mold.

6 Cover both halves of the mold with a damp cloth and leave the cement fondue to cure for 24 hours.

7 Make a fresh mix of cement fondue slurry and paint this onto the first layer of cured cement fondue, again taking care not to get any on the seams of the mold.

8 Use scissors to cut strips of fiberglass matting, enough to cover the interior surface of the mold twice. Fully immerse a strip into the slurry and bring it out, squeezing off any excess.

9 Lay the fiberglass matting down on the slurry in the mold. Continue coating strips in slurry and laying them in the mold, overlapping the previous strip and going right up to the edge of the mold.

10 Holding a paintbrush vertically, firmly tamp down the fiberglass matting to ensure that it is fully impregnated with slurry and to push out any trapped air. Repeat Steps 7-9 to coat the other half of the mold with slurry and fiberglass matting. Wipe the seams clean, then cover both halves of the mold with a damp cloth. Leave for 24 hours to cure.

11 Fit the two halves of the mold together using the registration points. If they do not fit snugly, use a rasp to bring the cement fondue level with the edge of the mold. Tie the two halves firmly together.

12 Cut strips of fiberglass matting 2 x 1 in. (5 x 2.5cm) and make a fresh slurry mix. Paint the slurry 1 in. (2.5cm) on either side of the join. Soak a strip of fiberglass matting in the slurry and place it across the join at one end. Continue by overlapping fiberglass strips along the length of the join. Cover with a damp cloth and leave to cure for another 24 hours.

13 Use a chisel and mallet to gently break off the plaster mold from the cast. You will find it comes away easily. There will still be areas of the sculpture impregnated with plaster, and a slight bloom on the surface. Place the sculpture under running water and clean with a scrubbing brush.

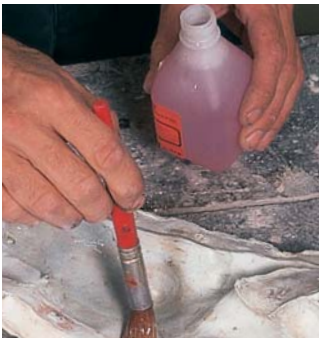
Cement fondue in an enclosed mold

When a mold encloses the cement fondue completely, the seams cannot be joined using the fiberglass matting technique (see step 12, page 83). In this instance, apply cement fondue slurry to the edges of all sections of the mold, then position the mold pieces together. This seam cannot be reached from the inside, so is a squeeze join, where the cement fondue bonds by pressure on the mold sections. Tap the mold pieces together with a mallet, then tie or strap them securely during the curing period.

Casting polyester resin in a waste mold

It is difficult to distinguish between a cast made from polyester resin and bronze filler and a sculpture actually cast in bronze, except that the latter is much lighter. The hollow resin cast is built up in layers, using a combination of resin and fiberglass matting, known as laminating.

The temperature of your work area will affect the length of time it takes for the resin to cure. A higher than average room temperature will make the resin set quickly, and it will set more slowly in a low temperature. Try to avoid working in a draft or a damp atmosphere.



1 When making a cast with resin, the mold needs to be absolutely dry, because water prevents the resin from curing properly. Generously paint the surfaces of the mold with a water-soluble release agent, as recommended by the resin manufacturer. Do not let the release agent collect in pools. Leave to dry.

See also
Polyester resin, *pages 26-27*
Moldmaking, *pages 72–78*

2 Mix a small amount of the colored gel coat of polyester resin and add the required amount of hardener, following the manufacturer's instructions. Paint the gel coat onto the interior surface of the mold, working as quickly as you can. If any resin gets onto the seam clean it off immediately, before it has a chance to cure. Apply a thicker layer of gel coat to detailed areas to ensure that all of the detail is captured. Apply gel coat to the other parts of the mold and leave to cure for the time recommended by your product's manufacturer.

3 Cut fiberglass matting into strips, enough to cover the surfaces of the mold twice. Weigh out a small amount of resin and add the required amount of hardener. This resin coat does not contain any color. Working systematically, coat a small area of the cured gel coat with resin, then lay down overlapping strips of fiberglass matting in the resin, as soon as you have painted it. Allow the matting to soak up the resin.

4 Apply more resin to the matting, using a hard, vertical action with the brush to ensure that it is pushed well into the matting. Continue in the same way to cover the surface of the mold. Apply two layers of matting: you can add the second layer before the first one has cured.

5 Apply a thick bead of gel coat along the seam of the cast for each section of the mold, making sure you do not get any of the mix on the mold seam.

6 Join all parts of the mold together and tie securely. Leave for at least 24 hours to allow the resin to cure.

7 Soak the mold in water overnight to dissolve the release agent, then start to chip away the plaster from the cast with a chisel. Take extra care when you reach the colored layer of plaster, so as not to damage the cast.

8 Use a pointed tool to remove plaster from awkward cavities or areas that are too small to be reached with the chisel.

9 Trim off the excess matting where necessary.

10 Use a riffler to level off the raised areas of resin where the two halves of the mold were joined

11 Gently rub the surface of the sculpture with a wire brush to break through the resin and reveal the bronze coloring.

12 Rub over the whole sculpture with wire wool to buff up the bronze.

Direct modeling

Two important factors set direct modeling apart from the traditional sculptural practice of modeling. Primarily, the material that you choose to model with is also the final material of the sculpture. Secondly, the armature to which the material is added is a permanent structure and remains within the sculpture.

The material that you use for direct modeling needs to be resilient and strong enough to last in its final state, while being malleable and plastic enough to model. Plaster and papier mâché are good examples, and mud and straw, a hard-wearing building material, is malleable when wet but strong when dry, so is also perfect for this technique.

Direct modeling with plaster

The armature for direct modeling needs to be a strong, rigid construction that will not deteriorate. The one shown here was constructed from steel, so shellac has been coated over it to prevent rusting that would bleed through the plaster. This is not necessary when using an aluminum armature.

1 Pack out the armature so that it starts to resemble the finished form. This reduces the amount of plaster you will need to use and makes the sculpture lighter. You can easily shape polystyrene foam for this purpose using a wire brush.

See also
Plaster, *pages 20-23*
Armatures, *pages 61–64*

2 Cut up strips of scrim and mix up a small amount of plaster. Dip a strip of scrim into the plaster until fully impregnated, then quickly lay it flat on the armature, starting at the top. Alternatively, dip ready-made plaster bandage in water before positioning.

3 Cover the whole sculpture with plaster-impregnated bandage, taking special care when wrapping it around the thinner elements of the armature, where it will tend to bunch up. Keep the bandage smoothed out, then, when this has set, turn the sculpture upside down to lay plaster bandage on the underside.

4 Mix up another quantity of plaster and allow it to set to the consistency of cream cheese. Using a plaster modeling tool, apply it to the sculpture quickly, until completely covered. You only have a short time to work with the plaster before it becomes too stodgy to manipulate.

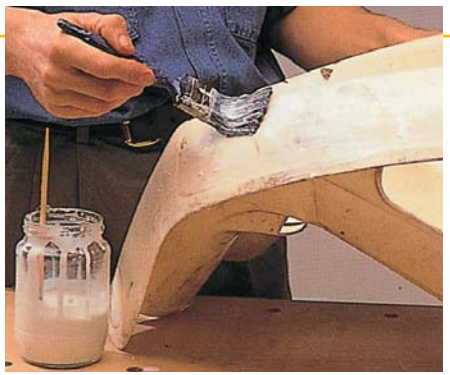
5 Use more plaster to gradually build up the shaped areas of the sculpture and develop the form. Check the result from all angles and make adjustments where necessary.

6 When the plaster has set you can shape the form further using knives or modeling tools. To correct any undulations or imperfections, apply a small amount of plaster and let it set before scraping it back to the required shape.

7 Finally, smooth over the whole surface with a rasp.

Direct modeling with papier mâché

The armature for this sculpture is a found object, chosen for its interesting sculptural possibilities. However, this does not mean the sculpture has a predetermined form. It can be developed further during the modeling process.



1 First mix up some papier mâché, then dilute some craft glue following the manufacturer's instructions. Apply the glue to the underside of the armature, working on a small area at a time.

2 Start adding small quantities of papier mâché, a little at a time, to the area treated with glue.

3 Press the papier mâché firmly onto the surface of the armature, blending each application in with the adjacent mix.

4 Continue adding craft glue and papier mâché one area at a time. When the underside is complete, allow it to dry before turning the armature over. Always work on a horizontal surface, which makes for easier modeling and lessens the chances of the papier mâché falling off while you are applying it.

5 When the sculpture is complete, allow it to dry out thoroughly.

6 Apply two coats of diluted craft glue, allowing the first coat to dry before applying the next, to seal the surface.

See also
Papier mâché, *page 23*

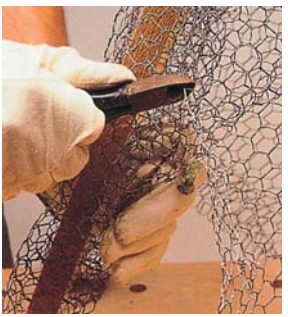
Direct modeling with mud and straw

The crude combination of mud and straw has been used as an effective building material for many years. The marriage of materials, once dry, is extremely strong and, of course, very cheap.

1 In order to successfully make an armature that will provide adequate support for the material, and whose form closely resembles the form of the proposed sculpture, first make a dummy armature by gluing together strips of wood or cardboard. This will alert you to any changes that may be necessary.

2 Nail strips of wood together to form the full-size armature. In this case it was necessary to add a small length of wood at the top of each of the front legs, so that they could be joined to the shoulder piece.

3 Wearing protective gloves, wrap chicken wire around the armature, pushing it tightly together to hold it in place. Manipulate the chicken wire all the way around so that it imitates the final form as closely as possible.



4 Use wire cutters to cut the chicken wire once it is all in place.

See also
Preliminary planning,
pages 48-49

5 Stuff the interior of the chicken-wire form with straw, packing it in as tightly as possible.

6 Add a few handfuls of straw to half a bucket of mud and mix well. The consistency of the mix should not be too dry, nor wet and runny.

7 Taking a handful at a time, pack the mix tightly over the surface of the armature, so that it integrates fully with the chicken wire and straw, especially on the vertical areas.

8 Continue packing the mud and straw mix until the whole armature is covered, paying attention to the form of the sculpture.

Carving

Unlike modeling, which builds up a sculpture by adding material, carving is a reductive process, which means that material is removed, by cutting, chiseling, and abrading, to shape the form. Once material has been removed from a block of plaster, aerated concrete, stone, or wood it cannot be replaced, therefore carving is a very disciplined activity that should be carefully planned.

It is a good idea to use a drawing or maquette to help you visualize the shape of the sculpture inside the block of material you plan to carve. Take the drawing or maquette with you when you select your carving material, and try to match your material as closely as possible to the size and shape of your planned sculpture. Your first task will be to dispose of as much waste material as quickly and efficiently as possible—known as "roughing out"—and choosing a suitable block to work from will keep this to a minimum.

Health and safety considerations

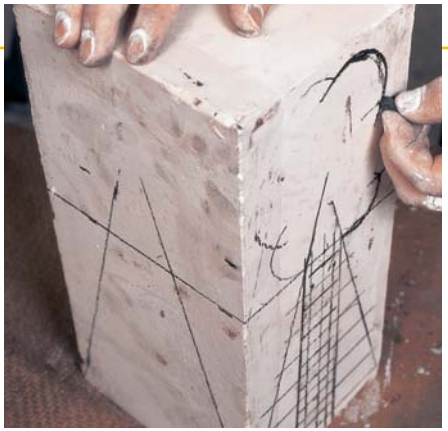
No matter what material you are carving, you will need to protect yourself from the dust created by sawing, chiseling, filing, and sanding.

- ◆ Work in a well-ventilated area.
- ◆ Wear a dust mask and safety goggles.
- ◆ Use a water spray to keep dust levels to a minimum.

See also
Preliminary planning, *pages 48-49*
Plaster, *pages 20–23*

Carving plaster

Plaster is easily carved and makes an economic material to practice on.



1 Line a cardboard box with plastic and pour the plaster mix into it. Allow the plaster to set and the heat of the reaction to cool, then turn the plaster block onto the work surface. Draw rough guidelines for the design of the sculpture onto the faces of the plaster block.

2 Using a flat chisel and mallet, rough out the basic form by chiseling away the waste material. Work in toward the center of the block to avoid breaking off the edges, and do not drive the chisel too far into the block, which may split it.

3 Once the basic shape has been established, use chisels to begin modeling the form. Carve rounded forms with a claw chisel, pushing it carefully with a small mallet and slowly developing the carving.

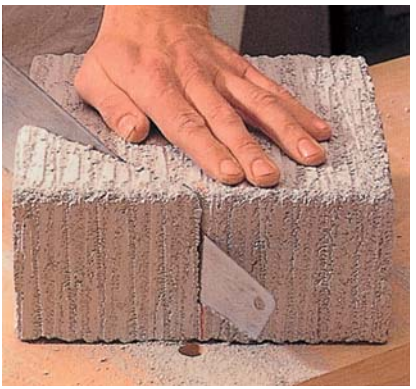
4 Plaster is not a very resistant carving material, so the chisels may be pushed with the hand rather than hit with a mallet. Continue shaping with chisels until you are happy with the final form.

5 Use plaster or surform rasps to carry out the final shaping, refining the form and eliminating chisel marks.

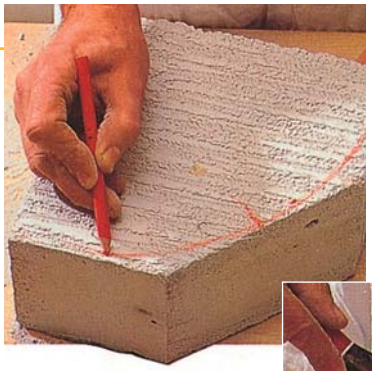
Carving aerated concrete

Aerated concrete is soft and easy to saw and shape with rasps, making it an ideal material for those new to carving to experiment with.

1 Saw a standard block of aerated concrete down to a size that is close to that of the finished sculpture.

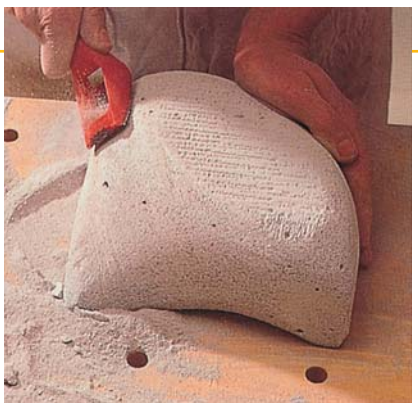


2 Saw away the waste material to rough out the basic shape of the sculpture. Hold the block firm and steady as you saw.



3 Mark out guidelines for the design of the sculpture on the faces of the concrete block.

4 Use a surform rasp to model the form, keeping the blade flat and parallel to the surface of the block. A chisel and mallet can also be used to cut away larger chunks of material if necessary.



5 The whole sculpture can be shaped using surform rasps only. When using this tool, imagine that it is your hand, which will help you to feel your way over the surface of the block.

6 For the final detail work and refinement, alternate using the surform rasp with sandpaper to shape and develop more intricate parts of the surface.

Roughing out stone

The two main techniques for roughing out stone—removing waste material to establish the basic form of the sculpture—are pitching and punching.

◆ **Pitching** The purpose of pitching is to remove excess stone so that more detailed work can begin. The pitching tool is not a cutting tool, but is shaped to strike a shockwave into the stone in order to make a localized split. A succession of blows side by side can multiply the shockwave and split a stone in two. Large corner pieces can be struck off by pitching, while smaller blows directed into the mass can help to prepare the stone for punching.

◆ **Punching** The punch is a long pointed tool that makes a series of parallel strokes along the stone. Hold the punch fairly loosely and at an angle to the stone. Make a series of blows along parallel paths so that each strike reinforces the next. Do not hit too deeply, otherwise the punch will penetrate the stone and not remove any material.

Carving stone

The process of carving stone involves roughing out the basic shape from the original block, modeling the shape further by chiseling away material, and the final stages of refining the work with rasps.

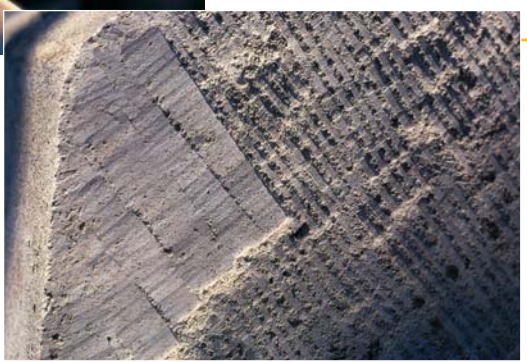
1 First clear away broad areas of stone to rough out the shape by tapping down the stone with a pitching tool and heavy hammer.

2 The initial taps weaken the stone. Hit the pitching tool hard with the hammer to split and break off sections of stone.

3 Now change to a punch and hammer to continue roughing out the shape a little more closely. Hold the punch at a shallow angle against the stone and make parallel cuts down the surface.

4 Use a claw chisel and mallet for the more refined work of shaping the stone. The claw chisel can work around a form without giving the emphasis of a series of flat planes, and leaves hatched marks on the surface.

5 Work down to the final shape using flat chisels, choosing progressively smaller tools to shape the fine details and refine the sculpture. Do not dig right into the block, and rotate your mallet to avoid undue wear on any one part.



6 Use a flat chisel to remove the claw marks and define the finished form of the carving.

See also
Preliminary planning, *pages 48–49*
Stone, *pages 28–32*

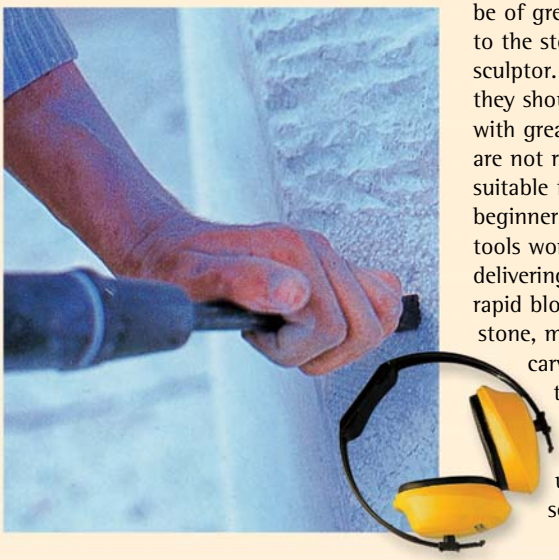
7 Use a rasp to file down the remaining chisel marks. On soft stone a rasp can also be used as a shaping tool.

8 For the final shaping and trimming of delicate work, and sharpening angles, use fine chisels.

9 To avoid cutting into the stone at the final stages, use a riffler to file down and work into the details.

10 Finish the surface by rubbing with abrasive stones, working from a coarse to a smooth grade. This work may be done wet or dry; dry is more laborious but more controlled.

Pneumatic tools



Tools powered by compressed air can be of great service to the stone sculptor. However, they should be used with great care and are not really suitable for the beginner. These tools work by delivering a series of rapid blows to the stone, making carving work that much quicker. Of especial use to the sculptor are the power hammer and power chisel, and also of some use is a power grinder and diamond grit discs. However, with these power tools the sculptor often has less sensitive control of the cutting edge than when using a handheld tool. It is necessary to wear ear protectors as well as the usual safety equipment when using pneumatic tools.

Carving wood

The processes of carving wood are much like those of carving stone. The basic shape is roughed out by sawing away waste wood, then the shape is refined using gouges and/or chisels before finishing to a smooth surface with rifflers and sandpaper.

1 Draw the basic shape of the sculpture onto the surface of the wood block and cut away as much waste wood as you can using a hand- or bandsaw.

See also
Wood, *pages 33–37*
Preliminary planning, *pages 48–49*

2 Turn the shape on its side and mark the center of the side at equidistant points all around. Join the marks up with a line all the way around the cutout shape. On either side of this line, draw another one, to give the width you wish to carve down to.

3 Making sure you don't carve too much wood away, use a mallet and gouge to carve from the top of the cutout block down to the marked lines on the side. Keep the carving consistent to establish an even curvature from the center down to the edges.

4 As the carving progresses, discard the wooden mallet and hold and push the gouge with your hands, making sure you keep both hands behind the cutting edge. Use different sizes of gouge as necessary.

5 Smooth out the curved forms using a surform rasp. You may find it easier to fix the sculpture in a vise at this point. Keep a consistent curvature from the center of each side down to the center line all the way around the shape.

6 Use a handheld gouge to carve out the finer details of the form.

7 Define and smooth over all the surfaces with rasps or rifflers: rasps for larger surface areas and rifflers for smaller sections and details. Then use the riffler all over to eliminate the gouge marks and undulations in the surface.

8 To finish, sand the surface, starting with a coarse grade of sandpaper and working through the grades to a fine one, until you have a smooth surface all over.

Relief

A sculpture in relief is not totally "in the round," instead the forms project from a flat surface. Relief can be low (*bas*) or high (*haute*), depending on the distance between the highest point of the sculpture and the ground from which it rises.

Relief sculptures can be modeled or carved, and moldmaking and casting techniques can also be employed.

Modeling in relief

A clay slab is the starting point for relief modeling, to which raised shapes are pressed and smoothed into place.

1 Roll out a slab of clay and use a sharp modeling tool or knife to mark your design in the clay. Shape a small piece of clay to form the first element of the raised design, then scratch—using a knife or fork—and wet the clay slab where this element is to be positioned. Press the clay shape into position. Continue adding the raised elements in the same way.

2 Refine the modeling and detail with small modeling tools. Ensure that there are no undercuts by working the tool outward from the top of the raised element into the clay slab.

See also

Clay, *pages 12-19*
Plaster, *pages 20–23*
Moldmaking, *pages 72–78*
Casting, *pages 79–87*

Undercuts

If you plan to make a reusable plaster mold from a clay relief model, it is important that you avoid making undercuts on the clay model. An undercut is a shape that has an overhang or concave profile, and if a clay model features undercuts the liquid plaster will flow around and underneath them and become trapped. When the mold is set, it is likely that the trapped pieces of plaster will break off from the mold when you release the clay model or the cast.

This smooth shape has no undercuts, so a reusable plaster mold can be made from it.

This shape features undercuts that liquid plaster will get trapped in when making a mold.

Making a reusable relief mold

A reusable relief mold can be used to make repeats of the relief in clay, as long as the model is kept simple. A clay wall is built around the model to keep the liquid plaster enclosed as the mold sets.

1 Cut a slab of clay into four strips and position the slab walls around the relief model, with a gap of about 1 in. (5cm) between the model and the walls. Position a thick roll of clay around the outside of the walls to secure them in place. Paint clay slip over the exposed work surface to help release the set plaster later. Mix up some plaster and pour the liquid over and around the relief model.

2 Agitate a flattened hand gently over the plaster to raise any air bubbles. Leave the mold to harden.

3 Remove the clay wall, then turn the mold over and carefully pull away the clay model, using your fingers rather than a modeling tool, to avoid damaging the mold. Allow the plaster to dry out completely before using it to make clay casts.

Making a waste relief mold

When the clay relief model is reasonably detailed or complicated, or you wish to make a cast in a durable material such as plaster, polyester resin, cement, or cement fondue, you will need to make a waste mold. This mold can only be used once, so you do not need to worry about avoiding undercuts, and can work in high relief.

1 Build and secure a clay wall around your clay relief model (see page 105) and paint the enclosed work surface with clay slip. Mix up some colored plaster and pour this over the model until all the elements are just covered. Blow on the plaster to fill any holes, and allow to set. When you have made your cast and are breaking down the mold, this colored layer will inform you that you are getting close to the surface of the cast.

2 Mix up some uncolored plaster and pour this over the set colored plaster to fill the mold to the top of the clay wall. When the second layer of plaster has set, remove the clay wall and turn the mold over. Pick out the clay model using wooden tools to help reach into the detailed areas, but taking care not to break any details in the plaster mold. Wash all traces of clay out of the mold by brushing gently with water.

Casting plaster in a waste relief mold

The technique of casting a relief in plaster, using a waste mold, is very simple, but you will need to use a very hard, strong plaster that will not crack as you chisel off the waste mold. You can also use a waste relief mold to cast with cement, cement fondue, or polyester resin, following the advice given in the Casting section (see pages 79–87).

1 A plaster mold needs to be wet when casting with plaster, so either use the mold before it has thoroughly dried out, or soak it in water before use. Mix a generous teaspoon of soft soap in a small amount of water and brush the mixture all over the mold. Allow the bubbles to disappear. The soft soap acts as a release agent, preventing the plaster cast from bonding to the mold.

2 Mix up a strong plaster, following the manufacturer's instructions, and pour the liquid plaster into the mold to fill it. Jiggle the mold gently to remove any air bubbles. Leave to set.

3 Turn the mold over onto a folded towel and use a mallet and chisel to carefully chip off the plaster mold. The layer of colored plaster will alert you to when you are close to the surface of the cast. Use a pointed tool to pick out any mold plaster caught in the crevices of the cast, and brush away small flakes and crumbs of plaster.

Making relief sculptures using everyday objects

Simple relief sculptures can be made using a variation on the casting technique. Impressions are made in a clay slab, which is then covered by the casting material, such as plaster. When the clay is pulled away you are left with a relief sculpture.

1 Roll out a slap of clay to the dimensions required for the finished relief. Make a jig to enclose the plaster you will be using later by temporarily fixing together four pieces of wood, using panel pins or corner brackets (as here). The height of the sides of the jig above the clay determines the thickness of the plaster. Before fixing the wood in position, paint the interior surfaces with soft soap so that they will be easy to release from the set plaster.

2 Press a wooden block, or other everyday object, into the surface of the clay, taking care not to push it in too far, otherwise it will reach the work surface. Continue pressing the shape into the clay in various positions until you are happy with the arrangement. The plaster cast will be a negative impression of the clay bed.

3 Mix up some plaster and pour it slowly onto the clay bed, aiming for the center and letting it flow out toward the sides. Gently shake the jig to disperse the plaster evenly and remove any pockets of air. Leave to set.

4 When the plaster has set, remove the jig, turn the clay and plaster over, and peel off the clay to reveal the plaster relief cast. Wash the cast with water to remove any clay residue.

Fruit variation

This relief sculpture has been made using the same technique described in Making Relief Sculptures Using Everyday Objects (see opposite), except that the cast was made using cement instead of plaster. A simple, pleasing arrangement was made by pressing pieces of fruit into a clay slab.

Health and safety considerations

When carving relief sculptures, whether you are working with stone or wood, you will need to protect yourself from the dust that this process creates.

- Always work in a well-ventilated area.
- Wear a dust mask and safety goggles during any carving work.
- Use a water spray to keep dust levels to a minimum.

Carving stone in relief

When carving stone in relief, the usual carving techniques are utilized, but a few special considerations of relief work need to be considered.

1 Draw your design onto the surface of a stone slab, either freehand or using a grid, as here. Work out the lowest and highest points of the design, then mark the lowest background depth on each of the four sides of the slab.

See also

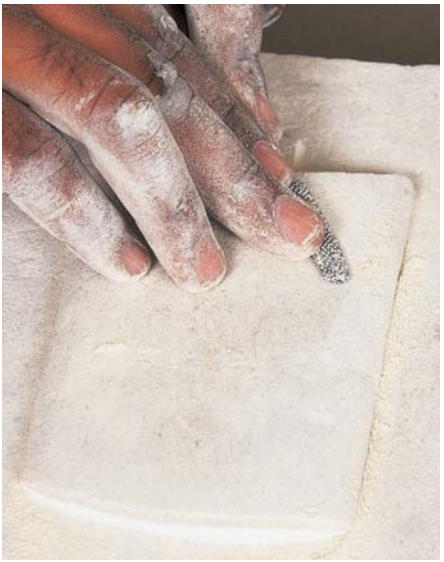
Stone, *pages 28–32*
Preliminary planning, *pages 48–49*
Carving, *pages 94–103*

2 Start by disposing of areas of waste material, the biggest of which will be the background area. Position a chisel horizontally and hit it with a mallet with firm and consistent taps.

3 Start carving on the waste side of the drawn line that describes the relief form, and follow this line all the way around. This releases the relief from the waste material. Use a flat chisel to make the surface of the background level.

4 Continue carving the relief, starting with the receding areas. The straight edge of this area is just higher than the level of the background. Gently round off the edges of the relief just above the background.

5 Take particular care when carving any undercuts. Tilt the chisel at the required angle and tap it gently with the mallet.



6 Use rifflers of various sizes for the final shaping. Use a rasp to smooth off the background and rifflers to level out any undulations made by the rasp.

7 Finish by rubbing down with sandpaper.

Carving wood in relief

The same techniques are used when carving wood in relief as when carving any other sculpture from wood. A technique is often repeated a number of times during the course of the carving as you gradually progress toward the finished piece.

1 Draw your design on the face of a wood block, then mark the background level all around the sides. Use a saw to remove as much waste wood as possible. Saw across a corner about ⅛ in. (3mm) outside of the drawn design down to about ⅛ in. (3mm) above the background line. Set the wood in a vise and saw in the same plane as the background and ⅛ in. (3mm) above it. Remove all the corners in the same way.

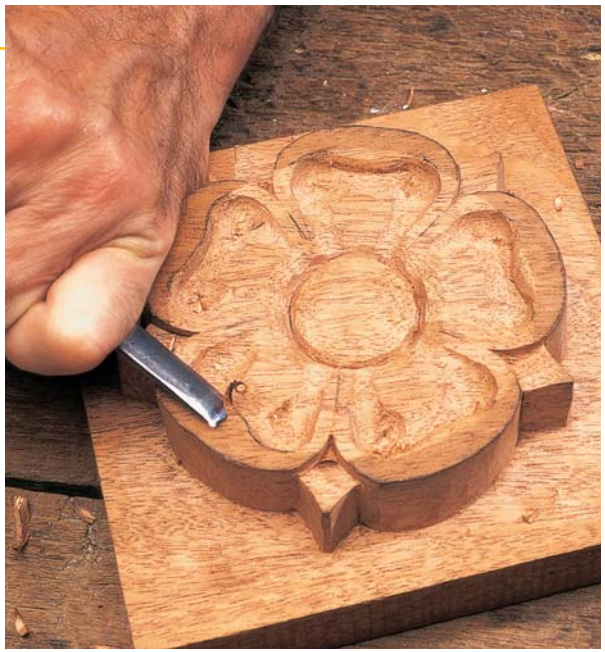
See also

Wood, *pages 33–37*
Preliminary planning, *pages 48–49*
Carving, *pages 94–103*

2 Begin setting in—cutting close to the line of the design—by using a gouge to cut vertically down to the background. Keep about ⅛ in. (3mm) away from the drawn line and stop at least 1/16 in. (2mm) above the final background level.

3 Set in again, close to the line this time, using gouges that match the curves of the lines as closely as possible.

4 Ground in—cutting away to the background level—to within 1/16 in. (2mm) of the final depth of the background, using a gouge that is almost flat.



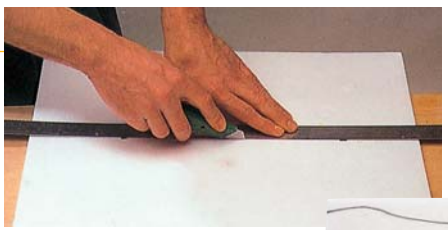
5 Work on the relief shape using various carving gouges to model and define the form.

6 To convey the illusion that the relief form is resting on the background, and not a part of it, undercut the shape, removing wood from under the relief.

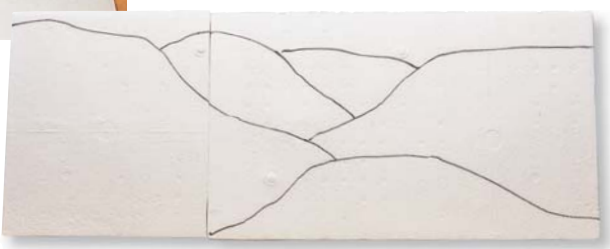
7 Ground in the background to its final level before sanding all over, working from a coarse grade of sandpaper through to a fine one.

Constructing and shaping a relief

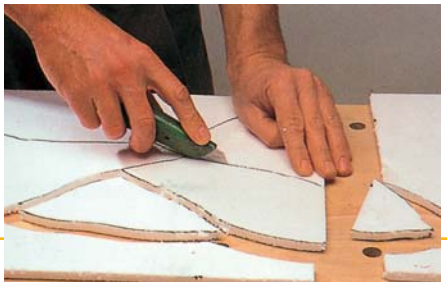
Styrofoam tiles are very easy to shape with a small wire brush, such as a suede brush, and can be bonded together to achieve varying heights of relief.



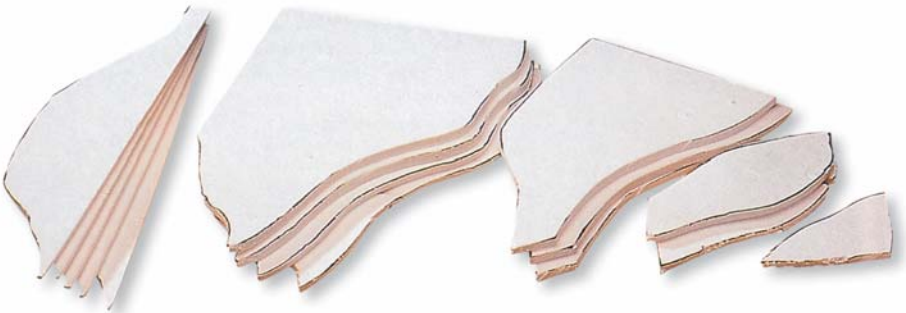
1 Paint a wooden board with two coats of diluted craft glue, allowing the first coat to dry before recoating. Use a craft knife and metal ruler to cut one Styrofoam tile to the same size as the board.



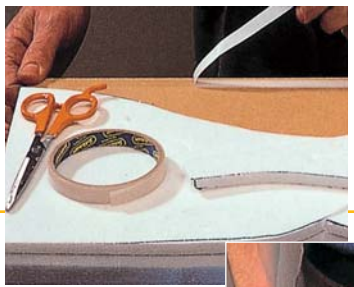
2 Draw your relief design onto the cut Styrofoam tile. A landscape vista, as here, illustrates a simple rule of perspective: that objects nearer to you appear bigger than those that are further away.



3 Using the craft knife, cut along the drawn shapes to cut out the individual elements of the relief. You may want to number the pieces, starting with the piece furthest away from the viewer and working up to the highest point of the relief.



4 Use the cutout shapes as templates to cut out more shapes from Styrofoam tiles. The smallest shape is furthest away, so you only need one of these. Increase the number of pieces cut out as the elements come nearer to the viewer.



5 Fix the first layer of shapes to the board using double-sided adhesive tape. Here a strip of aluminum foil has been glued to the board to represent the sky.

6 Fix the remaining Styrofoam shapes in position using the double-sided tape. When bonding one identical shape to another, make sure you line them up so that they fit snuggly on top of one another.

7 Overlaps are unavoidable along the edge, but can be trimmed off with an old kitchen knife.

8 Use a small wire brush to shape each area of the relief. You will find that Styrofoam is very easy to shape with the brush.

9 The shaping smooths out the relief and brings the sculpture together. The low relief in the background builds up to medium relief in the foreground, and in the case of this landscape creates a sense of perspective.

Construction

A constructed sculpture is one whose parts have been joined together using everyday fixing methods such as gluing, screwing, and riveting, or using the construction material itself to bind the form together.

Constructing forms allows you to experiment with new materials and sculpting techniques, and learn about the concepts of strength and stability that are relevant to all types of sculpture.

In this section you will learn how to join sheet metal using rivets, and see examples of what can be achieved using straws and coat-hanger wire. However, with this discipline anything goes, so use the advice provided here to help you research and develop your own ideas.

Joining metal

Using rivets is an extremely efficient and permanent fixing method for thin gauge sheets of metal. Although it is an industrial technique, riveting is very suitable for construction sculpture, and you can create any number of forms by joining sheets of metal.

1 Before riveting, you need to bend a seam allowance along the edge of each sheet of metal to be joined. Place a wood block at the edge of your work surface and position the metal sheet on top so that it overlaps the block.

2 Align a second block of wood with the first on top of the metal to hold it in place. Clamp the wood and metal sandwich firmly to the work surface.

See also
Construction equipment, *page 38-39*

3 Hammer along the overlap of metal to flatten it down against the lower wood block, making a clean, sharp bend. Repeat the whole bending process to make a seam allowance on the second sheet of metal to be riveted.

4 Interlock the bent edges of the two metal sheets. The edges must be absolutely straight.

5 Hold the pieces in place and hammer down the seam. Work from each end toward the center until the seam line is quite flat.

6 Use a marker pen to mark holes for the rivets at each end of the seam. Place a punch on the metal at one mark, hold it vertical, and tap it with a hammer. Repeat at the next mark.

7 Place the seam of the metal sheets on a wood block and drill through the punched marks to make holes for the rivets.

8 Fit an aluminum rivet into a pop riveter and insert the rivet into a drilled hole, following the manufacturer's instructions. Repeat with the remaining rivet hole.

9 Continue to work in the same way, joining sheets to make the required shape.

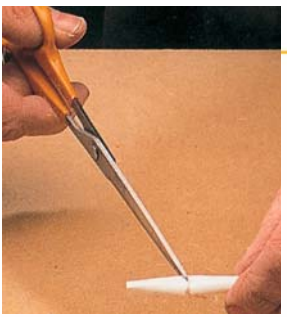
10 To rivet a cylindrical metal shape, find a support that will fit inside the curve, on which the seam can be drilled and hammered.

Constructed metal column

Metal Column by Andrew Fyvie stands several feet high and is constructed from tin using the riveting process described opposite. The form derives from the artist's interest in the powerful solidity of tree trunks. The spirals of tin sheets suggest organic growth. The sculpture is hollow and so relatively fragile, yet at the same time it evokes the strength of a heavy, old tree.

Constructing with art straws

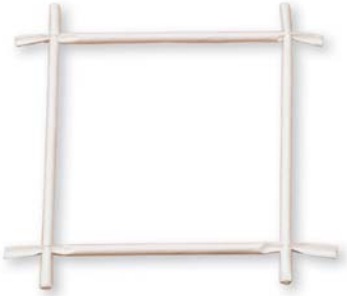
In this example, paper straws are joined together to produce geometric units that are then used to build a stable structure. This is not an easy task, but paper straws are relatively inexpensive, so you can use plenty of them to explore all their possibilities and find a combination that can be interlocked and repeated.



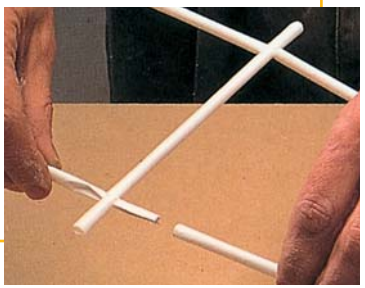
1 Make a mark 1 in. (2.5cm) in at each end of a paper art straw. Along each mark cut out two small wedge-shaped openings opposite one another. For each unit you will need two ordinary straws and two with openings cut at each end.

2 Take the two ordinary straws and pinch each of the four ends.

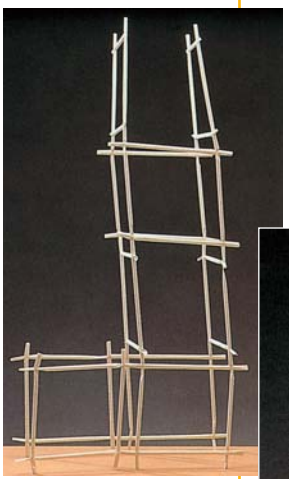
3 Push a pinched end into the opening of one of the cut straws. Repeat at the other end. Push the other two pinched ends into the cuts in the other straw.



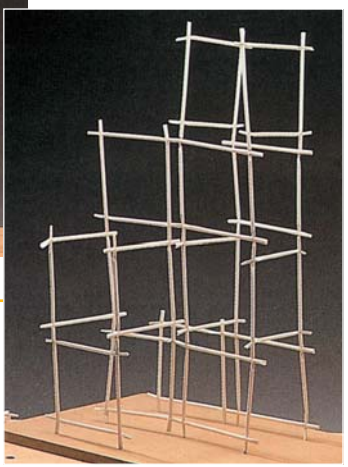
4 This makes the first unit. Aim to push the pinched straws in approximately 1 in. (2.5cm), and splay out the ends a little. Make a number of these units to build on in the following steps.



5 Fix units together by pinching the ends of the straws of one of the units and inserting them into the ends of the adjoining straws.



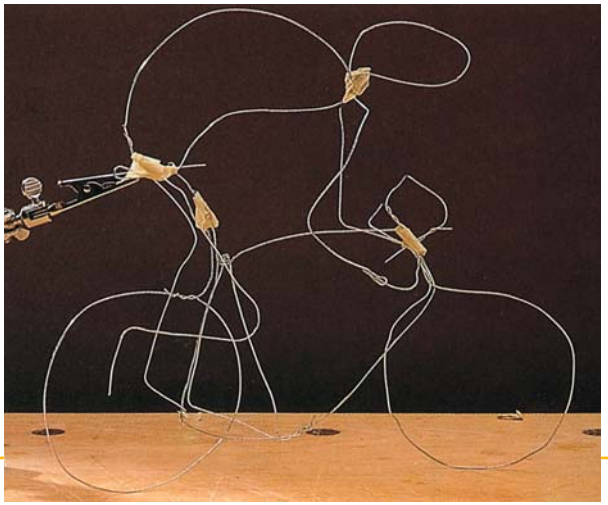
6 Experiment with the arrangement of units to achieve a stable structure. By alternating the units at right angles to each other you can begin building a tall structure. Extending the structure horizontally along the base also gives more stability.



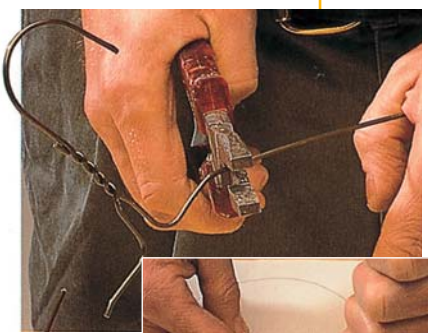
7 Continue to build vertically while at the same time joining units together horizontally. By increasing the base area you can continue to build stories onto your structure.

Constructing with wire

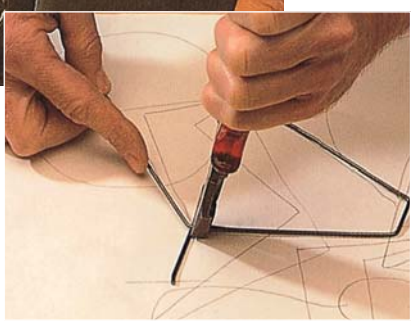
Coat-hanger wire has a certain amount of structural strength, but is also easily bent and shaped, and can be joined using binding wire. When bending the wire, only use one hanger-length for each section of the sculpture, because the less joining of parts there is the stronger the finished piece will be.



1 It can be a good idea to use binding wire to work out the most efficient way to create the shape for your sculpture. Make a note of your configuration on paper, then bind the various wire parts together with masking tape. This will give you an indication of how the sculpture will look.

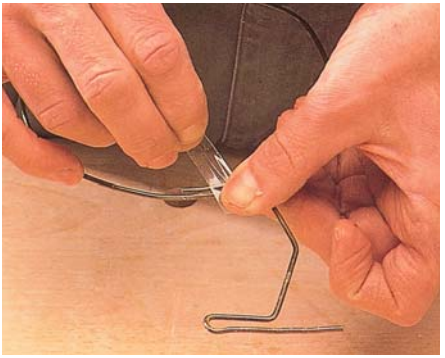


2 Prepare the required quantity of coat hangers by cutting off the hanging hooks and bending each hanger straight with pliers.

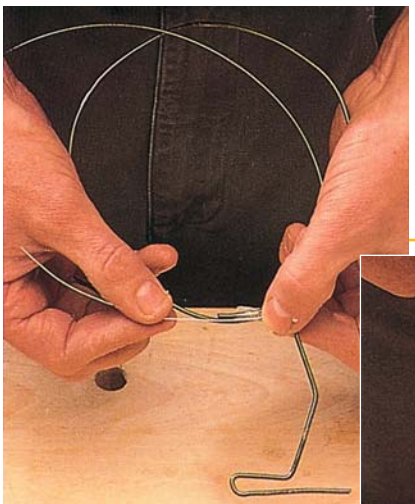


3 Using the notes made in Step 1, begin bending the wire into the shapes of the various elements of the sculpture. Some elements can be bent by hand. Others will need to be bent by holding the wire steady with pliers and bending with the other hand.

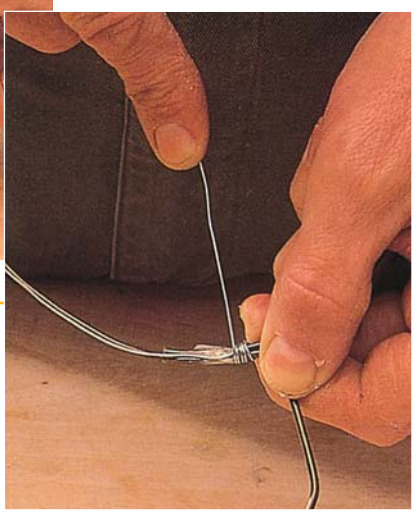
4 Once all the elements have been bent into shape, they can be joined together.



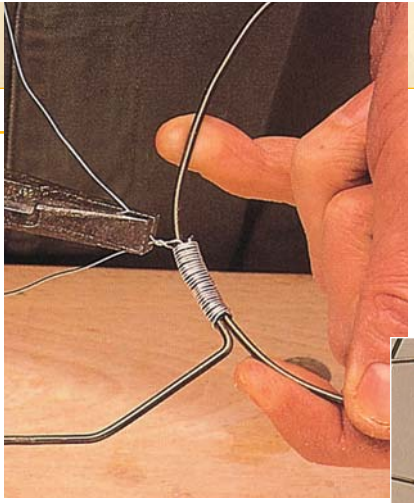
5 Before applying the binding wire, use clear adhesive tape to hold two parts together.



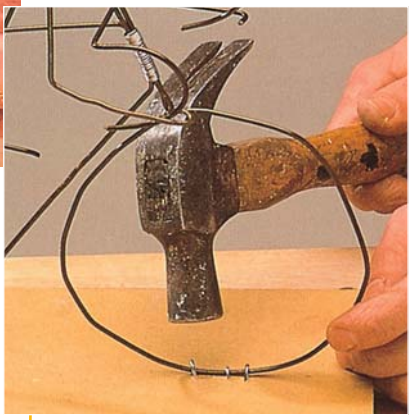
6 Lay a straight length of binding wire along the join of the thicker coat-hanger wire, making sure that a short length—about 3 in. (7.5cm)—goes beyond the area to be joined.



7 Wrap more binding wire tightly around the join of the two parts and over the straight length of binding wire already there. Wrap the wire neatly and avoid crossing over a piece of wire that has previously been wrapped around.



8 At the end of the join, finish off the two ends of binding wire by twisting with pliers, then cut off the excess wire with wire cutters. Continue to assemble the remaining elements of the sculpture following Steps 5–8.



9 Use netting staples to fix the sculpture to a wooden base.

Wood and nail construction

This porcupine sculpture has been constructed by hammering nails into a painted block of wood at various angles. A sense of geometry is achieved by using a rectangle of wood with an equal number of holes drilled into each face, each hole being equidistant from the other. Hammering nails into the holes at a diagonal angle and gradually altering the direction of each nail has produced an even flow around the block.

Assemblage

Assemblage is the process of bringing together everyday and found objects to make a sculpture. A successful assemblage focuses our perception on what the sculpture represents, rather than on the identity or function of the original objects. Therefore, assemblage requires that you use your imagination to identify the sculptural potential that exists in the objects that surround you.

Abstract form

The shape of these plastic coat hangers makes them ideal for arranging in a spiral formation around a central axis, in this case a threaded steel rod, The repetition of the same object produces a sense of movement, which is a conventional theme of abstract sculpture.

Figurative forms

Trees, because of their upright stance and the linear form of their twigs and branches, possess definite figurative connotations. From a collection of twigs of random shapes, sizes, and lengths, pieces that would contribute to a successful figurative sculpture have been chosen and joined with glue.

Assemblage on an armature
A discarded piece of furniture has been used as an armature for *Boxer* by Leo Sewell. Found objects, selected not for their identity but for their role in describing the form of the sculpture, have been screwed firmly into place. At 31 x 11 x 22 in. (78.5 x 28 x 56cm), the strength and stability of the armature is all important.

Symbols within assemblage
The main elements of Brian Ord's *Ikea*, *Ikea* (72 x 36 x 24 in. [182 x 91.5 x 61cm]) are items of wooden furniture, some of which have been cut up and reassembled. The table is used to provide support and stability to the sculpture, and various parts have been joined together with screws and glue. With the minimum of effort the sculptor has created a surrealistic figure reflecting his love/hate relationship with domesticity.

Surface finishes

A wide variety of surface finishes can be used on all of the materials featured in this book, and the following pages feature some of the products and techniques that can be used to color or embellish your sculptures. In most cases the products featured can be substituted for use with different sculpting materials, so, for example, if you like something you see in the plaster section, the chances are you can also use it on fired clay.

There are no hard-and-fast rules as to what can and cannot be used, but it is important to remember that the finish should complement the sculpture, not overpower it. Whatever your choice, it is a wise idea to experiment with a surface finish on scrap material before committing to your final piece.

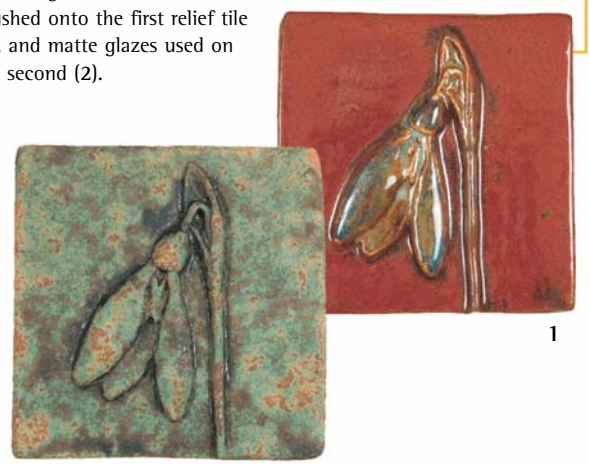
Clay

Perhaps one of the best-known finishes for clay work is glaze. However paints, inks, varnishes, and waxes are among some of the many other finishes that can be applied to fired clay. Alternatively, before firing, texture can be applied by impressing various materials into the malleable clay surface.

Glazing

Glaze applied to bisque-fired clay acts as a sealer as well as surface decoration, and once the glaze has been applied the piece is fired again. Brushing is the most straightforward method of application, especially on awkwardly shaped sculptures, but ensure that glaze does not get onto the bottom of the sculpture where it will rest on the kiln shelf, since any glaze on the base will melt and fuse the sculpture to the shelf.

Gloss glazes have been brushed onto the first relief tile (1), and matte glazes used on the second (2).



1

2

See also

Clay, *pages 12–19*
Finishing materials, *pages 42–43*
Firing, *pages 69–71*

Texturing clay

Before modeling a sculpture, slabs of clay can be textured by imprinting with various household materials or implements. If using sandpaper (1), the coarser the grade, the rougher the surface of the clay will be. The various sizes and grades of string (2), twine, and rope have the potential to produce a variety of interesting textures, while pressing a cheese grater (3) into the slab produces a fairly uniform imprint.

1

2

3

1

2

3

4

5

6

Finishing fired clay

A variety of effects can be applied to fired or fully dried air-drying clay. Metallic spray paints (1) are very easy to apply and have a dramatic, shiny effect, while artists' acrylic paints (2) can be brushed on. Artists' oil paint (3) gives a rich, colorful surface and highlights any texture.

Boot polish (4) gives the clay a leather-like appearance and is also useful for bringing out surface texture, while using a brush to apply washes of tea (5) gives the clay a matte finish.

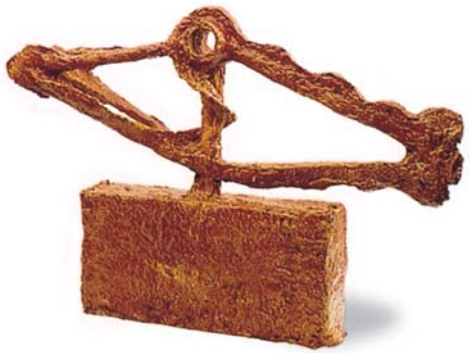
To replicate a marble effect (6), first paint on a layer of artists' acrylic paint and allow it to dry. Dribble mineral spirits onto the painted clay, then drop small amounts of different colored inks onto the still-wet surface. The spirits repel the ink and interesting marbling effects appear.

Papier mâché

Papier mâché has its own inherent texture, so the best way to embellish the surface is with color. Once the surface has been sealed with dilute craft glue, a paint of your choice can be brushed or sprayed on. In this example, a two-color effect is achieved by dry brushing.

1 Seal the surface of the sculpture with dilute craft glue, then brush on one coat of artists' acrylic paint and allow to dry.

2 Load a clean brush with a second color of acrylic paint and brush it out on spare paper until nearly dry. Slowly drag the dry brush across the sculpture so that the paint is only deposited on the higher points of the uneven papier mâché surface.



3 A final coat of polyurethane varnish adds more definition to the textured surface and really brings the sculpture alive.

Plaster

Plaster sculptures, like fired clay pieces, can be treated with paints, varnishes, and waxes, which in turn can be applied using various techniques for unique results. The finish of the surface of a plaster sculpture can also be altered by making additions to the initial plaster and water mix.

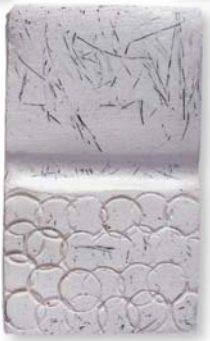
Additions

Coarse sand (1) and gravel (2), added at approximately 10 percent by volume to the plaster mix, become an integral part of the plaster. Paintbrush bristles (3), again at approximately 10 percent by volume of bristles to plaster mix, form a series of linear marks in the dry plaster.

Add instant coffee granules (4) to the water before you add the plaster, and it acts as a colored stain, creating a mottled finish. Instead of coloring plaster with powder paint, artists' acrylic paints can also be used. For a patterned effect (5), add acrylic paint to the water before mixing the plaster, then add a second color to the plaster mix and swirl it around with a stick. Bear in mind that the intensity of the original color will be lost somewhat when it is mixed with water and plaster.

1

2



3

4

5

Finishing dry plaster

When plaster has set completely, it can be colored or finished with a wide variety of materials. If you are using a water-based finishing product, first seal the surface of the plaster with a coat of dilute craft glue (1), which forms a transparent layer. Subsequent layers will give a more opaque finish. For oil-based finishes, use shellac (2) to seal the plaster and fill any pores. Shellac dries quickly and reduces the opacity of the plaster.

Acrylic varnish (3), painted over sealed plaster, dries to a clear finish that retains the original color of the plaster. Multiple layers of a dark shellac (4) form a shiny and lustrous skin, tinting the surface of the plaster. Clear wax (5), rubbed on with a cloth, forms a protective layer that repels water, and takes on a high shine when polished.

Artists' acrylic paints (6) dry quickly and smoothly, giving a good coverage of opaque color, while hammered-effect metallic spray paints (7) create the illusion of textured metal. Household gloss paints can be flicked on with a brush (8), or poured (9) over the sculpture.

This plaster cast (10) was sealed with shellac, then a brush was used to paint on two even coats of silver enamel paint.

1

2

3

4

5

6

7

8

9

10

Cement

Paints, varnishes, and waxes can be used in the same ways as on fired clay and plaster to enhance the surface of a dry cement sculpture. Alternatively, as with plaster, the surface finish of a cement sculpture can be altered in the initial mix by replacing one part sand with another material. Dilute craft glue (**1**) or shellac should be painted on to seal the cement surface and afford it some degree of protection. When crystalline wax and wax dye (**2**) are melted over a gentle heat, the resulting molten liquid can be carefully poured over the sculpture. When this has cooled and starts to harden, use a ball of cloth to rub it into the surface. Polyurethane varnish (**3**) is a resilient varnish that is perfect for outdoor sculptures. For a more subtle effect, try using a cloth to wipe over the paint before it has a chance to dry. A green hammered-metal effect paint (**4**) has been brushed on and rubbed back in this example, revealing the cement and leaving a green residue on its surface.

1

2

3

4

Cement fondue

As with cement, a coat of dilute craft glue (**1**) or shellac (**2**) should be applied to dry cement fondue to seal the surface before embellishing further, for example with artists' acrylic paint (**3**), polyurethane varnish (**4**), or liming wax (**5**).

1

2

3

4

5

See also
Cement and cement fondue, *pages 24–25*
Finishing materials, *pages 42–43*

Using iron paste on cement fondue

Iron paste, generally used to rejuvenate cast-iron fireplaces, in this case gives a darker and more consistent surface to a sculpture in cement fondue.

1 Use a cloth to rub the iron paste well into the surface of the sculpture.

2 Use the paste on a toothbrush to get into any crevices or hard-to-reach areas.

3 Allow the paste to dry, then buff it up with a soft cloth to produce a slight shine.

Polyester resin

The method of achieving a surface finish with polyester resin is completely different from the techniques used for any of the other sculpting materials. In order to color polyester resin, a pigment or filler must be added at the mixing stage, following the manufacturer's instructions. This swatch (right) shows how cured polyester resin looks without the addition of a pigment or filler, while the following examples illustrate the results achieved using some of the available pigments and fillers that can be added to the gel coat during the laminating process.

Pigments

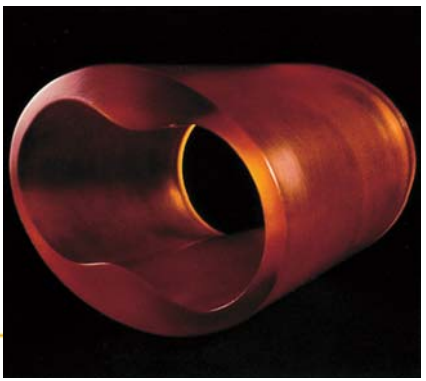
Colored pigments for polyester resin can be translucent (1, 2) or opaque (3, 4). Amber translucent pigment (5) brings an element of warmth and energy to *Untitled 2*, by Michael Shaw.

1

2

3

4

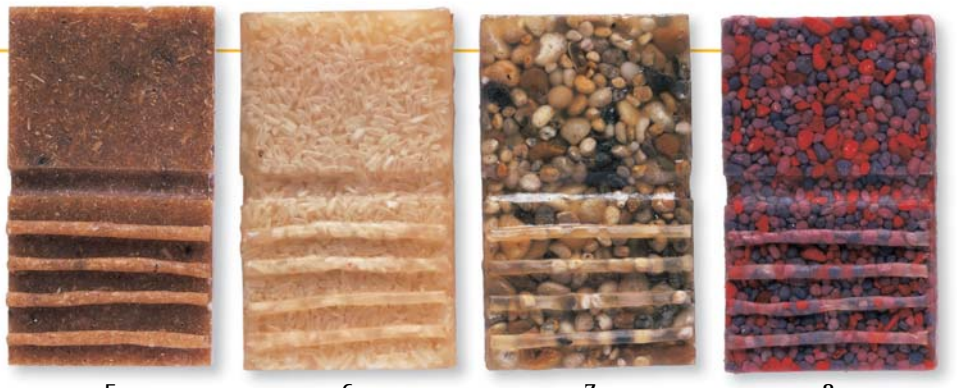


5

Fillers

Specialty polyester resin fillers are extremely effective, making a cast of resin and brass filler (1) look to all purposes like a brass cast. Other fillers include aluminum (2) marble (3), and slate (4). Alternatively, you can add your own fillers, working on a ratio of equal volumes of filler to resin, before adding the hardener. Ideas for homemade fillers include sawdust (5), rice (6), gravel (7), and aquarium stones (8).

1 2 3 4



5 6 7 8

Stone

Carved stone does not need coloring, and in many cases a stone sculpture will be polished to a high and very seductive shine using various grades of abrasive stones or a pneumatic grinding compressor and diamond grit discs. However, you do not have to choose the highly polished finish, and instead may consider the possibilities of one of the surface textures achieved at the various stages of work.

The surface texture of white marble when worked over with a pitching tool and heavy hammer (**1**) is quite different from a polished finish (**2**). On this alabaster example (**3**), even strokes with a hammer and claw chisel have created a pattern of parallel lines.

Jay Battle's *Smooth Ripple* (**4**) illustrates beautifully how different surface treatments can be used to stunning effect on the same piece of stone. The outer part of the form has been shaped and textured using a bouchard hammer, which has many small points on its surface, while the inner "ripple" has been sanded and polished to create a smooth, shining surface.

1

2

3

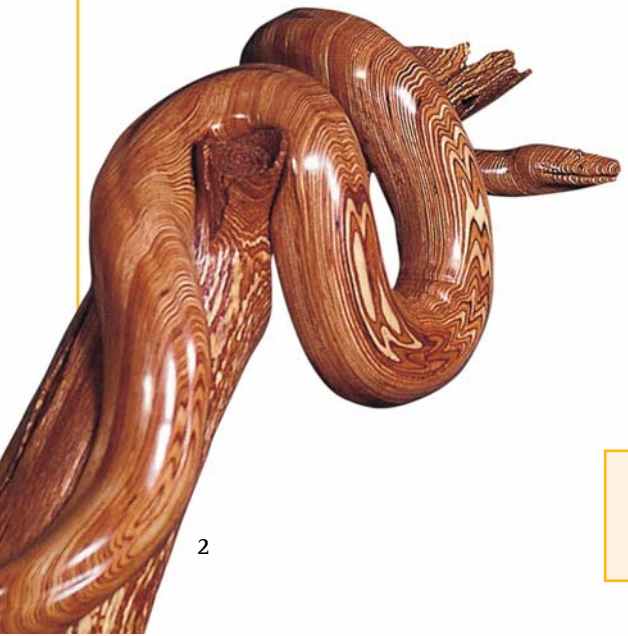
4

See also
Stone, *pages 28–32*

Wood

Like stone, wood often does not need any coloring, because it has an inherent beauty that you don't want to cover. However, this material may need protecting, and your choice of preservative finish will depend on the sculpture's intended location and the degree of sheen you require. A stable indoor environment permits any finish, and in this instance you may decide to leave the sculpture untreated, like Martin Heron's *Feather Tower* (**1**). Wood suffers from changes in humidity, and oiling or waxing can help even out such changes, while for outdoor siting frequent oiling will help extend the sculpture's life. By finely sanding, oiling, and waxing the surface of *Tree Python* (**2**) to a high sheen, Bill Prickett has emphasized the sinuousness of the python.

1



2

See also
Wood, *pages 33–37*
Finishing materials, *pages 42–43*

Coloring wood
When it is appropriate to apply color to a wooden sculpture, the aim is usually to ensure that the grain of the wood is not completely obscured. A transparent wood stain (1)—usually diluted with denatured alcohol or turpentine—will not hide the grain, while an acrylic wood stain (2)—diluted with water—will hide the grain to some extent, depending on how thickly it is applied with a brush or cloth.

A colored wax (3) is another option, and is quick and easy to apply and buff up with a soft cloth.


1


2


3

Sheet metal

The simplest way to color sheet metal is using spray paints, working in a well-ventilated area and protecting adjacent work areas. Sprays produce a very smooth, flat area of color that can be particularly suitable for construction techniques.

Use newspaper and masking tape to mask the areas of the sculpture that you don't want to paint, then, holding the sculpture at arm's length, apply an even coat of spray paint. When the paint has dried, remove the mask.

Bases

The main function of a base is to support a sculpture, although in many cases a sculpture will not actually need one. Sometimes a base is an absolute necessity, allowing a sculpture to be seen to its best advantage. In other instances a base is an integral functional part of the sculpture itself. Alternatively, a base can act as a purely compositional element, defining the space within which the sculpture is seen and so producing a sense of scale.

Unobtrusive base

This base acts as a support to the sculpture, and should be as unobtrusive as possible, so that the viewer is aware only of the sculpture.

1 Choose a block of wood for the base and draw diagonal lines on one face from corner to corner to locate the center point. Clamp the block to your work surface and drill a hole at the center point to match the width of the stand material, in this case ⅛ in. (3mm) to fit a length of coat-hanger wire.

2 Use a bradawl or drill to make a hole in the underside of the sculpture.

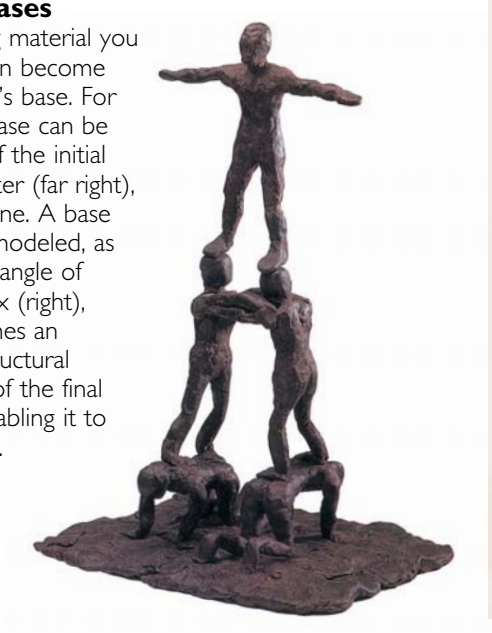
See also
Making bases, *page 41*

3 Insert a length of coat-hanger wire into the hole in the wooden base block. Insert the other end into the hole on the underside of the sculpture. Fill the holes around the wire with decorating filler, and sand it smooth when dry.

4 Paint the sculpture and its base so that they blend nicely together.

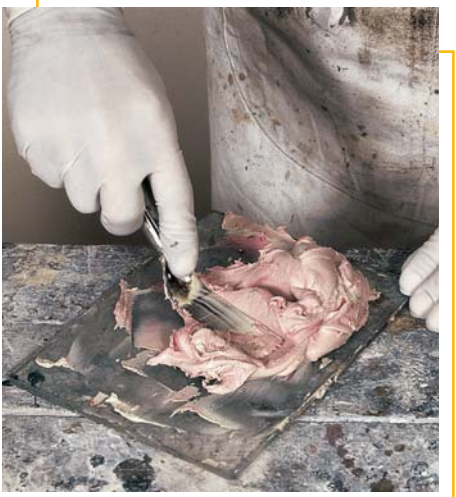
Integral bases

The sculpting material you work with can become the sculpture's base. For example, a base can be carved out of the initial block of plaster (far right), wood, or stone. A base can also be modeled, as with this rectangle of modeling wax (right), which becomes an important structural component of the final sculpture, enabling it to stand upright.



A base for a hollow form

A sculpture that has been cast using a laminating method, or a hollowed-out and fired clay piece, needs a stand embedded in filler to show it off to its full advantage.



1 Mix car body filler and its hardener together on a sheet of glass, following the manufacturer's instructions, until you achieve an even and consistent coloring.

2 Support the hollow sculpture in a sand-filled inner tube or on some upholstery foam and add the body filler to the front wall of the cavity, working as quickly as you can.

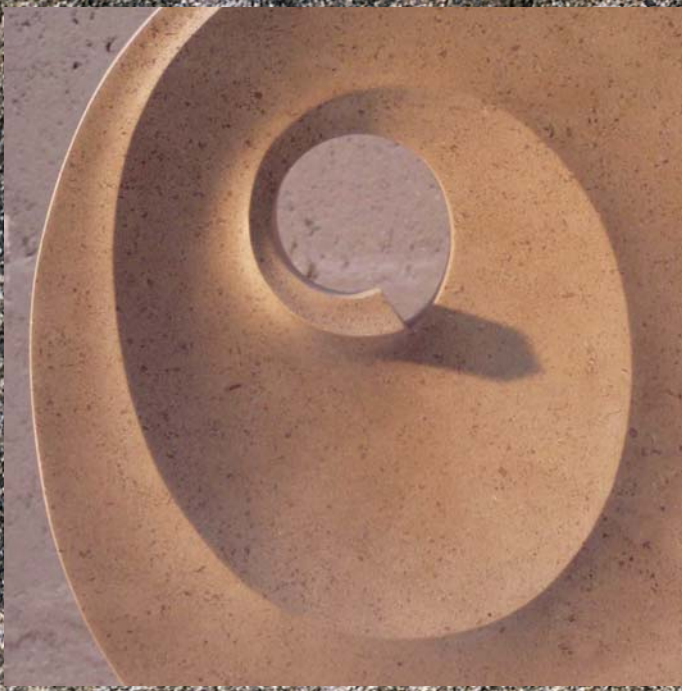
3 Position a metal pipe centrally over the filler before the mix sets. Press the pipe into the mix and hold in position until the filler sets.

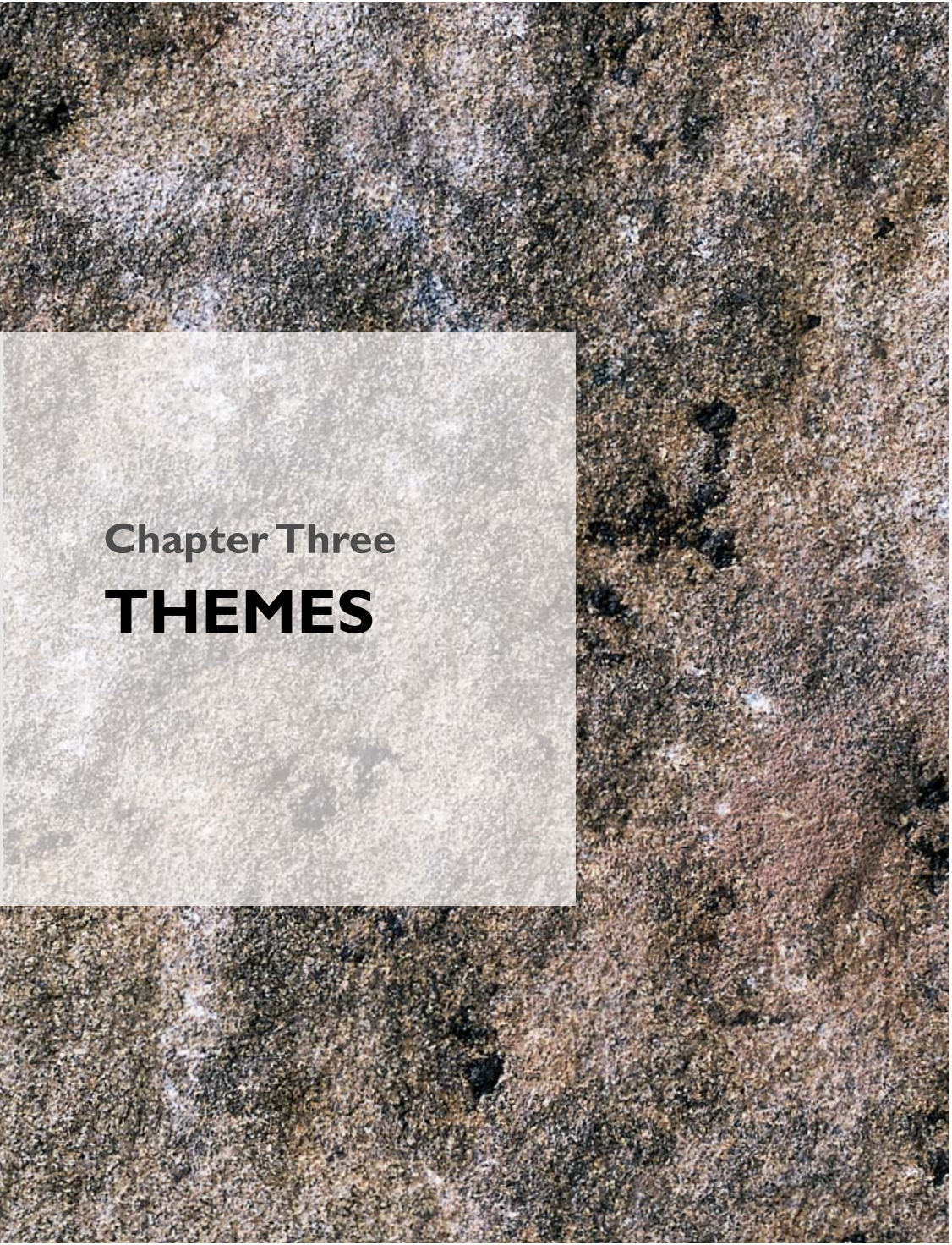
4 Remove the pipe, leaving an impression in the filler, and mix up more body filler. Hold the pipe in its impression with enough length for the stand left outside of the cavity. Apply more filler around the pipe in the cavity and allow it to set, holding the pipe in place. Mix more filler and use this to completely fill the opening. Leave to set.

5 Level off the filler with a riffler and color it with the same material used to color the sculpture.

6 Drill a hole wide enough to take the pipe in a block of wood, drilling down to a depth that matches the exposed length of pipe.

7 Following the manufacturer's instructions, mix up some epoxy resin glue and use a spatula to put a little in the hole in the wooden base and some on the exposed pipe. Place the pipe in the hole in the base. Keep the sculpture supported with blocks of wood as the glue dries.





Chapter Three

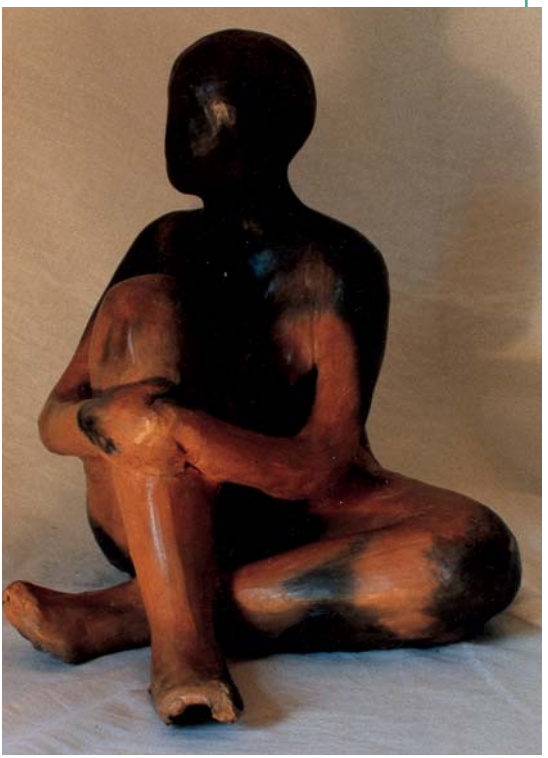
THEMES

People

The human form has been the basis of many a work of art since the beginning of time, and across all cultures. Much can be learned from direct observation of the human body, and there is a vital correlation between the structure of a figure and that of a sculpture.

The first figures were carved from stone, and this tradition of figurative sculpture continues to this day. However, a diverse range of techniques is currently being used to depict the human figure in sculpture, fostered by new materials and technologies, as well as contemporary issues an artist may wish to address.

SEATED
Deborah Tompsett
Based on a number of life drawings, the artist chose this pose because of the contained, calm atmosphere it invokes. After working up a maquette, the clay figure was modeled to approximately 12¾ x 10 in. (32 x 25cm), and when leather hard it was sliced in half and hollowed out. Before firing, it was fixed back together, covered with slip, and burnished with a spoon and pebble until smooth. The random, smoky markings are achieved by sawdust firing, where the sculpture is placed in a metal container and covered with sawdust, which, once set alight, leaves black marks on the ceramic as it smolders down. A clear wax enhances the burnished and smoky surface.

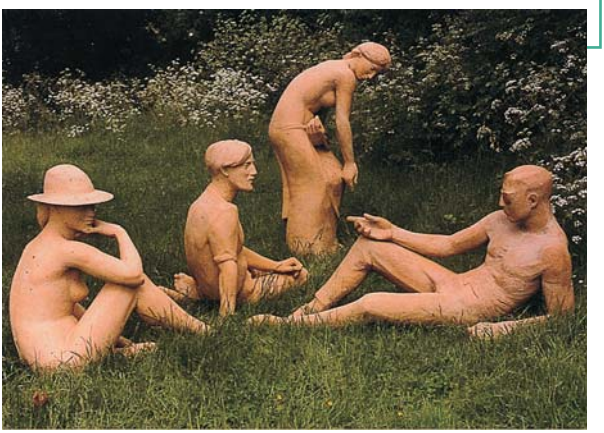


Metamorphosis
Riccardo Finizia

This beautiful sculpture is carved from Canadian Ontario marble, which is much harder than Italian marble, and presents a challenge that the sculptor relishes. Because it is so hard, power tools are used for some of the rough work, but hand files and rasps are preferred for detail work, and sandpaper for finishing.

Déjeuner Sur L'Herbe
Althea Wynne

Built using rolls of clay and fired to a high temperature to be durable outdoors, these life-size ceramic sculptures are based on the famous Impressionist painting by Manet of the same title. Placing the figures directly onto the lawn creates a realistic, informal atmosphere, while the uniformity of the surface color and texture gives a calm mood that makes the pieces stand out against the greenery.

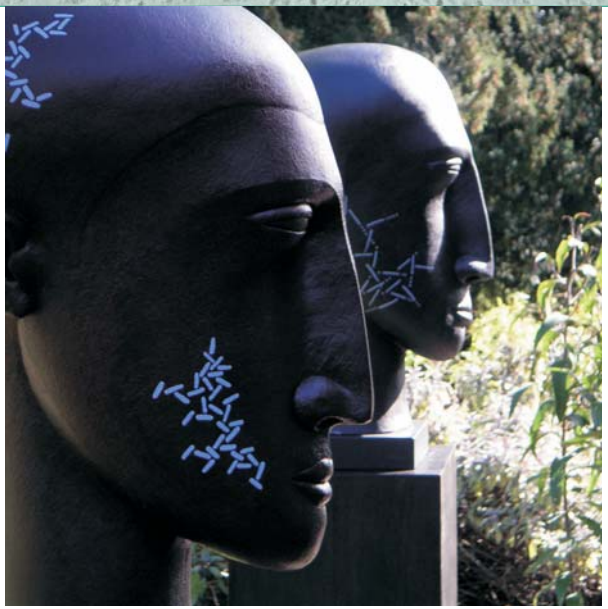


The Dungeness Drifter
Brian Yale

By bringing together diverse found objects and pieces of timber washed up by the sea, the artist has created a figurative sculpture that exudes a real sense of humor.

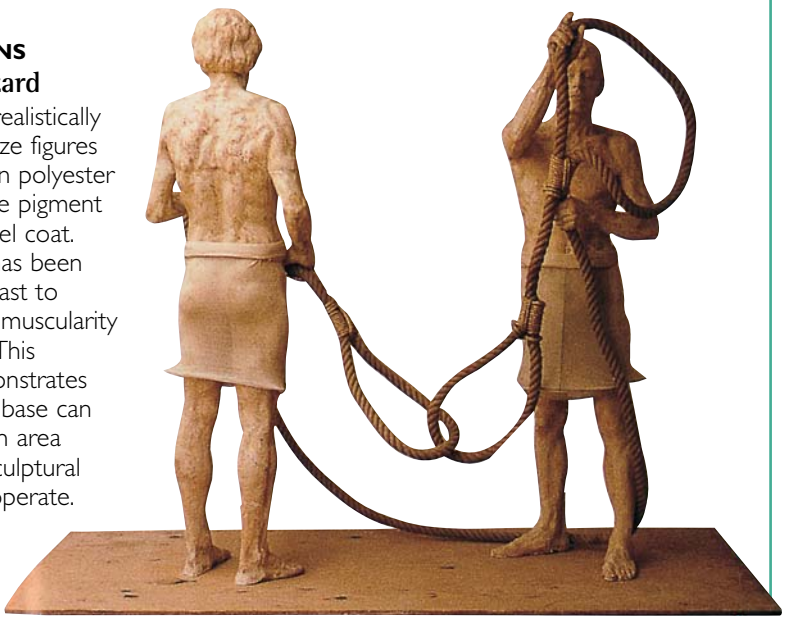
Alice And The Cat
Sue Nunn

Lewis Carroll lived in and is buried in Guildford in Surrey, England, and this woodcarving, drawing inspiration from his books about Alice, is permanently sited there. The sculpture was carved from English oak completely by hand, using a mallet and chisels, and its ample size—7½ ft x 20 x 20 in. (2.3m x 50 x 50cm)—is supported by a further 3 ft (1m) of wood buried underground.



Sentinels
Patricia Volk
Simple heads, made from coiled clay, fired, and painted with acrylic paint in strong colors, are big—26 in. (67cm)—and powerful, grounded yet spiritual. The markings have been added to represent the inner workings and emotions of the brain, and the completed sculptures are mounted on slate.

Connections
Charles Hazzard
Each of these realistically modeled, life-size figures has been cast in polyester resin with white pigment added to the gel coat. Further color has been added to the cast to emphasize the muscularity of the figures. This sculpture demonstrates the role that a base can play, defining an area within which sculptural elements can operate.



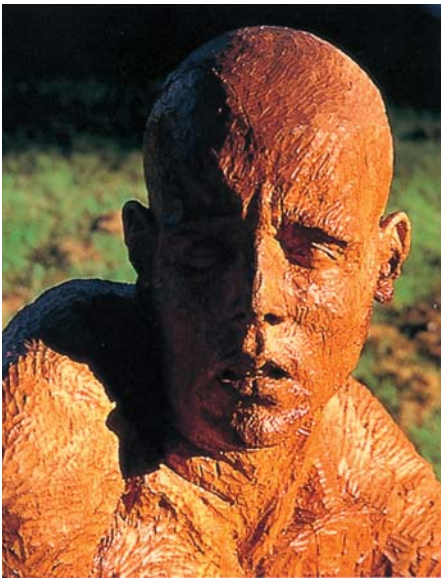
Of Dreadful Nights
Mike Roles

Brass powder and photographic emulsion are suspended in the polyester resin of this sculpture to create a figure that seems both metallic and real. Cast from life, the form is hollow, and where the surface is broken through we can see the inside and, in the case of the head, to another inner face. The surface of this sculpture, with its varying degrees of solidity, transparency, and openness, explores the inner life concealed within the outer form.

Woman
Giorgie Cpajak

Presenting an abstract aspect of a woman's head in a modern form, this sculpture has been carved from black granite and polished to a high sheen.

GEORGE
Stefanie Rocknak
In this piece, the features and identity of "George" shine out through the highly textured surface. The oak has been carved by hand, and the marks of the gouges left clearly visible, adding a powerful energy to the already concentrated features of the figure.



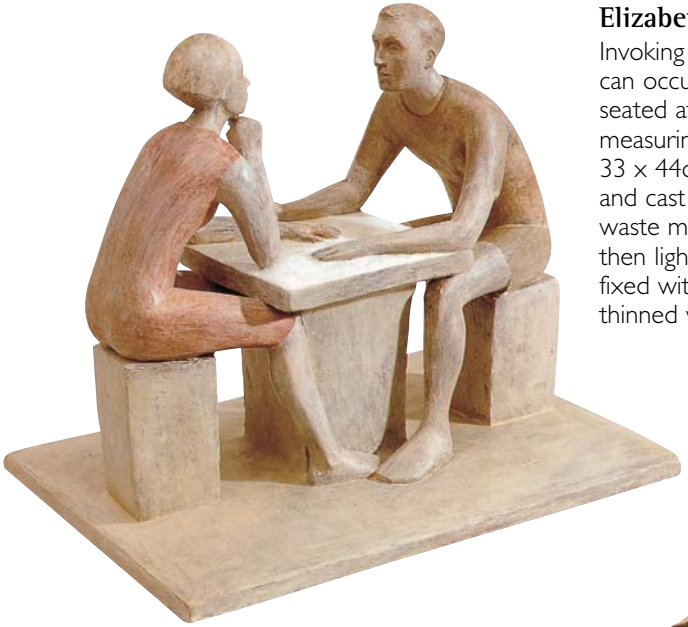
THE SIN EATERS
Mark D. Chatterley
This large—4½ x 6 x 6 ft (1.4 x 1.8 x 1.8m)—grouping of fired clay figures invokes a real sense of drama, and is a good example of how a figure can be modeled without being bogged down by detail. Notice how each chair becomes both a sculptural and a compositional device, allowing each of the seated figures to exist within the sculpture.

Seeing A Jewel Hang In Ghastly Nights
Stefanie Rocknak

This is an intensely realistic sculpture, where the surface of the wood has been sanded and oiled to such a fine finish that it resembles skin. The lifelike color and grain, and the way the muscles and bones appear to press out beneath the skinlike surface, emphasize the interweaving of human form and natural material.

Rustic Dance
Robert Koenig

Each of the five figures in this dynamic, over life-size, carved wood sculpture has a base that is integral to the tree trunk from which it is carved. A combination of the base and their vertical configuration enables them to stand up.



Figures At A Table
Elizabeth Watson

Invoking the sense of intensity that can occur between two people seated at a table, this sculpture, measuring 15 x 13 x 17½ in. (38 x 33 x 44cm), was modeled in clay and cast in cement fondue using a waste mold. The sculpture was then lightly colored with pigments fixed with polyurethane varnish thinned with mineral spirits.

Shutting Out The world
Bernard McGuigan

The soft, rounded shapes and the inward gesture of this slate figure combine to create a very intimate expression of tenderness and vulnerability. The surface of the slate, especially the energetic waves of the hair, the strong line of the nose, and the carved fingernails, has been finely worked, and softly catches and reflects the light.

Animals

Closely aligned with the figurative tradition, animal sculpture has always been popular, allowing for freedom of expression in terms of materials, techniques, and styles, whether representational, stylizations, or abstract. A good range of forms is available to the artist depicting an animal theme within sculpture, from animals kept as pets, such as cats and dogs, semi-domesticated animals, like horses and birds, or wild animals.

Rhino Bust
Bill Prickett
This life-size rhinoceros bust has been carved from laminated hardwoods, giving the sculpture a beautiful grained effect. To emphasize the difference between the textures of the head and the horns, the horns have been finely sanded to achieve a smooth, hard-looking surface, while the head has a matte finish achieved by leaving the tool marks of various sizes of gouge unsanded. The lamination technique allows for sculpture of any dimensions to be carved, because the work is not constrained by the size of any one tree.

VULTURE
Dawn Beresford
This 72 x 36 x 36 in. (183 x 91.5 x 91.5cm) assemblage is a powerful image of a bird and makes good use of common discarded objects. These have been cut, bent, and held in place using pop rivets and wire.

ELEPHANT AND CALF
Philip Cox
The success of this life-size sculpture, directly modeled using laminated paper glued together, lies in the construction of a strong cardboard armature that delineates the main forms of the piece. The paper has been cleverly ruffled to mimic the texture of an elephant's skin.

Dancing Hares
Sophie Ryder

In this large—5½ x 5½ ft (1.7 x 1.7m)—sculpture the artist exploits the structural qualities of wire, together with the naturalistic dancing configurations of hares, to enable the sculpture to support itself.

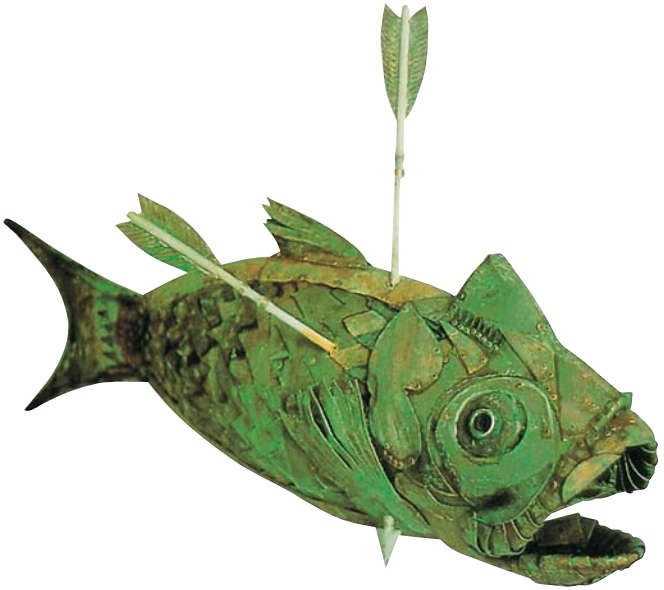
Elements Of Birds I
Harlan Mitchell

The lines and curves of this work suggest elements of our thoughts of birds, rather than literally depicting a particular bird. As the light on the sculpture changes, and as you view it from various angles, different thoughts of birds come to mind.

Harlan Mitchell has no preconceived image of what he is going to carve before he begins work; instead, he allows the work to evolve as he carves. He finds that once the ideas begin to form he becomes engrossed in his work, and needs to carve quickly to get them all down. He works solely with hand tools, and often uses Polyphant stone, as here, which is unique to a particular area of Cornwall in England.

Elephant Fossil
Deborah Scaldwell
This sculpture was modeled in coarse clay, from which a plaster waste mold was made to produce a plaster cast. Once the plaster had dried, the sculpture was sealed with shellac and colored with oil paints to simulate the appearance of bronze. Although a small sculpture, at 21 in. (53.5cm) high, its subject gives it a real sense of monumentality.

Emperor Penguin
Stewart Langworth
Stylized just enough to convey the majesty of its subject, this entire bird was carved from one piece of ash. The egg is separate.



St. Sebastian's Fish
Martin Rayner
Copper sheet is an extremely malleable and flexible material that is easy to bend and cut into shape. The copper sheet used in this sculpture was taken from old water tanks and joined using pop rivets.

Bird Embrace
Jon Buck
This composition of stylized animal forms was first modeled in clay and then a mold made for a cast in plaster, which was worked further to develop the forms. Note how the relationship of the two forms draws the eye around the sculpture.

Nature

Many pieces of sculpture have been inspired by the natural beauty of flowers, plants, and the landscape that surrounds us, and sculpture is increasingly being made specifically to be sited within a landscape setting. In some cases, the setting itself will have been the source of inspiration for the sculpture. However, sculpture can also be made to interrupt or interfere with the natural order of the landscape, to produce a new order. In both cases, there is no doubt that some sculpture benefits from being exhibited outdoors in a natural rather than an urban environment, where it enhances or complements the beauty that surrounds it.

Edge Of Spring
Roger Stephens

This stone carving, representing the emerging new growth of spring, sits beautifully in an outdoor setting. The sculpture measures 20 x 11 x 10 in. (50 x 28 x 25cm) and has been carved from two very different stones—Portland oolitic limestone and Kilkenny fossil limestone, allowing for a strong contrast of color and finish. The "tooled," rough finish of the husk has been achieved using a small airgun with a bush or bouchard hammer, the face of which is covered with rows of pyramids, while the bud has been rubbed with wet and dry (silicon carbide) abrasive papers to a high shine.

Although the sculptor uses power tools to speed up the carving process, both stones could be worked by hand using a hammer and point, mallet and chisels, rasps, and finally carbide papers for smoothing.

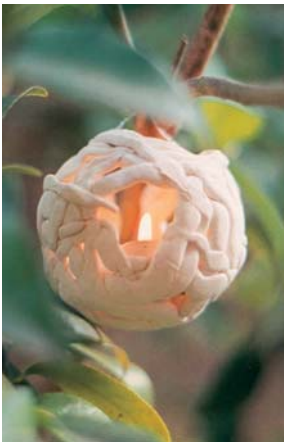
White Flame
Ann Ford

Ann Ford gets her inspiration from growing plants and trees that sway or climb in a graceful movement.

This sculpture is about 2 ft (60cm) high and was made using clay slabs, which means the work does not need to be hollowed out before firing. Working from drawings of the proposed sculpture, work begins at the base, with a slab of clay about ¾ in. (1.5cm) thick, and in this case a wooden bowl was used to create the rounded shape. The sides are gradually built up with slabs that are always of the same thickness, according to the weight that the drying base can take each time, and props are occasionally needed to hold the clay in position until it dries. This piece was fired to 1,832°F (1,000°C) to give the white/creamy look of earthenware.

Water Figure
Anne Kristin V. Moen

Built in cement fondue over a steel and wire mesh armature, and placed in a garden near a pond, this female figure reflects the inner stillness of the setting. The surface has a rough, random texture that fits in well with the natural environment and allows moss to grow, so that in a short time the piece will look a part of its environment.



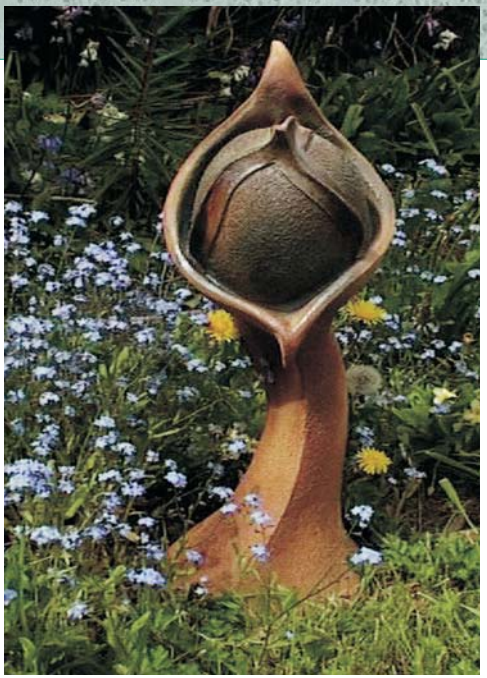
Nests
Deborah Tompsett

Deborah Tompsett's clay nests, with tea lights inside, are designed to hang in a tree and produce fascinating patterns at night, when the candlelight shines through the coils. The idea was developed after observing nests and spider webs, and the artist has achieved her aim of making something that looks fragile, but is in fact very strong.

Each nest is approximately 4 in. (10cm) in diameter, and they are made by wrapping coils of clay around a balloon that has been covered with two layers of wet newspaper to prevent the clay sticking to it. When the clay is leather hard the balloon is popped and removed. and the nest is fired.

Mushroom
Giorgie Cpajak

A mighty mushroom-like form, this sculpture stands at 11 ft 5 in. (3.5m) and is shown off beautifully in this wide open space. Power tools were needed not only to save time but also because the Chinese gray granite it was carved from is especially hard.



Pioneer
Ann Ford
Clay slabs have been used to build a sculpture that represents a plant's movement from the earth, in particular as it turns to face the sun. The sculptor is particularly interested in the textures of the bark on trees, some rough and some smooth, and has used modeling tools to create a surface texture here. The completed sculpture does not need hollowing out, and was fired to 1,832°F (1,000°C), at which point the center was lightly glazed with a dark green matte glaze and the whole piece fired again to 2,372°F (1,300°C).

Cherish
Roger Stephens
The beautiful pale color of pink Northumberland gritstone becomes much darker when wet, and because of its high silica content also glints and sparkles in the sunlight, making it an especially interesting stone to use for outdoor sculptures. The high silica content makes it essential that a good dust mask be worn at all times, whether working with power tools, as here, or using hand tools. This commissioned sculpture is 5½ ft (1.6m) high and is a commemoration of interdependence born out of shared lives and experiences.

Cabbages
Deborah Tompsett
To make these ceramic "cabbages," a rolled slab of clay was laid in a shallow plaster mold and coils of clay were added on to form a bowl. The inside was painted with purple slip and burnished with a pebble until smooth, while the outside was covered with grog to give a rough texture. A slab of clay was curled around the inside of the bowl to form the spiral pattern.

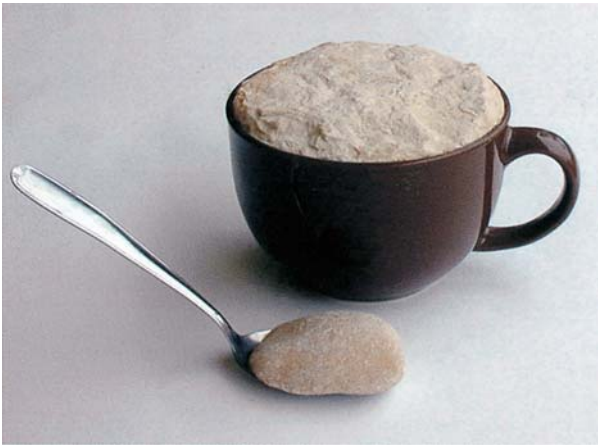
The artist took her inspiration from handling empty horse-chestnut husks, which are rough and spiky on the outside but smooth and velvety on the inside. However, as work progressed, the forms began to look more look cabbages than chestnuts. After an initial firing, the sculptures were sawdust fired, which means they were placed in a metal container and covered with sawdust, which, once set alight, leaves black smoky marks on the ceramic as it smolders down.

Mashonack Deep
Derek Howarth
The natural order of the landscape has been interrupted by cast concrete forms submerged in the ground to produce a sculpture that contrasts the natural with the human-made.

Objects

Various techniques may be used to make a sculpture of an object or derivation of an object, or using an object, even though the sculpture itself is an object in its own right. You will find that very interesting sculptures are made when, for instance, a particular sculpting process lends itself to making a particular form, and in many cases the viewer may be drawn to admire the technical virtuosity that went into making the sculpture.

Bath Robe
Christian Renonciat
This highly detailed carving of a bath robe has been worked in Canadian cedar, with the knots and texture of the wood used to good effect. The composition is kept deliberately casual, heightening the naturalism of the piece.



Natural Breakfast
Tanya Preminger
An everyday coffee cup makes the stone inside it look like soft, light, foamy material, while in reality it is, of course, hard and heavy. In life one can never tell what is true and what is not. The stone was sharpened with a small air drill in order to fit it better into the cup.

Defenestration Of The Heart
Brian Ord
The familiar and the abstract are found in this sculpture constructed from wood and aluminum, and measuring 48 x 48 x 36 in. (120 x 120 x 91.5cm). The piece alludes to the workshop where the sculpture was made. The base takes the form of a saw bench, on top of which intersecting geometric planes have been constructed, interspersed with actual tools, including a hammer and dividers.

Sting In The Tail
Roger Stephens

Measuring 21¾ x 12 x 13¾ in. (55 x 30 x 35cm), this piece of sculpture is based on the idea of making a fossil from fossil stone—Grangemill fossil limestone—and presenting it as an exhibit on a vertical stand of Portland roach oolitic limestone and stainless steel. There is a great contrast between the dense stone of the "fossil" and the open oolitic base. The sculptor uses power tools for the carving processes and finishes by hand polishing with wet and dry (silicon carbide) abrasive papers, although the carving could also be carried out using hand tools.

Still Life
Fred Watson

This still life is virtually life size, and was carved from different pieces of ash that were then fitted together. As the artist had hoped, the piece gives the impression of calmness.

Cake
Tanya Preminger
When the artist found this Onyx stone, its unique colored layers reminded her of a cream cake. She cut the basic 7 in. (18cm) shape with power tools and filed it manually, because only with a manual filing process can a soft, round shape be achieved. Holes were then drilled in the top part of the cake and birthday candles inserted.

Telefono
Joan Mora
This carving in Calatoreo stone is an amazing feat of virtuosity. Even with sustained viewing you are convinced that this is the object itself—a telephone. The color of the stone lends itself very successfully to the object it portrays.

Untitled
Dean Whatmuff

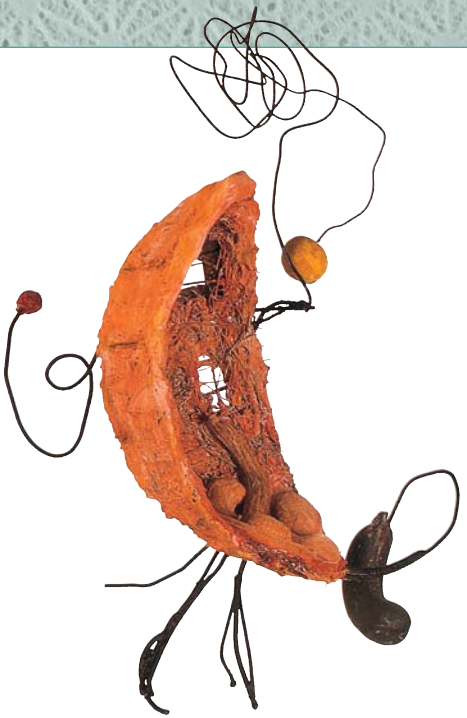
In this piece—measuring 65½ x 38½ x 28 in. (166 x 98 x 72cm)—objects have been used to make an object, which in turn becomes another object—the sculpture. Two cupboard doors have been reversed and joined together, to produce what looks like an open book. A lectern has been made from wood for the book to rest on.

Wheel Of Fortune
George Tkabladze

The nature of fortune and misfortune is artistically visualized in this work, which, with traditional materials, uses symbolic objects, such as nails, locks, and keys, to let the observer read the composition. The bulk of the sculpture is made using traditional woodcarving methods, and the surface has been sanded and finished with tang oil to give it warmth. The lower part of the work and some of the wheel are also made from wood, but using the sculptor's own original technique of combining fabric with several coats of oil and acrylic paints mixed with epoxy.

Bateau de Fruits
Amanda Lorens

Inspired by a ferry journey from England to France, this sculpture uses a 36 in. (91.5cm) high steel armature, some of which is left exposed, to which plaster and straw have been added to create the boat and fruit forms.



The Golden Fish
Hilary Bryanston

The weird and wonderful shapes found in branches provided the inspiration for this sculpture, which measures 32 x 12 x 9 in. (81.5 x 30.5 x 23cm). Some parts of the wood have been left in their natural shape, while other areas have been carved, leaving tool marks, and painted gold.

Spring-Fall Collection
Tanya Preminger
Fashion is a constantly changing, highly dated medium, and is here offered in stone, an ancient, ageless, eternal material. The cloth, light and shapeless, appears here as heavy and unalterable. The figures are 4½ ft (1.4m) tall and both were carved from a plate of Turkish marble using power and hand tools.

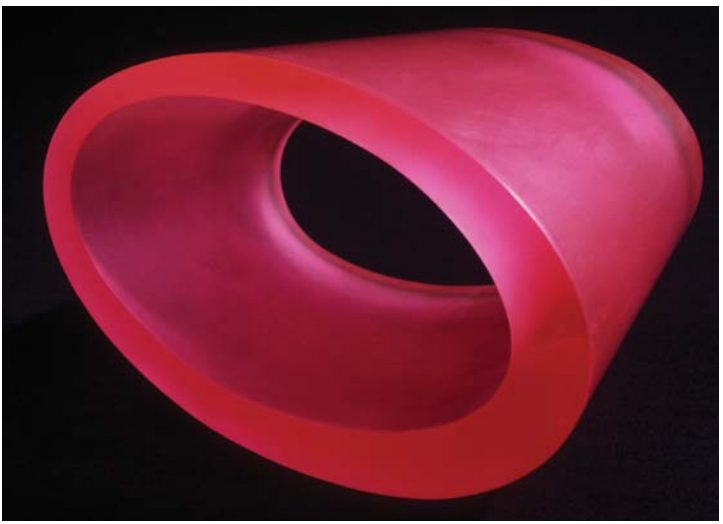
Composition

Compositional devices are the purely visual means that ensure that the various parts of a work come together as a cohesive "whole." In sculpture this refers to mass, lines, and planes. The following examples will show you some of the forms these devices can take, although there are no hard-and-fast rules for when and how to use them, and they are difficult to preplan. You will find that you naturally learn about compositional devices through the practical processes of modeling or carving, and by studying other people's work.

SPLIT FORM NO. 4
Michael Marriott
By splitting this geometric form diagonally and positioning the two parts to give the impression of a slippage, a dynamic abstract sculpture has been created using basic geometry. This 1 yd (3m) high sculpture is sited on the side of a building and blends very well with the geometric nature of present-day architecture.

HANDS ON EARTH
Cornelius Guiste de'Jersey
This sculpture was carved from a block of limestone, and great care was taken to produce a naturalistic form for the two hands. The central stone column is used not only as a support, but also as a compositional device, conveying a flowing movement through the hands. Fragments of stone—pieces cut away from the original block—scattered around the base of the sculpture reinforce this sense of movement.

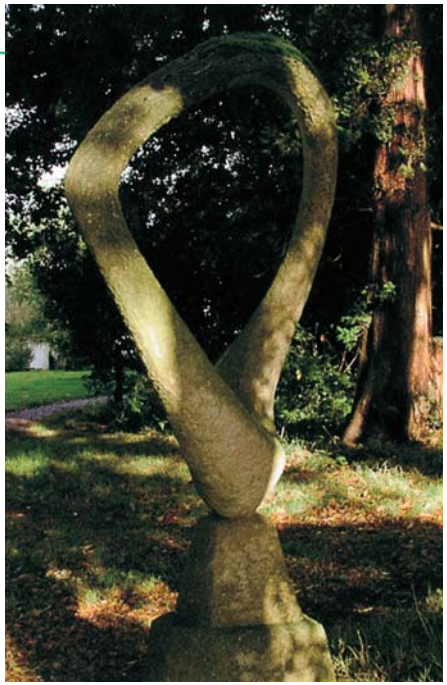
Twice Infinity
Dick Onians
This ingenious design is based on the Möbius strip, consisting of one continuous surface. The small interval in the middle is intended to convey tension. From a different angle the work looks like two infinity symbols—hence the title. It is carved from spalted poplar and mounted on green slate.



Untitled (F), 2004
Michael Shaw
Cast from pigmented polyester resin, the geometry of this 7 x 4 x 4¾ in. (18 x 10 x 12cm) sculpture explores singular form with both unity and variation, whereas its translucency is a vehicle for light and color that glows from within to be projected onto its surroundings.

New Beginnings
Robert Callender

This sculpture—measuring 14½ x 9 x 5 ft (4.40 x 2.75 x 1.50m)—is made from reinforced cardboard, painted to give the illusion of wood. The sculpture has a strong structural bias, due to the various elements giving the impression that they are a much heavier material in reality. They therefore seem dependent on each other for support.



Heart Form
Claudia Pluer

The clean lines of this cement sculpture encourage the viewer's eye to follow its twisting movement. The dynamics of the shape create a rhythmic movement that expands at the top and contracts at the bottom, both in the solid form and in the space that is held beneath.

Surface texture

The surface of a sculpture is of primary importance in enabling the viewer to make sense of the sculpture's form, since the surface encourages the eye to move around the sculpture. Therefore, a variety of surface textures can be used as compositional devices to enhance and define the forms within the sculpture.

STONE FOREST
Neal Barab

Each of these pieces measures 9 x 5 x 4 in. (23 x 12.5 x 10cm), and they have been made as maquettes for larger installations. They could be made up to 9 ft (2.7m) tall. The sculptor often sends small models to clients, because it is possible to visualize a larger composition more clearly by feeling and holding a piece of actual stone, rather than by looking at drawings or photographs, or even holding a plaster model. To achieve the tactile surface finish, the artist sanded the three pieces, each shaped from a different marble, then used a thin diamond saw blade to make crosshatching cuts around each sculpture, leaving untouched a large border at the bottom and the peak at the top. The whole sculpture was then sanded again, rounding over the saw cuts, before being lightly polished.

Floating Form
Ken Smith

The white and soft nature of plaster is used in this piece to create the impression of gentle and dreamy floatiness. There are no clear boundaries, so the light falls over the matte, convex surface to create subtle shades of light and shadow. The sculpture was first modeled in clay, then cast in plaster and sanded with increasingly fine grades of sandpaper to achieve the ultra-smooth finish.

Manuscript
Tanya Preminger

Mitzpe stone is a kind of dolomite stone that exists in the south of Israel. It has a layered structure. This sculpture, measuring 7 x 9 x 2¼ ft (2.1 x 2.75 x 0.7m), is made from one of those layers, placed vertically, maintaining the natural surface texture. Between the layer rinds are fine, paperlike cuts made using a power grinder and diamond disc. The paperlike cuts are pages in a book, just as the whole layers of stone are pages in the history book of life.

HUANGHE
Joseph Wesner
A variety of media has been used in this construction, including steel, steel mesh, and wicker basket, all of which have been cut, shaped, and manipulated to fit in with the composition, which measures 42 x 28 x 24 in. (107 x 71 x 61cm). The emphasis on textures and contrasts results in a tactile, abstract sculpture.

Flow
Michael Thacker

The texture at the center of this stone carving is produced by striking the surface at 90 degrees using a point chisel, hitting it straight on, and moving the chisel around to shatter the surface and give it a pitted look. The surface of the two larger sections was polished up using a combination of diamond hand pads, and wet and dry (silicon carbide) abrasive paper.

This sculpture measures 16 x 16 x 2½ in. (40 x 40 x 6cm) and is carved from Lincoln limestone, a hard limestone that features clusters of fossils. The central textured section seems to grow out of the polished sections and flows between them, conveying the idea of two separate forms growing together through a shared central element.

Time's Winged Chariot
Althea Wynne
Combining relief images on the columns with three-dimensional figures seated on top, this large ceramic sculpture brings together many surface qualities to good effect. The textured surface creates a lively background out of which details emerge and become clearly defined, thus focusing our attention on them.

Inner Seed
Raphael Daden
No attempt has been made to obscure the marks left by the gouge when carving this 54 in. (137cm) tall block of wood, so that the process by which the wood was shaped is revealed. This rough surface contrasts beautifully with the interior lined with red fabric.

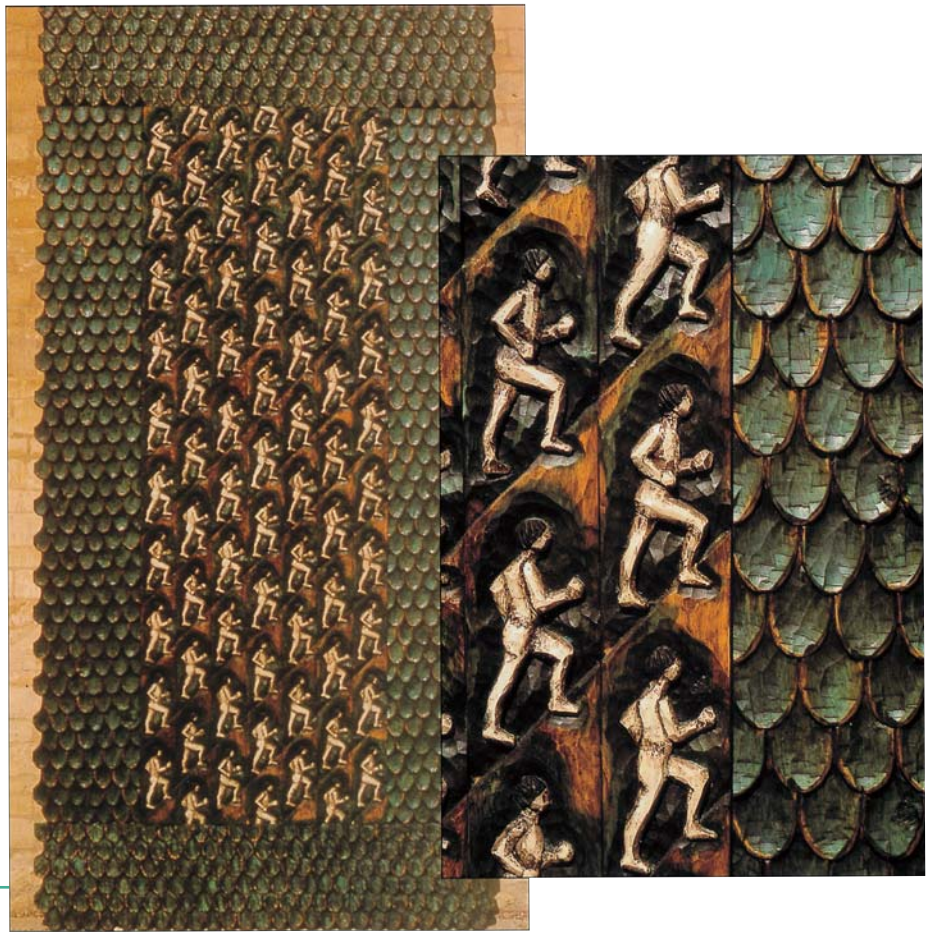
Relief

Relief sculpture has only one viewpoint, and uses three-dimensional forms combined with an element of spatial illusion that you would usually find with two-dimensional art forms. This kind of work has its roots in architecture, where it was used as a way to incorporate sculpture into the fabric of a building. It is therefore tied historically to stone and wood carving, although modeling, assemblage, and construction techniques can also be used to great effect.

Curtain Blowing
Claire Langdown
For this modern relief carving the artist has chosen a simple, everyday image and recreated it in obeche wood. The folds of the curtain help to convey the feeling of movement as the fabric blows in the wind.

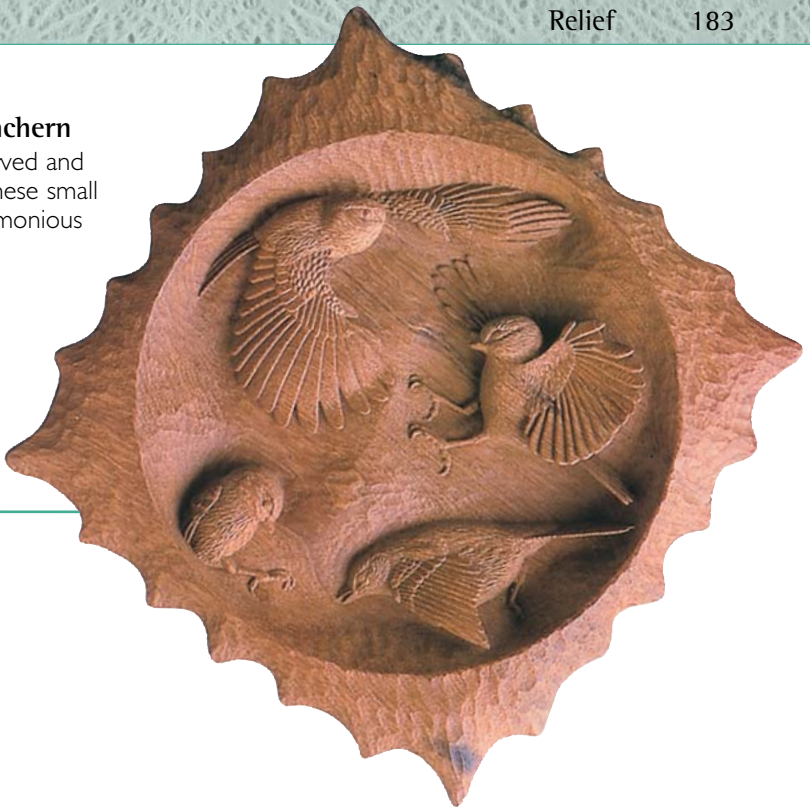
Genesis
Valerie Coffin Price
This relief sculpture measures 5 × 3½ ft × 2 in. (1.52 × 1.10m × 5cm) and combines plaster casts taken from the building and collections at the Natural History Museum in London. The fossils and architectural decorations have been painted to create a narrative.

Lasting Impressions (detail)
Robert Callender
This relief sculpture, measuring 48 × 24 in. (122 × 61cm), has been made by arranging decaying objects made from painted card, wood, and paper pulp in a way that is reminiscent of a museum display case.



Portal No. 7
Robert Koenig
This large relief—10 x 5 ft (3.2 x 1.5m)—alludes to a specific architectural function and relies for its overall impact on the symmetrical arrangement of a repeated motif carved into the wood. The use of color is very skilful and, together with the marks left by the carving gouge, enhances and brings together the whole composition.

Blue Tits
Charles MacEachern
Accurately observed and carved in teak, these small birds form a harmonious composition.



Bird Eating Fish—Obuerse
Peter Nicholas
Shallow-relief sculpture, such as this one carved from slate, depends upon the clear definition of the shapes. Light falling on the sculpture brings out the figures by contrast, highlighting some parts and casting others into shadow.

Glossary

Abrasion
A technique of shaping stone, wood, or plaster by rubbing the surface with an abrasive material to wear it down.

Armature
A framework that gives rigid support to a modeled sculpture. A basic linear form in wire can be bulked out with chicken wire or padded with wood, paper, or Styrofoam if appropriate. The medium is modeled directly onto the armature.

Assemblage
A sculpture constructed from various materials not originally manufactured for artistic purposes, often including whole found objects.

Back iron
See Fixed iron support

Balloon armature
A type of armature used for modeling heads, consisting of a wooden post and two wire loops.

Bandsaw
A narrow, power-driven blade set in heavy machinery, used to cut shapes from wood.

Base
A plinth or podium on which a sculpture is displayed, or the portion of a sculpture on which its weight rests.

Bat
A thick plaster slab on which wet clay is left to lose enough moisture to make it workable.

Bisque (or biscuit) firing
The first stage of firing clay or ceramics before a glaze is applied.

Block
A body of material, such as wood or stone, for carving.

Body
A term used to refer to a mass of clay formed from a mixture of clays, or clay and ceramic materials.

Bush hammer
A hammer used in stone carving to create a uniform textured surface. It has many small points on its head.

Calipers
An instrument used to measure a three-dimensional object, consisting of two curved arms hinged together.

Carborundum
Another name for silicon carbide, this block is used for filing and grinding.

Carving
The technique of cutting and abrading the surface of a block of material to shape it into a particular form.

Cast
A sculpture produced from a mold. There are various casting processes by which an original sculpture can be reproduced exactly in a different material, or several copies can be made.

Ceramics
Pottery or hollow clay sculpture that is hardened and finished by firing.

Chisel
A cutting tool consisting of a metal shaft beveled at one end to form the cutting edge. A chisel is specially designed for cutting a particular material, such as wood or stone.

Claw chisel
A stoneworking chisel with the blade fashioned into small teeth. It is used for shaping and leaves striations in the stone surface.

Clay wash
A thin liquid made by dissolving a little clay in water. Used to help fix pieces of wet clay together, and to coat the seams of a plaster mold to prevent adhesion.

Cure
The hardening process of a material that is initially worked in a fluid form, such as cement or polyester resin. This term is most often used when a chemical reaction occurs, rather than when a material dries through exposure to the air.

Dummy
A hammer with a rounded head, usually of iron, for striking stone-carving tools.

Fiberglass matting
A mesh of glass filaments bonded onto sheets and used to reinforce cement-fondue or polyester-resin sculptures.

File
A metal tool with a rough surface used to smooth, shape, or cut materials by abrasion.

Filler
A material added to polyester resin to create a specific appearance.

Firing
Baking clay in a kiln to harden it permanently and also to fuse glaze to the surface.

Fixed iron support
A metal frame set on a wooden base, which is attached to an armature and supports the weight of the modeling material.

Flat chisel
A chisel with a straight cutting edge used for shaping and finishing wood or stone.

Gel coat
The first coat of liquid polyester resin applied to a mold, containing the pigment or filler.

Glaze
A colored or transparent coating that decorates and seals ceramicware. Glazes are applied in liquid form and hardened and fused to the clay by firing in a kiln.

Gouge
A woodcarving chisel with a curved cutting edge.

Grog
Fired clay ground into fine particles and added to some clays to give them strength.

Hardener
A substance added to polyester resin to promote curing.

Hardwoods
The tough and durable woods produced by certain deciduous trees, such as mahogany and oak.

Hollow casting
Casting in a mold by lining the walls of the mold with layers of the sculpture material rather than filling it up.

Hollow modeling
A technique for making clay sculpture in which the form is built from slabs and tubes of clay so that it is hollow throughout.

Key
A small interlocking device in the seam of a mold enabling it to be precisely reassembled.

Kiln
A special oven in which clay objects are baked at high temperatures to harden them.

Kneading
The process of mixing small amounts of clay to ensure an even consistency.

Leather hard
A description of clay that has become stiff but not completely dry and rigid.

Maquette
A small preparatory model for a sculpture, often made of clay.

Modeling
The process of making sculptures by building up a form in a malleable material, such as clay or wet plaster. The material is shaped with the fingers or with modeling tools.

Modeling stand
A turntable mounted on a tripod that can be raised or lowered, giving the sculptor access to the work from all angles.

Mold
A negative form or impression taken from an original sculpture, in which a cast is made to copy the sculpture or reproduce it in another material.

Pigment
A material added to polyester resin to color it.

Pinching
A pottery technique that involves pressing the thumb into a ball of clay and drawing the clay out into a pot shape between thumb and fingers.

Pitching tool
A broad, heavy, stone-carving chisel, used to strike off large pieces of stone in roughing out and carving.

Plaster bat
See Bat.

Pneumatic
Powered by compressed air.

Punch
A broad, pointed metal tool used in roughing out stone.

Rasp
A coarse abrasive tool made of metal, used for working the finer details of carvings.

Release agent
A substance applied to the interior or seams of a mold to prevent the adhesion of the two surfaces.
See also Soft soap.

Relief
A sculpture that is not completely three-dimensional, but protrudes from a flat background.

Riffler
A small metal filing tool, used for delicate shaping and finishing of a carving.

Riveting
A method of joining sheets of metal using short bolts with flattened heads.

Roughing out
The first part of the carving process where the basic shapes are made without any finer detail.

Scrim
A loosely woven burlap fabric, used in reinforcing plaster molds and casts.

Shim
A thin brass strip used to divide the surface of a modeled sculpture into sections for a waste mold.

Silicosis
A disease of the lungs caused by inhaling dust.

Slabbing
A technique in which a form is built from thick sheets of damp clay.

Slip
An opaque creamy liquid made from clay and water. Slip can be colored and used to decorate clay sculptures.

Slurry
A mix of cement or cement fondue and water that is applied as a first coat to a mold when making cement or cement-fondue hollow casts.

Soft soap
Liquid soap that is diluted with water and applied to molds to prevent adhesion of a cast.

Softwoods
Woods from coniferous trees, some of which are suitable for carving.

Spokeshave
A small planing tool consisting of a blade with a handle at either end.

Surform
A metal abrasive tool fitted with a replaceable blade so that small particles of material pass through and do not clog the cutting teeth.

Tamping
Process of compacting material into a mold.

Template
A pattern cut from a sheet of paper or cardboard and used as a guide for cutting or forming parts of a sculpture.

Tin snips
Shears with short blades used to cut through thin sheets of metal.

Undercut
A recess or awkward angle in a sculptural form that prevents the easy removal of a cast from a mold.

Waste mold
A mold from which only one cast can be made because the mold must be broken away to release the cast.

Wedging
The process of mixing large amounts of clay to ensure an even consistency.

Suppliers

UNITED STATES

The Clay Alley
75 Kinsey Drive
Gettysburg, PA 17325
Tel: +1 717-334-7473
www.clayalley.com/sculpting.htm

Polyform Products Co
1901 Estes Avenue
Elk Grove Village, IL 6000
Tel: +1 847-427-0020
www.sculpey.com/index.htm

Polymer Clay Express at TheArtWay Store
9890 Main Street,
Damascus, MD 20872
Tel: +1 301-482-0399
www.polymerclayexpress.com

2Sculpt
Tel: +1 785-838-3885
Email: sculpt@bigplanet.com
www.2sculpt.com

Seattle Pottery Supply
35 South Hanford Street
Seattle, WA 98134
Tel: +1 800-522-1975 Email:
info@seattlepotterysupply.com
www.seattlepotterysupply.com

Trow & Holden Inc.
45 South Main Street
Barre, VT 05641
Tel: +1 802-476-7221
Email: info@trowandholden.com
www.trowandholden.com

Stoneman Inc.
2925 Rufina Court
Santa Fe, NM 87507
Tel: +1 505-471-0018

The Complete Sculptor, Inc.
90 Vandam Street
New York City, NY 10013
Email: tcs@sculpt.com
www.sculpt.com

Colorado Alabaster Supply
1507 N. College Avenue, Fort
Collins, CO 80524
Tel: + 1 970-221-0723
www.coloradoalabaster.com

Rockler Woodworking and Hardware
4365 Willow Drive
Medina, MN 55340
Tel: +1 800-279-444
www.rockler.com

Christy Metals, Inc.
2810 Old Willow Road
Northbrook, IL 60062
Tel: +1 847-729-5744
Email: info@christymetals.com
www.christymetals.com

Brad Oren Sculpture Supply
800 Lone Oak Road
Eagan, MN 55121
Tel: +1 800-366-9000
Email: art@bradsculpture.com
www.bradsculpture.com

Alumilite Corp.
315 E. North St
Kalamazoo, MI 49007
Tel: +1 800 447-9344
www.alumilite.com

Ceramics & Crafts Supply Co.
490 Fifth Street
San Francisco, CA 94107
Tel: + 1 415-982-9231 Email:
ceramics@ceramicsSF.com
www.ceramicssf.com

UNITED KINGDOM

Alec Tiranti Ltd
70 High Street
Theale, Reading, Berkshire
RG7 5AR
Tel: +44 (0)118 930 2775
Email: enquiries@tiranti.co.uk
London shop: 27 Warren
Street, London, W1T 5NB
Tel: +44 (0)20 7636 8565
www.tiranti.co.uk

Potclays Ltd
Brickkiln Lane
Stoke-on-Trent, ST4 4BP
Tel: +44 (0)1782 219816
Email: sales@potclays.co.uk

Alltek UK
The Old Railway Buildings
Silk Road, Macclesfield
Cheshire, SK10 1JD
Tel: +44 (0)1625 434 043
Email: info@icp-alltek.co.uk
www.icp-alltek.co.uk

Canonbury Arts
266 Upper Street
Islington, London, N1 2UQ
Tel: +44 (0)20 7226 4652
Email: sc@canonburyarts.co.uk
www.canonburyarts.co.uk

Index

Credits

Quarto would like to thank the contributing sculptors for kindly submitting work for inclusion in this book. Artists are acknowledged beside their work.

We are also indebted to the following:
Art Outside www.art-outside.com specialists in sourcing, promoting and selling outdoor sculpture
Potclays www.potclays.co.uk manufacturers and suppliers of clays, glazes, materials, kilns, and equipment.

A QUARTO BOOK

Published in 2006 by
CHARTWELL BOOKS, INC.
a division of BOOK SALES, INC.
276 Fifth Avenue Suite 206
New York, New York 10001
USA

Reprinted 2010

ISBN-13: 978-0-7858-2142-7
ISBN-10: 0-7858-2142-2
QUAR.TST

Digital edition: 978-1-61058-374-9

Softcover edition: 978-0-7858-2142-7

This book was designed and produced by
Quarto Publishing plc
The Old Brewery
6 Blundell Street
London N7 9BH

Project Editor **Mary Groom**
Art Editor and Designer **Jill Mumford**
Picture Research **Claudia Tate**
Assistant Art Director **Penny Cobb**
Art Director **Moira Clinch**
Publisher **Paul Carslake**

Manufactured by Modern Age Repro House Ltd, Hong Kong
Printed by Midas Printing International Ltd, China