We live in a physical world whose properties are familiar, and, together with line, space is one of the most familiar. It is all around us, all the time. We talk about “outer” space (the space outside our world) and “inner” space (the space inside our own minds). We cherish our own “space.” We give “space” to people or things that scare us. But in the twenty-first century, space has become an increasingly contested issue. Since Einstein, we have come to recognize that the space in which we live is fluid. Not only does it take place in time, but we are able to move in and across it with far greater ease than ever before.

The work of Ethiopian-born Julie Mehretu consciously reflects this new condition. She moved...

**Fig. 5-1 Julie Mehretu, Dispersion, 2002.**

**THINKING AHEAD**

How does a shape differ from a mass?

What are negative spaces?

How can three-dimensional space be represented on a flat surface using perspective?

How does oblique projection differ from axonometric projection?

Why have modern artists challenged the means of representing three dimensions on two-dimensional surfaces?

Listen to the chapter audio on myartslab.com
to the United States when she was six, grew up in Michigan, and has worked in Senegal, Berlin, and New York. Her work investigates what she calls “the multifaceted layers of place, space, and time that impact the formation of personal and communal identity.” She accomplishes this by mapping public spaces at very large scale. She might, for instance, project an elevated view of a city onto a canvas, and then trace the lines of its streets disappearing into the distance, or she might begin by drawing the architectural plans of a building, or the layout of an international airport. Across this space swirl lines of movement, quasi-geometrical planes of color, and a multitude of marks derived from sources as varied as weather maps, graffiti, Chinese calligraphy, cartoons, and anime—the signage, that is, of contemporary life. (In myartslab, you can see an Art21 “Exclusive” video of Mehretu working on the painting Middle Grey [2007–2009], one of a group of seven paintings exhibited at the Solomon R. Guggenheim Museum in New York in 2010.) In Dispersion (Fig. 5-1), she takes up the theme of diaspora—the scattering of peoples that began with the dispersion of the Jews in the sixth century BCE, but which in more modern times affected, particularly, African peoples transported to the Western hemisphere by the slave trade, and in more modern times yet, by the worldwide movement of people, like Mehretu herself, from one culture to another. A giant cleft or rift divides the painting down its middle like an ocean lying between what might be called “populations” of dense black marks. At the lower left, the fuselage of an airplane evokes a world on the move. Travel, in fact, accounts for nearly 10 percent of world trade and global employment, as nearly 700 million people travel internationally each year, and half a million hotel rooms are built each year to house them. Dispersion suggests the sheer complexity of creating and negotiating communal space in the contemporary world. And it suggests an even newer kind of space—the space of mass media, the Internet, the computer screen, “virtual reality,” and cyberspace—as well as the migration of the human mind across it. This new kind of space results, as we shall see, in new arenas for artistic exploration. But first, we need to define some elementary concepts of shape, mass, and perspective.

Shape and Two-Dimensional Space

A shape is flat. In mathematical terms, a shape is a two-dimensional area; that is, its boundaries can be measured in terms of height and width. A form, or mass, on the other hand, is a solid that occupies a three-dimensional volume. It must be measured in terms of height, width, and depth. Though mass also implies density and weight, in the simplest terms, the difference between shape and mass is the difference between a square and a cube, or a circle and a sphere.

Donald Sultan’s Lemons, May 16, 1984 (Fig. 5-2) is an image of three lemons overlapping in space, but it consists of a flat yellow shape on a black ground over 8 feet square. To create the image, Sultan covered vinyl composite tile with tar. Then he drew the outline of the lemons, scraped out the area inside the outline, filled it with plaster, and painted the plaster area yellow. The shape of the three lemons is created not only by the outline Sultan drew but also by the contrasting colors and textures—black and yellow, tar and plaster.

Sultan’s image contains two shapes: the square black background, and the yellow figure. Indeed, the instant we place any shape on a ground, another

manner similar to standing human forms. (See, for example, the sculpture’s similarity to the standing forms of King Menkaure and His Queen, Fig. 13-9.) Into each of these figures Hepworth has carved negative spaces, so called because they are empty spaces that acquire a sense of volume and form by means of the outline or frame that surrounds them. Hepworth has painted these negative spaces white. Especially in the left-hand figure, the negative spaces suggest anatomical features: The top round indentation suggests a head, the middle hollow a breast, and the bottom hole a belly, with the elmwood wrapping around the figure like a cloak.

The negative space formed by the bowl of the ceremonial spoon of the Dan people native to Liberia and the Ivory Coast (Fig. 5-6) likewise suggests anatomy. Nearly a foot in length and called the “belly pregnant with rice,” the bowl represents the generosity of the most hospitable woman of the clan, who is known as the wunkirle. The wunkirle carries this spoon at festivals, where she dances and sings. As wunkirles from other clans arrive, the festivals become

Three-Dimensional Space

A photograph cannot quite reproduce the experience of seeing Martin Puryear’s Self (Fig. 5-4), a sculptural mass that stands nearly six feet high. Made of wood, it looms out of the floor like a giant basalt outcropping, and it seems to satisfy the other implied meanings of mass—that is, it seems to possess weight and density as well as volume. “It looks as though it might have been created by erosion,” Puryear has said, “like a rock worn by sand and weather until the angles are all gone. . . . It’s meant to be a visual notion of the self, rather than any particular self—the self as a secret entity, as a secret, hidden place.” And, in fact, it does not possess the mass it visually announces. It is actually very lightweight, built of thin layers of wood over a hollow core. This hidden, almost secret fragility is the “self” of Puryear’s title. Barbara Hepworth’s sculpture Two Figures (Fig. 5-5) invites the viewer to look at it up close. It consists of two standing vertical masses that occupy three-dimensional space in a

![Rubin vase](image1)

![Martin Puryear, Self, 1978](image2)
competitions, each woman striving to give away more than the others. Finally, the most generous wunkirle of all is proclaimed, and the men sing in her honor. The spoon represents the power of the imagination to transform an everyday object into a symbolically charged container of social good.

The world that we live in (our homes, our streets, our cities) has been carved out of three-dimensional space, that is, the space of the natural world, which itself possesses height, width, and depth. A building surrounds empty space in such a way as to frame it or outline it. Walls shape the space they contain, and rooms acquire a sense of volume and form. The great cathedrals of the late medieval era were designed especially to elicit from the viewer a sense of awe at the sheer magnitude of the space they contained. Extremely high naves carried the viewer’s gaze upward in a gravity-defying flight of vision. At Reims...
Cathedral (Fig. 5-7), the nave is 125 feet high. If you visit the panorama of the site in myartslab, you can experience for yourself something of the magnitude of the space, which is heightened in the panorama by the quality of golden light that fills the space. In fact, light can contribute significantly to our sense of space. Think of the space in a room as a kind of negative space created by the architecture. Danish artist Olafur Eliasson seems to fill this space with color in his 1995 installation Suney (Fig. 5-8). Actually, he has bisected a gallery with a yellow Mylar sheet. The side of the gallery in which the viewer stands seems bathed in natural light, while the opposite side seems filled with yellow light. There are separate entrances at each end of the space and, if viewers change sides, their experience of the two spaces is reversed.

Representing Three-Dimensional Space

Many artists, such as Beverly Buchanan (See The Creative Process, pp. XXX-XXX), work in both two- and three-dimensional forms. But in order to create a sense of depth, of three dimensions, on a flat canvas or paper the artist must rely on some form of illusion.

There are many ways to create the illusion of deep space—and most are used simultaneously—as in Steve

---

Fig. 5-7 Nave, Reims Cathedral, begun 1211; nave c. 1220. View to the west.

View the panorama of Reims Cathedral on myartslab.com

Fig. 5-8 Olafur Eliasson, Suney, 1995.
Installation view at the Kunsthalle Stuttgart, Germany, 1995.
Courtesy the artist, Tanya Bonakdar Gallery, New York, and Neugerriemschneider, Berlin.
DiBenedetto’s Deliverance (Fig. 5-9). For example, we recognize that objects close to us appear larger than objects farther away, so that the juxtaposition of a large and a small helicopter suggests deep space between them. Overlapping images also create the illusion that one object is in front of the other in space: the helicopters appear to be closer to us than the elaborately decorated red launching or landing pad below. And because we are looking down on the scene, a sense of deep space is further suggested. The use of line also adds to the illusion, as the tightly packed, finer lines of the round pad pull the eye inward. The presence of a shadow supplies yet another visual clue that the figures possess dimensionality, and we will look closely at how the effect of light creates believable space in the next chapter. Even though the image is highly abstract and decorative, we are still able to read it as representing objects in three-dimensional space.
Beginning in the early 1980s, Beverly Buchanan started photographing the makeshift shacks that dot the Southern landscape near her home in Athens, Georgia. It is an enterprise that she has carried on ever since (Fig. 5-10). “At some point,” she says, “I had to realize that for me the structure was related to the people who built it. I would look at shacks and the ones that attracted me always had something a little different or odd about them. This evolved into my having to deal with [the fact that] I’m making portraits of a family or person.”

Buchanan soon began to make both drawings and sculptural models of the shacks. Each of her three-dimensional models tells a story. This legend, for instance, accompanies the sculpture of Richard’s Home (Fig. 5-11):

Some of Richard’s friends had already moved north, to freedom, when he got on the bus to New York. Richard had been “free” for fifteen years and homeless now for seven. . . . After eight years as a foreman, he was “let go.” He never imagined it would be so hard and cruel to look for something else. Selling his blood barely fed him. At night, dreams took him back to a childhood of good food, hard work, and his Grandmother’s yard of flowers and pine straw and wood. Late one night, his cardboard house collapsed during a heavy rain. Looking down at a soggy heap, he heard a voice, like thunder, roar this message through his brains, RICHARD GO HOME!

Buchanan’s sculpture does not represent the collapsed cardboard house in the North, but Richard’s new home in the South. It is not just a ramshackle symbol of poverty. Rather, in its improvisational design, in its builder’s determination to use whatever materials are available, to make something of nothing, as it were, the shack is a testament to the energy and spirit of its creator. More than just testifying to Richard’s
Fig. 5-12 Beverly Buchanan, *Monroe County House with Yellow Datura*, 1994.
Oil pastel on paper, 60 x 79 in.

Beverly Buchanan’s *Shackworks* is a testament to her creative and aesthetic genius. Her pastel oilstick paintings, such as *Monroe County House with Yellow Datura* (Fig. 5-12), are embodiments of this same energy and spirit. She eschews traditional perspective (see the following pages) in order to capture the improvisational construction of the three-dimensional shacks, which, after all, challenge the geometrical regularity of standard construction in their own right. The giant yellow datura flowers, which seem to fall out of the sky, collapse the normal distinction between the near and the far (also addressed later in this chapter). Her use of expressive line and color is almost abstract, especially in the fields of color that surround the house. These distinctive scribble-like marks are based on the handwriting of Walter Buchanan, her great-uncle and the man who raised her. Late in his life he suffered a series of strokes, and before he died he started writing letters to family members that he considered very important. “Some of the words were legible,” Buchanan explains, “and some were in this kind of script that I later tried to imitate. . . . What I thought about in his scribbling was an interior image. It took me a long time to absorb that. . . . And I can also see the relation of his markings to sea grasses, the tall grasses, the marsh grasses that I paint.”

The seemingly untutored rawness of her marks mirrors the haphazard construction of the shacks. And both equally depict the human drive to create real or imaginative spaces of our own.

Watch the video on Beverly Buchanan on myartslab.com
LINEAR PERSPECTIVE

The overlapping images in DiBenedetto’s work evoke certain principles of perspective, one of the most convincing means of representing three-dimensional space on a two-dimensional surface. Perspective is a system, known to the Greeks and Romans but not mathematically codified until the Renaissance, that, in the simplest terms, allows the picture plane to function as a window through which a specific scene is presented to the viewer. In one-point linear perspective (Fig. 5-13), lines are drawn on the picture plane in such a way as to represent parallel lines receding to a single point on the viewer’s horizon, called the vanishing point. As the two examples in Figure 5-13 make clear, when the vanishing point is directly across from the viewer’s vantage point where the viewer is positioned, the recession is said to be frontal. If the vanishing point is to one side or the other, the recession is said to be diagonal.

To judge the effectiveness of linear perspective as a system capable of creating the illusion of real space on a two-dimensional surface, we need only look at an example of a work painted before linear perspective was fully understood and then compare it to works in which the system is successfully employed. Commissioned in 1308, Duccio’s Maestà (“Majesty”) Altarpiece is an enormous composition—its central panel alone is 7 feet high and 13 1/2 feet wide. Many smaller scenes depicting the life of the Virgin and the Life and Passion of Christ appear on both the front and back of the work. In one of these smaller panels, depicting the Annunciation of the Death of the Virgin (Fig. 5-14), in which the

![Fig. 5-13 One-point linear perspective. Left: frontal recession, street level. Right: diagonal recession, elevated position.](image)

![Fig. 5-14 Duccio, Annunciation of the Death of the Virgin, from the Maestà Altarpiece, 1308–11 (perspective analysis). Tempera on panel, 16 3/8 x 21 1/4 in. Museo dell’Opera del Duomo, Siena. Canali Photobank.](image)
Leonardo evidently drew strings out from this nail to create the perspectival space, a theory described in the myartslab video on the restoration of the painting.

The Last Supper itself is a wall painting created in the refectory (dining hall) of the Monastery of Santa Maria delle Grazie in Milan, Italy. Because the painting’s architecture appears to be continuous with the actual architecture of the refectory, it seems as if the world outside the space of the painting is organized around Christ as well. Everything in the architecture of the

By way of contrast, the space of Leonardo da Vinci’s famous depiction of The Last Supper (Fig. 5-15) is completely convincing. Leonardo employs a fully frontal one-point perspective system, as the perspective analysis shows (Fig. 5-16). This system focuses our attention on Christ, since the perspective lines appear almost as rays of light radiating from Christ’s head. During the mural’s restoration, a small nail hole was discovered in Christ’s temple, just to the left of his right

Leonardo evidently drew strings out from this nail to create the perspectival space, a theory described in the myartslab video on the restoration of the painting. The Last Supper itself is a wall painting created in the refectory (dining hall) of the Monastery of Santa Maria delle Grazie in Milan, Italy. Because the painting’s architecture appears to be continuous with the actual architecture of the refectory, it seems as if the world outside the space of the painting is organized around Christ as well. Everything in the architecture of the
painting and the refectory draws our attention to him. His gaze controls the world.

When there are two vanishing points in a composition—that is, when an artist uses **two-point linear perspective** (Fig. 5-17)—a more dynamic composition often results. The building in the left half of Gustave Caillebotte’s *Place de l’Europe on a Rainy Day* (Fig. 5-18) is realized by means of two-point linear perspective, but Caillebotte uses perspective to create a much more complex composition. A series of multiple vanishing points organize a complex array of parallel lines emanating from the intersection of the five Paris streets depicted (Fig. 5-19). Moving across and through these perspective lines are the implied lines of the pedestrian’s movements across the street and square and down the sidewalk in both directions, as well as the line of sight created by the glance of the two figures walking toward the viewer. Caillebotte imposes order on this scene by dividing the canvas into four equal rectangles formed by the vertical and the horizon line.

---

**Fig. 5-17** Two-point linear perspective.


---

12 PART 2 THE FORMAL ELEMENTS AND THEIR DESIGN
SOME OTHER MEANS OF REPRESENTING SPACE

Linear perspective creates the illusion of three-dimensional space on a two-dimensional surface. Other systems of projecting space, however, are available. A type of projection commonly found in Japanese art is **oblique projection**. The sides of the buildings are parallel, with one face parallel to the picture plane as well. The same scale is used for height and width, while depth is reduced. This hanging scroll (Fig. 5-20) depicts, in oblique perspective, the three sacred Shinto-Buddhist shrines of Kumano, south of Osaka, Japan. The shrines are actually about 80 miles apart: the one at the bottom of the scroll high in the mountains of the Kii Peninsula in a cypress forest, the middle one on the eastern coast of the peninsula, and the top one near a famous waterfall that can be seen to its right. In addition to oblique projection, the artist employs two other devices to give a sense of spatial depth. As is common in traditional perspective, each shrine appears smaller the farther away it is. But spatial depth is also indicated here by position—the farther away the shrine, the higher it is in the composition.

A related means of projecting space is **axonometric projection** (Fig. 5-21), commonly employed by architects and engineers. It has the advantage of translating space in such a way that the changes of scale inevitable in linear perspective—in the way that a thing in the distance appears smaller than a thing close at hand—are eliminated. In axonometric projections, all lines remain parallel rather than receding to a common vanishing point, and all sides of the object are at an angle to the picture plane.

---

**Fig. 5-20** Kumano Mandala, Kamakura period, c. 1300. Hanging scroll, ink and color on silk, 52 1/4 x 24 1/4 in. The Cleveland Museum of Art. John L. Severance Fund, 1953.16. © 2004 The Cleveland Museum of Art.

DISTORTIONS OF SPACE AND FOreshortening

The space created by means of linear perspective is closely related to the space created by photography, the medium we accept as representing “real” space with the highest degree of accuracy. The picture drawn in perspective and the photograph both employ a monocular, that is, one-eyed, point of view that defines the picture plane as the base of a pyramid, the apex of which is the single lens or eye. Our actual vision, however, is binocular. We see with both eyes. If you hold your finger up before your eyes and look at it first with one eye closed and then with the other, you will readily see that the point of view of each eye is different. Under most conditions, the human organism has the capacity to synthesize these differing points of view into a unitary image.

Fig. 5-22 Photgrapher unknown, Man with Big Shoes, c. 1890.
Stereograph. Library of Congress.

Fig. 5-23 Albrecht Dürer, Draftsman Drawing a Reclining Nude, c. 1527.
Woodcut, second edition, 3 x 8½ in. One of 138 woodcuts and diagrams in Underweysung der Messung, mit dem Zirkel und richtscheyt (Teaching of Measurement with Compass and Ruler).

14 PART 2 THE FORMAL ELEMENTS AND THEIR DESIGN
In the nineteenth century, the stereoscope was invented precisely to imitate binocular vision. Two pictures of the same subject, taken from slightly different points of view, were viewed through the stereoscope, one by each eye. The effect of a single picture was produced, with the appearance of depth or relief, a result of the divergence of the point of view. Usually, the difference between the two points of view is barely discernible, especially if we are looking at relatively distant objects. But if we look at objects that are nearby, as in the stereoscopic view of the Man with Big Shoes in Figure 5-22, the difference is readily apparent.

Artists working in other media can make up for such distortions in ways that photographers cannot. If the artist portrayed in Dürer’s woodcut (Fig. 5-23) were to draw exactly what he sees before his eyes, he would end up drawing a figure with knees and lower legs that are too large in relation to her breasts and head. The effect would not be unlike that achieved by the enormous feet that reach toward the viewer in Man with Big Shoes. These are effects that Andrea Mantegna would work steadfastly to avoid in his depiction of The Dead Christ (Fig. 5-24). Such a representation would make comic or ridiculous a scene of high seriousness and consequence. It would be indecorous. Thus, Mantegna has employed foreshortening in order to represent Christ’s body. In foreshortening, the dimensions of the closer extremities are adjusted in order to make up for the distortion created by the point of view.

Fig. 5-24 Andrea Mantegna, The Dead Christ, c. 1501. Tempera on canvas, 26 x 30 in. Brera Gallery, Milan. De Agostini Editore Picture Library.
THE NEAR AND THE FAR

Foreshortening is a means of countering the laws of perspective, laws which seem perfectly consistent and rational when the viewer’s vantage point is sufficiently removed from the foreground, but which, when the foreground is up close, seem to produce weird and disquieting imagery. When Japanese prints entered European markets after the opening of Japan in 1853–54, new possibilities for representing perspectival space presented themselves. Many Japanese prints combined close-up views of things near at hand, such as flowers, trees, or banners, with views of distant landscapes. Rather than worrying about presenting the space as a continuous and consistent recession from the near at hand to the far away, Japanese artists simply elided what might be called the “in between.” Thus, in Utagawa Hiroshige’s Moon Pine, Ueno (Fig. 5-25), from his One Hundred Famous Views of Edo (Edo was renamed Tokyo in 1868), a giant gap lies between the foreground pine and the city in the distance. The habit in Edo was to give names to trees of great age or particular form, and this pine, renowned for the looping round form of its lower branch, was dubbed “moon pine.” Looking at the tree from different angles, one could supposedly see the different phases of the moon as well. The site is a park in the Ueno district of Tokyo, overlooking Shinobazu pond. In the middle of the lake is an island upon which stands the Benten (Benzaiten) Shrine, dedicated to the goddess of the fine arts, music, and learning. In the print, the shrine is the red building just above the branch at the lower right. Here, where the branch crosses the island, the gulf between the near and far seems to collapse, and a certain unity of meaning emerges, as the extraordinary beauty of the natural world (the nearby pine) merges with the best aspects of human productivity (embodied in the distant shrine).

This flattening of space proved to be especially attractive to European modernist painters in the late nineteenth and early twentieth centuries, who, as we will see in the following pages, found the rules of perspective to be limiting and imaginatively
we approach it. We know, in other words, that we are in an impossible place, and yet is is a place that we have long contemplated and desired as a culture, the sense of possibility that always seems to lie “just over the horizon.” When, in the course of the full-length video, both Antoni and the rope disappear, we are left, as viewers, contemplating this illusory line and just what it means. And we come to understand that the horizon represents what is always in front of us. “It’s a very hopeful image,” Antoni says, “it’s about the future, about the imagination.”

Modern Experiments and New Dimensions

One of the most important functions of the means of representing three dimensions on a two-dimensional surface is to make the world more intelligible. Linear
perspective provides a way for artists to focus and organize the visual field. Axonometric projections help the architect and engineer to visualize the spaces they create. Foreshortening makes the potentially grotesque view of objects seen from below or above seem more natural, less disorienting.

Modern artists have consistently challenged the utility of these means in capturing the complex conditions of contemporary culture. Very often it is precisely the disorienting and the chaotic that defines the modern for them, and perspective, for instance, seems to impose something of a false order on the world. Even photographers, the truth of whose means was largely unquestioned in the early decades of the twentieth century, sought to picture the world from points of view that challenged the ease of a viewer’s recognition. One of the most startling of these points of view was the overhead shot. Used to seeing people on the street at eye level, viewers found the sudden appearance of people’s bodies from above, compacted into spaces the breadth of their shoulders, disconcerting.

Foreshortening makes the potentially grotesque view of objects seen from below or above seem more natural, less disorienting. A good example is Mystery of the Street, by German photographer Otto Umbehr, known as Umbo (Fig. 5-27). Umbo actually photographed the scene from the other side, but recognizing the power of the shadows, seemingly standing erect on the flat street and sidewalk, he inverted the image. As a result, the shadows seem more animate, more human and real, than the figures themselves.

Similar effects were achieved by photographers by means of other odd points of view, extreme close-ups, and radical cropping. In his Abstraction, Porch Shadows (Fig. 5-28), Paul Strand employs all three techniques. The image is an unmanipulated photograph (that is, one not altered during the development process) of the shadows of a porch railing cast across a porch and onto a white patio table turned on its side. The camera lens is pointed down and across the porch. The close-up of approximately 9 square feet of porch is cropped so that no single object in the picture is wholly visible. Strand draws the viewer’s attention not so much to the scene itself as to the patterns of light and dark.

Modern artists have consistently challenged the utility of these means in capturing the complex conditions of contemporary culture. Very often it is precisely the disorienting and the chaotic that defines the modern for them, and perspective, for instance, seems to impose something of a false order on the world. Even photographers, the truth of whose means was largely unquestioned in the early decades of the twentieth century, sought to picture the world from points of view that challenged the ease of a viewer’s recognition. One of the most startling of these points of view was the overhead shot. Used to seeing people on the street at eye level, viewers found the sudden appearance of people’s bodies from above, compacted into spaces the breadth of their shoulders, disconcerting.
that create a visual rhythm across the surface. The picture is more abstraction, as its title suggests, than realistic rendering; it is a picture of shapes, not things.

In painting, modern artists intentionally began to violate the rules of perspective to draw the attention of the viewer to elements of the composition other than its verisimilitude, or the apparent “truth” of its representation of reality. In other words, the artist seeks to draw attention to the act of imagination that created the painting, not its overt subject matter. In his large painting Harmony in Red (Fig. 5-29), Henri Matisse has almost completely eliminated any sense of three-dimensionality by uniting the different spaces of the painting in one large field of uniform color and design. The wallpaper and the tablecloth are made of the same fabric. Shapes are repeated throughout: The spindles of the chairs and the tops of the decanters echo one another, as do the maid’s hair and the white foliage of the large tree outside the window. The tree’s trunk repeats the arabesque design on the tablecloth directly below it. Even the window can be read in two ways: It could, in fact, be a window opening to the world outside, or it could be the corner of a painting, a framed canvas lying flat against the wall. In traditional perspective, the picture frame functions as a window. Here the window has been transformed into a frame.

What one notices most of all in Cézanne’s Mme. Cézanne in a Red Armchair (Fig. 5-30) is its very lack of spatial depth. Although the arm of the chair seems to project forward on the right, on the left the painting is almost totally flat. The blue flower pattern on the wallpaper seems to float above

---

**Fig. 5-29** Henri Matisse, *Harmony in Red (The Red Room)*, 1908–09. Oil on canvas, 70 7/8 x 86 7/8 in. The Hermitage, St. Petersburg. © Alinari / Art Resource, New York. © 2010 Succession H. Matisse, Paris / Artists Rights Society (ARS), New York.
the spiraled end of the arm, as does the tassel that hangs below it, drawing the wall far forward into the composition. The line that establishes the bottom of the baseboard on the left seems to ripple on through Mme. Cézanne’s dress. Most of all, the assertive vertical stripes of that dress, which appear to rise straight up from her feet parallel to the picture plane, deny Mme. Cézanne her lap. It is almost as if a second, striped vertical plane lies between her and the viewer. By this means Cézanne announces that it is not so much the accurate representation of the figure that interests him as it is the design of the canvas and the activity of painting itself, the play of its pattern and color.

With the maturity of the computer age, a new space for art has opened up, one beyond the boundaries

![Fig. 5-30 Paul Cézanne, Mme. Cézanne in a Red Armchair, 1877. Oil on canvas, 28½ x 22 in. Museum of Fine Arts, Boston. Bequest of Robert Treat Paine II, 44.77.6. Photo © 2004 Museum of Fine Arts, Boston.](image-url)
of the frame and, moreover, beyond the traditional boundaries of time and matter. It is the space of information, which in Terry Winters’s *Color and Information* (Fig. 5-31) seems to engulf us. The painting is enormous, 9 by 12 feet. It is organized around a central pole that rises just to the left of center. A web of circuitry-like squares circle around this pole, seeming to implode into the center or explode out of it—there is no way to tell. Writing in *Art in America* in 2005, critic Carol Diehl describes her reaction to paintings such as this one:

> At any given moment, some or all of the following impressions may suggest themselves and then quickly fade, to be replaced by others: maps, blueprints, urban aerial photographs, steel girders, spiderwebs, X-rays, molecular structures, microscopic slides of protozoa, the warp and woof of gauzy fabric, tangles or balls of yarn, fishing nets, the interlace of wintry tree branches, magnified crystals, computer readouts or diagrams of the neurological circuits of the brain, perhaps on information overload. That we can never figure out whether what we’re looking at depicts something organic or man-made only adds to the enigma.

In fact, the title of this painting refers only to Winters’s process, not its enigmatic content. The work began with a series of black-and-white woodcuts generated from small pen-and-ink drawings scanned into a computer so that the blocks could be cut by a laser. Winters wanted to see what would happen if he transformed this digital information into a painting, confounding or amplifying the stark black-and-white contrast of the source images by adding color and vastly magnifying their size. In front of the resulting work, we are suspended between order and chaos, image and abstraction, information and information overload.

Standing in front of Winters’s painting is something akin to being immersed in the technological circuitry of contemporary life. But few artists have more thoroughly succeeded in integrating the viewer into digital space than Chinese artist Feng Mengbo. In 1993, having graduated in 1991 from the Printmaking Department of Central Academy of Fine Arts, Beijing, he created a series of 42 paintings entitled *Game Over: Long March*. They amounted to screenshots of an imaginary video game, and, as one walked by them, one could imagine oneself in a side-scrolling game of the classic Super Mario Bros. variety. When Mengbo finally acquired a computer in 2003, he began transforming his project into an actual video game based on the 8,000-mile, 370-day retreat of the Chinese Communist Party’s Red Army, under the command of Mao Zedong, in 1934–35. The audience’s avatar in Mengbo’s work is a small Red Army soldier who, seated on a crushed Coca-Cola can, encounters a variety of ghosts, demons,
Gustave Caillebotte create an illusion of real space in his painting *Place de l’Europe on a Rainy Day*?

How does oblique projection differ from axonometric projection?

In both oblique and axonometric projection, the sides of an object are represented as parallel. In oblique projection, one face is parallel to the picture plane as well, while in axonometric projection, all sides of an object are at an angle to the picture plane. How do these forms of projection differ from linear perspective? How do Theo van Doesburg and Cornelius van Eesteren represent space in *Color Construction*? What role does position play in oblique projection?

Why have modern artists challenged the means of representing three dimensions on two-dimensional surfaces?

Modern artists have consistently challenged the utility of perspective and other techniques used to create the illusion of three dimensions on two-dimensional surfaces. Often it is precisely the disorienting and chaotic that defines the modern to many artists, and systems such as perspective seem, to them, to present a false sense of order. How have photographers challenged the viewer's recognition of the world? In *Harmony in Red (The Red Room)*, how does Henri Matisse nearly eliminate any illusion of three-dimensionality? How can the illusion of digital space be created?


**THINKING BACK**

How does a shape differ from mass?

A shape is a two-dimensional area, whose boundaries can be measured in height and width. A form, or mass, by contrast, is a solid that occupies a three-dimensional volume. How does Donald Sultan work with shapes in *Lemons, May 16, 1984*? What are negative shapes and positive shapes? What is figure–ground reversal?

What are negative shapes?

Negative spaces are empty spaces that acquire a sense of volume and form by means of the outline or frame that surrounds them. Negative spaces can be used to suggest forms. How does the sculptor of the Feast-making spoon use negative space to suggest form? How does Barbara Hepworth treat negative spaces in her sculpture *Two Figures*?

How can three-dimensional space be represented on a flat surface using perspective?

By means of illusion, a sense of depth, or three dimensions, can be achieved on a flat surface. There are many ways to create such an illusion, and an artist will often use more than one such technique for creating depth in a single work. Perspective is a system that allows the picture plan to function as a window through which a specific scene is presented to the viewer. What is a vanishing point? How is two-point linear perspective used? How does and deities, in an effort to rescue Princess Toadstool. Now entitled *Long March: Restart* (Fig. 5-32), the work is a giant digital space consisting of two walls each 80 feet long. The viewer is invited to take control of the Red Army avatar who moves through five screens following the Great Wall into 14 progressively more difficult levels of play. “You go inside the video game. You don’t passively sit and play it,” says Mengbo. The speed at which the avatar moves causes the viewer to move at a frenetic pace down the gallery, then to spin around and move back up the opposite wall. Disembodied, fighting long odds, at the brink of disaster, one realizes that Mengbo’s *Long March* is a metaphor for the long march that is contemporary life itself.

Gustave Caillebotte create an illusion of real space in his painting *Place de l’Europe on a Rainy Day*?

How does oblique projection differ from axonometric projection?

In both oblique and axonometric projection, the sides of an object are represented as parallel. In oblique projection, one face is parallel to the picture plane as well, while in axonometric projection, all sides of an object are at an angle to the picture plane. How do these forms of projection differ from linear perspective? How do Theo van Doesburg and Cornelius van Eesteren represent space in *Color Construction*? What role does position play in oblique projection?

Why have modern artists challenged the means of representing three dimensions on two-dimensional surfaces?

Modern artists have consistently challenged the utility of perspective and other techniques used to create the illusion of three dimensions on two-dimensional surfaces. Often it is precisely the disorienting and chaotic that defines the modern to many artists, and systems such as perspective seem, to them, to present a false sense of order. How have photographers challenged the viewer’s recognition of the world? In *Harmony in Red (The Red Room)*, how does Henri Matisse nearly eliminate any illusion of three-dimensionality? How can the illusion of digital space be created?
The history of modern art has often been summarized as the growing refusal of painters to represent three-dimensional space and the resulting emphasis placed on the two-dimensional space of the picture plane. While modern art diminished the importance of representing “real” space in order to draw attention to other types of reality, continuing developments in video and computer technologies have made it increasingly possible to represent the effects of these technologies on human experience in an era of ever-increasing mobility, both real and virtual.

Video artist and filmmaker Doug Aitken continuously explores this condition in his work. “On some level,” he says, “all my work is related to what I see as certain new tendencies in the culture . . . . Accelerated nomadism, self-contained, decentralized communication—these things are at the core of the space we’re living in, a terrain that is radically different from the past.” In his video installation the moment (Fig. 5-33), for instance, 11 screens suspended from the ceiling in a giant S-curve in a large room show people waking up in various hotel rooms or other more-or-less anonymous environments and then moving out into the nearly deserted cityscapes of their daily lives. As projection begins, a voice whispers, “I want to be every place.” Characters in the screens migrate from one screen to another at an increasingly frantic pace, until the 6:30-minute video ends, and they return to the state of rest at which they began, only to begin their “moment” again as the loop recycles.

Confronted with 11 screens in a deep, dark space, viewers find themselves wandering through a similarly disorienting landscape, wanting to see, more or less impossibly, what is on every screen at once. As a result, our sense of space opens to redefinition, and Aitken’s work suggests that this new perception of space is perhaps as fundamental as that which occurred in the fifteenth century when the laws of linear perspective were finally codified. How would you speak of this space? In what ways is it two-dimensional? In what ways is it three-dimensional? How is space “represented”? How is time incorporated into our sense of space? What are the implications of our seeming to move in and through an array of two-dimensional images? What would you call such new spaces? Electronic space? Four-dimensional space? What possibilities do you see for such spaces?