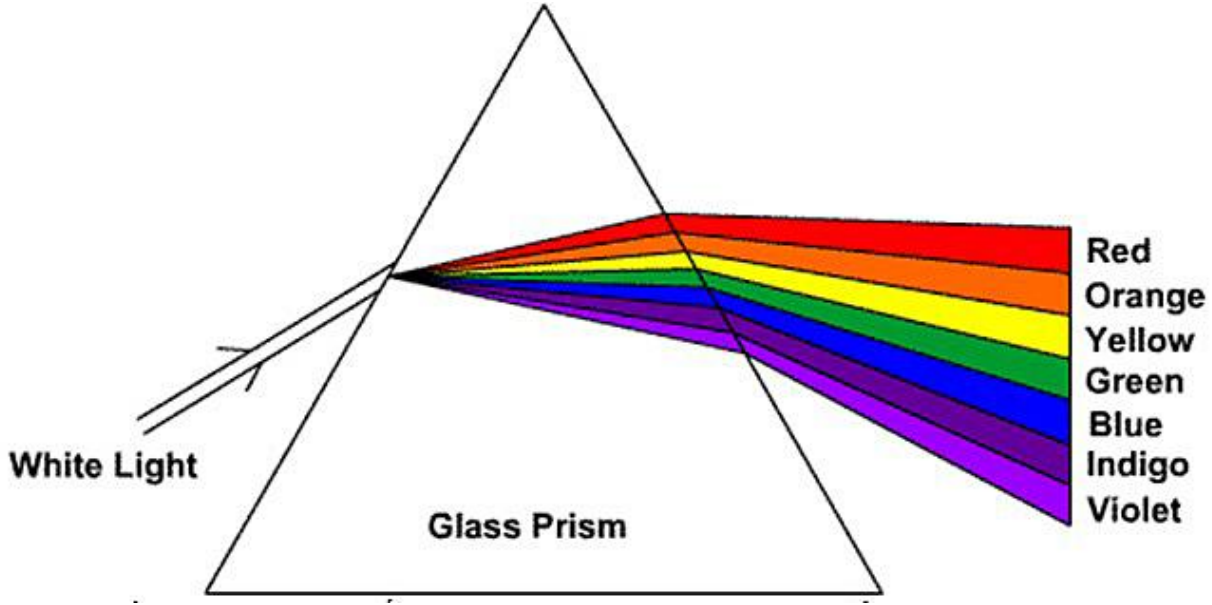
color theory

Color- the illusion of producing different hues to the eye as a result of various electromagnetic wavelengths of white light reflecting from a surface.



When white light passes through a prism it breaks in bands of different colors, known as the **spectrum**.

Color Theory Vocabulary

Color Wheel-The visual representation of colors arranged according to their chromatic relationship.

Additive Color- the creation of color by mixing colors of *light*. Televisions, Computer screens, and your smartphone all use additive color.

Subtractive Color- the creation of color by mixing colors of *pigment,* such as paint or ink in your computer printer.

Local Color- the color of an abject unmodified by adding light, shadow or any other distortion. The color the brain perceives an object to be. For example, an apple is red.

Hue – Is the name of the color itself, the dominant wavelength of light or the choice of pigment.

Value – Relative lightness or darkness of a color

Tint – Base color plus white.

Tone – Base color plus grey.

Shade – Base color plus black.

Temperature- The relative warmness or coolness of a color.

Warm Colors- The yellows, oranges, and reds. These come towards the eye more (spatially) and are generally 'louder' than passive colors.

Cool Colors- The greens, blues, and violets. These recede from the eye more (spatially) and are generally 'quieter' than the aggressive colors.

Intensity- refers to the purity of a hue. Also known as Chroma or Saturation.

Chromatic Gray- Grays that are made from mixing complementary colors rather than black and white.

Neutral colors- don't usually show up on the **color** wheel. **Neutral colors** include black, white, gray, and sometimes brown and beige. These are sometimes called “earth tones.”

2 Types of Color Mixing

Additive Color

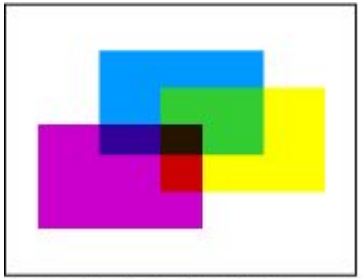
the creation of color by mixing colors of *light*. Televisions, Computer screens, and your smartphone all use additive Color.

Example 1: Additive principle of color combining (light)

Subtractive Color

the creation of color by mixing colors of *pigment,* such as paint or ink in your computer printer

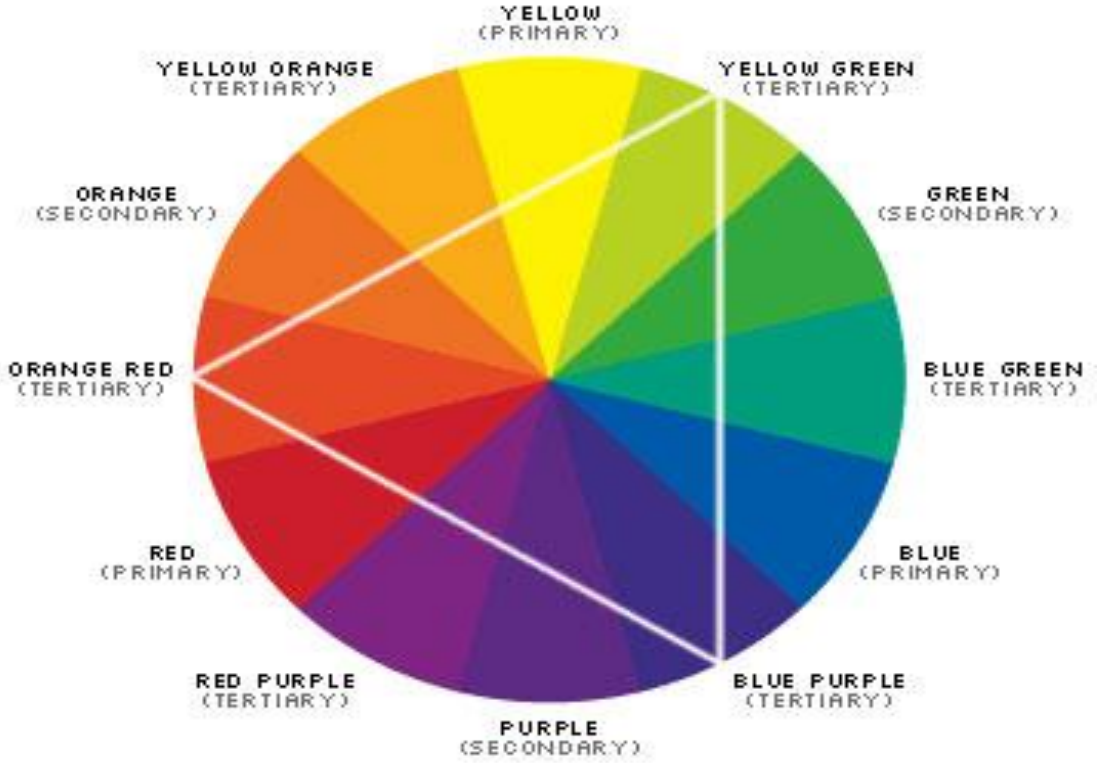
For this class will we be talking about Subtractive Color



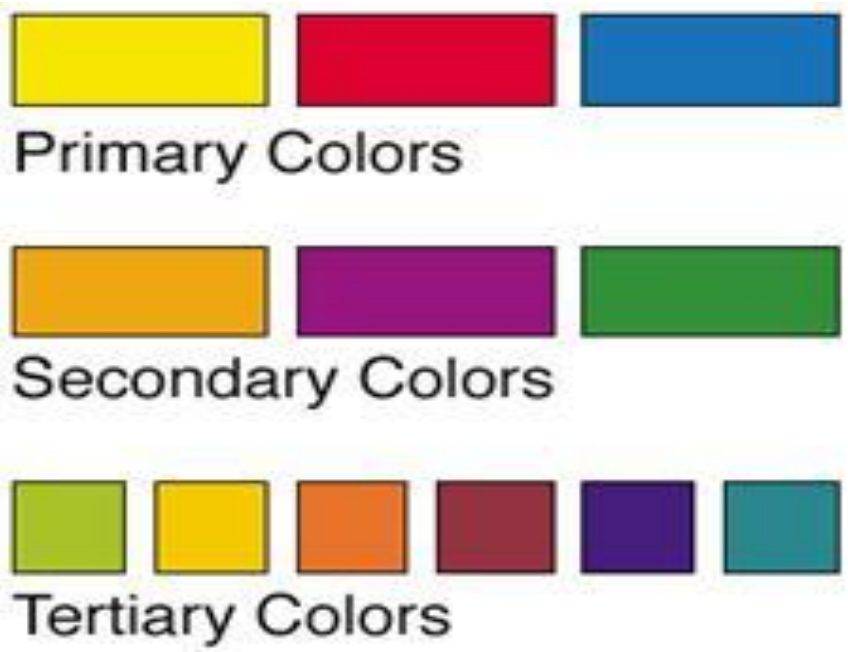
Example 2: Subtractive principle of color combining (pigment)

Color Wheel

The visual representation of colors arranged according to their chromatic relationship.



A ***primary*** color is a color that cannot be made from a combination of any other colors. A ***secondary*** color is a color created from a combination of two primary secondary colors. ***Tertiary*** color is a combination of three colors.



A ***primary*** color is a color that cannot be made from a combination of any other colors.

Color Wheel

Primary Colors on Color Wheel

A ***secondary*** color is a color created from a combination of two primary secondary

Color Wheel

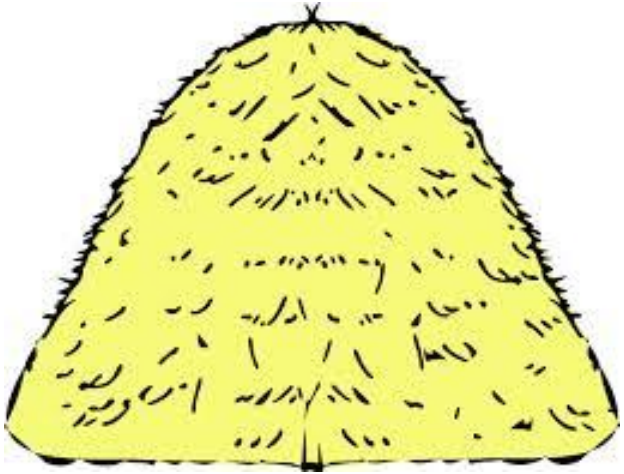
Secondary colors on color wheel

Tertiary color is a combination of three colors.

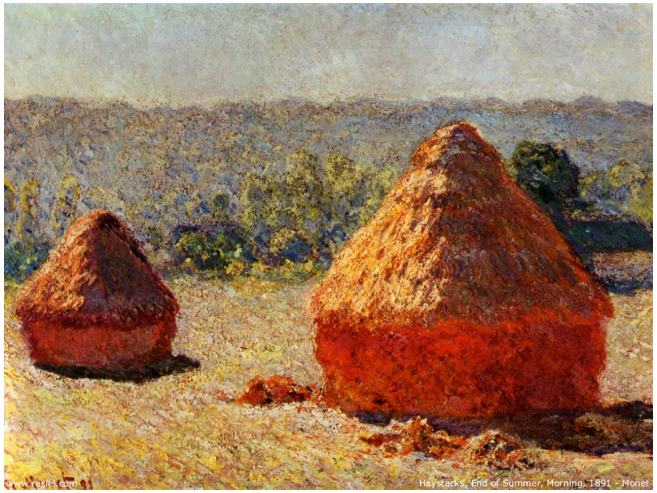
Color Wheel

Tertiary colors on color wheel

Local Color:
The color of an object unmodified by adding light, shadow or any other distortion. The color the brain perceives an object to be. For example, an apple is red.



Local Color



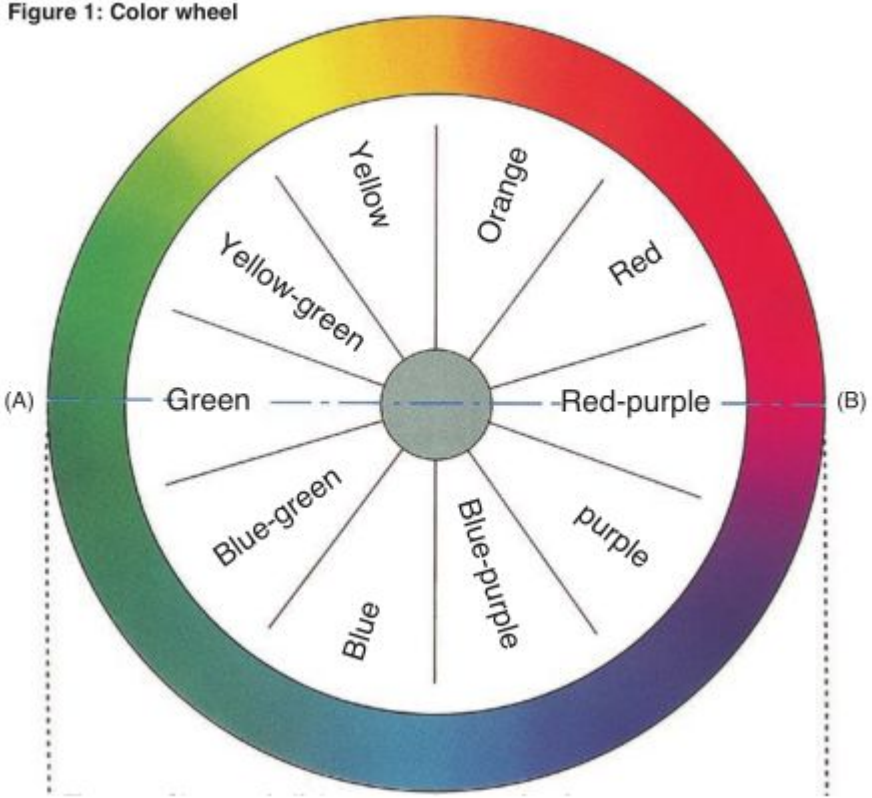
Actual color

4 Aspects of Color

- ***Hue*** – Is the name of the color itself, the dominant wavelength of light or the choice of pigment.
- **Temperature-** the apparent warmth or coolness of a color
- ***Value*** – How light or dark a color is.
- ***Intensity/Chroma/*Saturation** – the brightness (purity) or dullness of a color

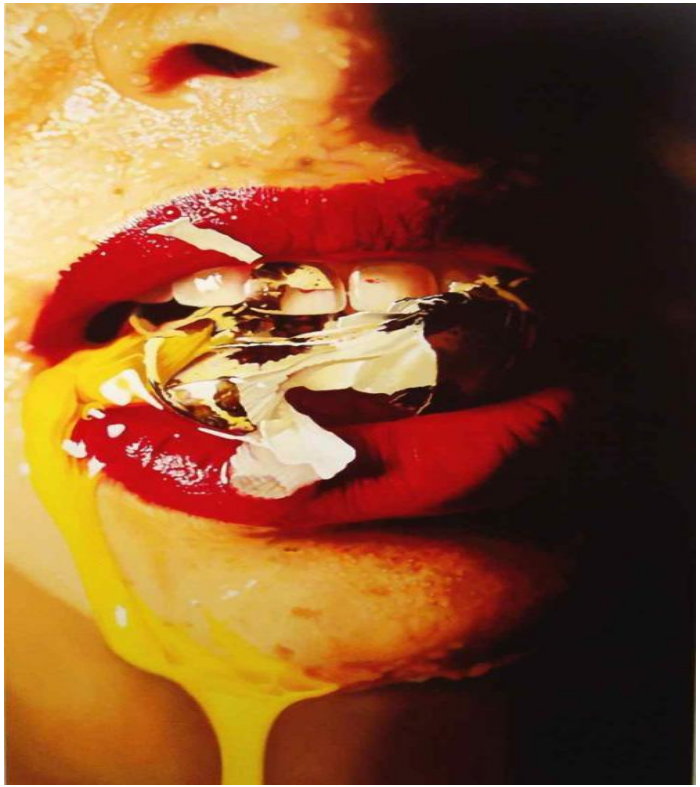
Hue – Is the name of the color itself, the dominant wavelength of light or the choice of pigment.

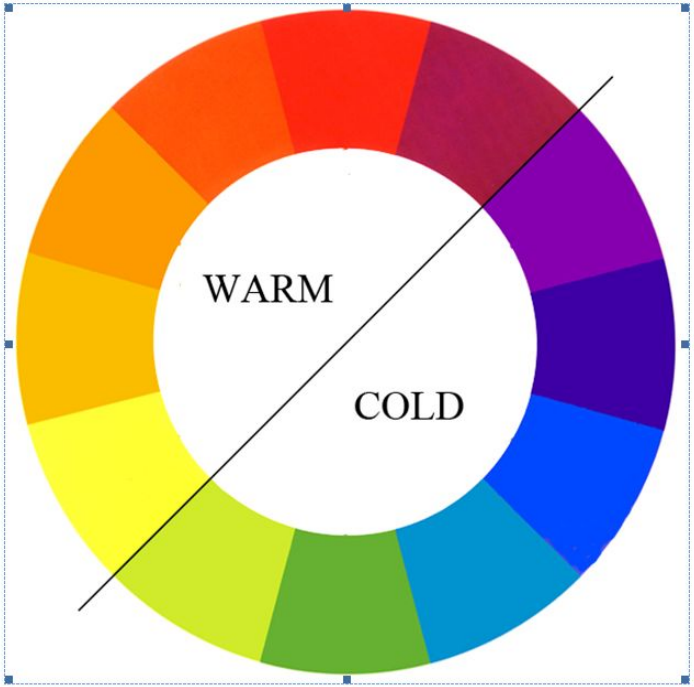
Figure 1: Color wheel



Temperature- the apparent warmth or coolness of a color

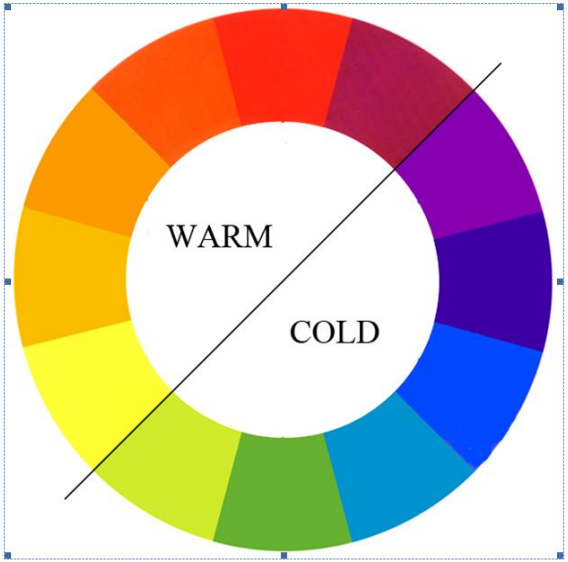
Warm Colors- The yellows, oranges, and reds. These come towards the eye more (spatially) and are generally 'louder' than passive colors.





Temperature- the apparent warmth or coolness of a color

Cool Colors- The greens, blues, and violets. These recede from the eye more (spatially) and are generally 'quieter' than the aggressive colors.

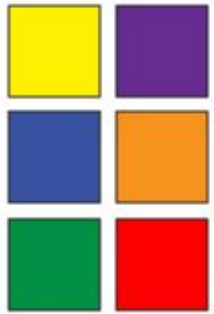


Color Temperature

Orange is the warmest color.

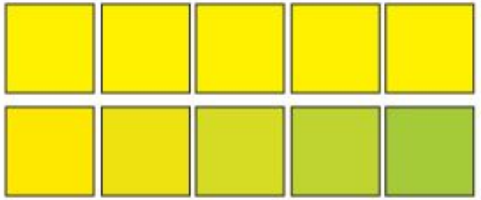
Blue is the coolest color.

The image to the right shows the primaries and their complements. Which color of the each pair is warmer or cooler?

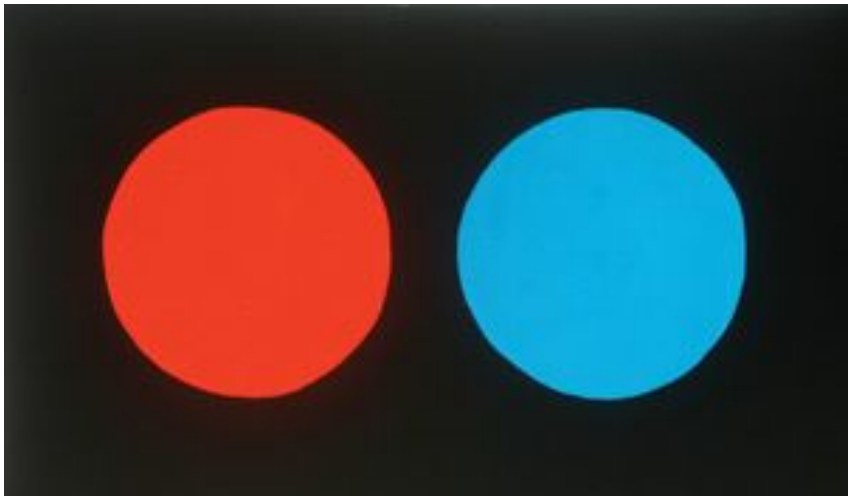


Color temperature is not always used to describe the relationship between different colors as it is sometimes applied to the difference between two variants of the same color. Looking at the two versions of green on the right, we can see one appears cooler than the other.

Adding small amounts of blue changes this yellow from a warm yellow into a cool yellow on its way to green.

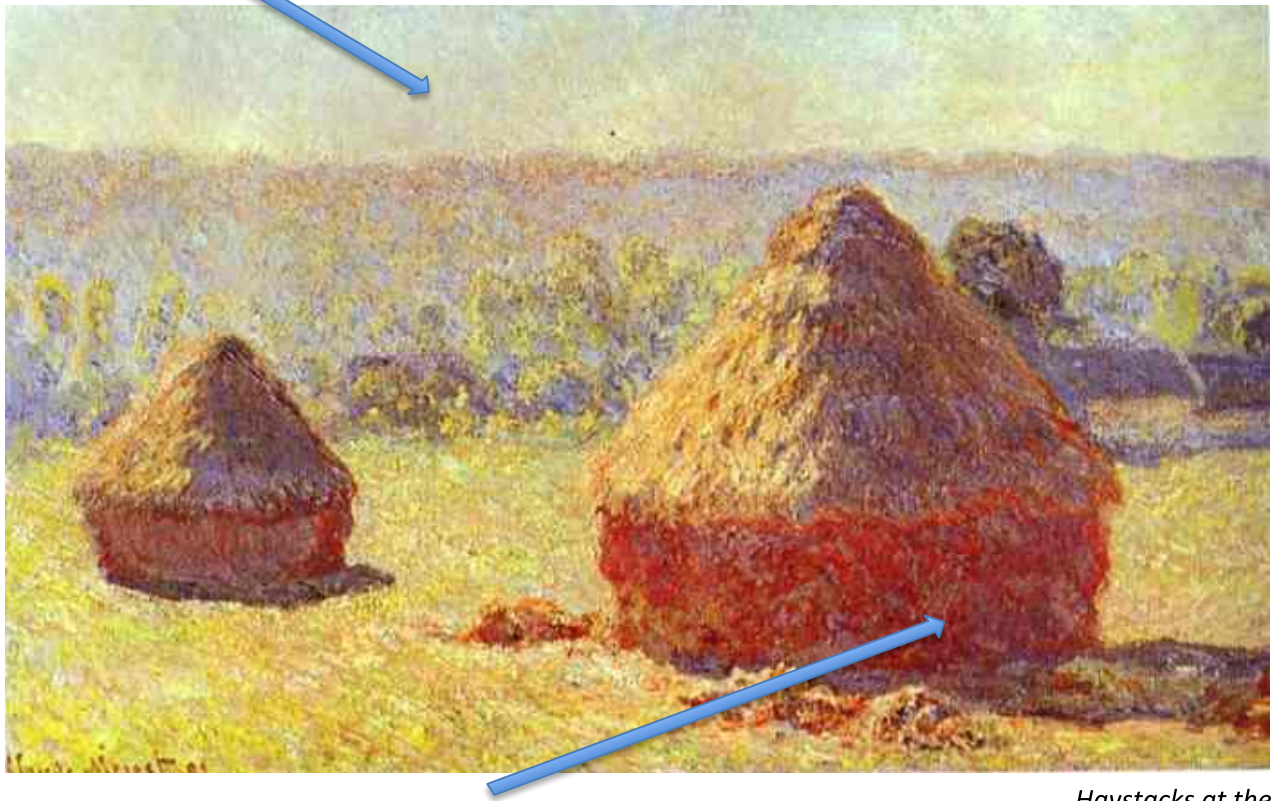


Which circle pops out?



The warm, red circle appears to advance, or come forward, on the picture plane while the cool, blue circle appears to recede or go back in space. This is because the wavelengths of warm colors are longer so your eyes see them sooner than the shorter wavelengths of cooler colors. Using warm colors in the foreground of a painting and cool colors in the background of a painting can help create the illusion of miles of distance in a landscape and of a more shallow depth of space in a still life painting. The illusion of advancing or receding also helps create a sense of form.

Cool red (pink) in recedes background.



Warm red pops out in foreground.

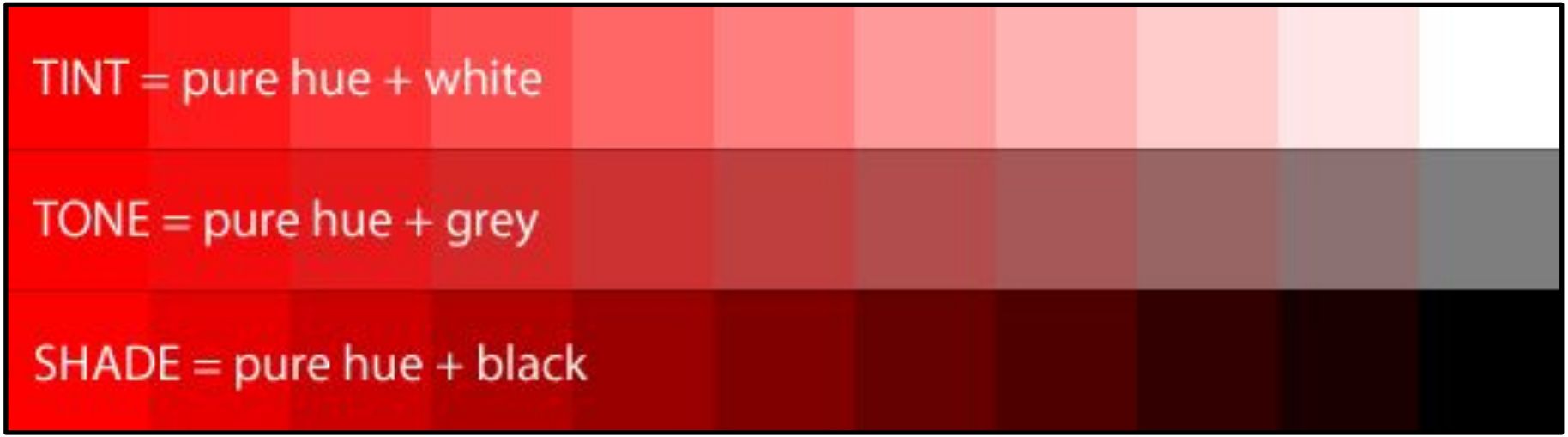
Haystacks at the End of Summer, Morning Effect
Claude Monet

Value – The relative lightness or darkness of a color

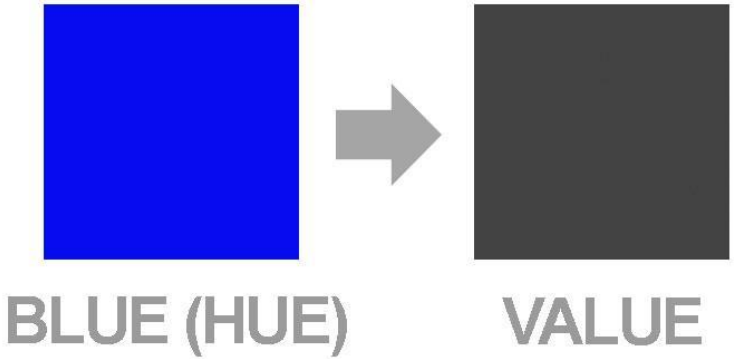
Color value can be changed by adding:
Shade-color plus black
Tint-color plus white
Tone-color plus gray

Chris Musina

Value Scale for Red



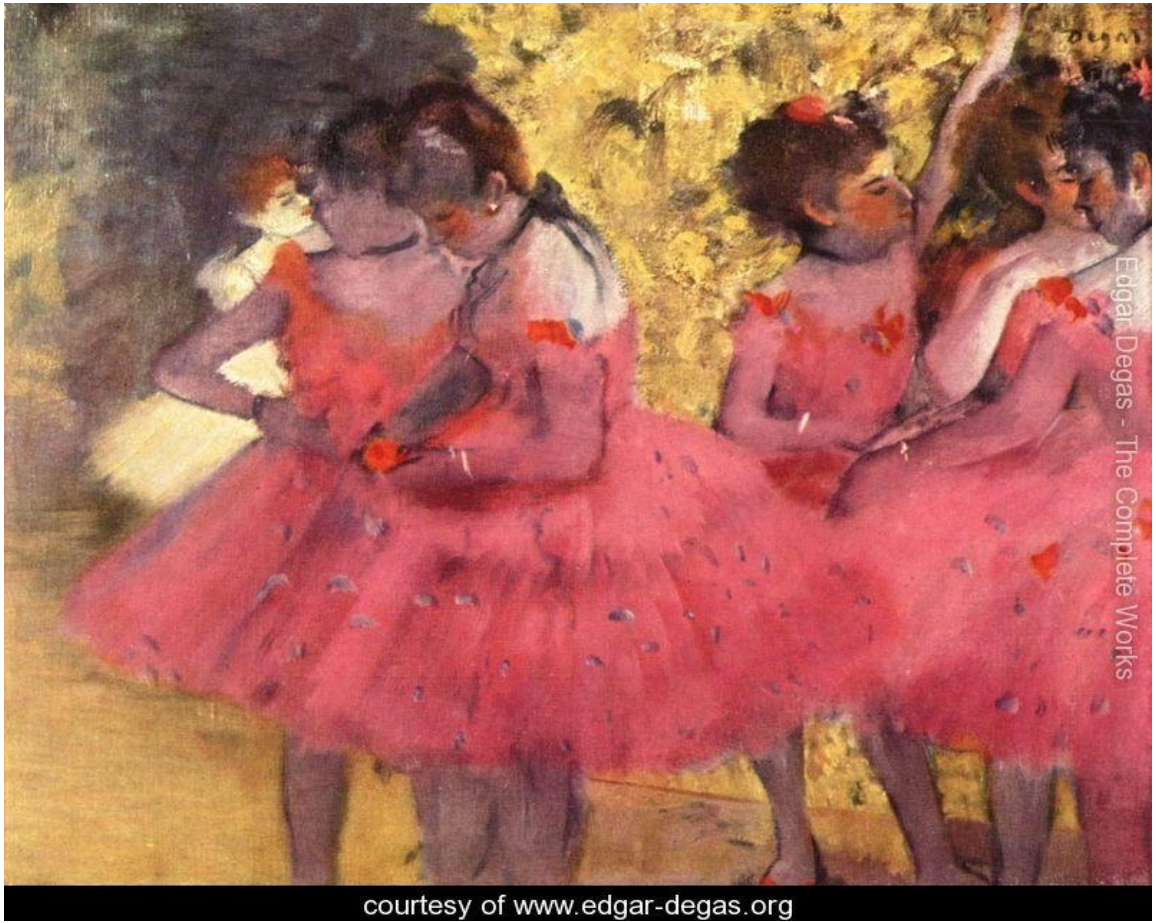
Each color converted to gray



Tint – Base color plus white.

Red

Tint:
Red + White= Pink



Degas

Shade – Base color plus black

Red

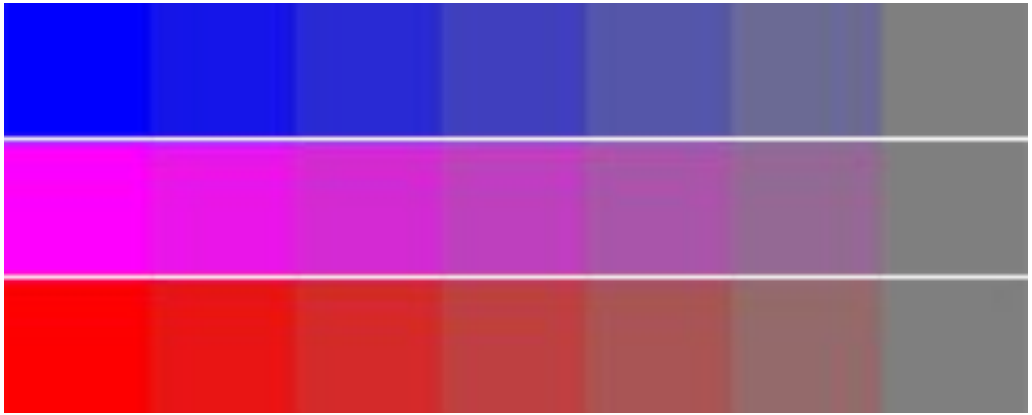
Shade:
Red + Black= Maroon

Degas

Intensity – the brightness (purity) or dullness of a color
Colors are desaturated by adding that colors complement,
which creates gray

*Intensity/Chroma/*Saturation

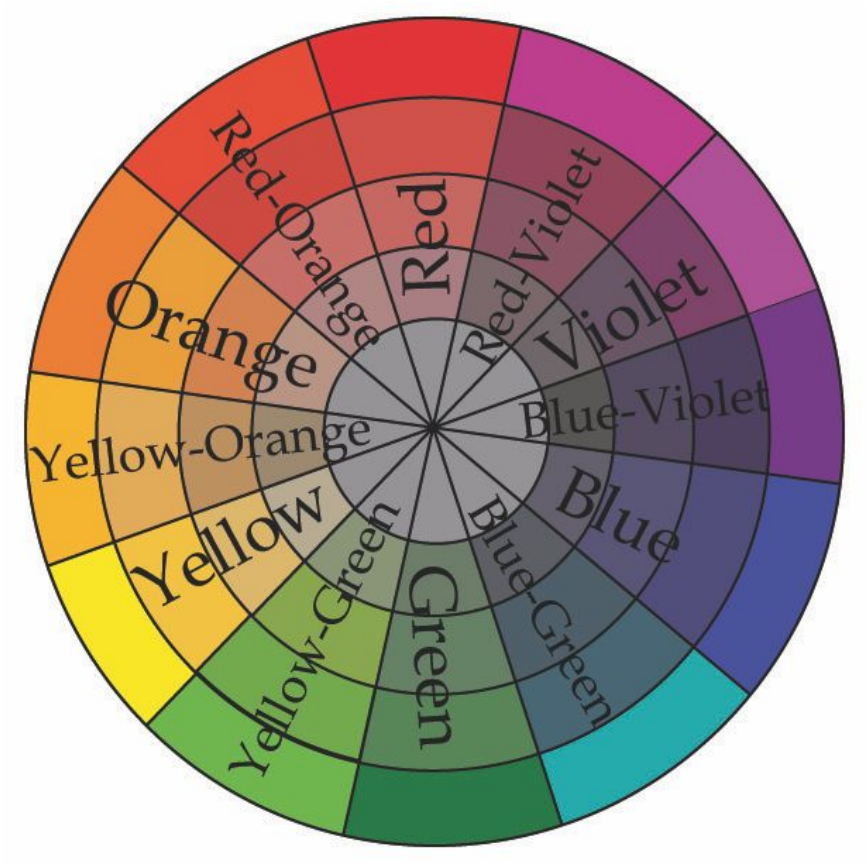
- the brightness (purity) or dullness of a color
- Colors are desaturated by adding that colors complement, which creates gray.
- 100% saturation means there's no addition of gray to the hue.
- The color is completely pure. At the other extreme a hue with 0% saturation
- appears as a medium gray. The more saturated (closer to 100%) a color is,
- the more vivid or brighter it appears.
- Desaturated colors, are dull, less colorful or washed out but can also make the
- impression of being softer.



100% saturation
Color is pure

0% saturation
Color is completely desaturated

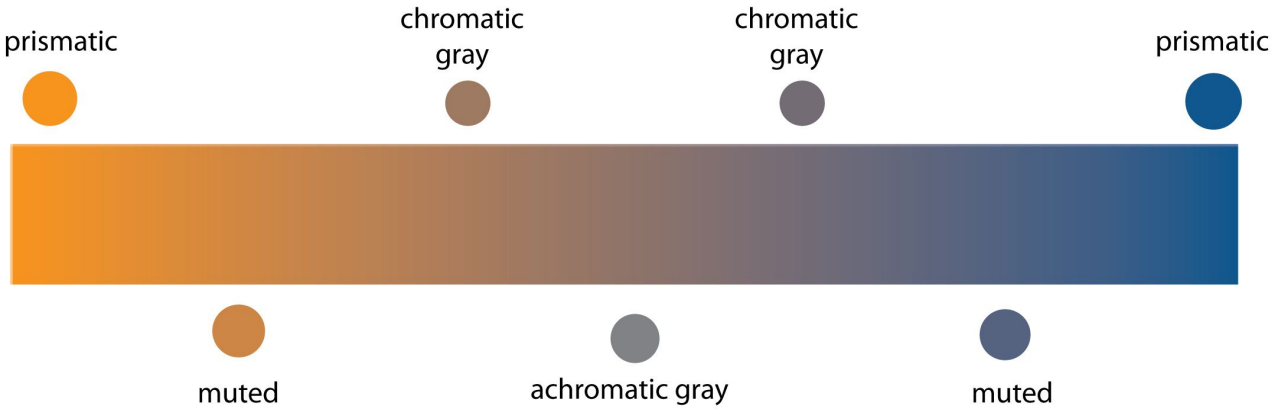
Chromatic Gray- Grays that are made from mixing complementary colors rather than black and white.



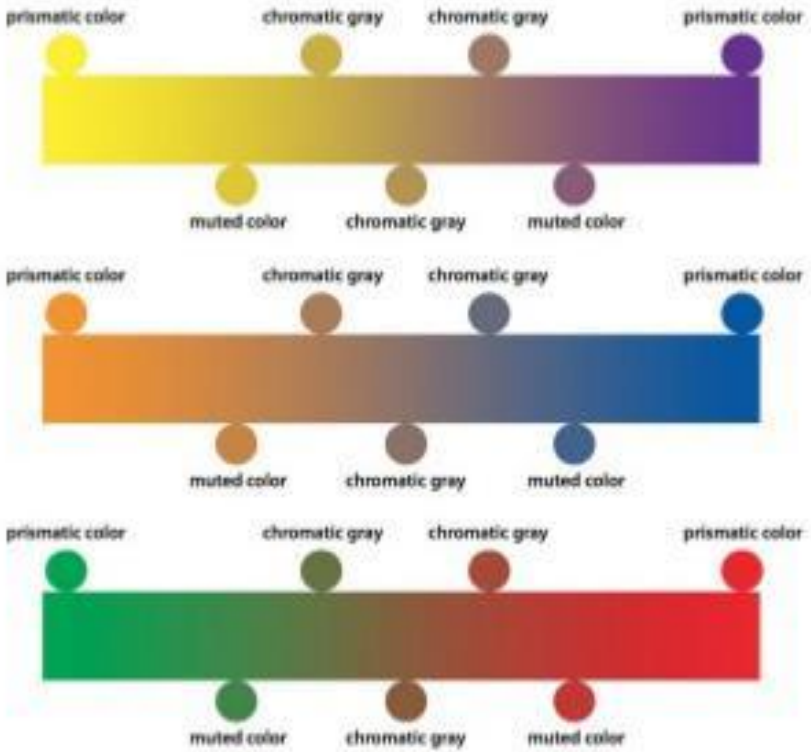
***Intensity/Chroma/*Saturation** – the brightness (purity) or dullness of a color

Chromatic Gray- Grays that are made from mixing complementary colors rather than black and white.

Chromatic Gray Scale



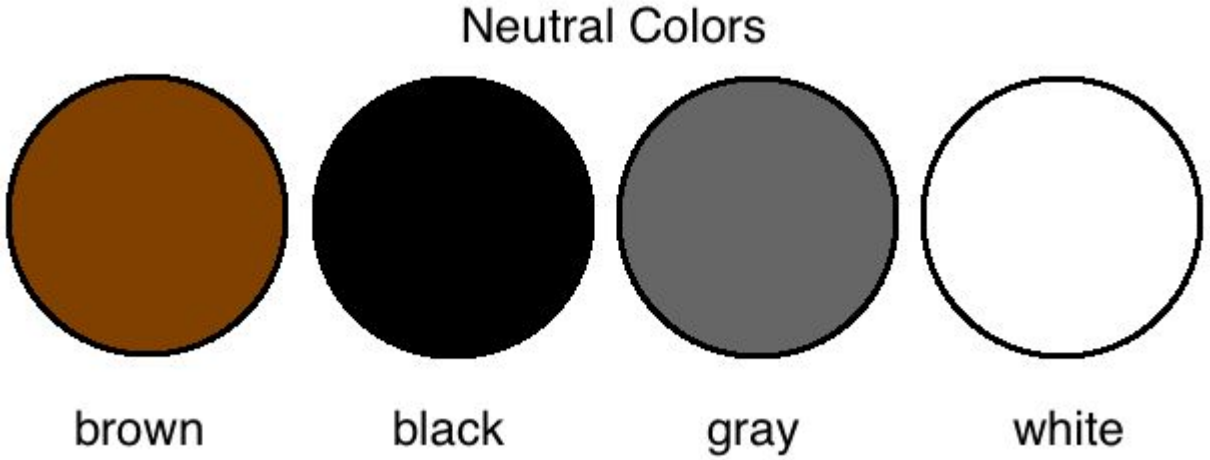
Chromatic Gray Scale



Notice the difference of intensity in the use of orange.

Neutral Colors

Neutral colors don't usually show up on the color wheel.
Neutral colors include black, white, gray, and sometimes brown and beige. These are sometimes called “earth tones.”



Neutral colors in a painting will give the eye room to “rest” and make more chromatic colors “pop” giving emphasis.

Andrew Wyeth
Squall tempura on hardboard

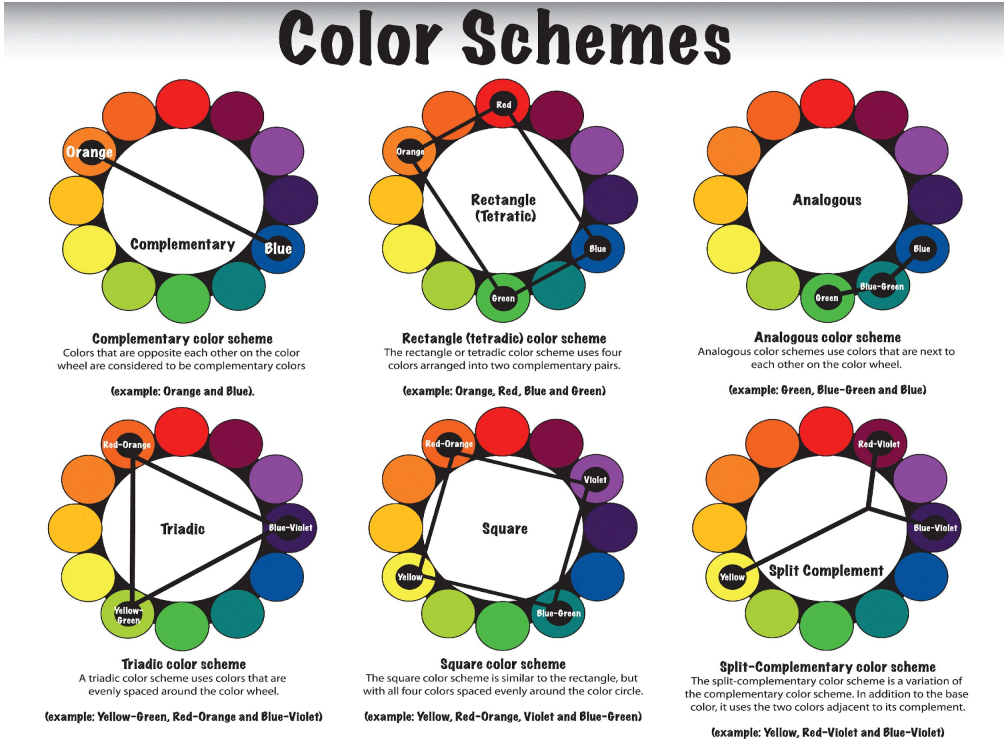
Neutral Colors

The wall, door, chair shirt and skin tone are all neutral colors, which draws attention to the warm orange color

Archibald J. Motley Jr.,
Mending Socks, 1924

Color Schemes

An orderly arrangement of colors on the color wheel used within a piece of artwork.



Achromatic

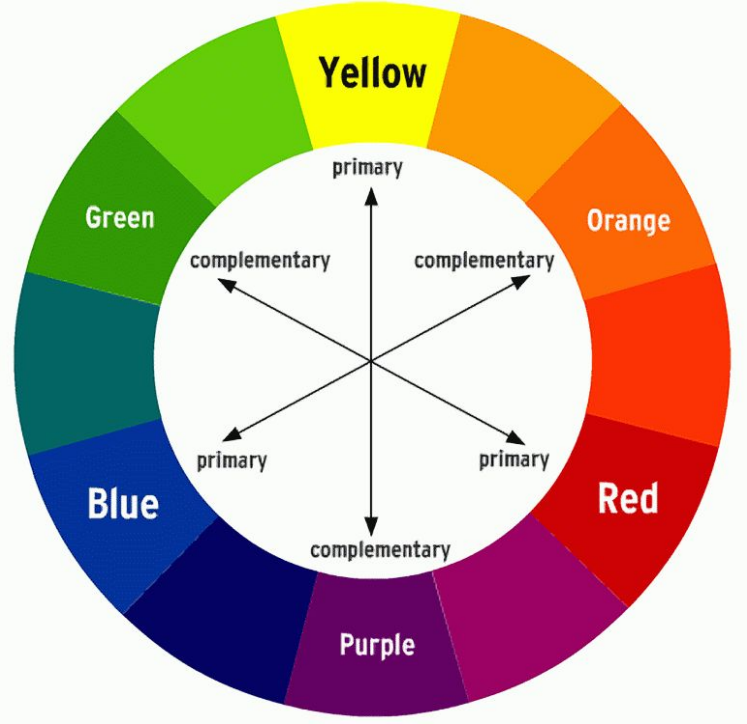
An achromatic color scheme is one that is colorless – using blacks, whites and grays.

Monochromatic

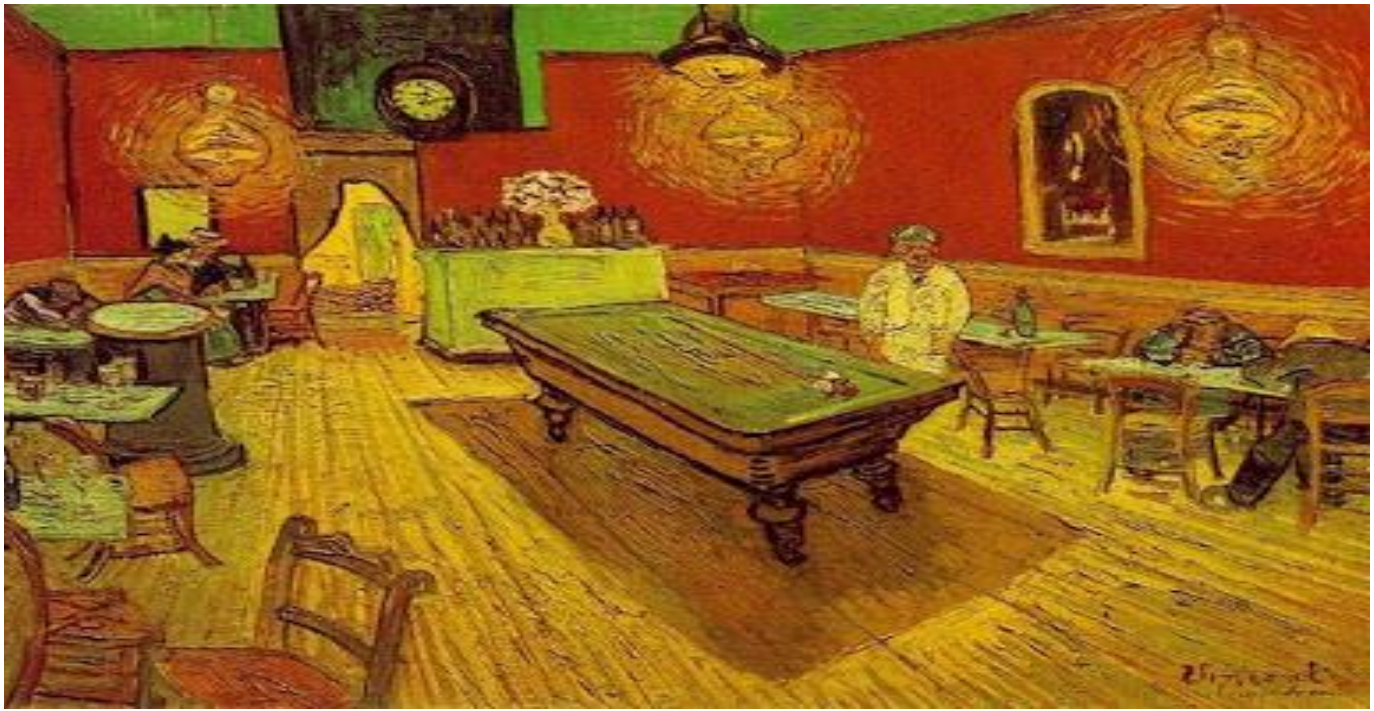
A monochromatic color scheme is a one-color color scheme.

Complementary Colors

Colors that are opposite one another on the color wheel. Our eyes perceived these colors to pulsate or vibrate when placed next to each other.



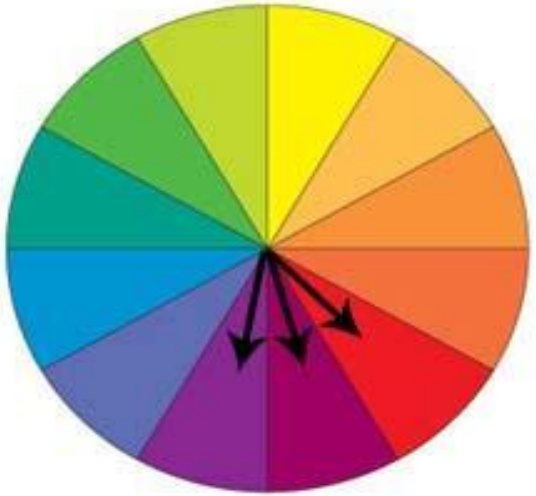
Complementary – A complementary color scheme is one that uses colors directly across from each other on the color wheel. This can be accomplished by using two colors or hues that are opposites such as red and green or violet and yellow. In this color scheme any two complements, all the semi-neutrals and the neutral they produce can be used. Black and white can also be used. Since you can choose from varying colors and hues which can give a bold and dramatic effect, this color scheme is best used for dramatic, strong, or bold statements.



Van Gogh

Analogous

An analogous color scheme is any three adjacent primary, secondary, or tertiary colors on the color wheel.



Kehinde Wiley

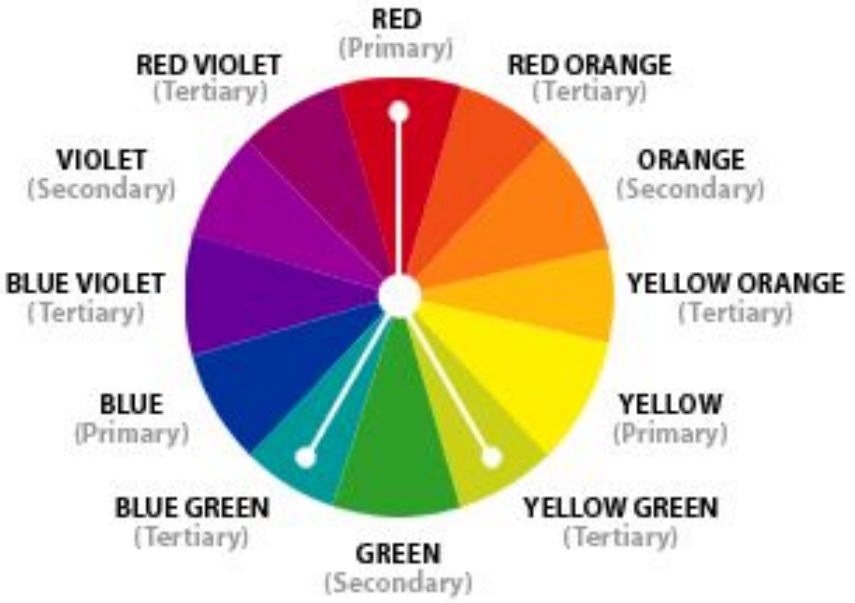
Color Triad

A triadic color scheme are colors that are an equal distant from each other on the color wheel. Any three colors equidistant around the color wheel form a triad and can be used in this color scheme. This can create a very balanced scheme.

Kehinde Wiley

Split Complementary

A split complementary color scheme is similar to complimentary but instead of just two colors directly opposite on the color wheel, two of the three colors are adjacent to one of the colors that is opposite. More simply, choose one color and use the color on each side of its complement.



Double complementary uses four colors arranged into two complementary color pairs. This scheme is hard to harmonize; if all four colors are used in equal amounts, the scheme may look unbalanced, so you should choose a color to be dominant or subdue the colors.