Chapter 10 the dynamics of color

Color for the designer and color for the fine artist is similar at the creative stage. A basic knowledge of color theory is useful to both. Later, in preparing art on the computer for the Web, or for the printing process, the designer needs to be familiar with how color is influenced by its intended publication venue. A great deal of new terminology must be understood. Let us first brush up on color as a creative and expressive communication. Then we will consider color from the computer and the printing perspectives. Web color is discussed in Chapter 12.

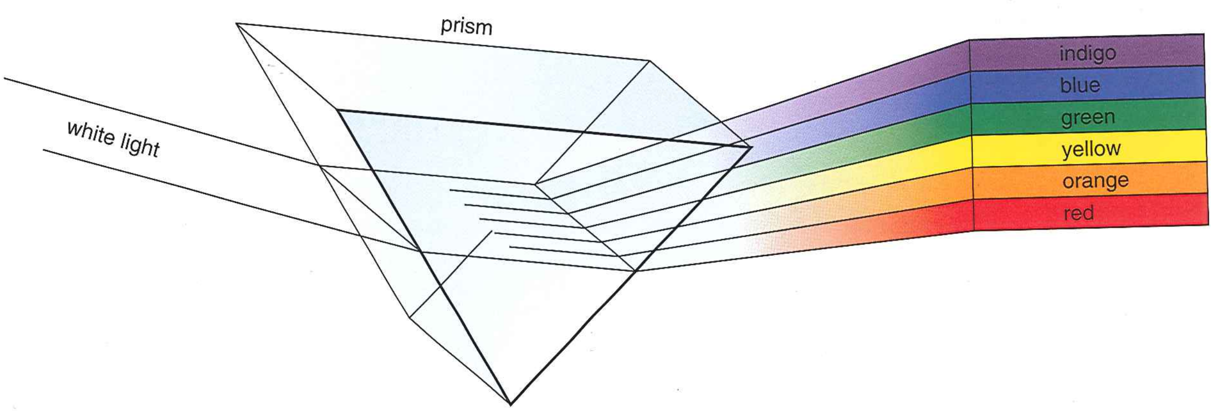
DESIGNING WITH COLOR

Every student who has completed an elementary course in art has heard that color is a property of light. Many people do not fully understand those words, however, until years after their art degree is completed. A young painter several years past her B.F.A. tells a story of looking around her living room for a composition to paint. "I considered the objects in the room and the space they occupied; the corners of the ceiling and the negative spaces in the staircase. I looked at the carpet and saw the standard 'landlord green.' And then I looked at the carpet again and realized that my mind was processing 'landlord green,' but my eyes were actually looking at black geometric shapes swimming beside a shining pastel/fluorescent color of fresh spring leaves. The sun was shining in the window of my dark living room and transforming my carpet. Color is a property of light, I thought. Oh!"

Color has been accurately described as both "the way an object absorbs or reflects light" and "the kind of light that strikes an object." The painter's carpet would appear to have a different color had it a deep shag texture or a slick, shiny surface. It would appear to have a different color under an incandescent or fluorescent light, under bright natural sunlight or light overcast cloud cover. Even the angle from which it is viewed has an effect.

Isaac Newton first passed a beam of white light through a prism and saw it divide into several colors. The colors of the light wave spectrum are red, orange, yellow,

10-1
Light waves of many colors join to make white light.



green, blue, and indigo (Figure 10-1). In physics, mixing the colors of the light wave together produces pure white light. It is these light waves, bouncing off or being absorbed by the objects around us, that give them color.

The three primary colors in white light are red, blue, and green. They are called *additive* primaries because together they can produce white light. The eye contains three different types of color receptors, each sensitive to one of the primary colors of the light spectrum. This seems to suggest an active connection between our physiological makeup and the world in which we live (Figure 10-10).

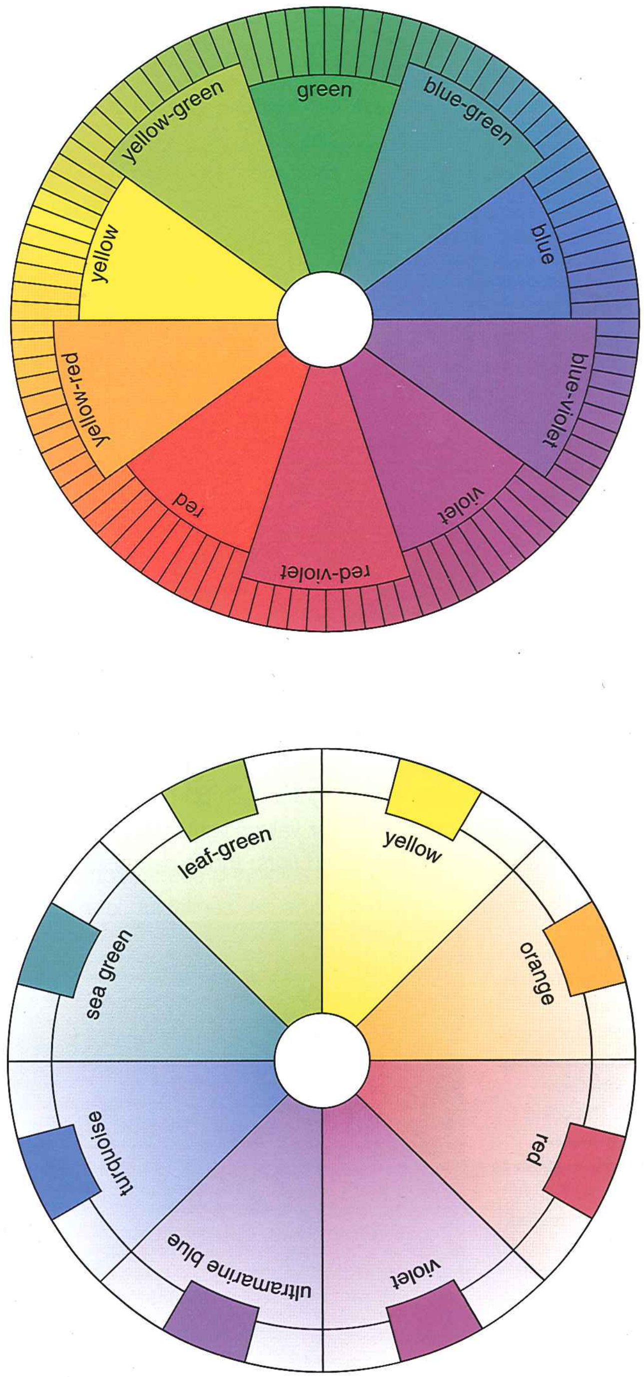
The designer needs to understand that color depends on light. *Color is not an unchanging, absolute property of the object. It is dynamic and affected by its environment.*

The Color Wheel

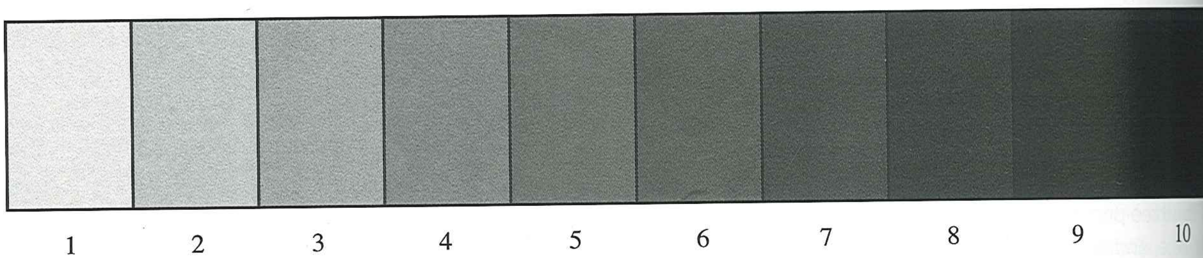
For the artist and designer, mixing pigments will never produce white. Black is the sum of all pigment colors. Several color wheels have been developed to help us understand the effects of combining pigments.

The traditional color wheel, developed by Herbert Ives, begins with *subtractive* primary colors of red, yellow, and blue. Mixing these hues produces secondary colors. Mixing the secondary colors with the primary produces a tertiary color.

The Munsell color wheel is based on five key hues: red, yellow, blue, green, and purple. Secondaries are formed by mixing these primaries. Although these two classification systems differ, the basic look of the resulting colors is similar. The color wheel is only a workable system, not an absolute (Figure 10-2). The CMYK process colors used in offset printing are also a pigment-based subtractive gamut.



10-2
Two possible color wheels.



10-3
Changes in value.

Properties of Color

Every color has three properties: hue, value, and intensity. *Hue* is the name by which we identify a color. The color wheel is set up according to hue.

Value is the degree of lightness or darkness in a hue. It is easiest to understand value when looking at a black and white image. The darkest value will be close to black, the lightest close to white, with a range of grays in between. Value also plays an important role in all color images. Every hue has its own value range. Yellow, for example, is normally lighter than purple. Its normal value in the middle of a yellow value scale will be lighter than purple. In a value scale, the color values lighter than normal value are called *tints;* those darker than normal value are called *shades.* When working with pigments, the addition of white lightens a value, whereas the addition of black darkens it (Figure 10-3).

The third property of color is *intensity,* or saturation. It is a measure of a color's purity and brightness. In pigments there are two ways of reducing the intensity of a color: Mix it with a gray of the same value, or mix it with its complement (the color opposite on the color wheel). Low-intensity colors have been toned down and are often referred to as *tones.* Colors not grayed are at their most vivid at full intensity (Figure 10-4).

Color Schemes

Color combinations are grouped into categories called *color schemes.* Colors

10-4
Tom Girvin, art director, designer; **Anton Kimball,** illustrator; **Mary Radosevich,** production. Bright Blocks is a package design by Tom Girvin Design, Inc. This colorful package uses highly saturated color to target its young audience. The colorful design increased sales dramatically. *Courtesy of the artist.*

10-5
Linda Godfrey.
This freelance illustrator while she was still a student created a whimsical collage using photographic textures. The strong use of blue is accented with complements, and repetition is used throughout this creative design.

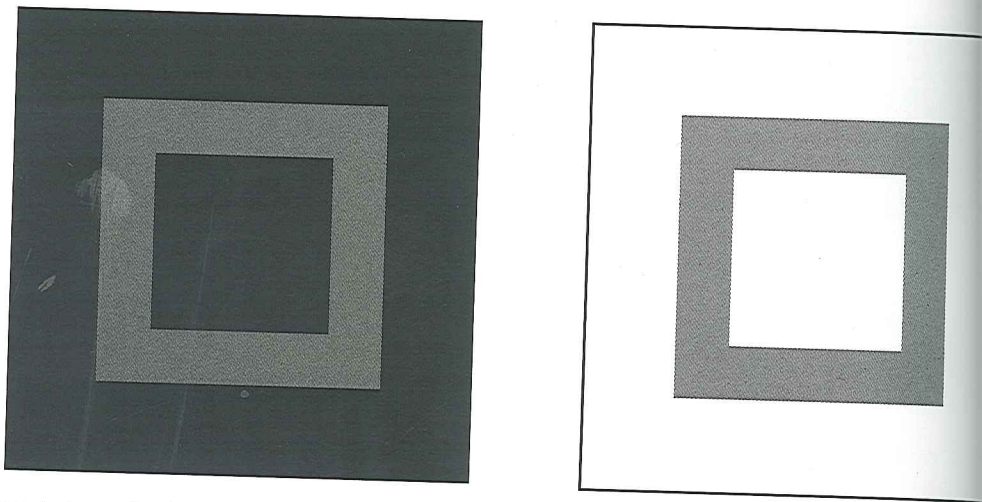
opposite one another on the color wheel are called *complements.* Art that combines these colors is said to be using a complementary color scheme. Figure 10-5 uses a range between blue and gold/brown/orange. Complements heighten and accent one another. They often are used to produce a bold, exciting effect. A split complementary scheme includes one hue and the two hues on either side of its direct complement. Colors next to one another on the color wheel are called *analogous.* An analogous color scheme is generally considered soothing and restful. A *monochromatic* color scheme is composed of one hue in several values.

In color there are no real absolutes. That is why this information is often called *color theory.* It is unusual, but quite possible, to produce a tense, dramatic effect using analogous colors or a soothing, harmonious effect using complementary colors. Remember, these principles are not rules, but useful guidelines. An artist or designer may choose to deliberately violate them for effect.

THE RELATIVITY OF COLOR

Our perception of color is colored by many considerations. For example, the way each color looks to us is strongly affected by what surrounds it. This phenomenon is known as *simultaneous contrast.*

We automatically compare colors that sit side by side. When complements (such as red and green) are placed side by side, they seem to become more intense. They complement one another. A gray placed beside a color appears to have a tinge of that color's complement in it because our eye automatically searches for it. Therefore a

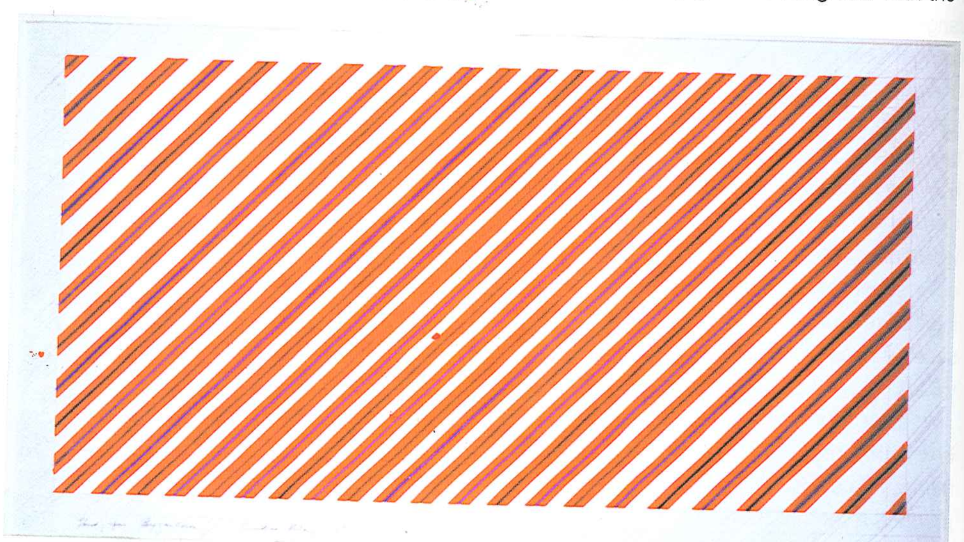


10-6
Simultaneous contrast gives two boxes of the same gray appear to have different values.

neutral gray beside a red will appear to be a greenish gray; the same neutral gray beside a green will appear to have a reddish cast.

Value also is affected by simultaneous contrast. A gray placed against a black ground will appear to have a lighter value than the same gray placed against a white ground (Figure 10-6). Our eye makes a comparison between the black and gray and judges the gray as much lighter. In the other sample, our eye looks at the white and judges the gray as much darker.

One designer first experienced this effect when she was a child, visiting her aunt for dinner. Butter in her own home was a yellow stick brought home from the store. On the aunt's farm it came straight from the cows, after a little churning. This fresh butter did not have yellow food coloring added to it. When her aunt placed it on the table on a yellow plate, the niece would not eat it. It looked white and could not be the real thing. Who would eat white butter? The aunt, however, knew about simultaneous contrast, although not by that name. She whisked the butter plate away and returned with the same butter, this time on a white plate. The young girl was delighted with the



10-7
Bridget Riley.
1969. Gouache study. H 62 cm W 98 cm. Each red stripe is altered by the band it encloses. Victoria and Albert Museum, London.

"new" butter. This time, compared with the white plate it sat on, the fresh butter looked yellow.

Simultaneous contrast means that color is relative to the colors surrounding it. This fact was first discovered in the 19th century when a French chemist named Michel-Eugène Chevreul, also a merchant who dyed fabric, was disturbed by apparent inconsistencies in his bolts of cloth. He discovered that his dye remained consistent, but the viewing conditions did not. Bolts of the same color appeared to be different colors depending on the color of the fiber samples around them. He went on to research and document color properties. In the 20th century, Josef Albers made a further intensive study of color. Albers experimented with simultaneous contrast and contributed greatly to our understanding of that effect. Figure 10-7 by Bridget Riley uses the optical effects of color in this painting.

THE PSYCHOLOGY OF COLOR

Relativity also holds true in the psychology of color. Colors have the power to evoke specific emotional responses in the viewer—some personal and some more universal. In general, for example, warm colors stimulate, whereas cool colors relax most people. Interior designers pay close attention to this relationship when they consider the color schemes for a dentist's waiting room or the newsroom of a daily paper. Can you imagine sitting in a dentist's chair staring at a bright red or yellow wall?

Red, yellow, and their variations are referred to as warm colors, perhaps because we associate them with fire and the sun. Blue and green are considered cool colors. They also happen to be the colors of sky, water, and forests. The difference in the wave lengths of these colors may also account for our reactions to them.

Associations

Personal memories play a part in color perception as well. If your mother usually wore a particular shade of blue, and you loved your mother (and she loved you), that shade of blue has good associations for you. It seems a warm, friendly color, although to other eyes it might look cool.

Along with personal associations, we have cultural associations with color. They often appear in our language: "black anger," "yellow-bellied coward," "feeling blue," and "seeing red" are a few examples. To her wedding a bride wears white, the color of purity; to a funeral we wear black, the color of mourning. These are not absolute; they change from culture to culture. For example, people in India wear white to a funeral. For a wedding, they favor yellow. But these cultural preferences are changing with global awareness.

We can describe our culture's general color associations. It is by no means a description to be memorized and taken as gospel. Color psychology is complex, affected by many considerations, but if you can combine this information with a light hand and sensitive eye, it may prove useful.

Red

Red is a dramatic, highly visible hue. It is associated with sexuality and aggression, with passion and violence. It is also an official hue found in most national colors. Red is often the favored color of a sports car or a sports team. A dignified, conservative executive, however, is unlikely to choose red for a car or a corporate logo unless its intensity is toned down or its value darkened toward black.

Blue

In its darker values, blue is associated with authority. Our executive might likely favor a navy blue car, suit, and logo. A middle-value blue is generally associated with cleanliness and honesty and has a cooling, soothing effect. It is used as a background color in package design because of its quiet, positive associations. Even at full intensity, blue retains a calm quality.

Yellow

Yellow is used in food packaging a great deal because it is associated with warmth, good health, and optimism. There remain in English the reminders that yellow also has been associated with cowardliness and weakness. That does not appear to be the case currently, however. Even our cultural associations are subject to change.

Green

Green is associated with the environment, cleanliness, and naturalness. Soothing and cooling, it is consequently a favored color among manufacturers of such products as menthol cigarettes and noncola beverages.

10-8
Julie Talcott.
Freelance illustrator. This computer-generated illustration uses complementary colors and strong repetition of line and shape to create this integrated design.
Courtesy of the artist.

Selecting Color

Consider the psychology of the audience in a choice of color. A game or toy intended to appeal to children should have different colors than one intended to reach adults considering retirement plans. Our color preferences change as we grow older. In general, youth prefers a more intense color that signals urgency and excitement. The subtle color preferences of age are associated with restraint and dignity.

The institution you are designing for should also affect the selection of color. Banks tend to prefer the darker values and the blues and grays associated with authority and stability. A physical fitness club would probably want more vibrant and intense colors. A restaurant may choose complementary colors that are toned down to an attractive and intimate level (Figure 10-8).

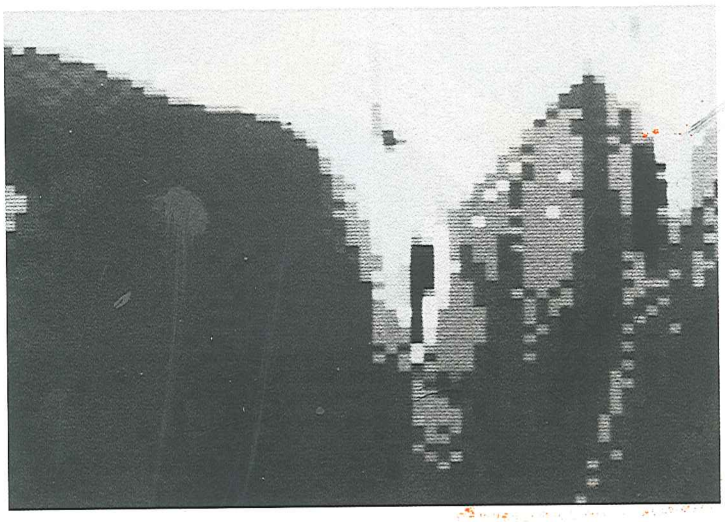
As a designer, individual color preference is not the only or even the primary consideration. Choice of color should reflect five psychological factors:

1. Cultural associations with color.
2. The profile of the audience and its color preferences.
3. The character and personality of the company represented.
4. The designer's personal relationship with color.
5. An awareness of current color trends.

UNDERSTANDING ELECTRONIC COLOR

Color on a computer monitor is created in a manner much like a pointillist painting by Georges Seurat. Computer images are composed of individual dots called *pixels*. The pixel is a rectangle of light on the computer screen that can be set to different colors. The more pixels, the better the resolution and clarity of the image. The resolution is determined by the hardware (Figure 10-9).

Many designers work with a 24-bit system. In such a system, each pixel is represented by 24 bits of color information: 8 for red, 8 for green, and 8 for blue. There are 256 possible values of each of these three



10-9
This enlargement of a digitized flower also shows the pixel structure.

colors. These differing values of red, green, and blue can be combined to produce more than 16.7 million colors.

Color Models

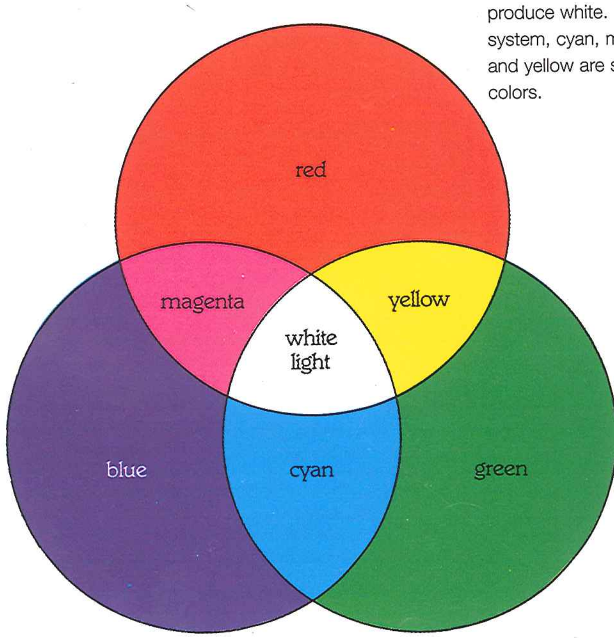
Designers study color theory in order to use it effectively. Color theory remains the same whether it be applied to a traditional or electronic design. But when using electronic color, it can be helpful to study its practical differences. We must understand the various ways color is created in order to see the final design printed and looking the way we intended. The previous section of this chapter discussed creating color using pigment-based subtractive primaries. There are three color models you need to be familiar with when using computer graphics. These are the most prevalent color models.

RGB

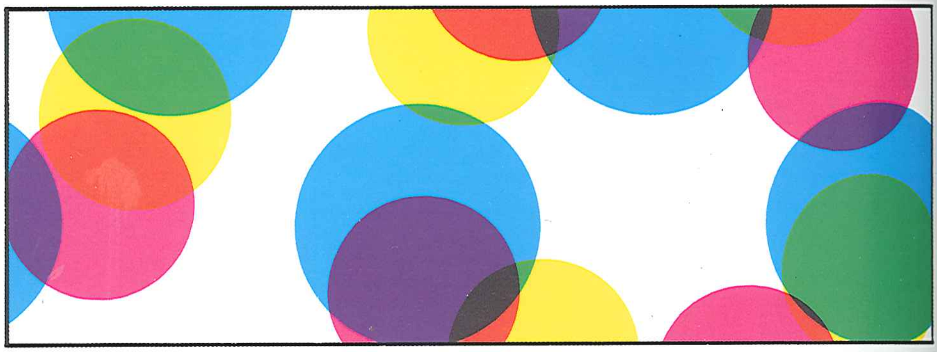
The image on the computer monitor is displayed in the additive primaries RGB (red, green, blue) and is a back-lit image made by adding light. An image on the monitor may display colors in RGB that cannot be duplicated in the reflective copy of CMYK printing. Be prepared if the printout does not match the computer screen. They are displayed in different color *gamuts,* or models. Calibrating the monitor will help (Figure 10-10).

CMYK

All of this electronic color is quite different from mixing and blending paint or colored pencils. When the monitor's colors are transferred to paper or the file is ripped for offset reproduction, it is printed in the subtractive model of CMYK. The CMYK model is the basis for four-color process printing comprised of cyan, magenta, yellow, and black inks. (The K stands for black, which is added to give



10-10
Red, green, and blue are the primary colors in the additive system. Red, green, and blue together produce white. In this system, cyan, magenta, and yellow are secondary colors.

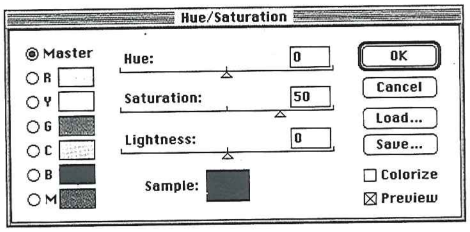


10-11
In the subtractive color system, cyan, magenta, and yellow are the primary colors, and their overlapping produces the red, green, and blue of the secondary colors. Cyan, magenta, and yellow together produce black.

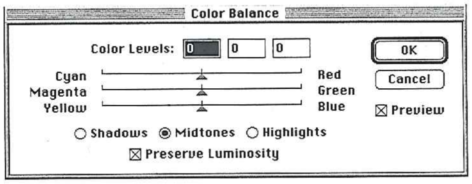
density to the final print.) For additional information on CMYK, see "Process Colors" later in this chapter (Figure 10-11).

HSL

Hue, saturation, and *lightness* (HSL) are terms familiar to us from the world of color theory and a discussion of the properties of color. Photoshop allows the user to manipulate colors using this model and other models, by moving popup menu sliders. The intensity of a color diminishes when its saturation slider is moved (Figure 10-12). The lightness control varies a color from white to black (this corresponds to value in pigment-based color models). If you are not concerned about preparing a file for four-color (process) printing, this can be a satisfying color model to use because it is the most intuitive and closest to the way mixed pigment color is used in painting and drawing.



10-12
Photoshop slides allow careful control of hue, saturation, and lightness (value).



10-13
Photoshop sliders control and demonstrate the relationship between RGB and CMY color systems.

Another Color Wheel

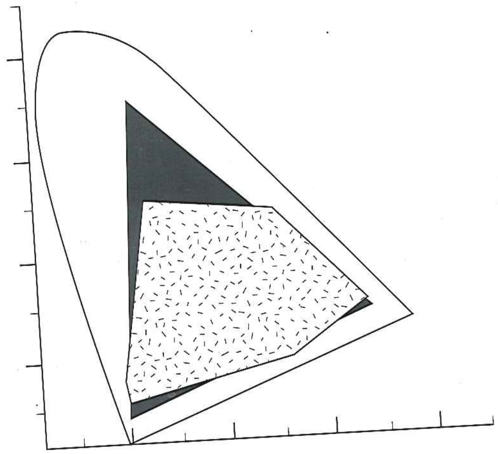
The RGB/CMY color model positions the two sets of primaries equidistant from one another. Each secondary color is between two primary colors, each color on the wheel is between two colors that are used to create it, and each color is directly opposite its complement. This is a helpful model to study in order to understand what is happening on the computer monitor.

Red and blue make magenta. In order to decrease magenta from an image, the red and blue must be decreased. Whatever is done to a color, it has the opposite effect on that color's complement. In other words, decreasing red will increase cyan (Figure 10-13).

Various computer programs that allow designers to do color correction have popup menus allowing this kind of manipulation. Photoshop is an effective color correction software in common usage by designers, although there are other dedicated color management programs. Its sliders allow the user to manipulate color quickly and see the resulting effects. It also allows the user to work from numbered percentages in order to specify colors that will match a CMYK print. And, finally, it allows the user to switch between color models, specifying that an image be created in RGB, CMYK, spot color, black and white, or duotone modes.

Color Gamuts

The visible color range of a color model is called a *gamut.* As Figure 10-14 shows, the eye can see more colors than can be created in either the RGB or CMYK color models. The gamut of RGB, however, is larger than that of CMYK. That means that if a design is created with the RGB mode, some of those colors probably cannot be printed using CMYK process colors. Photoshop will give you an alert symbol (a triangle with an exclamation mark inside) in the Picker palette if your color is not printable. This allows you to substitute a printable color before sending the file for reproduction.



10-14
The exterior shape represents the colors the eye can see. The black triangle represents the colors that can be shown on the monitor; the texture represents colors that can be printed on coated paper.

COLOR IN PRINTING

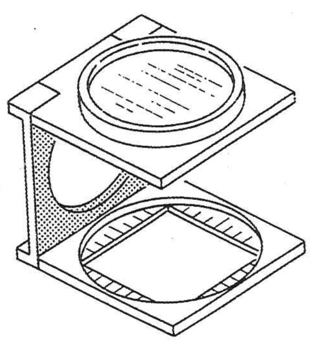
In addition to applying the psychology of color theory to design work, you must stay within restrictions imposed by the technology of mass reproduction. Designs must be created within the limitation of the budget, equipment, expertise, and time available for a particular project. *The designer's use of color must be not only creative and appropriate, but practical and printable.*

Tint Screens

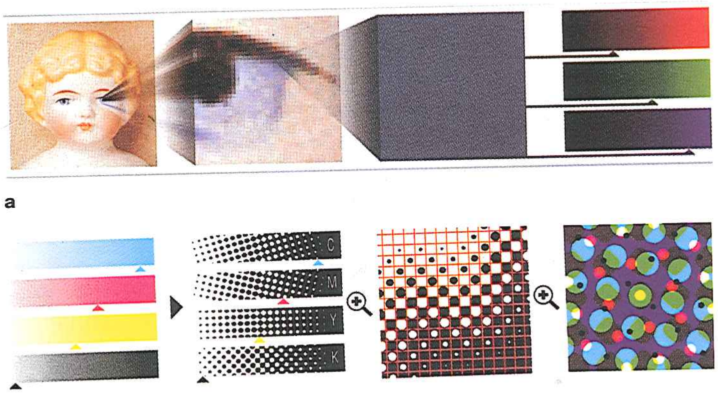
In mixed pigments, color changes are created by adding a different pigment-based hue. White is altered to gray by the addition of black; red is altered to a light pink by the addition of white; and green is created by mixing blue and yellow.

Additive color on the RGB computer monitor is created though varying intensities of light, as just discussed. When the file is sent to press, in order to create a tint or a light value of a hue, the printer cuts back on the density of the ink through varying screens. Screens are available in gradients from 10 to 90 percent. There is a similarity between the tint screens of printing inks and the application of transparent watercolor. In both cases, white is made by allowing the white of the paper to show through, and lighter values are made by applying less pigment or ink.

In appearance, the value scale of printer's screens is similar to a value scale mixed by an artist combining pigments. However, if you look at the printer's scale under a magnifying glass, the screened dots will show up (Figure 10-15). All commercial printing is a form of optical illusion achieved not by sleight of hand, but by dot screens. The same black ink is applied to paper for a 90 percent gray or a 10 percent gray, but the



10-15
A linen tester magnifies screened dots.



a

b

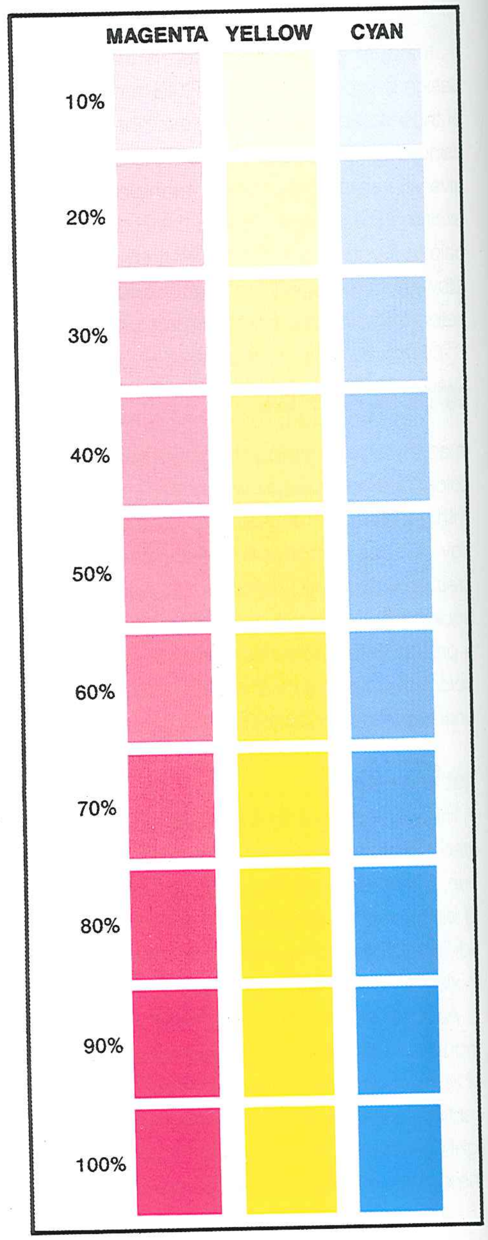
10-16a, b
This illustration documents the process of converting an original image into pixels, converting to CMYK halftones, and finally to the four-color printed piece. *Courtesy of Apple Computer.*

dot screen fools the eye into believing it is different. Where there are more dots, the ink looks blacker. A solid ink is not screened but printed at 100 percent.

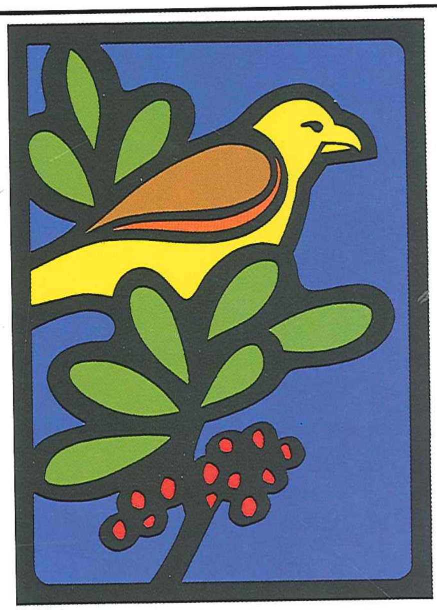
There is an analogy here with the computer screen. The image on screen is composed of dots, or pixels, of varying colors. The image the printer creates is also composed of dots, this time of solid colors of ink. The monitor uses varying intensities of light to create (additive) color, and the printer uses varying densities of ink (subtractive pigment (Figures 10-16a and 10-16b).

Figure 10-17 shows 10 to 100 percent tint screens of the three process colors: yellow, magenta, and cyan. Try looking at them with a magnifier. Changing the hue or making an ink appear darker is done by combining screened percentages of different colors. To change a cyan to purple, for example, a tint screen of magenta could be laid over it. The new color effects generated by using screens of process colors are referred to as *fake colors* (Figure 10-18). Figure 10-19a is a Pantone Guide that shows process color combinations; Figure 10-19b shows an array of solid spot colors. When creating such colors electronically, or specifying by traditional pasteup mode, reference guides like these charts and specify ink percentages or numbers rather than "going by eye."

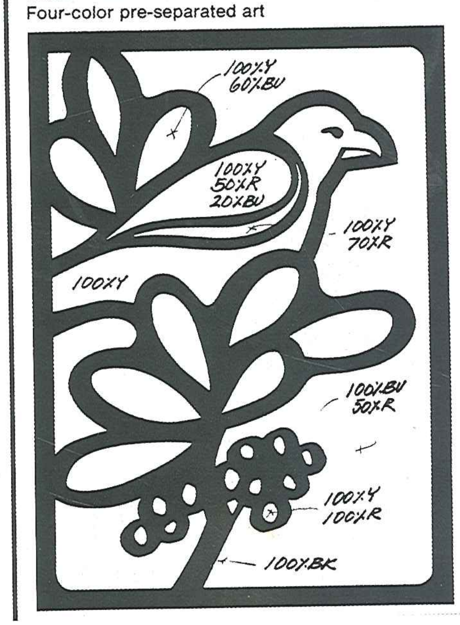
It is important to visualize these screened color combinations correctly before sending them to the printer. The comp may have been generated on the computer and shown on screen or it may be output as a proof print. The goal is to arrive at a printed piece that matches your expectations.



10-17
Changing tint values with screens. Material furnished by Hammermill Papers Group for plates 4 and 5.



Four-color pre-separated art

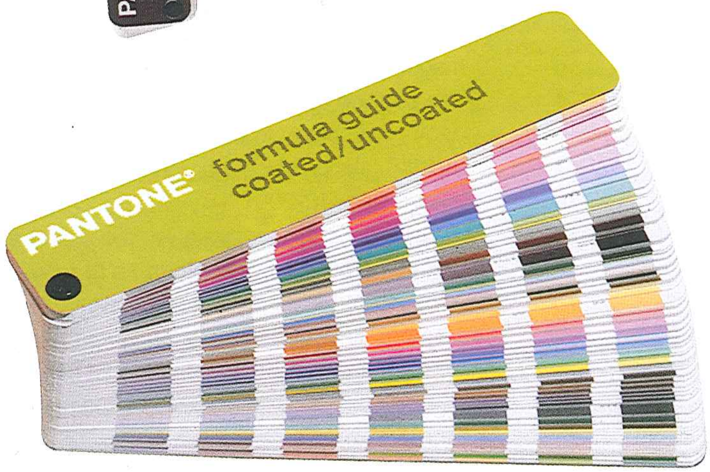


(left)
10-18
Tint screen percentages of the four process colors are combined to create this illustration.

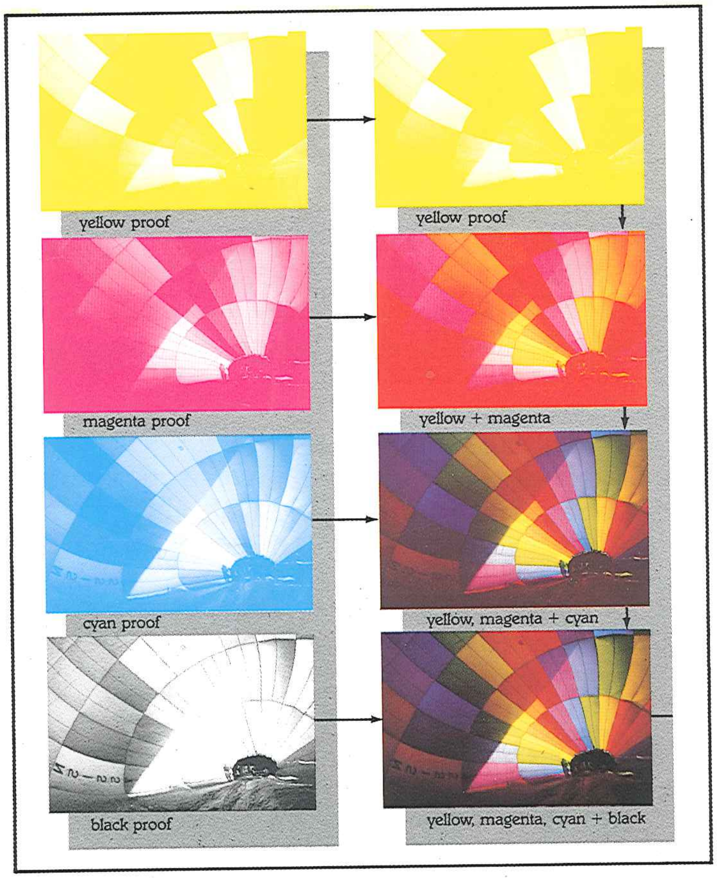
Spot Color or Process Color?

If you are using one to three spot colors, several numbered guides are available to assist you. The most complete, the Pantone Matching System, consists of a full line of color specification books, coordinated by numbers. These formula guides, first developed in 1963, enable you to specify a color number that the printer can match, using a reference guide. This is much more scientific than specifying a logo be printed in a bright cool red. Each ink color has its own number. Choose the ink color from the guide and enter it on your computer, or tell the printer its number. The printer then prepares the ink you have specified. To get the desired blue for your two-color design, you might specify a spot color of Pantone 313 with a 20 percent screen of black. A variety of reference books show screened percentages of these ink colors. They also show what happens when you combine two different ink colors in screened percentages. Using spot colors is usually less expensive than full process colors.

10-19a
Pantone Process Color System Guide.



10-19b
Pantone Color Formula Guide.



10-20
Yellow, magenta, cyan, and black proofs and their combinations.

Process Color Separations

The offset reproduction of a full range of color, rather than just two or three colors, is done with CMYK process color. The three primary colors in process printing are yellow, magenta, and cyan, as we have discovered. The addition of black as a fourth color gives depth and solidity to the image. These four printer's inks produce the visual effect of full color (Figure 10-20).

Once the designer has given the printer a full-color illustration or photograph to reproduce, either traditionally or electronically transferred, the printer separates out the process colors. Artwork is separated into three color exposures from which the printing plates are made. A black separation is also made. When the press is inked with each of these four colors, and the color is laid down from the plate onto the paper, an illusion of full color results. The varying densities of halftone dots overlap and lie beside one another, mixing optically. It is a truly effective illusion.

As with spot color tint screens, the mixing happens not within the pigment, but within the eye of the viewer. Unlike the even dot coverage of tint screens, a process color separation is made of dots of varying densities that correspond to the color density in the original image. This variation is why such a complex range of color can be produced from only four process colors. Examine the full-color images in this book with a linen tester magnifier (see Figure 10-15).

Cutting Costs

Each additional ink used in a design means the printer must do additional work preparing plates, negatives, and the press. The more ink colors you use, the more printing the design will cost. Combining screened percentages of inks will enable you to get the most out of each color you pay for and can decrease the cost of the job.

Another way to get more color into a job without increasing the cost is by printing on colored paper. Excellent reference books (often from paper companies) are available on using colored inks on colored papers. The color of the paper will show through, subtly altering the look of the ink. For this reason, white ink is seldom used in the printing industry. Opaque white is difficult to achieve. A study of how tint screens, ink, and paper interact will help achieve the desired effect at a minimum cost.

Halftones, Duotones, and Tritones

Photographic prints used for halftones should have an extended tonal range with good contrast. If your negative has good detail, it can be converted to a good halftone. Although a poor negative or print

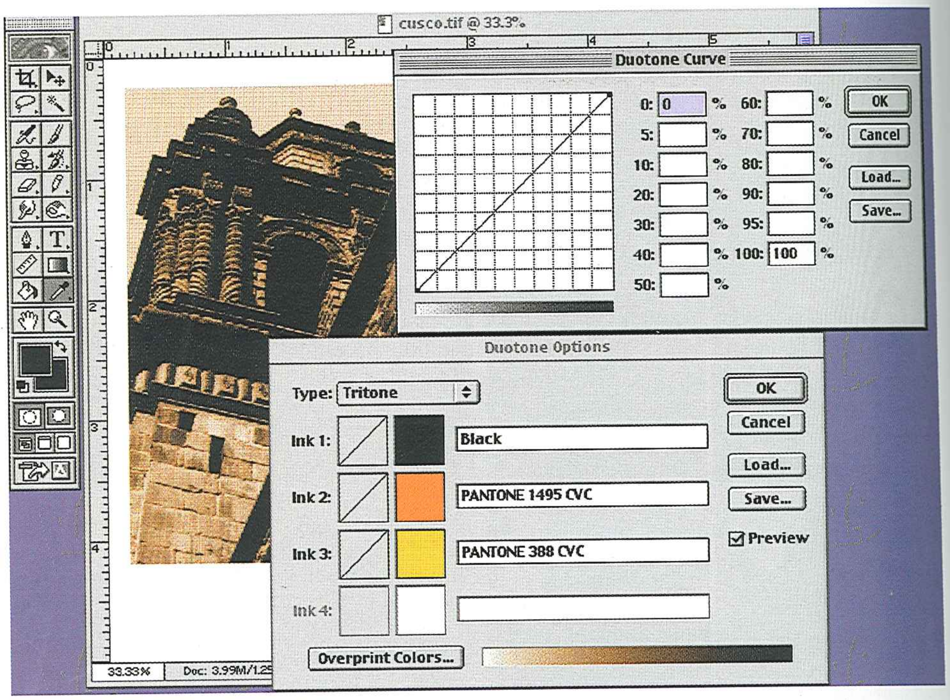
10-21
Duotone and tritone combinations.

with loss of detail can be improved, it cannot be converted into a high-quality halftone.

Duotones and tritones are commonly used techniques for printing black and white photography using spot colors. Although these halftones are limited in color, there are many options to consider (Figure 10-21). Electronic scanning can selectively enhance the tonal range, and different line screens can be employed from coarse to very fine. A halftone can be printed over a solid color or over a screened color to create a fake duotone effect.

A duotone is created by generating two halftone negatives from the same image. By printing these negatives in varying colors, you can achieve different effects (Figure 10-22a). Duotone effects depend as much on how you use the two colors as what colors you specify. For example, a black and violet duotone can be run with the black dominant or the violet dominant. The density range of each plate can be extended or compressed, producing shadow detail in one color while the other accents the highlights.

The tritone uses three colors for still more creative options. Black combined with two colors yields a new effect, as does printing with a warm black instead of a true black. A tritone can also be created during printing



10-22a
Photoshop popup menu showing a duotone curve on one of the colors that will be used to create a duotone. It controls the distribution of color throughout the darks and lights of the image.

10-22b
Photoshop popup menu showing a tritone combination of inks.

using varnishes as a third color (Figure 10-22b).

Whereas designers used to be dependent on reference guides and their instincts to specify these techniques, now it is possible to simulate them quite accurately on the computer. The effect of varnishes and various paper surfaces on ink color, however, are still difficult to visualize before printing.

Technology is changing fast in the design and printing industry, but many principles stay the same. A good design sense and a working knowledge of color theory, coupled with a basic foundation in computer graphics, will see you through.

PROCESS COLOR SEPARATION SUMMARY

When a computer is used to generate four process color separations, a scanner first digitizes your photo into a fine grid of rectangles called pixels (see Figure 10-8). A higher quality scanner gives a finer grid with a higher resolution and more pixels. Each pixel is assigned a value for each of the three additive primaries (red, green, blue, or RGB).

The scanned image can be previewed on a color monitor. This display also uses RGB colors, but the final image is printed with subtractive primary colors (cyan, magenta, yellow, or CMY), with the addition of black (K).

Translating the three RGB values into four CMYK values results in variations caused by switching from an additive (RGB) system to a subtractive (CMYK) system. This entire translation process can be done on a personal computer as well as on higher end systems.

The final step is to turn the CMYK values (which are continuous tone separations) into four halftone films. The halftones are translated into film for making printing plates. In the halftone film, color shades are simulated by varying sizes of halftone dots. In a digital press environment the film step can be skipped. Files are sent directly from computer to plates.

Exercises

1. Find printed samples of monochromatic, analogous, and complementary color schemes. Search for samples of color used in graphic design, advertising, or packaging that convey a particular mood and reach a particular audience.
2. Find an example of a two-color design that uses tint screens to achieve a multicolor effect. Analyze how this design was prepared for printing. Make notes and discuss them with your instructor.
3. Find a duotone or tritone and compare it under a magnifying lens to a traditional process color photograph. Then compare these halftone effects to the tint screen you analyzed.
4. Using a program such as Photoshop, practice converting from RGB to CMYK to HSL and manipulating the colors using slider controls (see Figures 10-22a and 10-22b).

Project

Word and Image Poster

Prepare two full-color posters that combine the image of a famous person, place, or thing with a related word. The word related to each image can be a name or an association the image brings to mind. Pay close attention to integrating the typography with the image through various gestalt unit-forming techniques and color choices (see Figure 10-23).

Choose a complementary, split complementary, or analogous color scheme, and create two color versions of the poster. Use tint, tone, and shade to give your color schemes different personalities. Be creative with color choices. *Local color* designs try to keep realistic color (a sky is blue), but there are other choices. The use of arbitrary color frees you to assign whatever color seems desirable. The sky may become yellow to enhance the purple backlit tree trunks, or hair may become dark blue in an analogous color scheme of cool hues.

Objectives

Practice using color to express a mood appropriate to an image.

Practice integrating word and image from the standpoint of both pure design and content.

Control color and learn more about it by using different models and creating variants of tint, tone, and shade.

10-23
E. McKnight Kauffer. Reigate, 1916. 24.4 × 20" (62 × 50.8 cm). The London Transport Museum. This influential painter and designer used complementary colors to create this striking poster for London's subway system.