VISUAL COMMUNICATION

WEEK 5

Communicating with colour

Learning Outcomes

At end of this week lesson the students should be able to:

1. Show an understanding of the element colour
2. Explain the colour wheel and its theory
3. Analyze colour symbolism

Introduction to colour

According to Esaak (2020), Color is the element of art that is produced when light, striking an object, is reflected back to the eye: that's the objective definition. But in art design, color has a slew of attributes which are primarily subjective. Those include characteristics such as harmony — when two or more colors are brought together and produce a satisfying effective response; and temperature — a blue is considered warm or cool depending on whether it leans towards purple or green and a red whether it leans towards yellow or blue.

Subjectively, then, color is a sensation, a human reaction to a hue arising in part from the optic nerve, and in part from education and exposure to color, and perhaps in the largest part, simply from the human senses (Bailey, 2023).

According to Britannica online (2024), colour is the aspect of any object that may be described in terms of hue, lightness, and saturation. In physics, colour is associated specifically with electromagnetic radiation of a certain range of wavelengths visible to the human eye. Radiation of such wavelengths constitutes that portion of the electromagnetic spectrum known as the visible spectrum—i.e., light.

Vision is obviously involved in the perception of colour. A person can see in dim light, however, without being able to distinguish colours. Only when more light is present do colours appear. Light of some critical intensity, therefore, is also necessary for colour perception. The manner in which the brain responds to visual stimuli must also be considered. Even under identical conditions, the same object may appear red to one observer and orange to another. Clearly, the perception of colour depends on vision, light, and individual interpretation, and an understanding of colour involves physics, physiology, and psychology (Britannica online, 2024).

Color is a visual perception resulting from the way light interacts with objects and is interpreted by the human eye and brain. It is one of the most fundamental aspects of visual communication, influencing emotions, perceptions, and behaviors. According to Lester (2021), Every color we see can be made with three basic, primary colors—red, green, and blue. When these colors are mixed, it is called additive color. Equal amounts of these colored lights will add together to produce white light. The additive mixing of colors is the basis for color we see from our eyes and in photography, television and computer monitors, and stage lighting.

The primary colors for pigments, dyes and inks are magenta, yellow, and cyan (Red, Yellow and Blue). These primaries used for paint pigments and printing presses—not light. When paints are mixed together, the colors in the paint absorb every color except the wavelength that we see reflected back. This method of color mixing is called subtractive color because as they are mixed, they become darker. Subtractive color is used in offset printing, in which four colors are used to create color photographs and illustrations on paper—magenta, yellow, cyan, and for added definition, black or CYMK (Cyan, Yellow, Magenta, and Key or Black).

The colour wheel and its theory

In this lesson you'll explore color wheels, tints and shades, complementary colors, CMYK, hexadecimal numbers, and other terminology and concepts that are important both in selecting appropriate colors for your designs and for specifying those colors whether you are printing to your desktop, a commercial printer, or putting pages on the Web. These are some key points about color:

1. **Wavelengths of Light**: Color is a product of the different wavelengths of light. When light interacts with an object, certain wavelengths are absorbed, while others are reflected. The reflected wavelengths are what we perceive as color.

2. **Traditional (Think Paint or Crayons)**

- *Primary Colors*: In traditional color theory, there are three primary colors: red, blue, and yellow. These colors cannot be created by mixing other colors together.
- *Secondary Colors:* Secondary colors are created by mixing two primary colors together. The secondary colors are orange (red + yellow), green (blue + yellow), and purple (red + blue).

- **Tertiary Colors or intermediate:** Yellow-orange, red-orange, red-purple, blue-purple, blue-green & yellow-green. These are the colors formed by mixing a primary and a secondary color. That's why the hue is a two-word name, such as blue-green, red-violet, and yellow-orange. Tertiary colors are created by mixing a primary color with a neighboring secondary color. For example, mixing red (primary) with orange (secondary) creates red-orange. Note the primary colour comes first then the secondary colour.

3. **Color Models**: Different color models are used to represent and manipulate colors. Common color models include RGB (Red, Green, Blue) used in digital displays, CMYK (Cyan, Magenta, Yellow, Black) used in printing, and HSL/HSV (Hue, Saturation, Lightness/Value) used in graphic design and digital imaging.

• *Adjacent or analogous* colors appear next to each other on the color wheel. Two or more adjacent colors harmonize with one another. They work well together (usually but not always). Learn more about adjacent colors.

The term harmonize sounds nice, pleasant. But some harmonizing colors may appear washed out (yellow/green) or too dark and similar (blue/purple) to work well together.

• *Contrasting* colors appear in different segments of the color wheel (divide it in quarters to help visualize this). The further apart from one another in hue, saturation, or value, the more contrast. Learn more about contrasting colors.

While contrast is often needed to provide optimum readability (such as high contrast between background and text) some contrasting colors when printed side by side can appear to vibrate and be very tiring on the eye.

• *Complementary* colors appear on opposite sides of the color wheel, directly or almost directly across from one another. Learn more about complementary colors.

Complementary is often confused with complimentary. Different meanings. Two colors that compliment (flatter) each other may or may not be complements of each other.

The secondary colors are orange (red + yellow), green (blue + yellow), and purple (red + blue). • Tertiary Colors or intermediate: Yellow-orange, red-orange, red-purple, blue-purple, blue-green & yellow-green. These are the colors formed by mixing a primary and a secondary color.

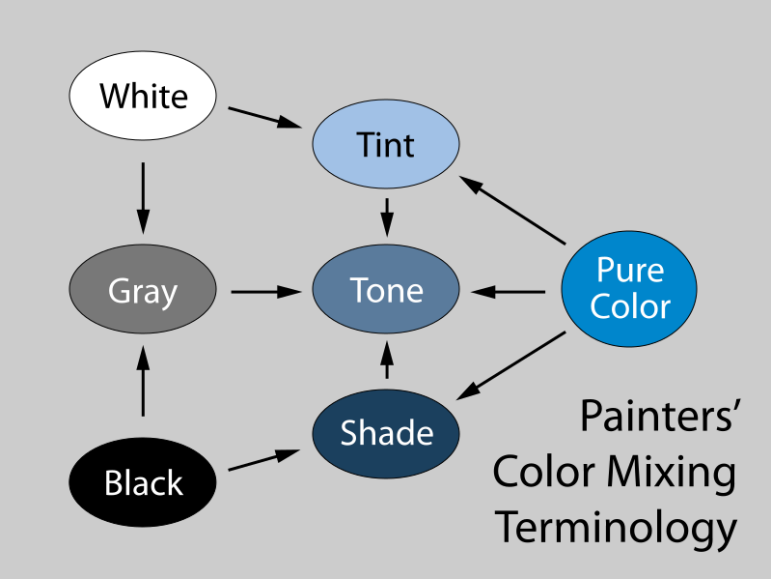
Source:https://commons.wikimedia.org/w/index.php?search=Color+wheel&title=Special:MediaSearch&go=Go&type=image

This simulation demonstrates the mixing differences between the additive (light) and subtractive (pigments or reflective) colour systems.

Source: https://commons.wikimedia.org/wiki/File:Subtractive-Additive-Colour-Mixing.jpg

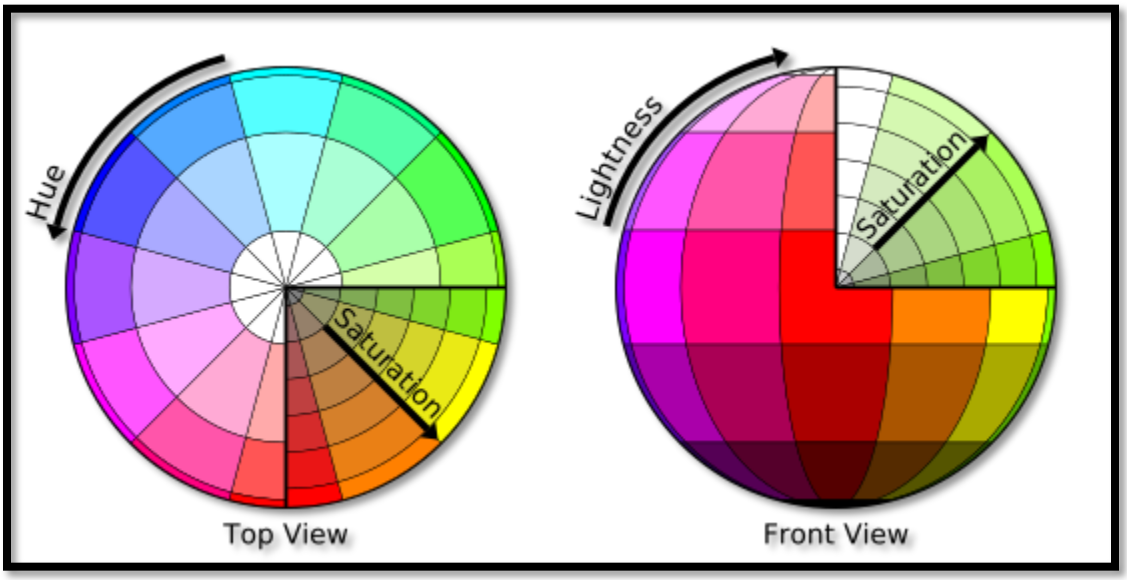
According to Mollica (2023), in color theory, a **tint** is a mixture of a color with white, which increases lightness, while a **shade** is a mixture with black, which increases darkness. Both processes affect the resulting color mixture's relative **saturation**. A tone is produced either by mixing a color with gray, or by both *tinting* and *shading*. In the graphic arts, especially printmaking and drawing, "tone" has a different meaning, referring to areas of continuous color, produced by various means, as opposed to the linear marks made by an engraved or drawn line.

According to Merriam-Webster online (2024), in common language, the term shade can be generalized to encompass any varieties of a particular color, whether technically they are shades, tints, tones, or slightly different hues. Meanwhile, the term tint can be generalized to refer to any lighter or darker variation of a color (e.g. "tinted windows").



A diagram demonstrating common color mixing terms. A tint is any mixture of a bright "pure" color with white. A shade is any mixture of a "pure" color with black. A tone is any mixture of all three: white, black, and the "pure" color.

Source: https://en.wikipedia.org/wiki/Tint,_shade_and_tone



Source: https://en.wikipedia.org/wiki/Tint,_shade_and_tone

4. **Color Perception**: The perception of color is subjective and can vary based on individual differences in vision, culture, and personal experiences. Factors such as lighting conditions, surrounding colors, and color contrast can also influence how we perceive color. One of those factors can be shown by the position of colors on the color wheel in relation to other colors. Color perception refers to the way in which humans perceive and interpret the wavelengths of light that are reflected off objects. It involves the complex interaction

between the eyes, brain, and external stimuli. Here are some key points about color perception:

a. **Human Vision**: The human visual system consists of the eyes, which capture light, and the brain, which processes this information to create visual perception. The eyes contain specialized cells called cones, which are responsible for detecting color.

b. **Trichromatic Theory**: According to the trichromatic theory of color vision, there are three types of cones in the retina that are sensitive to different wavelengths of light: red, green, and blue. By combining the signals from these cones, the brain is able to perceive a wide range of colors.

c. **Opponent Process Theory**: The opponent process theory suggests that color perception is based on opposing pairs of colors, such as red-green, blue-yellow, and black-white. When one color in a pair is stimulated, its opposite is suppressed, leading to the perception of color contrast.

d. **Color Constancy**: Color constancy is the phenomenon where the perceived color of an object remains relatively stable under different lighting conditions. This allows us to perceive objects as having consistent colors even when viewed under different types of light.

e. **Color Blindness**: Color blindness is a condition in which individuals have difficulty distinguishing between certain colors. The most common type of color blindness is red-green color blindness, where individuals have difficulty distinguishing between red and green hues.

f. **Cultural Influences**: Cultural factors can also influence color perception. Different cultures may associate certain colors with specific meanings or emotions, leading to variations in color preferences and interpretations.

g. **Emotional and Psychological Effects**: Colors can evoke different emotional responses and psychological associations. For example, warm colors like red and orange are often associated with energy and passion, while cool colors like blue and green are associated with calmness and tranquility.

h. **Individual Variations**: Color perception can vary between individuals based on factors such as age, gender, and genetics. Some people may have more acute color vision or be more sensitive to certain colors than others.

Overall, color perception is a complex and dynamic process that plays a fundamental role in how we experience and interact with the world around us. It is influenced by a combination of physiological, psychological, and cultural factors, shaping our visual experiences and interpretations of color.

Colour symbolism

Color symbolism is the use of color to represent traditional, cultural, or religious ideas, concepts, or feelings or to evoke physical reactions. Choosing colors based on symbolism or color meanings can apply to everything from clothing to wall paint to home furnishings. In desktop publishing and design choosing color based on color meanings applies to print and electronic projects from logos to Web site backgrounds.

Psychological Effects: Colors can evoke different emotional responses and associations. For example, warm colors like red and orange are often associated with energy, passion, and excitement, while cool colors like blue and green are associated with calmness, tranquility, and nature.

Color Harmony: Color harmony refers to the pleasing arrangement of colors in a design. Different color harmonies, such as complementary, analogous, and triadic, can be used to create visual interest and balance in a composition.

Color in Design: In design, color plays a crucial role in conveying meaning, establishing brand identity, and guiding user behavior. Designers carefully select and manipulate colors to achieve specific visual effects and communicate effectively with their audience.

Color symbolism refers to the cultural meanings and associations that people attribute to different colors. These symbolic meanings can vary widely across cultures and contexts, but certain colors often evoke similar associations across different societies. These are some common examples of color symbolism:

1. **Red**: Red is often associated with passion, love, energy, and vitality. It can also symbolize danger, anger, or power. In some cultures, red is used to symbolize luck, prosperity, and celebration.
2. **Blue**: Blue is frequently associated with calmness, tranquility, and stability. It can also symbolize trust, loyalty, and wisdom. In some contexts, blue is associated with sadness or melancholy.
3. **Green**: Green is commonly associated with nature, growth, and renewal. It can symbolize health, fertility, and harmony. Green is also associated with money, wealth, and prosperity.
4. **Yellow**: Yellow is often associated with happiness, optimism, and warmth. It can also symbolize energy, creativity, and intellect. In some contexts, yellow may symbolize caution or cowardice.
5. **Purple**: Purple is often associated with royalty, luxury, and spirituality. It can symbolize wealth, nobility, and ambition. Purple is also associated with mystery, magic, and creativity.
6. **White**: White is frequently associated with purity, innocence, and cleanliness. It can symbolize peace, simplicity, and spirituality. In some cultures, white is worn at funerals to symbolize mourning and remembrance.

7. **Black**: Black is commonly associated with darkness, mystery, and power. It can symbolize sophistication, elegance, and formality. Black is also associated with mourning and death in many cultures.
8. **Orange**: Orange is often associated with energy, enthusiasm, and warmth. It can symbolize creativity, vitality, and adventure. Orange is also associated with autumn and harvest.
9. **Pink**: Pink is frequently associated with femininity, sweetness, and romance. It can symbolize love, affection, and tenderness. In some contexts, pink may also symbolize youthfulness and innocence.
10. **Brown**: Brown is commonly associated with earthiness, stability, and reliability. It can symbolize warmth, comfort, and security. Brown is also associated with nature and natural materials.

These are just a few examples of color symbolism, and the meanings of colors can vary widely depending on cultural and personal interpretations. Understanding color symbolism can be valuable in various contexts, including art, design, marketing, and communication, as it can help evoke specific emotions, convey messages, and create meaningful experiences for the audience. Overall, color is a multifaceted and powerful element of visual communication, with a profound impact on how we perceive and interact with the world around us.

FURTHER READING

Colors are more than a combination of red and blue or yellow and black. They are non-verbal communication. Colors have symbolism and color meanings that go beyond ink. If you want to skip the discussion of types of colors and jump right to a specific color, here are the colors I currently cover in detail: **Beige | Black | Blue (*plus azure* | *beryl* | *cerulean* | *cobalt* | *corporate blue* | *indigo* | *navy* | *sapphire*) | Brown | Gold | Gray | Green (*plus chartreuse*) | Ivory | Lavender | Orange | Pink (*plus fuchsia*) | Purple (*plus lilac* | *plum* | *violet*) | Red (*plus blood red* | *crimson* | *scarlet* | *vermilion*) | Silver | Turquoise | White | Yellow**

As you design brochures, logos, and Web sites, it is helpful to keep in mind how the eye and the mind perceive certain colors and the color meanings we associate with each color.

Physical and Cultural Color Reactions
Sometimes colors create a physical reaction (red has been shown to raise blood pressure) and at other times it is a cultural reaction (in the U.S. white is for weddings, in some Eastern cultures, white is the color for mourning and funerals).

Colors follow trends as well. Avocado, a shade of green, is synonymous with the 60s and 70s in the minds of some consumers.

Color Relationships

In addition to understanding color meanings, it helps with mixing and matching colors to know the relationship of adjacent, harmonizing, contrasting, and complementary colors. The subject is more fully explained in this Color Basics article. But below is a brief synopsis:

- *Adjacent* or **harmonizing** colors appear next to each other on the color wheel. Harmonizing colors often work well together but if too close in value they can appear washed out or not have enough contrast. A harmonizing trio could be something like blue, light blue, and cyan or perhaps red, orange, and yellow.
- *Contrasting* colors are separated from each other by other colors -- they come from different segments of the color wheel. The further apart, the more the contrast. Red (from the warm half of the color wheel) contrasts with green and blue (from the cool half of the color wheel). Shades of purple contrast with shades of green. Contrasting colors that are directly opposite each other on the color wheel may be described as **clashing** colors -- see the description for complementary. Despite the name, colors that clash are not always a bad combination if used carefully. They provide great contrast and high visibility.
- *Complementary* colors are on opposite sides of the color wheel -- they are each half of a pair of contrasting colors. For example, blue is a complementary color to yellow. Green is complementary to purple and magenta. A pair of complementary colors printed side by side can sometimes cause visual vibration (clash) making them a less than desirable combination. However, separate them on the page with other colors and they can work together. Note the spelling. These are not *complimentary* colors. They don't always flatter (compliment) one another but they do complete (complement) each other.

On each of the cool, warm, mixed, and neutral pages are links to profiles of specific groups of colors with descriptions of their nature, cultural color meanings, how to use each color in design work, and which colors work best together.

Summary

Overall, Color theory is a set of principles and guidelines that explain how colors interact with each other and how they can be combined to create harmonious and visually pleasing compositions. It encompasses concepts such as color mixing, color harmony, and the psychological effects of color. Here's a breakdown of some key aspects of color theory:

1. **Primary Colors**: In traditional color theory, there are three primary colors: red, blue, and yellow. These colors cannot be created by mixing other colors together and are used as the foundation for all other colors.
2. **Secondary Colors**: Secondary colors are created by mixing two primary colors together. The secondary colors are orange (red + yellow), green (blue + yellow), and purple (red + blue).
3. **Tertiary Colors**: Tertiary colors are created by mixing a primary color with a neighboring secondary color. For example, mixing red (primary) with orange (secondary) creates red-orange.
4. **Color Wheel**: The color wheel is a visual representation of the relationships between different colors. It organizes colors in a circular format, with primary colors spaced evenly around the wheel and secondary and tertiary colors positioned between them.
5. **Color Mixing**: There are two main methods of color mixing: additive and subtractive. Additive color mixing involves combining colored light sources, as seen in digital displays. Subtractive color mixing involves combining pigments, as seen in painting and printing.
6. **Color Harmony**: Color harmony refers to the pleasing arrangement of colors in a composition. Different color harmonies can be achieved by using specific combinations of colors, such as complementary, analogous, and triadic color schemes.
    - Complementary colors are located opposite each other on the color wheel and create high contrast when used together.
    - Analogous colors are located next to each other on the color wheel and create a sense of harmony and unity.
    - Triadic color schemes involve using three colors that are evenly spaced around the color wheel, creating a balanced and vibrant composition.
7. **Color Psychology**: Colors can evoke different emotional responses and associations, which can influence how they are perceived and used in design. For example, warm colors like red and orange are often associated with energy and

passion, while cool colors like blue and green are associated with calmness and tranquility.

8. **Color Temperature**: Colors can be classified as warm or cool based on their perceived temperature. Warm colors, such as reds, oranges, and yellows, are associated with warmth and energy, while cool colors, such as blues, greens, and purples, are associated with coolness and calmness.

By understanding and applying the principles of color theory, designers and artists can create visually appealing and effective compositions that communicate their intended message and evoke the desired emotional response from the audience.

Question

Hands-On Exercise I
Hands-On Exercise

Look at brochures, books, ads, business cards, and other print projects and find examples of warm, cool, and neutral color palettes. Find 2-3 examples that you consider excellent use of color. Find 2-3 examples that you consider poor use of colour. What makes each example work or not work?

Hands-On Exercise II
Look at ads, magazines, brochures, logos, and other printed projects and look for overuse of color, color pairings that clash horribly, and unusual colour combinations that 'work.' Compare the colors used and purpose of the piece to the general color symbolism described in the supplemental material. Is there a connection or did that piece 'fly in the face of convention' and use those colors in an unexpected way?

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