This artist has developed new ways to use the process of glassblowing to create large sculptures and installations. He calls the objects in this window installation “flowers.” Compare and contrast these glass flowers to the flowers painted by van Gogh in Figure 7.8 on page 178.

Traditionally, glass has been a medium of the craftsperson used to make small, decorative works of art. American artist Dale Chihuly (b. 1941) has revolutionized the process of glassblowing to create monumental forms. His works appear in some 200 museums worldwide. His creations have been grouped into series. These include handblown glass baskets, sea forms, flowers, chandeliers, and huge installations, which include the 16-foot-square window in Figure 3.1. The window graces the lobby of a corporate headquarters. Its purpose, according to the artist, was to make “a difficult view beautiful.” What do you think he meant by this statement? In other words, what do you think is the view outside this window?

In this chapter, you will:

- Compare and contrast the media used in drawing, painting, printmaking, and sculpting.
- Describe the media of crafts and architecture.
- Demonstrate the effective use of art media and tools in original works.
- Identify technological media.

**Focus on Art History**

Traditionally, glass has been a medium of the craftsperson used to make small, decorative works of art. American artist Dale Chihuly (b. 1941) has revolutionized the process of glassblowing to create monumental forms. His works appear in some 200 museums worldwide. His creations have been grouped into series. These include handblown glass baskets, sea forms, flowers, chandeliers, and huge installations, which include the 16-foot-square window in Figure 3.1. The window graces the lobby of a corporate headquarters. Its purpose, according to the artist, was to make “a difficult view beautiful.” What do you think he meant by this statement? In other words, what do you think is the view outside this window?

**Compare and Contrast.** Examine Figure 6.2 on page 136. Like Figure 3.1, these windows were created by an artist renowned for his inventive and beautiful glass designs. Compare the work of Chihuly and Chagall to identify the general trend or style each work shows.
Two-Dimensional Media

Jackson Pollock dripped paint onto canvas in Figure 1.13 on page 14. Leo Twiggs used dyes and wax resist on cotton in Figure 1.7 on page 10. Each of these artists created a two-dimensional work of art using different materials. Any material used to create art is called a medium. The plural form of medium is media. A medium can be something as ordinary as a graphite pencil or as exotic as gold leaf gilding. In two-dimensional works, such as drawing and painting, artists use media such as crayons, paints, pastels, and pencils.

Drawing

In baseball, a pitcher throws warm-up pitches before facing a batter. Musicians tune their instruments or warm up their voices before a performance. Artists must also prepare before creating art. By drawing, artists become better at perceiving, or carefully noticing, the lines, shapes, and forms of an object. Many artists use sketchbooks to record their surroundings and to produce studies of objects. Artists also record ideas for later use. The Renaissance artist Leonardo da Vinci filled more than 100 sketchbooks with his drawings and ideas. His sketchbooks included everything from perceptions of people, to his notations on the movement of water (Figure 3.2), to his plans for flying machines.

Drawing is usually the first step in producing artworks. Rough sketches, or studies, are often done before creating a work in another medium such as paint or clay. Fashion designers draw their ideas for new styles long before any fabric is cut. Stage designers, graphic designers, and architects must

**Vocabulary**

- medium/media
- shading
- printmaking
- print
- reproduction
- edition
show presentation drawings for a client’s approval. Figure 3.3 is a costume design for a comic ballet, *The Devil’s Holiday*. The designer modeled the costumes and stage designs based on the eighteenth-century paintings of Venice by the artist Canaletto.

Although drawings are often used as guides for other artworks, sometimes an artist’s drawing is the finished artwork. One example of a drawing as a work of art is Canaletto’s *Ascension Day Festival at Venice* (Figure 3.4).

**Drawing Media**

Drawing is the process of moving an instrument over a smooth surface to leave a mark, called a line. In drawing, line is the most important element of art. The characteristics of a line are determined, in part, by the medium used to draw it. The most popular drawing media are graphite pencils, colored pencils, crayons, colored markers, pens, pastels, and chalk. Pen and ink, pen and brush, and brushes with watercolors are also used to make drawings.

![Figure 3.3](image) How does this sketch let you know that this character is in a comedy? What makes him look humorous?


![Figure 3.4](image) Look closely at this meticulous drawing. Can you tell what city is depicted in this work? What helped you decide?

Each drawing medium has its own qualities. Chalk and crayon, for example, produce rough lines. Pens, by contrast, make smooth lines. Figure 3.5 shows lines made with different drawing media.

Shading Techniques

Shading is the use of light and dark values to create the illusion of form. There are four main shading techniques:

- **Hatching.** This technique consists of drawing thin lines that run in the same direction. Find the forms in Figure 3.6 that use hatching.

- **Crosshatching.** Shading created using crisscrossing lines is called crosshatching. Look at the forms in Figure 3.6 that demonstrate this technique.

- **Blending.** Artists perform blending by changing the color value little by little. Find the forms in Figure 3.6 that are shaded using blending.

- **Stippling.** Shading that creates dark values by means of a dot pattern is referred to as stippling. Locate the forms in Figure 3.6 that show stippling.

Look at the drawing in Figure 3.7. Isabel Bishop used three different drawing media to create a drawing that has the look of three dimensions. The artist accomplished this through shading.

Which shading technique was used in Figure 3.4 on page 43?

Painting

Painting is the process of applying color to a surface using tools such as a brush, a painting knife, a roller, or even your fingers. The surface is the material to which the paint is applied. Canvas, paper, and wood are frequently used as surface materials.
All paints have three basic ingredients:

- **Pigments.** Pigments are finely ground colored powders. Pigments come from natural or synthetic materials. Natural pigments include indigo, a vegetable, and the cochineal beetle, an insect. Natural pigments can also be made from minerals or clay. Synthetic pigments are artificially made from chemicals.

- **Binder.** A binder is a material that holds together the grains of pigment. The binder allows the pigment to stick to the painting surface. Egg yolks mixed with water have long been used as a strong binder for professional artist’s tempera paints. Other binders are linseed oil and wax.

- **Solvent.** A solvent is a liquid that controls the thickness or the thinness of the paint. Different painting effects require different thicknesses of paint. Using thin watercolor paint gives a light, washed-out appearance; using thick watercolor paint produces a more intense appearance. Solvents are also used to clean paintbrushes and other applicators.
Winslow Homer is considered one of the artists who has captured the true feelings of the United States in his works. Homer developed an appreciation and love for the outdoors while growing up with his two brothers in Cambridge, Massachusetts. By the age of ten, his interest in art began and his talent for drawing became obvious. When he was 19, Homer was accepted as an apprentice at a large printing firm in Boston, even though he had little formal art training.

When his apprenticeship was over, Homer worked as a draftsman, specializing in woodblock engraving. Soon he began illustrating magazines. By the 1860s he was contributing regularly to Harper’s Weekly magazine as an illustrator of events occurring in the Civil War. After the Civil War ended, Homer traveled to Europe. There, he was influenced by the works of French artists Édouard Manet and Gustave Courbet.

By the 1880s, Homer had begun painting the subject that was to become his trademark—the sea. He loved nature and spent hours outdoors. He felt at home on the sea although he knew its dangers as well. Because he was able to capture the elemental forces of nature, Homer is considered a Realist. His unique talent enabled him, as few others have done before him, to express the reality of the United States.
The look of a finished painting depends on the combination of media, tools, and the surface the artist chooses. In Figures 3.8 and 3.9, you can see how Winslow Homer has created two images that are almost exactly alike. However, he has used different media. Figure 3.8 is made with thin, wet, flowing watercolor on white paper. The white in this painting is the white of the paper showing through. Figure 3.9 is painted with thick, creamy oil paint on canvas. The white in this painting is opaque white paint.

**Painting Media**

As with drawing media, there are many different kinds of painting media, each with its own unique qualities. The artist chooses the paint based on personal preference and the purpose of the work.

**Oil-Based Paint.** First used in the 1400s, oil paint remains a popular medium today. True to its name, oil paint uses linseed oil as its binder. Its solvent is turpentine.

One advantage of oil paint is that it dries slowly. This allows the artist to blend colors right on the canvas. The work in Figure 3.9 is an oil painting. Notice how smoothly the colors blend.

**Water-Soluble Paint.** The most popular of water-based painting media, watercolor takes its name from its solvent, water. The binder is gum arabic. Compare the watercolor in Figure 3.8 with the oil painting in Figure 3.9. What differences do you see?

Tempera is another water-based paint. It dries more quickly than oil paint, and it has a more opaque finish than watercolor.

Acrylic paint, which first appeared in the 1950s, uses an acrylic polymer as a binder. The solvent used for acrylic paint is also water. However, once professional acrylic paint dries, it cannot be dissolved. School acrylics have been developed, however, that can be dissolved with soapy water after they dry.

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**Activity**

**Experimenting with Watercolor**

**Demonstrating Effective Use of Art Media and Tools in Painting.** Using watercolor paint, choose one bright color and paint several shapes on a dry sheet of watercolor paper. Then thoroughly brush water on both sides of a sheet of watercolor paper and repeat the process. If available, try using different types of natural and synthetic watercolor brushes. Share and compare your results with those of classmates.

**Computer Option.** Drawing with color on the computer is like drawing with light. Light as the computer’s pigment can vary in opacity from opaque, like tempera paint, to transparent, like watercolors. Find the menu in the application you are using that controls opacity. Explore the settings. Remember, these qualities change as you paint on different surfaces. If available, investigate rough, smooth, or textured papers.
Printmaking

Printmaking is a process in which an artist repeatedly transfers an original image from one prepared surface to another. Paper is often the surface to which the printed image is transferred. The impression created on a surface by the printing plate is called a print. A print is not the same thing as a reproduction, although sometimes people confuse the two. A print is an original work of art. A reproduction, such as the artwork shown in this book, is a copy of a work of art.

The Basic Steps of Printmaking

While prints may be made using many different media, processes, and surfaces, all require three basic steps.

- Creating the printing plate. A printing plate is the surface on which the desired image is created. In producing a printing plate, the artist makes a mirror image of the final print. Letters and numbers must be made backward on the plate.

- Inking the plate. The artist applies ink to the plate. This is done with a brayer, a roller with a handle. For a multicolor print, one plate must be made for each color. The ink creates the image on the print.

- Transferring the image. The paper or other material is pressed against the inked plate, and the ink is transferred to the new surface. Sometimes this is done by hand. Other times a printing press is used. Usually, more than one print is made from a single plate. Together, all the prints made from the same plate, or set of plates, form an edition. Each print in an edition is signed and numbered by the artist. The printmaker signs the work in the bottom margin and writes the title on each print as well as the number of each print. The number 10/200 indicates the tenth of 200 prints.

Printmaking Techniques

There are four main techniques artists use to make prints: relief, intaglio, lithography, and screen printing.

- Relief printing. In this method, the artist cuts away the sections of a surface not meant to hold ink. As a result, the image to be printed is raised from the background. In Figure 3.10, Elizabeth Catlett has controlled the light and dark areas of her linoleum-cut relief print by the amount she has cut away. Notice that the white lines are wider in the very light areas.


Figure 3.10 Catlett has devoted her artistic career to a socially conscious art that represents the struggles of African Americans.
- **Intaglio** (in-tal-yo or in-tal-ee-o). This name comes from the Italian word meaning “to cut into.” Intaglio is a process in which ink is forced into lines that have been cut or etched on a hard surface such as metal or wood. Then the plate’s surface is wiped clean and the prints are made. You can actually feel the lines of raised ink on an intaglio print.

- **Lithography.** In lithography the image to be printed is drawn on limestone, zinc, or aluminum with a special greasy crayon or pencil. Ink is attracted to this material. When the drawing is completed, the areas that should remain blank are etched with a special solution that repels ink. Then, when the surface is inked, the greasy area alone holds the ink. Because the process is complicated, new materials are being developed to make lithography easier. There are kits for schools that use paper instead of limestone or zinc for the printing plate.

- **Screen printing.** This is the newest method for making prints. It uses a stencil and screen as the printing plate. The stencil is placed on a fabric screen stretched across a frame. The screen is placed flat on the printing surface. Ink is pressed through the fabric screen where it is not covered by the stencil. If more than one color is used, a separate screen is made for each color. Another term for screen printing is serigraphy.

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**Activity**

- **Making a Printing Plate**

  **Demonstrating Effective Use of Art Media and Tools in Printmaking.** You can make your own relief printing plate. Begin by cutting a 4-inch square from a sheet of cardboard. Cut a variety of smaller geometric shapes from the same sheet. Arrange these on the surface of the square. Form an interesting design.

  Glue the shapes in place. Let them dry overnight. Apply printing ink to the surface with a brayer. Lay a sheet of paper over your inked plate. Apply pressure evenly. Carefully peel back the print.

  **Computer Option.** Explore the Shape and Line tools in your application. Change line thickness, color menus, gradients, and opacities. Arrange several shapes to make an interesting design. Print onto color transfer paper that is made for your printer. Remember to flip the image before printing if necessary because shapes and letters may be reversed. Follow the instructions on the printing paper package to transfer your design onto paper, cloth, or another surface. (An iron sets some transfer papers while others require more elaborate equipment.)

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**Check Your Understanding**

1. Name four of the most popular media used in drawing.
2. What are the three ingredients found in every type of paint?
3. What are the three basic steps of printmaking?
4. Compare and contrast the media used in drawing, painting, and printmaking.
Three-Dimensional Media

Have you ever taken a lump of clay and formed it into a bowl or an animal? If so, you were working with a three-dimensional medium. These media make solid forms that have height, width, and depth.

**Sculpture**

Sculpture is a three-dimensional work of art. Sculpture is art that is made to occupy space. This is one way in which sculpture is different from other kinds of art. Although objects in a drawing or painting can look quite real, the work is flat, or two-dimensional. Artists who create sculpture are called sculptors.

**The Media of Sculpture**

Like other artists, sculptors use a wide variety of media in their work. Sculpting media include clay, glass, plastics, wood, stone, and metal. No matter what medium is used, a sculpture will be one of two types: sculpture in the round or relief sculpture.

- **Sculpture in the round.** This type of sculpture is surrounded on all sides by space. Another name for sculpture in the round is freestanding sculpture. You can walk around sculpture in the round or turn it over in your hands to see all sides. Sculptures in the round can be realistic representations of people or objects (Figure 3.11). Not all freestanding sculptures have recognizable subjects, however. (See Figure 5.6 on page 101).

- **Relief sculpture.** This type of sculpture projects into space from a flat background. Relief sculptures are designed to be viewed only from one side. Figure 3.12 shows an example of a relief sculpture attached to a smooth, gently–rounded surface. You cannot see the back of the figure. The figure protrudes out into space from the smooth surface of the vase.

**Sculpting Techniques**

In addition to a wide array of media, sculptors use a variety of processes. The processes include modeling, carving, casting, and assembly.
Modeling. In this process, a soft, pliable material is built up and shaped. Media such as clay, wax, and plaster are used in modeling. Because the sculptor gradually adds more material to build a form, modeling is referred to as an additive process.

Carving. In carving, the sculptor cuts, chips, or drills from a solid mass of material to create a sculpture. Material is removed until the sculpture is completed. Carving is therefore called a subtractive process. Wood and stone are the most common carving media.

Casting. In casting, molten metal or another substance is poured into a mold and allowed to harden. The artist duplicates a form originally molded with clay, wax, or plaster using a more permanent material. Just as in printmaking, an edition of sculptures can be made from the same mold. Once the edition is complete, the mold is destroyed. This prevents the mold from being used again and safeguards the monetary value of the sculptures that were originally cast.

Assembling. In this process, also called constructing, a variety of different materials are gathered and joined together to make a sculpture. One assembly process involves welding metal, but media can be glued, sewn, or otherwise fitted together. Assembling is sometimes used along with other sculpting processes. A combination of casting and assembling was used to create Zaga (Figure 3.13).
Crafts

Before machines were invented, people made everything by hand. Today, artists are still creating one-of-a-kind items. Some objects are created for practical use, and others are made purely for decorative purposes. Art made to be experienced visually is called **fine art**. Art made to be functional as well as visually pleasing is called **applied art**. Today the distinction between fine art and applied art is fading.

Artists are currently creating both functional and decorative craft objects. Weavings are made from natural wool, linen, silk, cotton, and manufactured fibers. Quilts are stitched from fine fabrics to be hung on the wall like paintings. Baskets are woven from natural materials such as reeds and wood slats (Figure 3.14), as well as manufactured fibers. Pottery is made with clay from the earth. Handmade glass objects are formed by forcing air through a tube to shape globs of melted glass. Jewelry is crafted using expensive materials such as precious stones and gold, but it can also be made using paper. As wonderful as technology has become, we still appreciate having an object that is one-of-a-kind and made by hand.

**The Media of Crafts**

The most commonly used craft media are clay, glass, wood, fiber, and metal. Clay and glass can be used to make plates and cups, vases, and jars. Wood can be used to make furniture or containers. Fiber is used to weave cloth and to make baskets. Metal is used to make utensils and jewelry.

Each craft contains an almost unlimited number of choices. An artist using clay can choose stoneware, earthenware, or porcelain. A weaver can select natural

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**Figure 3.14** Imagine the skill it took to make this basket and lid perfectly round and to make each twist of the warp just the right size to create points in proportion to the shape of the basket. Notice that the points are smaller at the top and bottom and larger near the center.

fibers or synthetic fibers. A woodworker can choose among oak, ash, mahogany, rosewood, ebony, cedar, and pine. What media were used to create Figure 3.15?

The Processes of Crafts

The techniques and processes a craft artist uses depend on the media selected. Clay, for example, can be modeled, carved, and assembled. It can also be thrown on a potter’s wheel. Clay is finished by firing it in a kiln, a furnace that reaches high temperatures.

Glass can be mold-made or blown. Blown glass requires a process in which the artist, using special tools, blows air into molten glass in order to shape it.

Wood is worked using techniques such as carving and assembling, turning, and bending. In turning, a piece of wood is rotated on a machine called a lathe. The machine may have a fixed tool that shapes the piece, or the artist may use a special tool. Bending is another shaping process. A piece of wood is soaked in water or another liquid to make it pliable. Then it is slowly manipulated into place.

Fiber can be woven into cloth or baskets. It can be embroidered, sewn, or quilted. Metal can be shaped in molds or it can be cut with special shears. Pliable metals can be hammered or filed into shape. Pieces can be assembled by linking them together or by soldering them together. Soldering is a process using a handheld tool called a soldering iron that melts small areas of the metal. When the metal cools, the pieces are joined. Assembling larger pieces of metal, a process called welding, requires a larger, more powerful tool with an open flame.
Architecture

Of all the arts, architecture has the greatest impact on our daily lives. The quality of the architecture we use for shelter, for gatherings, and for worship affects the quality of our lives. Architecture is the planning and creation of buildings. Because a well-designed building is a shelter as well as a work of art, architecture is considered both an applied art and a fine art. An artist who works in the field of architecture is an architect. To be certified, an architect studies engineering because a structure must be designed to hold its own weight and withstand the physical forces placed on it. An architect also studies the visual arts in order to create buildings that are well-proportioned and pleasing to the eye. Architects design for individuals as well as for the public. The needs of each group must be considered and met before a building can be called a success.

The Media of Architecture

From the earliest times people have been creating shelters from materials found in their natural environment. Huts constructed from sticks and bark were covered with mud. Nomadic people constructed movable shelters from wood poles and covered them with animal skins. In the north, ice was cut and formed to make shelters. In the tropics, leaves and grasses were woven together. Gradually, people developed skills to make better use of available materials for permanent structures that were used for gathering as well as shelter. People learned to make bricks by firing clay to

Activity

Redesigning a Familiar Building

Demonstrating Effective Use of Art Media and Tools in Design. Architects are often hired to renovate an old structure. Look for a building in your community that you would like to see improved. Study it by making sketches from different points of view. Identify and list in your sketchbook the media that were used in the construction of the building you have selected. Think about the media you have just studied. List some that would harmonize with the surrounding buildings and the environment. Using pencil, draw one face of the building. Include the existing doors and windows. Then redesign the look of that side using the media that you believe will improve the look of the building. Use watercolors to indicate the colors of the new construction media.

Computer Option. Use a computer application to redesign the façade of a building in your community. Choose the Grids and Rulers option to guide your drawing so you can maintain scale and proportion. Consider how you can create harmony by repeating the materials, colors, or architectural features of other buildings in your community. Begin by drawing the front view. Hold down the Shift key to draw straight lines or restrict shapes. Use the copy and paste functions to make duplicates of features such as doors and windows. Save and title the line drawing. Then use your choice of brushes, textures, and gradients to simulate natural materials. Use the Save As option to retitle and save. Print and display your work.
make it hard. They stacked the bricks to build walls. Stonecutters develop methods for cutting stone so smoothly that one could be stacked on top of the next without anything to hold them in place (Figure 3.16). Others learned how to balance one long stone on top of two posts and developed the post-and-lintel method of construction. Today this is called post-and-beam construction because architects use wood or steel beams instead of stone lintels.

Later, architects learned to form an arch with stone. The arch carried the weight of walls and roofs without buckling. Arches led to vaults, or arched roofs that connect walls. Vaulted halls enabled architects to create more open space. A dome is a round roof, as if an arch had been extended into a full circle. Using more advanced construction techniques architects developed a pointed stone arch and supported it with buttresses. This allowed large openings to be made in the walls that were filled with stained-glass windows.

Wood was always a popular material, because it was plentiful. Balloon framing allowed builders to use heavy beams of wood to support thin walls. The truss supported a sloped roof. This technique is still being used today.

Technology has given us steel and reinforced concrete. Steel frames enabled us to cover the outside of skyscrapers with glass. The development of new materials has not eliminated the use of the older materials. New ways of

![Figure 3.16](image-url)
using them are always being developed. When Louis Sullivan built the Wainwright Building (Figure 3.17), he first created a large frame, or cage, made with steel beams. To cover the frame he used brick, which blended in with the surrounding buildings.

An architect is concerned with the environment into which the structure will be placed as well as the purpose of the building. The success of a building is the combination of the right media with good design. The Guggenheim Museum in Bilbao, Spain, by American architect Frank Gehry (Figure 14.1, page 388) is made of limestone, titanium, steel, and glass. The straight limestone blocks contrast with curved and bent titanium panels giving the building the look of a huge abstract sculpture.

**Check Your Understanding**

1. What are the two main types of sculpture?
2. What are the four basic sculpting methods?
4. Define architecture.

![Figure 3.17](image-url) This skyscraper echoes its internal steel frame in its exterior design. Sullivan emphasized the height of the skyscraper by stressing the vertical lines that move the viewer's eyes upward, and underplaying the horizontal elements in the window area.

Louis Sullivan, Wainwright Building, St. Louis, Missouri, 1890–91.
Technological Media

Artists try to communicate ideas through their art, and as they do so, they constantly seek out new media. In recent times, technological advances have allowed artists to create new and exciting forms of art. In this lesson, you will learn about photography, film, video, and computer art.

Photography

Photography is the technique of capturing optical images on light-sensitive surfaces. Photographs are all around us. Newspapers, magazines, and books are full of them. Almost everyone has a collection of snapshots that they’ve taken. It is hard to imagine that photography started out as an expensive, difficult process only 150 years ago.

Although anyone can point a camera and click the shutter, photography as art requires more than simply recording images. As photographic media and processes have improved, some photographers have begun exploring photography’s potential as art. They have gone beyond simply taking pictures of interesting images. Works by Dorothea Lange (Figure 3.18) and other photographers are carefully composed just as a painter composes an artwork. This artistic composition makes photography a fine art like painting or sculpting.

In recent years, some artists have combined painting and photography to create a new kind of visual expression. Look closely at Figure 3.19 on page 58. Notice how the artist has modified a black-and-white photograph of an automobile in front of a house. The finished work combines familiar images from the real world altered according to the photographer’s artistic vision.

Figure 3.18 Dorothea Lange did more than take a snapshot of this family. By moving her camera to get just the right angle and waiting for the right moment, her photograph reveals a lot about her subjects. What does the expression on the mother’s face tell you? What emotions do the children convey with their body language?

Dorothea Lange. Migrant Mother. 20.3 × 25.4 cm (8 × 10"). Courtesy of the Library of Congress, Washington, D.C.
The Media of Photography

The idea of capturing an image on film is very old. Attempts to do so date back to the Renaissance, but the first permanent photograph was not made until the nineteenth century. L. J. M. Daguerre invented a process of creating silvery, mirrorlike images on a copper plate. This was called a daguerreotype. Daguerreotype was a time-consuming and very expensive process. In the 1850s, the wet plate method was invented. It used glass coated with chemicals to record the image, which was then transferred to paper or cardboard. As with contemporary photographs, the wet plate photos used negatives, the reverse image of the object photographed. Today, newer and better methods of making film have been invented. The process is simpler and less expensive. Photographers have many media and processes available to affect the look of a finished photograph.

Film

A movie, or motion picture, like any work of art is created for others to enjoy. However, when you watch a movie, you may not be aware of all the work that went into making it. Filmmaking is a collaborative process involving many different artistic and technical professionals.

The Media of Film

Filmmaking only became possible about 100 years ago, after photography began to catch on with amateur hobbyists and professional artists. This encouraged the development of different types of film and the invention of the film camera. Unlike still cameras, motion picture, or film, cameras have a mechanism that moves the film through the camera. The film is stopped very briefly to be exposed. Each frame of film is a still image. The illusion of image motion is created by a rapid succession of these still images or photographs. Early films suffered from jumpy action, flickering light, and other flaws. As cameras, film, film printers, and projectors improved, so did the visual quality of movies. Cinematographers—artists who use movie cameras—now have the ability to choose from many different film media and production processes to create visually exciting artistic films.
Video

Videotape records and stores images and sounds as magnetic impulses. Patterns of light beams and wavelengths of sound are translated into electric waves, which are then imprinted magnetically on the videotape. Video technology, however, is rapidly evolving. Today, videotape is being replaced by digital videotape and other digital systems. A digital system is a system that processes words and images directly as numbers, or digits. This is improving not only the flexibility of video but also the sound and image quality.

The Media of Video

Video is a remarkable development because, unlike film, it does not require special processing or printing. With a video camera, a person can record an event and immediately view the results. Video artists record the sights, sounds, and scenes of nature; or they create totally new environments with moving and still images and sound. This technology allows an artist to create a visual story or communicate a message, just like an artist who paints on canvas. Also, video can be combined with computer software and systems to create artwork never before possible. Amazing artistic results can be achieved when video images and sounds are edited and manipulated using computers.

Computers

Thanks to advances in digital technology, today’s computers are becoming faster, smaller, and more versatile. Tiny computers, called microprocessors, can now operate computer programs that once required a computer the size of your classroom! These powerful computers are used by visual artists to create digital art.

Using Computers to Create Art

Computer programs, or software, are designed to instruct the computer to perform various functions. There are numerous programs available for artists. (For more information on software and hardware used in the art classroom, refer to the Digital Media Handbook, pages 445–454.) With paint or draw programs, artists can draw, paint, manipulate, and design images. The artwork in Figure 3.20 was created with a software program. Other digital technologies, such as digital cameras and scanners, can be used with the computer to provide even more exciting ways to stimulate an artist’s imagination.

When you use a computer to create art, the art images can be stored as files in the computer’s memory or on different kinds of storage devices. Once saved, they may be opened in a new file and reworked. The advantage is that, while the original art is saved, you can try as many variations as you wish, saving each as a new file. This prevents you from losing the original work.

Figure 3.20  This artist has used digital technologies to combine several layers of images into a unified artwork. What ideas do you think he is expressing in this composition?

Many computer applications exist to make the tasks of the artist more efficient. Some of these programs involve desktop publishing, word processing, image editing or manipulation, morphing or transforming images, and 3-D drawing and animation. To create digital drawings and paintings, there are two main types of programs: paint programs and draw programs.

- **Paint programs.** In paint programs, images are stored as bitmaps or a series of tiny dots called *pixels*. Images are made by filling in the dots using a variety of brush tools that imitate other media and drawing tools. An artist also has the ability to edit the image pixel by pixel.

- **Draw programs.** In draw programs, each line or curve drawn is stored as a separate object. An advantage of draw programs over paint programs are the crisp, sharp edges, which are excellent for fonts and straight line images. Because images are recognized as objects rather than individual pixels, they can be “resized”—made larger or smaller—without distortion.

Recently, the differences between paint and draw programs have begun to blur. Many paint programs today do jobs that were once performed only by draw programs and vice versa.

**Computer Art Tools**

In computer art, the physical tools that the artist actually handles are called *hardware*. Hardware includes equipment such as the monitor, keyboard, printer, and mouse. Along with these pieces of hardware, other external tools include the following:

- **Digital camera.** A digital camera works like a regular camera except that the images are recorded digitally. The camera usually has a viewer that allows you to see each picture you have taken. Most cameras store pictures on removable memory cards, which can be downloaded onto a computer. Pictures can then be printed out or they can be manipulated with special photo-editing software. The digital images can be altered and enhanced in unlimited ways, and each version can be saved as a separate file.

## Activity

**Traditional and Digital Media**

**Demonstrating Effective Use of Art Media and Tools in Drawing.** Artists use computers as sketchbooks, design tools, and as painting and collage media because they can store and retrieve artwork quickly. Images can be easily combined and altered, which allows the artist to explore many ideas without wasting time or materials. First, try this with traditional media and tools such as drawing paper, pencil, brush, and watercolor. Draw a large rectangle or circle on the paper. Create a design based on a mood or feeling using the pencil and brush. Change length, thickness, and texture of the lines to create variety and make a pleasing composition. Choose a color scheme and add color.

**Computer Option.** Now, repeat the same activity using a computer paint program. Select a Shape tool, and draw a large open rectangle or circle on the page. Explore the Pencil and Brush tools. Consider a mood or feeling. Arrange a variety of lines, changing length, thickness, shape, and texture to match this mood. Use the Eraser and Zoom tool, if available, to eliminate unneeded marks. When you are satisfied, title and save your project. Now, choose a simple color scheme. Apply color with the Fill or Brush tool. Select the Save As command to retile. Add a number behind the original title to indicate a new version.
Stylus and graphics tablet. A stylus and graphics tablet is the electronic equivalent of the pencil and paper. The stylus responds to pressure from the hand to make thick and thin lines—much like a real pencil, pen, or brush—and has an eraser on the end. Recent models are remote and programmable.

Scanner. A scanner is a device that “reads” a printed image. It then translates the image into a language the computer can use to make an image on the screen or print with a printing device.

On-Screen Tools. These tools are located on-screen on a toolbar or pull-down menu. They mimic handheld tools used by conventional artists. On-screen tools include pencils, pens, assorted brushes, and erasers, but they vary from program to program. The table in Figure 3.21 shows some common on-screen tools and the type of program in which each is found.

Multimedia Art

Combining technologies on the computer is made easier by the development of multimedia programs. These are computer software programs that help users design, organize, and combine text, graphics, video, and sound in one presentation. You can make reports, presentations, and art portfolios come alive. Multimedia art combines different media to create a new type of art. For example, an artist might scan a photograph into the computer to enhance it. The artist might also add sounds that help evoke a feeling. He or she could add text or quotations to add meaning. The artist might make the art appear to move (animate) or take different forms (morph) as the viewer watches. Multimedia art expands the boundaries of art by including more sensory experiences.

Check Your Understanding

1. What is photography?
2. How are motion picture cameras different from still cameras?
3. What advantage does video have over film?
4. Compare and contrast paint and draw programs.
5. What is the advantage of a multimedia program?
Critiquing the Artwork

1. **DESCRIBE** *What do you see?*
   
   What do you see when you look at this object? This is a clue-collecting step. If you are not sure of something, do not guess.
   
   - List all the information in the credit line.
   - Study the image carefully. Describe everything you see. *Hint:* There are four objects in the room that are not listed in the credit line. Two are solid, and two are reflections.

2. **ANALYZE** *How is this work organized?*
   
   This step deals with composition or the formal qualities. In it, you will gather information about how the work uses the elements and principles of art. Even though you have not studied them yet, there are some obvious questions you can answer.
   
   - What shapes make up the walls, floor, and ceiling of this room? How often are these shapes repeated?
   - What other shapes can you find in the work?

3. **INTERPRET** *What message does this artwork communicate to you?*
   
   In this step, you tell what feeling or mood the work creates. You make guesses about the meaning of the work.
   
   - How do you think it would feel to sit or stand within this room? Write a brief paragraph or a poem that expresses how you would feel sitting on the mirrored chair surrounded by infinite reflections.

4. **JUDGE** *What do you think of the work?*
   
   Now, you are ready to make an aesthetic judgment of the work.
   
   - Do you think this is a successful work of art? Why or why not? Use one or more of the aesthetic theories from Chapter 2 to defend your decision.

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Lucas Samaras was born in Kastoria, Greece. In 1948, he moved to the United States with his family. Samaras attended Rutgers University. His works use unusual “art” materials such as glass, aluminum foil, and aluminum paint. Samaras’s mirrored room series, which includes the installation in Figure 3.22, was created in the 1960s. These works, which are meant to be walked through, are remarkable for the precise positioning of the mirrors. They reflect the objects and viewer into infinity in all directions. All of Samaras’s artworks are concerned with the distortion of visual space as seen in the Mirrored Room. He also creates distorted and decorated chairs and manipulated Polaroid photographs.
The Art of Books

Making your own books and book covers is a growing trend.

The art of bookmaking is becoming an increasingly popular craft and hobby. In this age of digital technology, people are looking back to the traditional arts of bookbinding and papermaking. Some of these new book artists create their works from scratch, including writing, designing, and binding. One book is made with fabric, paper, and beads and folds out like origami. Another one-of-a-kind work is an eyeglass case that holds a tale about Benjamin Franklin, taking a cue from his trademark glasses. Other bookmakers simply take existing books and give them a new look. They gut, paint, and design new covers for books that are in print.

While bookmaking has been around for centuries, current homemade works are straddling the line between books and art. By using bright colors and unusual designs, people are creating spines that will stand out on the shelf. Part of the enjoyment for many bookmakers is finding unique materials to make their books. This often leads to discoveries at flea markets, in attics, and at yard sales.

If these creative designs spark your interest, you can enroll in one of the many new workshops offered at craft stores and community centers.

**TIME to Connect**

Design a book cover or interesting format for one of your favorite books. Keep these criteria in mind as you plan your design:

• What is the book about? How would your format and design summarize the book’s theme, plot, or message?
• What details from the book could you use in your design to express the main theme?
• What materials would you use to create the new version of the book?
Building Vocabulary

On a separate sheet of paper, write the term that best matches each definition given below.

1. Any materials used to create art.
2. The use of light and dark values to create the illusion of form.
3. A process in which an artist repeatedly transfers an original image from one prepared surface to another.
4. The impression created on a surface by a printing plate.
5. A copy of a work of art.
6. All the prints made from the same plate or set of plates.
7. A three-dimensional work of art.
8. The technique of capturing optical images on light-sensitive surfaces.
9. A system that processes words and images directly as numbers or digits.
10. Computer software programs that help users design, organize, and combine text, graphics, video, and sound in one presentation.

Reviewing Art Facts

Answer the following questions using complete sentences.

11. What is the difference between two- and three-dimensional art?
12. Describe the four shading techniques.
13. Name and define the three main ingredients of paint.
14. What are the three basic steps of printmaking?
15. What is the difference between sculpture in the round and relief sculpture?
16. Why are crafts called the applied arts?
17. How is videotape technology an improvement over cinematography?
18. What are the similarities and differences between paint and draw programs?

Thinking Critically About Art

19. Compare and Contrast. Study Figures 3.13 (page 51), 3.14 (page 52) and 3.15 (page 53). List the similarities and differences you find in all three artworks. In particular, compare and contrast the use of form in each work. How would you describe the form of each work?

20. Historical/Cultural Heritage. Review the Meet the Artist feature on page 46. Winslow Homer was influenced by the art trends of his time. Compare and contrast Figures 3.8 and 3.9 on page 46 with the work of another Realist, Édouard Manet in Figure 13.20 on page 369. Why are both artists considered Realists?

How would you describe the differences between two- and three-dimensional media if you were blindfolded? Play this interactive game with your classmates after taking the Web Museum Tour of the Walker Art Center in Minneapolis, Minnesota. Just click on the link at art.glencoe.com.

Linking to the Performing Arts

Use the Performing Arts Handbook, page 415, to see how choreographer Merce Cunningham uses the computer and other technology to help him create his renowned ballets.