Chapter 15

Color in Design

Content Terms

color
color spectrum
color wheel
primary colors
secondary colors
tertiary colors
hue
value
tint
shade
tone
intensity
complement
pigment
warm colors
cool colors
color harmony
monochromatic color harmony
complementary color harmony
split-complementary color harmony
double-complementary color harmony
analogous color harmony
triadic color harmony
neutral color harmonies
color scheme

Academic Terms

advancing
receding

Learning Outcomes

After studying this chapter, you will be able to

- analyze the psychological impact and meaning of different colors.
- summarize how color influences human behavior.
- analyze and describe the relationships between colors on the color wheel.
- evaluate the use of color harmonies in planning interior designs.

Reading with Purpose

On a separate sheet of paper, write the main headings from this chapter. Leave space for note-taking under each heading. As you read the chapter, write down three key points you learn from each section. Then answer the following: How does this information relate to what I already know about color?

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In the previous chapter, you learned about the elements of design—line, form, space, mass, and texture. In this chapter, you will learn about another element of design—color. Color is likely the most important element of design. Deciding what color to use is usually the first decision made when designing a room. It is one of the first things others notice about your design. Color sets the mood in a room and leaves a lasting impression with most people.

Understanding Color

Color is an element or property of light. It can help you create certain moods in your home by communicating excitement, calmness, mystery, or other sensations and emotions. When you understand the effects of color, you can use it to make your personal living space attractive and satisfying (Figure 15.1).

The Psychology of Color

Each color has certain psychological effects on people and can evoke certain feelings. Factors that can influence peoples' reactions to color include age, gender, culture, and life experiences. Although there is no single specific system for identifying ways all people respond to color, some of the effects for each of the following colors may include:

- *Red* is associated with power, danger, fire, strength, and passion. It is bold, aggressive, exciting, and warm. It demands attention. Red can make you feel energetic. However, too much red in a room can be overpowering.
- *Orange* is hopeful, cheerful, warm, and less aggressive than red. It expresses courage and hospitality. It can make a room feel energetic and friendly.
- *Yellow* is friendly, happy, and warm. It is associated with sympathy, sunlight, prosperity, cowardice, and wisdom. Yellow rooms are cheerful, light, and airy. However, pure yellow draws attention due to its brightness, so take care when using it in large amounts.
- *Green* is the color of nature. Consequently, it is refreshing, friendly, cool, and peaceful. Additional meanings include hope, good luck, and envy. Green mixes well with other colors and looks especially good next to white.
- *Blue* is cool, quiet, and reserved. It is associated with tranquility, serenity, and formality. Blue can be soothing and peaceful. It can be especially pleasing when used with white. However, too much blue in a room can be depressing.
- *Violet* is a royal color. It is dignified and dramatic. It works well with most other colors.
- *Black* is sophisticated and mysterious. It is associated with wisdom, evil, and death. Small amounts of black help ground a room, or may add a timeless, classic elegance. When used in large quantities, however, black may be oppressive.
- *White* is fresh, peaceful, and pure. It is associated with youth, innocence, and faith. White can make rooms look crisper and livelier.

People feel most comfortable when colors in their surroundings reflect their personalities. For instance, outgoing people might choose bright red or yellow for the main color in a room. Shy people might feel awkward in a red room. Instead, they might prefer a room that features a soft blue or green.

When making color decisions for your home or the home of a client, consider the preferences of each family member. No single color will satisfy everyone. The color and design of the social area

Photography Courtesy of Calico Corners—Calico Home Stores

Figure 15.1 The combination of colors used in this child's room creates a cheerful space.

of the home, however, should make all members feel as comfortable as possible. Use individual color preferences in personalized sleeping areas and other private work or play spaces.

The Color Spectrum

The **color spectrum** is the full range of all existing colors. A beam of white light produces *spectral colors* as it passes through a prism. Although limitless in number, more than 10 million colors have been identified in the color spectrum. Each distinct color derives from a few basic colors. The rainbow in Figure 15.2 is the ideal example in nature of how sunlight can separate into a continuous band of colors, or a *spectrum*. In the case of a rainbow, the raindrops themselves serve as tiny prisms separating the light.

The variety of colors possible in nature is virtually limitless. Paint manufacturers have translated the spectrum into several hundreds of different paint colors (Figure 15.3).

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Figure 15.3 This fan of different paint colors represents a portion of the many colors that exist in nature.

Jane McIlroy/Shutterstock.com

Figure 15.2 The water droplets in a rainbow separate light into its many colors.

Review & Assessment

1. What is color?
2. What factors influence the psychological impact color has on people?
3. Summarize the effects the following colors evoke in people: red, orange, yellow, green, blue, violet, black, and white.
4. When are people most comfortable in their surroundings? Give an example.
5. What is the color spectrum?

The Color Wheel

Color relationships are easy to understand when you learn a few basic principles. The standard color wheel is the tool used to best illustrate these principles. The **color wheel**, Figure 15.4, is the most commonly used tool to understand the basis of all color relationships. It is made of three concentric rings: an outer, middle, and inner ring. The middle ring of the color wheel consists of three types of colors: primary, secondary, and tertiary.

Yellow, red, and blue are the **primary colors**. They are the basic colors and you cannot create them by mixing other colors. However, mixing, lightening, or darkening the primary colors can make all other colors.

Orange, green, and violet are the **secondary colors**. Mixing equal amounts of two primary colors produces these colors. Orange is a mixture

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Figure 15.4 The arrangement in a color wheel provides a basis for all color relationships.

of red and yellow. Green is a mixture of yellow and blue. Violet is a mixture of blue and red. Look again at the color wheel. Notice each secondary color is located halfway between the two primary colors used to make it.

The other colors in the middle ring of the color wheel—yellow-green, blue-green, blue-violet, red-violet, red-orange, and yellow-orange—are the **tertiary colors**, or the third level of colors. Another name for the tertiary colors is *intermediate*

Sociocultural Connections — Color Psychology at Work

Color is a vital tool for interior designers because it impacts how people feel. Vibrant colors, especially oranges and reds, enliven the seating areas of many fast-food restaurants. They tend to stimulate customers' appetites.

Designers working for clients in various industries use color to achieve other goals. For example, designers of airplane interiors avoid using large expanses of fast-food reds and oranges. Their goal is not to stimulate appetites, but to create a relaxing environment for passengers. Neutrals and muted shades often work well. In hospital rooms, color is used to create spaces that do not raise anxiety or trigger depression among ill or injured people.

In residential settings, designers often use the color blue in bedrooms because it has a calming and peaceful effect.

Dig Deeper

Use online and print resources to research the effects of color for people in other cultures. Choose at least three cultures to research other than your own. How do people react to these colors in each culture? What are the color meanings in these cultures and how do they differ from those in the United States? Write a summary of your findings to post to the class website.

colors. The names of tertiary colors reflect the names of the two colors used to make them—an equal mixture of a primary color with a secondary color adjacent to it on the color wheel. Note that their names always have the primary color listed first. For example, blue-green is correct but not "green-blue."

The lightest color on the color wheel is yellow and it is always at the top of the wheel for that reason. Violet is the darkest color on the color wheel. It is directly opposite from yellow at the bottom of the wheel.

Color Characteristics

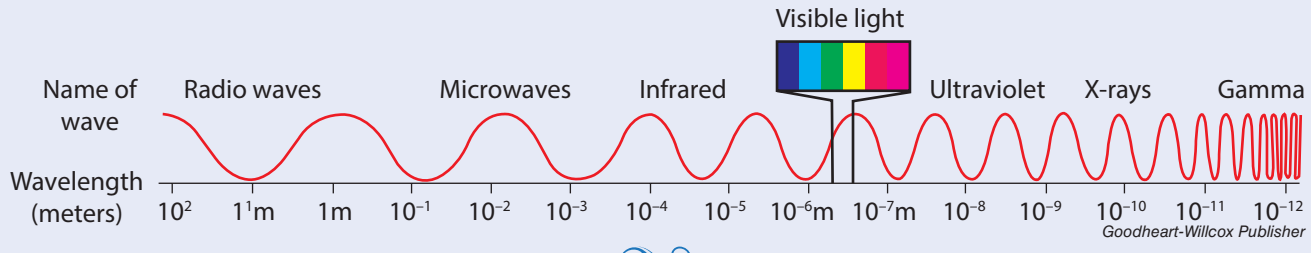
Each color has three characteristics: hue, value, and intensity. Various tools illustrate these characteristics. For example, the color wheel shows hues and some values. Separate scales, such as the

STEM Science & Technology — Visible Light and the Electromagnetic Spectrum

Light is a form of energy called *electromagnetic radiation*. It travels through space as oscillating waves. From crest to trough, these waves range in size from large as a building to small as a microscopic particle. *Wavelength* is the distance between the crests of two adjoining waves. *Frequency* is the rate at which a wave oscillates or fluctuates and is measured in hertz. The chart shows the electromagnetic spectrum arranged according to wavelength and frequency in hertz. As the length of a wave increases, its frequency decreases.

Visible light makes up a small part of the electromagnetic spectrum and it's the only part you can see. Visible light consists of the colors you see in a rainbow—red, orange, yellow, green, blue, and violet. These colors form the basis for the color wheel that interior designers use for creating color schemes.

The spectrum also includes other forms of energy you encounter every day: infrared, radio waves, microwaves, X-rays, gamma rays, and ultraviolet rays. Many consumer electronics products utilize the electromagnetic spectrum. Can you identify a few of them?



color rendering index (CRI), show color values more completely as well as color intensity.

Hue

A **hue**, or color name, is the color in its purest form, with no added black, gray, or white. It is the one characteristic that makes a color unique. It is what makes red different from blue and green different from yellow. It is the specific, individual nature of each color.

Value

The **value** of a hue is the relative lightness or darkness of a hue. The middle ring of the color wheel shows the normal values of hues. The normal values of some hues are lighter than the normal values of others. For instance, yellow has the lightest normal value of any color in the middle ring of the wheel. As you move away from yellow on the color wheel, the normal values of hues become darker. Violet has the darkest normal value.

Adding white to a hue makes it lighter. The addition of white to a hue produces a **tint**. For instance, pink is a tint of red. Adding white to red creates pink. Adding white to blue creates baby blue, a tint of blue. Peach is a tint of orange. Lavender is a tint of violet. The innermost ring of the color wheel shows the tints. Lighter tints require the addition of more white.

You can make the value of a hue darker by adding black. The addition of black to a hue produces a **shade**. For instance, burgundy is a shade of red. Adding black to red creates this shade. Navy blue is a shade of blue and is created by adding black to blue. Darker shades require the addition of more black. The outer ring of the color wheel shows the shades. Refer again to the color wheel to identify the normal value of hues, tints, and shades.

Adding gray softens the value of a hue, which produces a **tone**. Rose is a tone of red. Wedgwood blue is a tone of blue, created by adding gray to blue. Note that adding light gray to a hue causes confusion with a tint. Likewise, adding dark gray to a hue can cause confusion with a shade. However, there is a difference. Medium grays, of course, are the easiest to recognize as tones when mixed with hues.

Figure 15.5 pictures a *value scale*. The left column shows the range of tints obtained by adding greater amounts of white to the blue color. The right column shows the range of shades obtained by adding greater amounts of black to the blue.

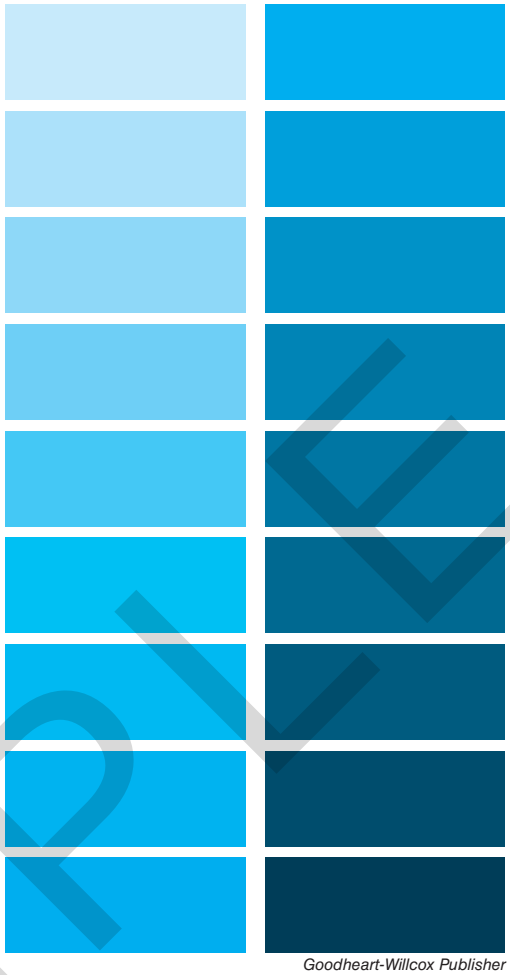


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Figure 15.5 Values for the color blue, ranging from tints to shades, are shown on this value scale.

Intensity

Intensity refers to the brightness or dullness of a hue. The middle ring of the color wheel shows the normal intensity of each hue.

One way to dull a hue, or lower its intensity, is to add some of its complement. The **complement** of a hue is the hue opposite it on the color wheel. For instance, blue is the complement of orange. To lower the intensity of orange, you add varying amounts of blue, as shown in Figure 15.6. To lower the intensity

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Figure 15.6 Adding blue to orange reduces the intensity of orange, making it a duller color.

of red, you add small amounts of its complement, green. Examples of high-intensity colors include hot pink and fire-engine red. Smoky blue and rust are examples of low-intensity colors. Another way to lower the intensity of a hue is to add gray, making the color a tone.

Neutrals

Although neutrals are not really colors, they are usually classified as colors when discussing design. Black, white, and gray are neutrals. Black is the combination of all colors when it exists as a pigment. A **pigment** is a coloring agent used in paint and printed materials. In contrast to black, white used as a pigment has no color. Gray is a combination of black and white. Brown and its tints and shades are also neutrals. Combining equal amounts of complementary colors forms a brown color.

By adding a neutral color to a hue, the value of the hue changes to either a tint or a shade. This makes the hue less intense. With any of these changes, neutralization of the hue occurs. Neutralized hues blend better with other colors.

Warm and Cool Colors

Colors can be classified as either warm or cool. Although the actual temperature may be the same throughout an entire home, some rooms may seem cooler or warmer due to the usage of certain colors in decorating.

Warm colors include yellow, orange, red, and the colors near them on the color wheel, with red being the warmest. They are called warm colors because they remind us of fire and the sun.

Warm colors are ***advancing***—meaning they appear to move forward. Warm-colored objects appear closer to you. Warm-colored walls look closer together. For example, a room painted red, yellow, or orange appears smaller than its actual size.

Warm colors attract your attention. They can make you feel happy, energetic, and full of excitement. Research shows the color red actually stimulates the nervous system and can increase blood pressure, heartbeats, and breathing rate. Many advertisements use warm colors to make you notice them. Restaurants use warm colors to increase your appetite. Locker rooms use them to generate excitement. Warm colors in homes make household members feel lively and cheerful. An overuse of warm colors, however, may make people feel nervous or tense, especially if they are full-intensity colors.

Cool colors are opposite the warm colors on the color wheel. These include blue, green, violet, and the colors near them. They are cool colors because they remind people of water, grass, and trees.

Cool colors are ***receding***—meaning they make objects seem smaller and walls seem farther away than they really are. Decorating a small room in cool colors can make it appear larger than in actuality.

Cool colors are quiet and restful. Hospitals often use them to help patients relax and feel calm. They are also popular for bedrooms. With overuse, however, cool colors may make people feel depressed.

Warm and cool colors create different moods that make people feel differently (Figure 15.7). For

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Figure 15.7 By comparing these two living rooms, you can sense the warmth created by the use of yellow and red (A) and the feeling of coolness generated by the use of green and blue (B).

example, workers in an office complained their lunchroom was always cold. When the employer changed the light blue room to orange, the complaints stopped even though the temperature never changed.

Review & Assessment

1. What is the color wheel?
2. Name the secondary colors. What primary colors, in what proportions, are used to make each?
3. Which color name is listed first in the name of a tertiary color?
4. Contrast value and intensity.
5. What are the differences among a tint, shade, and tone?
6. Summarize how to neutralize a hue.
7. List the characteristics of warm and cool colors. Give an example of each.

Color Harmonies

To achieve optimal success when using color in design, follow one of the standard color harmonies. A **color harmony** is a pleasing combination of colors based on their respective positions on the color wheel. There are seven basic color harmonies: monochromatic, complementary, split-complementary, double-complementary, analogous, triadic, and neutral. Established color harmonies bring colors together in combinations that are very satisfying to the eyes.

Monochromatic Color Harmony

A **monochromatic color harmony** is the simplest color harmony. It uses a single hue from the standard color wheel. The hue selected for the monochromatic color harmony in Figure 15.8 is pink (a tint of red).

You can achieve variation in a monochromatic color harmony by changing the value and/or intensity of the hue. For example, you could use light blue, gray blue, and navy blue—a tint, a tone, and a shade of the same hue. A paint fan deck will usually show five to seven values of the same hue. To add interest to the color scheme, use accents of neutral colors. Using a monochromatic color harmony can make a room appear larger. It can also unify the furnishings and accessories used in the space. The monochromatic color scheme is the most restful of all, because it has the least contrast or drama.

Complementary Color Harmony

Selecting two colors that are directly opposite each other on the standard color wheel creates a **complementary color harmony**. Complementary colors are sometimes called

Green Choices

Avoid Greenwashing

Are "green" products always "green?" Some companies and agencies may be less than truthful about the "green" aspects of their products and services. These companies and agencies realize that more consumers are looking for green products and are easily influenced by terms relating to green features. They may use terms that mislead consumers and professionals about the "green" features of their products. Some environmental product claims are false while others are misleading. The term for this deceptive way of doing business is *greenwashing*.

An example of greenwashing involves low- or zero-volatile organic compound (VOC) paints. Because they are less toxic to humans and the environment, these paints are catching on quickly with consumers. Several reliable paint suppliers produce these paints. Other companies are putting "green" on the labels, but their paint may actually be neither low- or zero-VOC products.

Before buying any green products, check a number of websites that provide information on the validity of products that indicate green features. See the websites for the following:

- GreenBiz
- EDC—(the official magazine for LEED® Professionals)
- GreenGuard (part of the UL Environment; a business of Underwriters Laboratories)

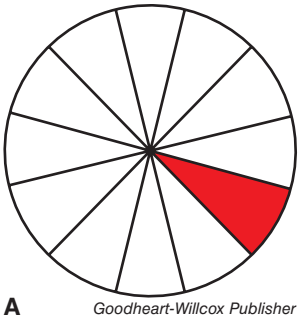

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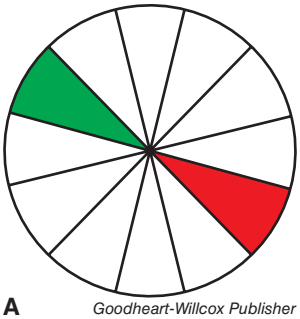
Figure 15.8 Pink, (a tint of red—A), is the basis for this monochromatic color harmony (B).



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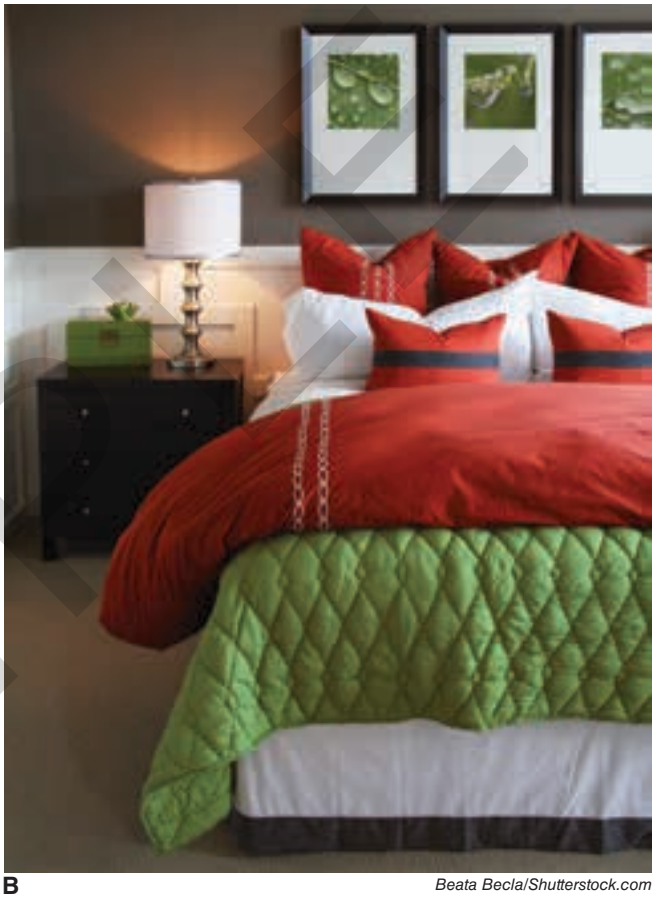

B Beata Becla/Shutterstock.com

Figure 15.9 Red and green are complementary colors (A). Shades of green and red are used in this contemporary bedroom to create a complementary color harmony (B).

contrasting colors because they make each other look brighter and more intense. For example, when using blue next to orange, the blue looks bluer, and the orange looks stronger. A complementary color harmony can make a room look bright and dramatic.

Although such a sharp contrast is fine for some rooms, most rooms are more comfortable with less contrast. Varying the values and intensities of the colors can do this along with varying the amounts of the colors (Figure 15.9). The more one color dominates the other, the less noticeable the contrast.

Split-Complementary Color Harmony

Using one hue with the two hues adjacent to its complement creates a **split-complementary color harmony**. As a variation of the complementary color harmony, the split-complementary harmony uses *three* colors. For example, if you choose the blue hue first, you would look directly across the color wheel to find orange, its complement. You would then select the colors on both sides of orange to establish your split-complementary color harmony. The resulting color harmony uses

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Figure 15.10 A split-complementary color harmony uses a main color (blue) with the colors on both sides of its complement (yellow-orange and red-orange) (A). How is the split-complementary color harmony used in this photo (B)?

blue, yellow-orange, and red-orange (Figure 15.10). With this color selection, blue will likely be the dominant color, while yellow-orange and red-orange provide lively contrast.

Double-Complementary Color Harmony

Selecting two colors and their complements from the standard color wheel creates a **double-complementary color harmony**. In this way, you use four colors to create the color harmony. One example of a double-complementary color harmony results from pairing red and green with violet and yellow (Figure 15.11). As long as each pair is composed of complementary colors, you may use any combination of pairs.

Analogous Color Harmony

Selecting related hues from the standard color wheel creates an **analogous color harmony**. These are hues that are next to each other on the color wheel. In an analogous color harmony, usually three to five hues are used. Since they are related, they

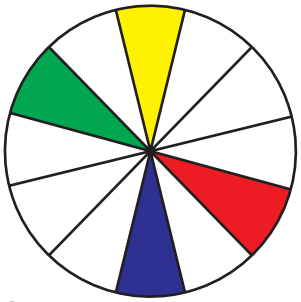

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Figure 15.11 A double-complementary color harmony is made of two sets of complementary color schemes (A). Which complementary schemes are represented in this photo (B)?

blend together well. One color seems to merge into another. Even when the colors in an analogous color harmony are all warm, the room will be more restful than one that uses colors from both sides of the color wheel. Figure 15.12 shows an example of an analogous color harmony.

An analogous color harmony will look best if you choose one color as the dominant color and use smaller amounts of the others to add interest and variety. You may also want to use a tiny amount of an unrelated color as an accent.

Triadic Color Harmony

A **triadic color harmony** uses any three colors that are equally distant from each other on

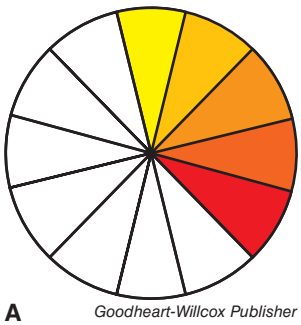

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Figure 15.12 An analogous color harmony uses hues next to each other on the color wheel (A). The analogous color harmony using yellow, yellow-orange, orange, red-orange, and red, gives this room a vibrant appearance (B).

Career Focus Color Designer

If you share some of the following interests, you may want to consider a career as a color designer.

Interests/Skills: Do you like to experiment with the colors of your clothing and accessories? Do you realize that color plays an important role by having a positive or negative impact on emotions? Do you enjoy being in spaces where the colors give you a sense of peace? Have you found enjoyment working with colors and paint throughout your education? Skill requirements for a color specialist include: an excellent eye for color; thorough understanding of color psychology, the color wheel, and how to use different color harmonies; and the ability to organize details and research information. In addition, excellent speaking, writing, and listening skills are needed to communicate with a client.

Career Snapshot: Color designers work with manufacturers and interior designers. They provide many different design services as well as marketing. A color designer must have a strong combination of the two. They consult manufacturers about colors that will work best for trends in new furniture, paint, wall coverings, fabrics, rugs, and other accessories. For example, a color designer may work for a textile firm and may recommend yarn colors that will be the most popular and marketable. Color designers must be able to recognize very subtle differences in colors. They must stay current in their research to predict color trends.

Education/Training: A bachelor's or a master's degree is preferred. Courses include color theory, psychology of color, art, art history, interior design, and computer programs.

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Licensing/Examinations: No license required.

Professional Associations: The Color Marketing Group (CMG); The American Society of Interior Designers (ASID); the International Interior Design Association (IIDA); the Inter-Society Color Council (ISCC)

Job Outlook: The many career possibilities for a color designer in interior design will grow about four percent, slower than average through 2029. Color designers may work for a large firm that specializes in color design, an interior designer specializing in color design, or an individual company as a consultant. Some choose freelance work for projects of interest.

Sources: The Occupational Outlook Handbook (OOH); Occupational Information Network (O*NET)

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B Stephen Coburn/Shutterstock.com

Figure 15.13 Triadic color harmonies use three colors that are equidistant from each other on the color wheel (A). Triadic color harmonies are often used in children's bedrooms (B).

the standard color wheel. The triadic color harmony will follow a pattern of using every fourth color on the color wheel. For example, yellow, blue, and red—the primary colors—form a triadic color harmony (Figure 15.13). The secondary colors—green, orange, and violet—also create a triadic color harmony. The two other possible color combinations are: yellow-orange, red-violet, and blue-green; or red-orange, blue-violet, and yellow-green. Designers use great care and skill to achieve pleasing triadic harmonies. Changing values and intensities can lessen the sharp contrasts.

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Figure 15.14 Combinations of black, gray, and white create neutral color schemes. Small splashes of accent colors can add interest.

Neutral Color Harmony

Although black and white are not hues on the standard color wheel, they are the basis for **neutral color harmonies**. Combinations of black, white, and gray create neutral color harmonies. Brown, tan, and beige can also be used. Sometimes adding small amounts of other colors to neutral color schemes gives the room more interest (Figure 15.14).

Review & Assessment

1. What is a color harmony?
2. What is the purpose of using established color harmonies?
3. Name the seven color harmonies and identify an example of each.

Using Color Harmonies

Now that you have learned about color and the color harmonies, you can begin to use this information to create interior design color schemes for a home. A **color scheme** is the combination of colors selected for the design of a room or house. When designing a room, choose colors that you like seeing together. The chosen colors probably look good together because they conform to an established color harmony.

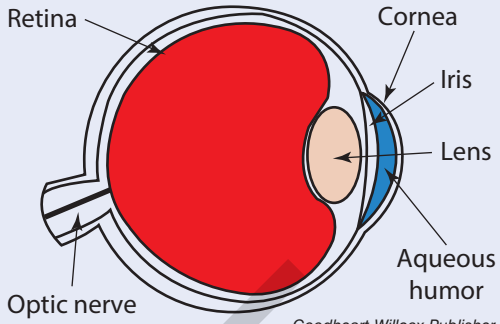
A well-planned color scheme will use color harmonies to blend and unify the design of the home as you transition from one room to another.

STEM Science & Technology The Anatomy of Color

Objects absorb and reflect light. The color that you see depends on the wavelength and frequency of the reflected waves. Red has the longest wavelength; violet has the shortest.

Humans have *trichromatic color vision*. The key part of the eye responsible for color vision is the retina. This area, at the back of the eye, contains millions of light-sensitive nerve cells called rod and cone cells. *Rod cells* enable you to see in low light. *Cone cells* enable you to see color and detail.

The *tri* in trichromatic refers to the three types of cone cells. Each type is sensitive to waves of a different part of the visible light spectrum. "Blue cone cells" react to the shorter waves on the blue end of the color spectrum. "Red cone cells" react to longer waves on the red end of the spectrum. "Green cone cells" react to medium-length waves in the green spectrum.



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When light enters the eyes and hits the retina, it stimulates the cone cells and sends electronic impulses to the brain. The signals from the cone cells are transmitted to the brain. In a complex process that researchers are still trying to understand, the human brain collects and processes this and other information to produce a color image.

It will also consider the function of the room. As you will see, even if you love red, it may be a poor choice for a bedroom because of its intensity. By following important guidelines, you can create a color scheme that will enhance the near environment and increase the enjoyment of a home (Figure 15.15).

Choosing the Right Colors

The color harmonies you choose for the color scheme of a home depend on several factors. They include what mood or style a person wants, the lifestyle of the family members, the function or the way the occupants will use the room, the items in the room, and the room's location.

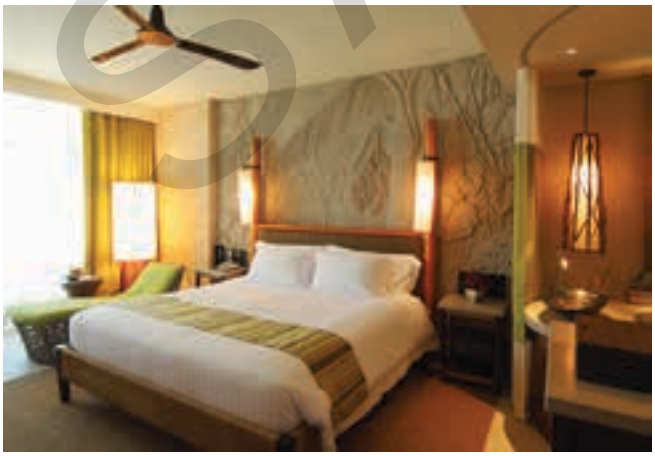

Abketta Sangasaeng/Shutterstock.com

Figure 15.15 Colors found in nature were the inspiration for the earthy color scheme in this bedroom.

Moods and Styles

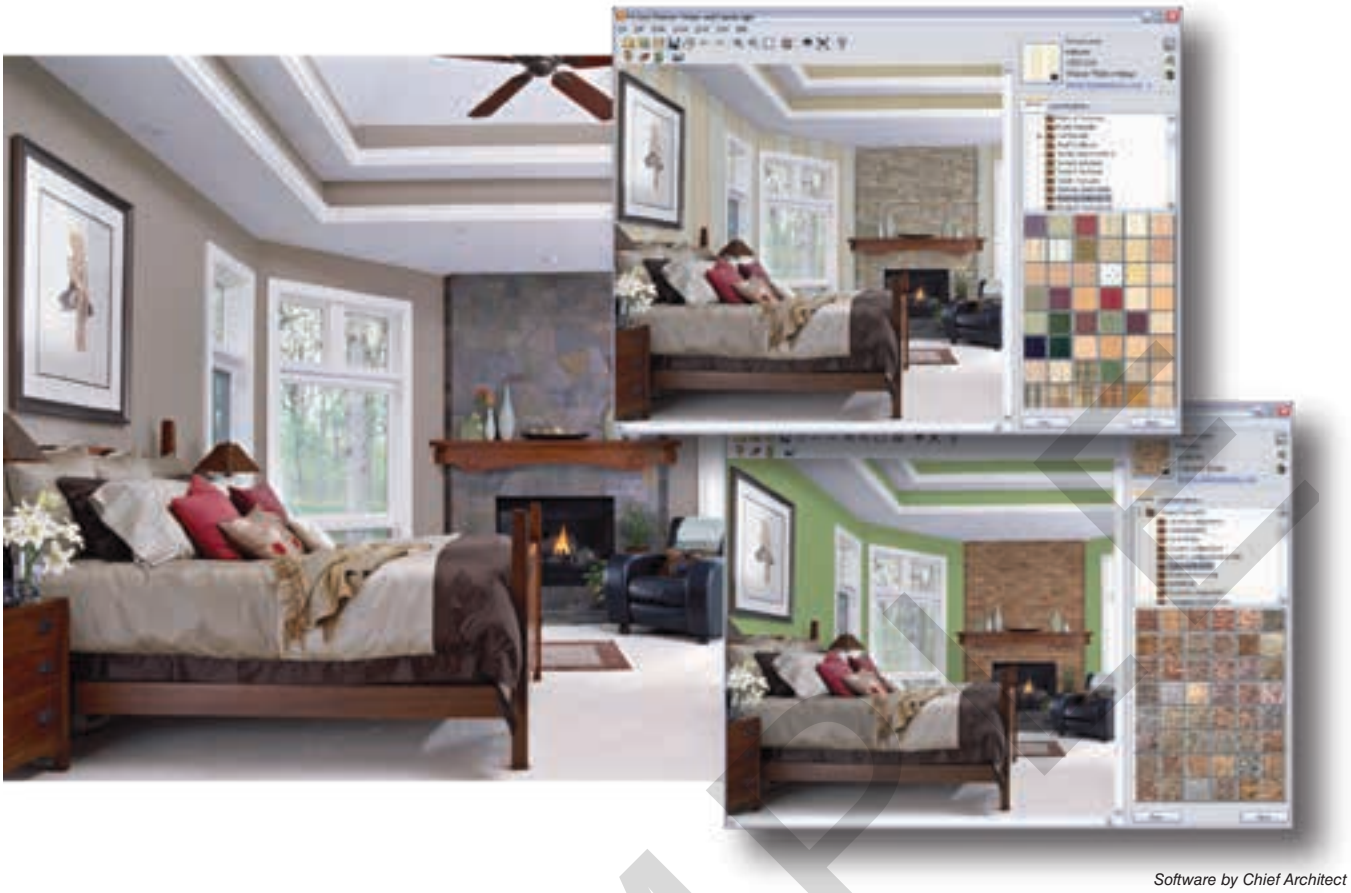
You can create a variety of moods in a room through the use of color. For example, you may want a room to feel restful, or you may want it to appear exciting. Choosing cool colors that have similar values will create a restful mood in the room, such as in Figure 15.16 on the next page. Choosing warm colors with contrasting values will make the room feel exciting.

You can also choose colors that will create a certain style in a room. Different styles, such as southwestern or country, often suggest the use of specific colors. You can use these colors in different color harmonies to achieve the style you want.

In a southwestern-style room, for example, you may choose warm desert colors, such as rust, sunset orange, brick, and sand. In a country-style room, you may choose low-intensity shades of reds, blues, oranges, and yellows.

Lifestyles

Some people have active lifestyles while others lead quieter lives. The colors you choose depend on the lifestyles of household members. For instance, with small children, give consideration to darker colors and shades that do not show dirt easily. In contrast, a household of adults may choose lighter



Software by Chief Architect

Figure 15.16 By using a CADD program, you can test how a paint color will look in a room to see the warmth or coolness it creates.

colors for the walls and upholstery because upkeep is less of a concern.

The colors you choose for each room also depend on how they are used. Primary and secondary colors of normal intensity are fine for a child's room, such as in Figure 15.17. If you use the same hues in an adult's bedroom, however, softer tints or tones at lower intensity levels are preferable.

Room27/Shutterstock.com

Figure 15.17 The use of primary and secondary colors in this child's room gives the room a feeling of fun and excitement.

Function of the Room

While teens may sleep, study, and socialize in their bedrooms, most adults use their bedrooms for rest and relaxation. In this case, cooler colors and less drama are more conducive to good sleep. A den or family room where everyone meets and socializes is often more appropriate in warm colors. For a writer or an accountant that works alone from home, the home office may be best in cool colors. In contrast, a salesperson who talks on the phone most of the day may perform best in warm colors. When choosing colors and color schemes, be sure to give thoughtful attention to colors that support the function and purpose of a room.

Items in the Room

Another way to choose color harmonies is to consider the usage of all items in the room plan. For instance, plans for a room may include an area rug, sofa, or favorite picture. To create a color scheme around any of these items, you need to select one color used in the object. This color becomes the base, or main color. After choosing the base color, use your knowledge of color harmonies,

Stephen Coburn/Shutterstock.com

Figure 15.18 A neutral base color and harmony in this room provide a backdrop for the existing art collection.

values, and intensities to select colors to go with it (Figure 15.18).

You also need to consider the type of lighting used in the room. The colors you select must work well during both day and night. This means you must view the intended colors during daylight hours in natural light and at night under the influence of artificial light. Always make your final color selections in the actual room and under the lighting conditions where you will use them. Many people experience disasters after selecting a paint color in a retail store under lighting that differs from the actual lighting in their space.

Most homes have some combination of natural, incandescent, and fluorescent lighting. However, some homes now are using the newer and more energy efficient lighting such as compact fluorescent lighting (CFL), light-emitting diodes (LED), and fiber optic lighting. Incandescent lighting can bring dullness to some colors and fluorescent lighting can completely distort color. Incandescent lighting generally makes colors appear warmer. Fluorescent lighting makes colors appear warmer or cooler, depending on the color of the lightbulb or tube. In general, most fluorescent lighting will make colors appear cooler compared to incandescent lighting. Halogen lighting renders the truest presentation of colors. *Compact florescent lighting* affects colors in various ways, depending on the color rating of the bulb. The chart, Figure 15.19, shows the impact of various lighting types on colors.

Location of the Room

The direction the room faces—north, south, east, or west—must be taken into consideration when choosing the base color and color harmony.

Color and Artificial Lighting

Type of Artificial Lighting	Yellow	Orange	Red	Blue	Green
Standard Incandescent	Warms	Strengthens	Enriches	Dulls	Darkens
Tungsten-Halogen Incandescent	Warms	Strengthens	Enriches	Dulls slightly	Darkens slightly
Deluxe Cool-White Fluorescent	Enriches and intensifies	Close to true hue	Warms	Enriches	Brightens
Deluxe Warm-White Fluorescent	Brightens	Strengthens	Enriches	Darkens and enriches	Enriches
Cool-White, Bright-White CFL	Enriches and intensifies	Close to true hue	Warms	Enriches	Brightens
Warm-White, Soft-White CFL	Warms	Strengthens	Enriches	Dulls	Darkens

Figure 15.19 Colors change when viewed under different types of artificial light.

If a bedroom is located on the north side of a house, the subdued light of the northern exposure may make colors appear cooler. To make the room appear warmer, choose a color harmony that uses warm colors. A southern exposure receives the most sunlight and generally makes colors appear bright and warm. Sometimes cool colors are preferred for rooms with southern exposures (Figure 15.20).

You cannot assume, however, the quality of light entering a room from a specific direction is always the same. The light entering a bedroom with a northern exposure will change significantly, for example, if it reflects off a bright white house next door. Also, a room with a southern exposure will not be sunny if a covered porch overhangs the windows and doors. Even the light that filters through trees outside a window can change the quality of sunlight entering the room. Consequently, the best rule of thumb is to view a color sample in the actual room at different times of day and night to examine all lighting factors.

When considering location, you also need to think about the colors used in adjoining rooms. The new colors you choose should blend with those used in adjoining rooms. In general, color should not change abruptly from room to room. Instead, it should make a gradual transition from one space to another.

If the location of a dining room is next to the living room, you can use the same base color in both rooms. You might use an analogous color harmony with yellow as the base color of the color scheme in both rooms. In the living room, consider selecting yellow as the dominant color with the other analogous hues playing secondary roles. Then use the same analogous color harmony in the dining room but expand the harmony from three to five hues and add interest by changing the tints or shades of the hues selected. You might also choose to have yellow play a less-dominant role in the dining room than it did in the living room. Introducing a color in the split-complementary color harmony with yellow as an accent will add excitement to the room. Since yellow is the base color of all the harmonies in both rooms, it provides a smooth transition.

There is an exception to the rule of blending colors in adjoining rooms. In homes using contemporary design, the walls of adjoining rooms may intentionally have different, bold colors. Devote special care, however, to applying the basic rules of color harmonies so the abrupt transitions result in good design.

WorldWide/Shutterstock.com

Figure 15.20 Because this bedroom has a southern exposure, the designer chose cool colors to decorate the room. These colors keep this room looking serene, light, and airy.

Using Color Correctly

As you work with color, the following guidelines will help you use color well:

- Applying colors to large areas makes them appear to gain intensity. Because of this, a color you select from a paint chip may appear too intense or dark when painted on all four walls of a room. At other times, a paint chip that appears soft and easy on the eye will fade to nothing when you apply it to the four walls of a room. It is advisable to paint a large swatch of the color on the wall or piece of foam board to help visualize how a paint color will appear on a wall.
- Using contrasting colors draws attention. For example, bright accent pillows against a neutral sofa will draw more attention than those of the same hue or tone (Figure 15.21). While you may want to avoid a totally neutral room, remember, too many strong contrasts in a room can be confusing and tiring.
- Color harmonies are easier on the eye when one color, the base color, is dominant. The dominant color should cover about two-thirds of the room area. When you use equal amounts of two or more colors in a room, your color selections can become a distraction and appear cluttered as each color competes for attention.

Naphat_Jorjee/Shutterstock.com

Figure 15.21 Color harmonies look best when your base color dominates the room. The dominate color should cover at least two-thirds of a space.

- When choosing colors for large areas, such as walls and floors, select low-intensity colors. If you use high-intensity colors in large amounts, they can become overpowering. Instead, use high-intensity colors in small amounts as accent colors in accessories or small pieces of furniture.
- Heavily textured surfaces make colors appear dark. This is because the light strikes the surface at different angles, making the item appear to have greater depth (Figure 15.22). When trying to match fabrics, it is important to have samples of the fabrics you are matching. For example, if you are matching drapery fabric to carpet, make sure you have samples of the carpet with you.

Khumnoo/Shutterstock.com

Figure 15.22 Although the trim work and furniture have the same wood tone, the textures on the chair and the bamboo curtains make the room look darker and heavier.

Iriana Shiyan/Shutterstock.com

Figure 15.23 Using the color guidelines to choose the right colors and create pleasing color harmonies is important for you or a client.

- If a room is very large, consider choosing colors that will make it look smaller. Shades, high-intensity colors, and warm hues that have advancing qualities make a room appear smaller.
- If a room is small, color can make the room appear larger. Tints, low-intensity colors, a monochromatic or analogous color scheme, or cool hues that have receding qualities make a room look larger.

Choosing the right colors, creating color harmonies, and following the color guidelines are important (Figure 15.23). This will help you make color work well for you, your home, or your customer.

Review & Assessment

1. What is a color scheme and on what is it based?
2. What factors influence the way color harmonies are used in planning an interior design?
3. How does lifestyle influence the way colors are chosen for children and adults? Give an example.
4. Why do you need to consider the type of lighting used in a room when choosing colors?
5. Give an example of how room location can impact choice of base color and color harmony.
6. Name four guidelines to follow to use color correctly.

Chapter 15 Assessment

Summary

- Color is one of the most important elements of design. It can create and communicate different moods.
- Color has its own physiological and psychological effects on people.
- The basis of all color relationships is the color wheel.
- Colors in the middle ring of the color wheel are primary, secondary, or intermediate colors.
- Color has three characteristics—*hue, value* and *intensity.*
- The cool colors are located on one side of the wheel, and the warm colors are on the other.
- Using colors together in a pleasing manner creates color harmonies.
- The color harmonies are monochromatic, complementary, split-complementary, double-complementary, analogous, triadic, or neutral. Colors in the neutral harmony are black, white, gray, tan, beige, and brown.
- When choosing a color harmony for a personal color scheme or that of a client, first choose the right colors for a home and the lifestyle of the occupants. Then following certain guidelines will coordinate the colors you select into good design.

Terms in Action

Term attributes Create a T-chart on a separate sheet of paper and list each of the *Content* and *Academic Terms* in the left column. Identify a word or group of words describing a quality of the term—an attribute. Pair up with a classmate and discuss your list of attributes. Then discuss your list of attributes with the entire class to increase understanding.

Think Critically

1. **Draw conclusions** No two people perceive color in exactly the same way and indeed some people are unable to distinguish between certain colors at all. How could these behaviors pose an obstacle to an interior designer's presentation to a committee in charge of finalizing selections for new corporate offices? Draw conclusions about what techniques the designer could use to overcome objections.
2. **Identify alternatives** Assume you are working with two clients who want to redesign the master bedroom in their home. The room has a northern exposure with little natural lighting. One client prefers warm, intense hues while the other prefers cool hues. In addition to sleeping, your clients also use the room for reading. What color alternatives would you suggest that both clients will find pleasing? How can lighting impact your color choices?

Core Skills

1. **Research, writing, and speaking** Tour a model home to research and observe the use of color. Record your observations and, if possible, take digital pictures of the site. Be sure to get permission to take pictures. Did the colors match your preferences? Did the colors reflect current trends? How were colors used to create mood in various rooms? Identify several psychological impacts the colors may have on some people. Use a school-approved web application to create a digital poster to summarize your findings. Upload your poster to the class website for peer review.
2. **Research, writing, and speaking** Analyze the color scheme of a room in your home or in the home of someone you know. Which of the colors used is your favorite? How long has this room had this appearance? What color scheme was used before? If you could redecorate next week, what colors would you select? What do you think your color preferences reveal about your personality? Take one or more pictures of this room with a digital camera to place in an electronic presentation. Include examples and colors you might want to use in the future. Share your electronic presentation with the class.
3. **Writing** Locate a home or business in the community whose exterior has a pleasing combination of colors. Identify the colors

Chapter 15 Assessment

used and how they were used. Also, identify a building's exterior that represents the opposite of pleasing to you. What colors are used? Which colors would you change if you had the job of updating the look of the building on a budget? Write a summary of your update suggestions citing a rationale for your thinking.

4. **Research and speaking** Search the Internet for current color trends in residential design. What cultural influences, elements of nature, or other factors inspire the new color trends? How strongly does culture influence color? Which of the new color trends do you find most appealing? Why? Why do you think color trends change from year to year? Share your findings during a small group discussion.
5. **Research and writing** Presume you are a reporter for a design magazine. Your supervisor has assigned you to investigate how *light reflectance value (LRV)* can influence an interior designer's choice of colors for a room design. How might LRV influence the aesthetics and function of a room design? Use online or print resources for your research. Write the article citing your sources and post the article for your supervisor's review (your instructor).
6. **Photo essay and speaking** Use a digital camera to take pictures of 10 rooms that display good interior design. (Perhaps some are in your home or in historical homes that you have visited.) For each room, identify the type of color harmony that predominates. Also, analyze possible reasons for the color harmonies selected, given the purpose of each room. Using presentation software, combine your photographs and explanations to share with the class.
7. **CTE career readiness practice** Do you find the psychology of color fascinating? Are you interested in the impact of color on overall room design? If you are, consider joining forces with a community organization, such as Rebuilding Together® for a community service project. Such groups repair and modify homes for people with limited incomes, including older adults, people with disabilities, and veterans. Join forces with your classmates to consult a leader in the organization about working with one or more clients to create a functional and aesthetically pleasing color palette for a room or entire home.

Design Practice

1. **Computer design project** Use technological applications (CADD, etc.) to create an architectural interior drawing. Create drawings of two small rooms of the same dimensions. Cover the walls of one room with light, dull, cool colors. Cover the walls of the other room with dark, bright, warm colors. Analyze which room looks larger and which looks smaller. Why? Print a copy of the room colors for each room. Write a brief report summarizing your analysis.
2. **Color consulting** Imagine you are a professional color consultant who has been hired to help select the room colors for a new community center in your neighborhood. Based on your knowledge of the psychological effect color has on people, what colors would you use in each of the following spaces? Why? Use your written communication skills to convincingly justify your choices (actions) in a socially acceptable manner that is easily understood by others.
   - children's recreation room
   - reading room for older adults
   - hospitality room with a snack bar
   - small nature museum room
   - drama room for theatrical rehearsals
3. **Portfolio** Continue the storyboard for the elements of design you started in Chapter 14. Add color as a design element and provide samples of all color harmonies, labeling the colors used. Keep a copy of your storyboard in your portfolio.