



Tishk
International University

Department of interior design

COLOR THEORY

Second Semester 2020-2021

Second Stage

Color in interior design- Third lecture

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OUTLINE

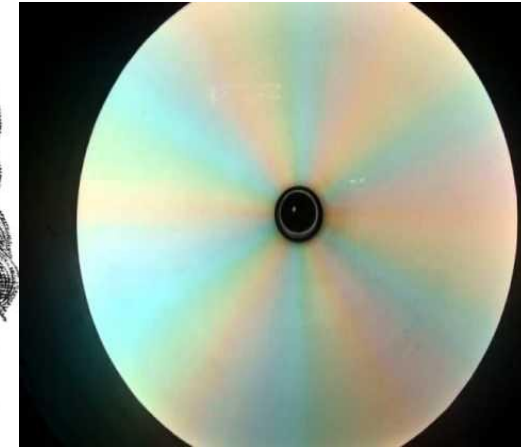
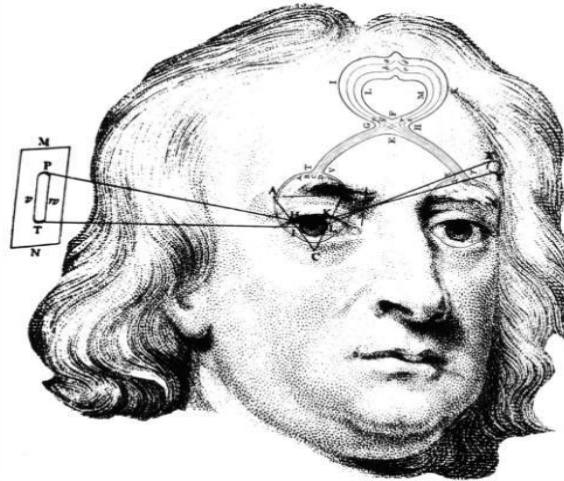
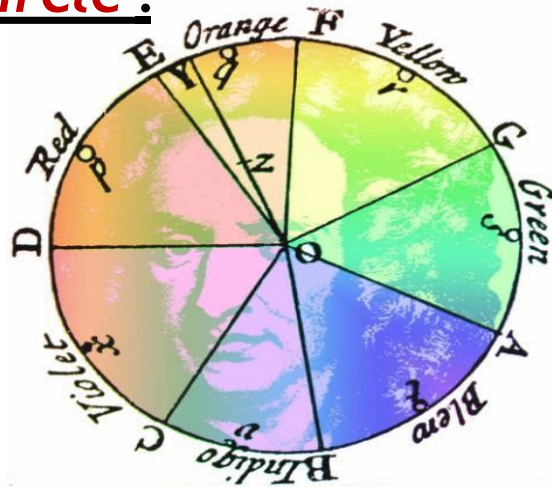
- **The Main theories to set up a color wheel**
- **Traditional Color wheel**
- **Color wheel (primary colors) (RYB)**
- **Color wheel (secondary colors)**
- **Colorwheel (tertiary colors)**
- **Color wheel Applications in Architecture**
- **Color terminology (vocabulary)**

THE MAIN THEORIES TO SET UP A COLOR WHEEL:

- Many attempts have been made to establish methodologies to evaluate the advantages of certain color combinations ,and the main color theories in design , are as the following :

- 1.Newton's Hue Circle.
- 2.Itten's Color Wheel.
- 3.Munsell's Color Order .
- 4.Ostwald Color theory .
- 5.The Pantone Color System.

➤ newton circle:

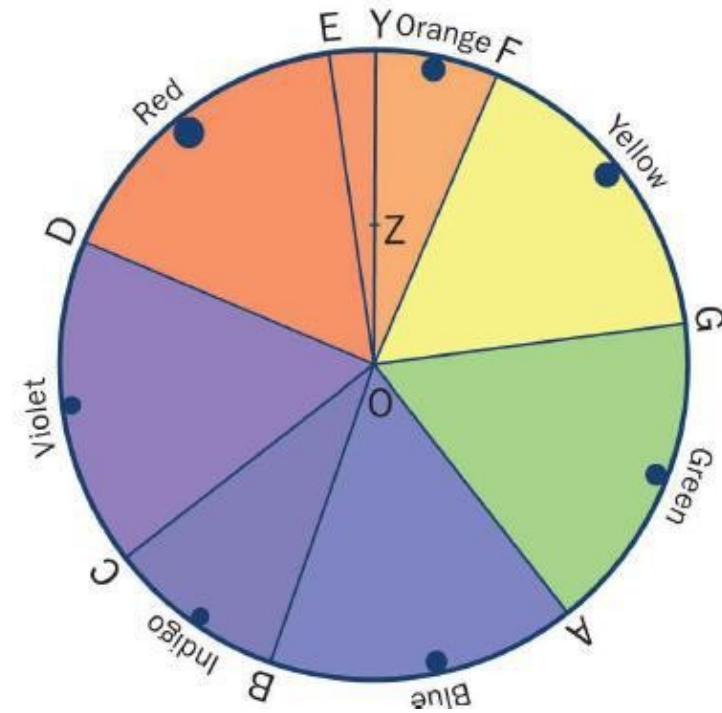


In his attempt to develop theory of color:

- Newton was the first to understand that colors did not lay on linear chart, but rather existed in a continuum.
- Isaac Newton split white light in to seven colors (red, orange, yellow, green, blue, indigo, violet) and he arranged them on a disk in proportionate slices such that the spinning of the disk would result in the color white.

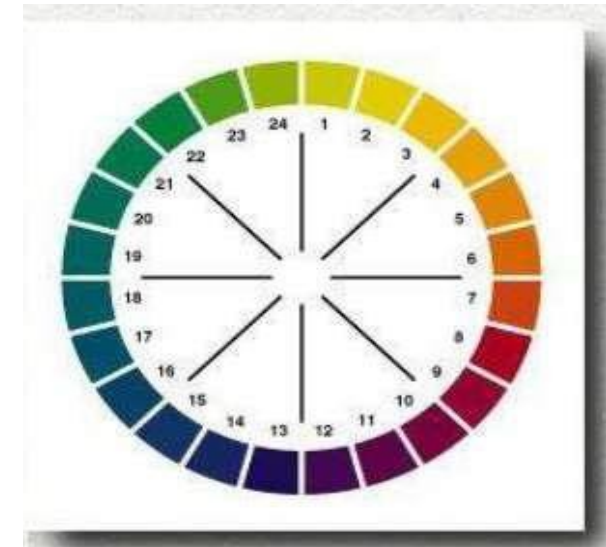
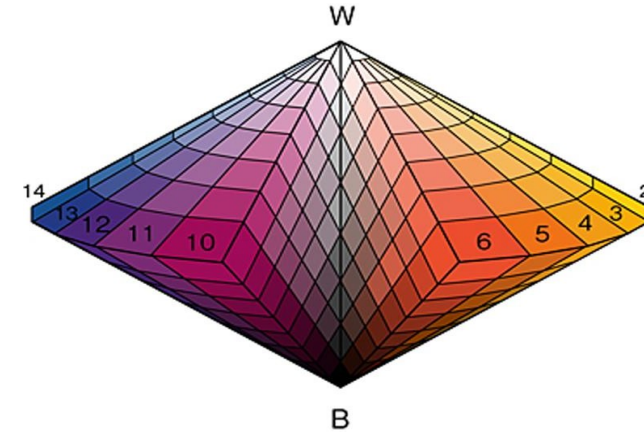
In his attempt to develop a theory of color:

- Newton **hue circle** is represented by **white** at the **center** . and the hues arranged in order around the disk.
- **Each hue** is given a **weight** ,or proportion ,that balances it within the system.
- Newton closed his system through a mix between **red and violet** that did not appear in his natural primary spectrum.



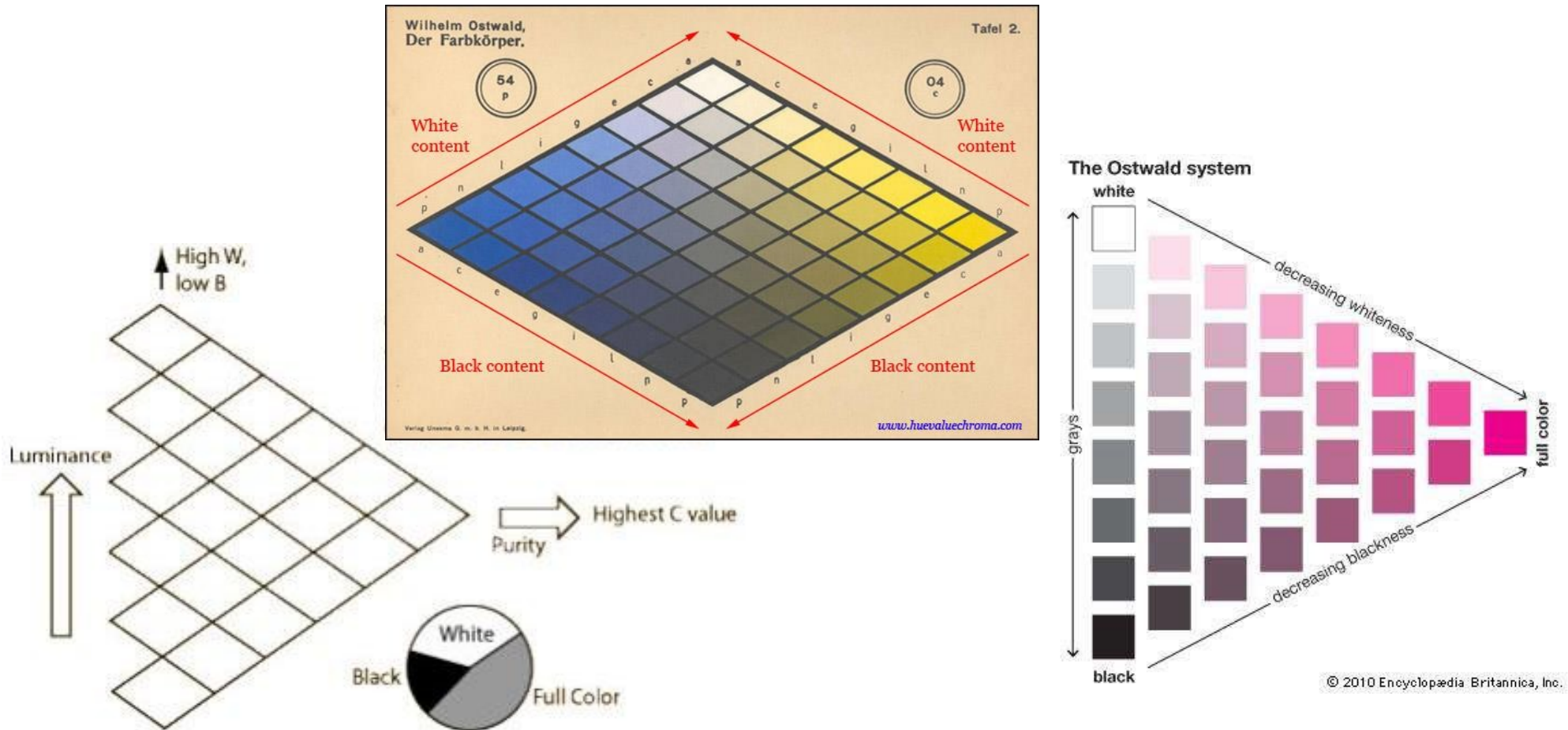
OSTWALD COLOR THEORY (1916):

- The Color Harmony Manuals were published in 1916,
- The Ostwald system creates a **color space** based on **dominant wavelength**, **purity**, and **luminance**, mapping the values of **hue**, **saturation** and **brightness**.
- The **full colors** are arranged around a complete circle starts out with four basic colors: **yellow** to the north; **red** to the east; **blue** to the south; and **green** to the west.
- With these **eight** colors, Ostwald constructs **24 color-hues** with equal spacing and numbers them.



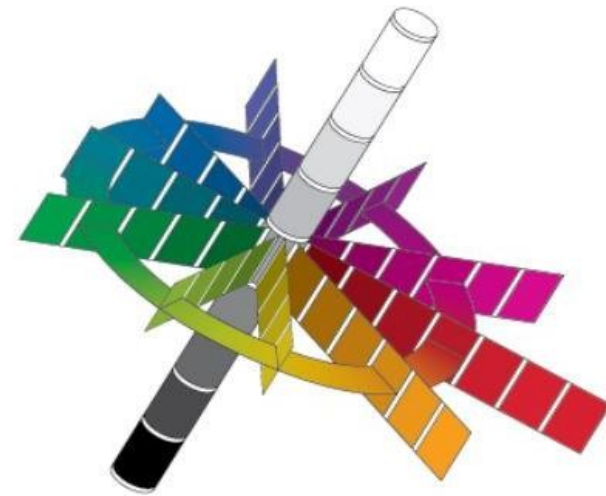
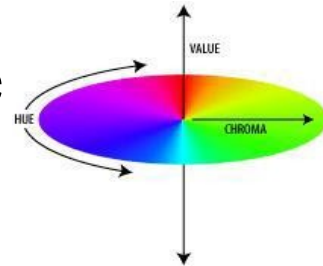
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- Thus the point in the Ostwald color space is represented by values **C**, **W**, and **B** to represent **the percentages** of the system.



➤ The Munsell Color Order System(1921):

- This theory is used to represent **color terminology** .
- The American Albert Munsell developed a system (**three dimensional**) model of color analysis based on the methodology that for each color **hue , value , and Chroma.**
- **In Munsell's system:**
 1. **Hue** is arranged around the perimeter of a sphere,
 2. **Value** as it moves from the top pole(light) to the bottom (dark) .
 3. **Chroma** as it moves toward the center.



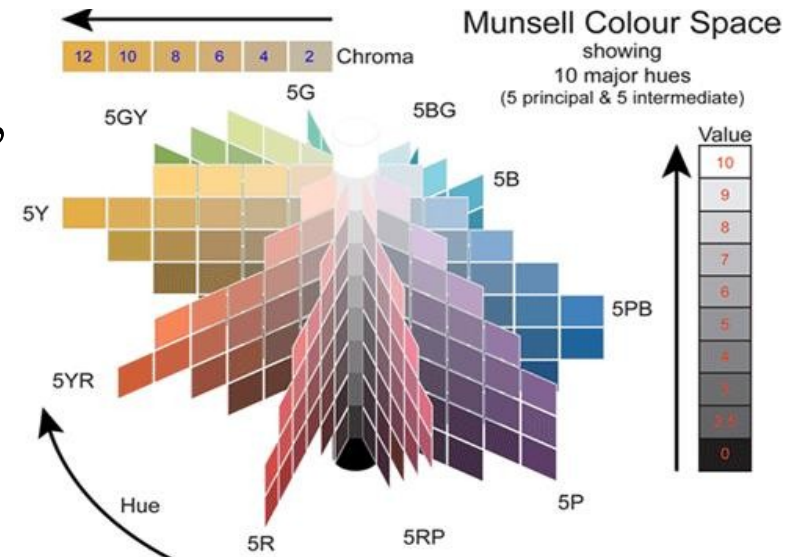
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- Munsell established **numerical scales** with visually uniform steps (notation) for each of these attributes , that made it easy to identify any color in his system.
- In this **notation**, each color has a logical relationship to all other colors. This leads to endless creative possibilities in color choices, as well as the ability to precisely communicate these choices.

Example :

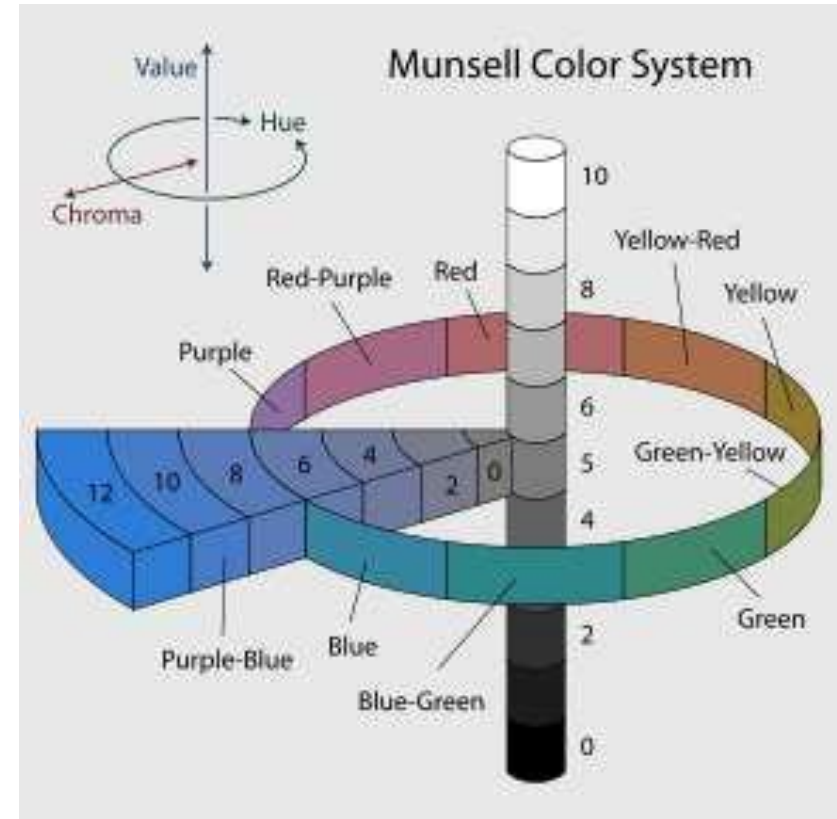
Using the Munsell numerical scale **HV/C**, for the color (**Red**) would have the Munsell notation (**5R 6/12**) =

1. (5) is the hue (red).
2. (6) is the value .
3. (12) Chroma .



- Munsell Color Order System is called , **the Color tree.**

- The notation for a neutral color is written: **NV**.
- The **Chroma** of a **neutral color** is **zero**, but it is customary to omit the zero in the notation.
- The notation **N 1/** denotes a **black**, (a very dark neutral), while **N 10/** denotes a **white**,(a very light neutral). This notation for a middle **gray** is **N 5/**.



➤ Itten's Color Wheel (1961)

- Johannes Itten developed his color wheel based on primary colors of (red , yellow ,and blue) , The three primary colors placed in an equal triangle ;yellow at the top ,red is the lower right, and the blue in the lower left.



Around this triangle Itten inscribed a hexagon, resulted from mixing the primaries to obtain the three, Secondary colors as the following:

Yellow + red = orange,
yellow + blue = green,
and red + blue = violet.

- The six colors (primaries and secondaries) mixed carefully 12 sequenced colors.



CONT.

- Itten didn't believe in further expanding the color wheel to 24 – or 100 hue wheels.
- He believes that the dilution (decrease) of the naming system in his establishment make it easier to identify every color distinctions.
- This theory is used to represent **color traditional wheel for artists and designers** .

Note: This 12 color wheel is represent the base for all schemes



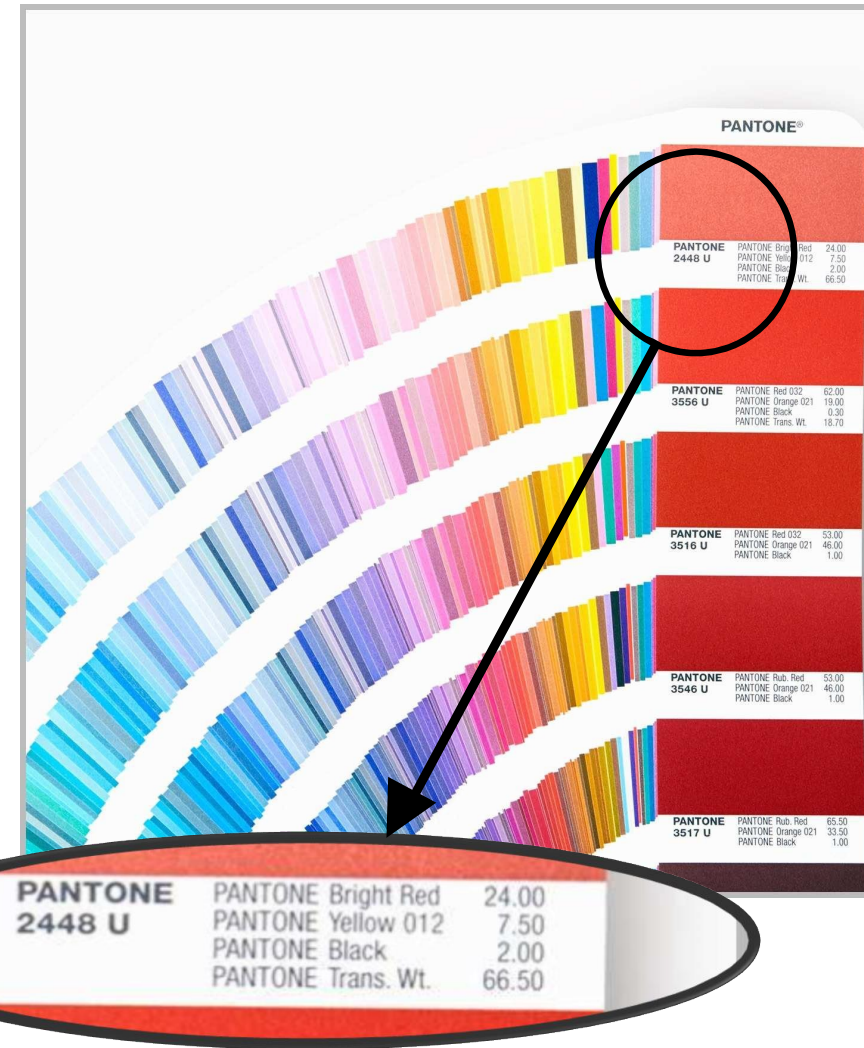
➤ The Pantone Color System(1962):

- Pantone is a company that began as a commercial printing company in the 1950s.
- This system is used in a variety of industries, like : **printing**, it is sometimes used in manufacture of colored **paint**, **fabric**, and **plastics**.
- Pantone's system consists of approximately **1,114 ink** colors that are produced from **13** base pigments (**15 including white and black**) mixed in specific amounts.



CONT.

- However, it is best known for its color matching system (**PMS**), as shown in the Figure.
- The idea behind the (**PMS**) is to allow designers to "**color match**" specific colors when a design enters production stage, regardless of the equipment used to produce the color.
- Each color is identified by a three – or four digit number followed by a **C**, **M**, or **U**, such as PMS (2448 U).
- The letters following the number refer to the type of paper they are printed on, such as C=coated, M=matte, and U=uncoated.



CONT.

- Since 2000, the Pantone Color Institute declares a particular color "**Color of the Year**".
- Pantone recommends that PMS Color Guides be purchased annually, as their inks become yellowish over time.
- The Pantone system can be used with the CMY mixing process as well as the screen based RGB process.

 <p>2000 Cerulean Pantone 15-4020 #9BB7D4</p>	 <p>2001 Fuchsia Rose Pantone 17-2031 #C74375</p>	 <p>2002 True Red Pantone 19-1664 #BF1932</p>	 <p>2003 Aqua Sky Pantone 14-4811 #7BC4C4</p>	 <p>2004 Tigerlily Pantone 17-1456 #E2583E</p>	 <p>2005 Blue Turquoise Pantone 15-5217 #53B0AE</p>	 <p>2006 Sand Dollar Pantone 13-1106 #DECD8E</p>	 <p>2007 Chili Pepper Pantone 19-1557 #9B1B30</p>	 <p>2008 Blue Iris Pantone 18-3943 #5A5B9F</p>
 <p>2009 Mimosa Pantone 14-0848 #F0C05A</p>	 <p>2010 Turquoise Pantone 15-5519 #45B5AA</p>	 <p>2011 Honeysuckle Pantone 18-2120 #D94F70</p>	 <p>2012 Tangerine Tango Pantone 17-1463^[21] #DD4124</p>	 <p>2013 Emerald Pantone 17-5641 #009473</p>	 <p>2014 Radiant Orchid Pantone 18-3224^[22] #B163A3</p>	 <p>2015 Marsala Pantone 18-1438^[23] #955251</p>	 <p>2016 Rose Quartz Pantone 13-1520^[24] #F7CAC9</p>	 <p>2016 Serenity Pantone 15-3913^[24] #92A8D1</p>
 <p>2017 Greenery Pantone 15-0343^[25] #88B04B</p>	 <p>2018 Ultra Violet Pantone 18-3838^[26] #5F4B8B</p>							

TRADITIONAL COLOR WHEEL

- The **color wheel** is a visual representation of **color theory** .
- One of the basic tools for combining colors, its represent an organization of **color hues** around a circle, which shows the **relationships** between **primary colors**, **secondary colors**, **tertiary colors** .

➤ **Color wheel consists of :**

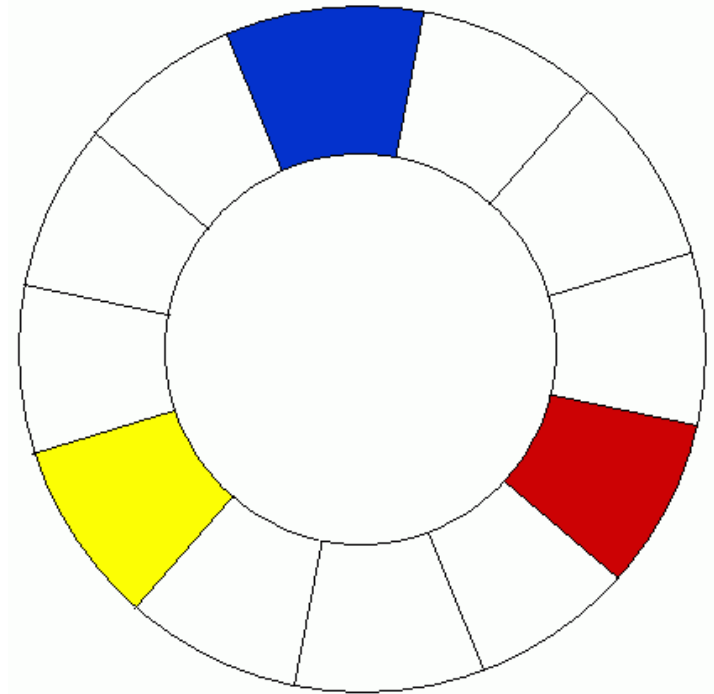
- Primary colors
- Secondary colors
- Tertiary colors



The most common color wheel is the twelve (12) hue wheel (artistic) model. A color wheel could have as few as six hues or as many as 24.48 96 or more.

COLOR WHEEL (PRIMARY COLORS) (RYB)

- Group of colors (**yellow, red, blue**) which represent the hues that form color wheel base.
- These **basic colors** can be mixed to **produce all other colors**.
- The primary colors **cannot** be made by combining other colors.
- Mixing primary colors : **Red, yellow, blue (RYB)** .



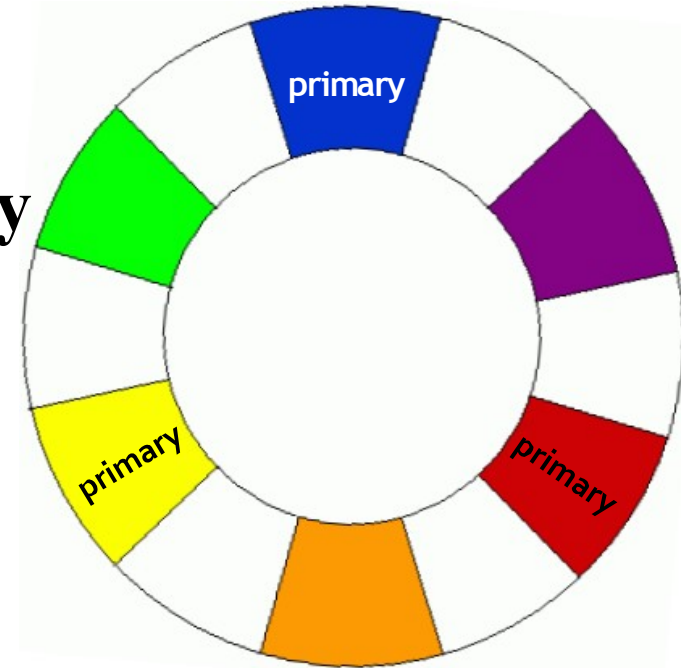
COLOR WHEEL (SECONDARY COLORS)

- Colors that are made by mixing two adjacent primary colors (a 50 percent the mixing any two primary colors.)

Primary

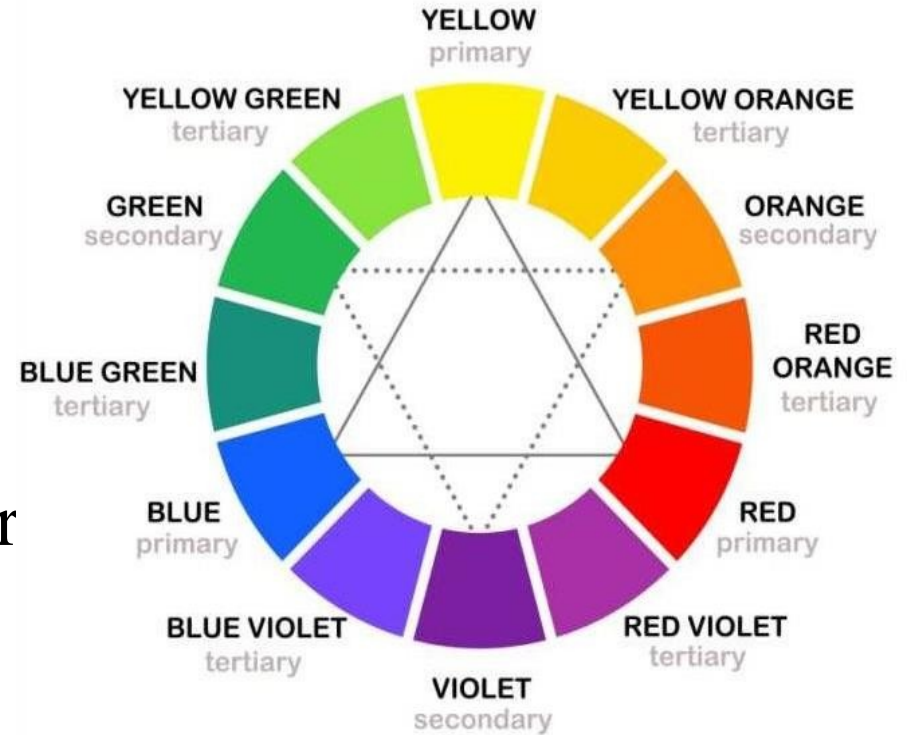
Cyanine(Blue)+ Magenta(Red) = Violet
Magenta(Red)+Yellow = Orange
Yellow + Cyanine(Blue) = Green

Secondary



COLORWHEEL (TERTIARY COLORS)

- Intermediate , or **Tertiary** , colors are created by mixing a **primary** and a **secondary** colors .
- **for example** , the tertiary color produced when mixing the primary color(**blue**) with the secondary color (**green**), is called '**blue- green**'.



Red-Orange

Yellow-Orange

Yellow-Green

Blue-Green

Blue-Violet

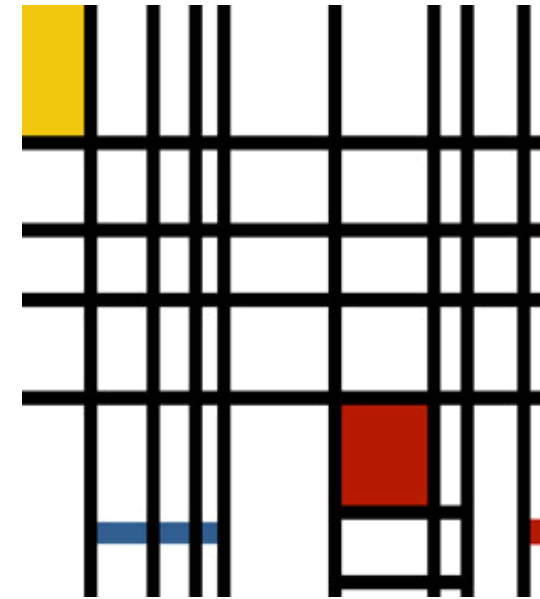
Red-Violet



Color wheel Applications in Architecture

1. “DE STIJL” art movement :

- The primary colors, (red, yellow and blue) use in design can have widely varying effects.
- They can evoke **nostalgia** for the 1960’s or give something a **pop art feel**.
- Used in small doses it can be powerful visual tool.
- One of the most famous application **for Primary colors** in Architecture is in “**DE STIJL**” art **movement** , “DE STIJL”, In Dutch, means “**The Style**”, also known as **neoplasticism**.
- It is a school of art founded in Holland in by the painter **Pieter Mondrian** , **Bart van der Lech** and **Theo van Doesburg** and the architect **Gerrit Rietveld** (1917 to 1931).



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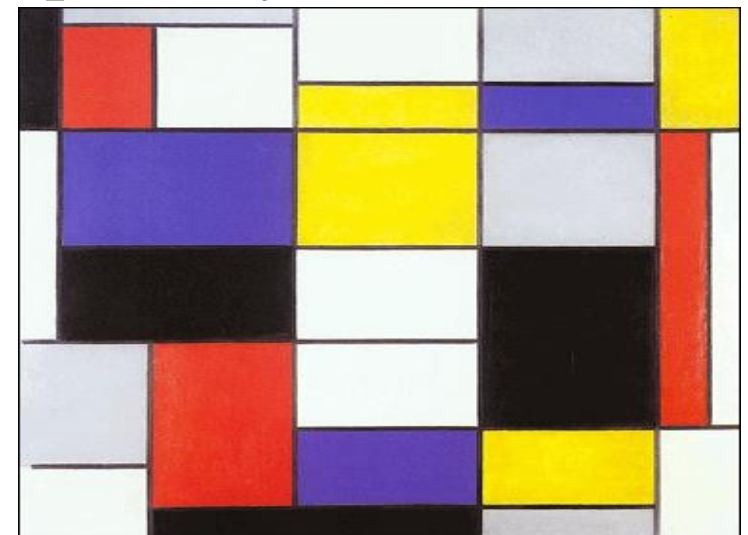
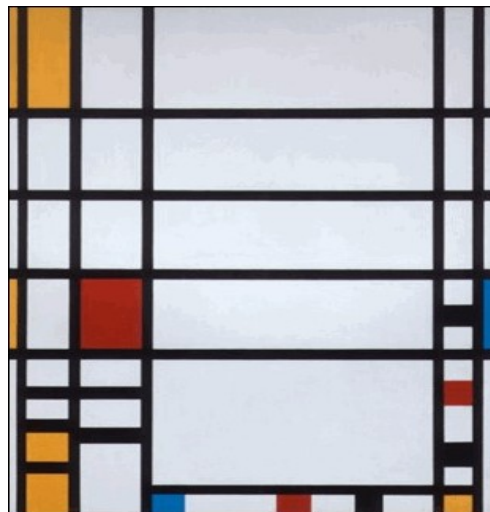
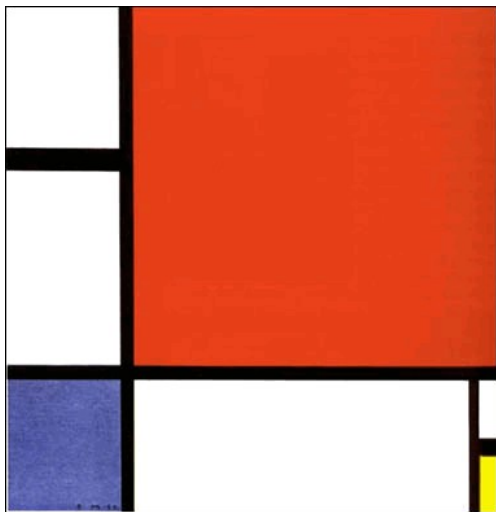
Arithmetische Compositie
Theo van Doesburg
1924



Red and Blue Chair
Designed by Gerrit
Rietveld 1917

CONT.

- This movement was based on **simplicity**, and **pure abstraction** through the use of straight **horizontal and vertical lines** and **rectangular shapes and forms**.
- The works **avoided symmetry** and **attained asymmetrical** balance by use of **primary colors (red, blue, yellow)**, **values of black, grey, and white**, **strong black geometric lines** on a white background.
- The **harmony and order** was established through a reduction of elements to **pure geometric forms and primary colors**.



CONT.

MODERN INTERPRETATIONS
from “DE STIJL” art movement
In Architecture (Elevations)



CONT.

MODERN INTERPRETATIONS
from **“DE STIJL”** art movement.
In interior, furniture and fashion



CONT.

2. **Wassily kadinsky theory.**

- Wassily Kandinsky (1866 –1944) was a Russian painter and art theorist. Kandinsky is generally credited as the pioneer of abstract art, Born in Moscow, studied first the Academy of fine Arts, After that, he taught at the Bauhaus school of art and architecture, and that's influenced on his thinking .
- Wassily Kandinsky's art explored the relationship between **color and its viewers.** embracing color as the primary vehicle for expression. , so he completely **separated painting from a need to drawing a subject.**



CONT.

- The theories he developed about color and meaning would prove influential in all **creative fields**, with **the De Stijl movement** expanding his philosophies and **incorporating color into industrial design and Architecture**.
- The goal of Kandinsky's art was to **capture music in a plastic medium**, to evoke the same feelings a piece of music could evoke **through shades and hues**.
- Employing the color wheel, Kandinsky went through each hue, explaining the **feelings it evoked, emotions it captured,** and the **sound it "made."**



Color Study: Squares with Concentric Circles by Wassily Kandinsky.

CONT.

- He was influenced by **Cubism movement** , but he avoid the grays, browns and blacks colors of this movement .



CONT.

- Cycling through the colors of the rainbow, here is a sample of Kandinsky's thoughts on color from his book **“Concerning the Spiritual in Art,”** paired with buildings and music .

1.Red color significiance.

alive, restless, confidently striving towards a goal, glowing, “manly maturity.” Translated into sound: “sound of a trumpet, strong and harsh,” like a Fanfare, Tuba, deep notes on the cello, clear violin.



YOUNG MODULES , Zaragoza, Spain



2. Orange color significance:

a mixture of red and yellow,
radiant, healthy, serious.

Translated into sound: middle
range church bell, an alto
voice.



**Refurbishment and
Extension of
ArcelorMittal R&D
Headquarters , Spain**

3. Yellow color significance:

“warm, cheeky, and exciting, disturbing for people, typical earthly color... representing madness in color, an attack of rage, blind madness, maniacal rage.” Translated into sound: loud sharp trumpets and high fanfares.



Falcon Headquarters San Angel, Mexico

4. Green color significance:

stillness and peace, but with a hidden, passive strength. “Green is like a fat, very healthy cow lying still and unmoving, only capable of chewing the cud, regarding the world with stupid dull eyes.” Translated into sound: quiet drawn out middle position violin.



social green housing in Madrid, Madrid



5. Blue color significance: deep, inner, supernatural, peaceful.
“Sinking towards black, it has the overtone of a mourning ... typical heavenly color.” Translated into sound: the flute, cello, and organ.

Unfortunately, Kandinsky didn't distinguish between blue and indigo. Apparently they were the same to him.

Didden Village, Netherlands



Avant Chelsea by 1100 Architect, New York City

6. Violet color significance: a mixture of red and blue, “morbid, extinguished and sad.” Translated into sound: the English horn and bassoon.



PURPLE HILL HOUSE, KOREA.

- After studying the impact of each color and analyzing this effect on the human we see the importance of selecting colors when designing each Architectural facility because the colors raised in the human self different feelings and emotions and thus ensure the achievement of the desired goal for each facility of psychological comfort and different feelings depending on its function .



COLOR TERMINOLOGY (VOCABULARY)

The Main Qualities of Color :

1. Hue
2. Value (Tint ,shade)
3. Saturation (Tone)

In this color wheel , we have 4 splitted circles , the 12 colors .

Each circle represent a certain term (hue , tint , tone and shade) .



Color Terminology
circle

CONT.

1. Hue:

- Another name for color .
- A hue is the purest form of a color.
- **Hues** are colors that have **not** been **mixed** with **white, gray, or black** .
- **White, Black and Grey** are **never** referred to them as a **Hue**.

Hue(pure color)



Hue

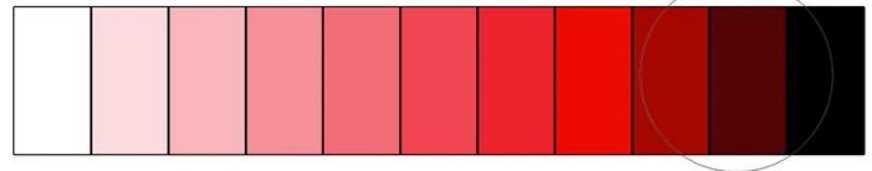
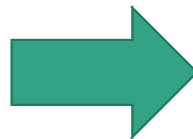
2. VALUE (Tint, SHADE) :

- In nature there are hundreds of different steps in value that are sometimes not easily distinguished by the human eye.
- Value is Refers to the lightness or darkness of a color.
- It indicates the quantity of light reflected.
- 8 graduations of value scale between white and black.
- By applying a single color (in this case red), we can get an entire range of values of the single color..

VALUE SCALE

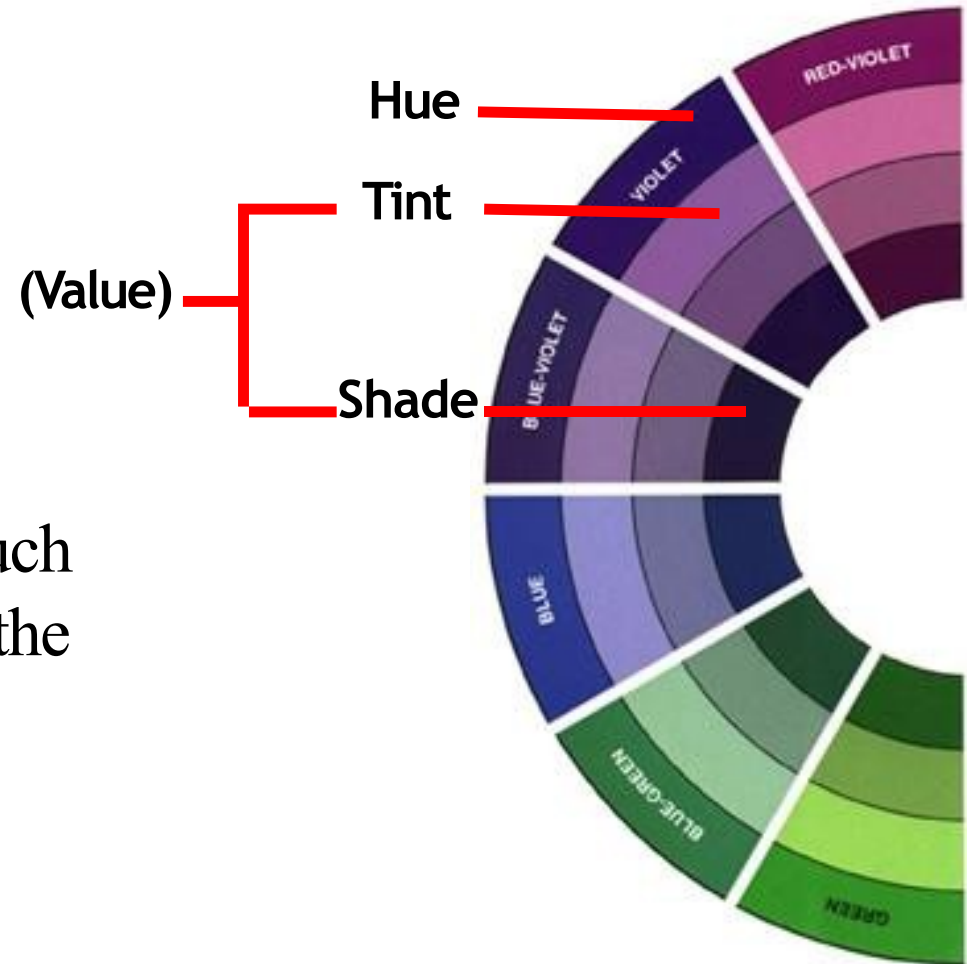


ELEVATEYOURART.COM

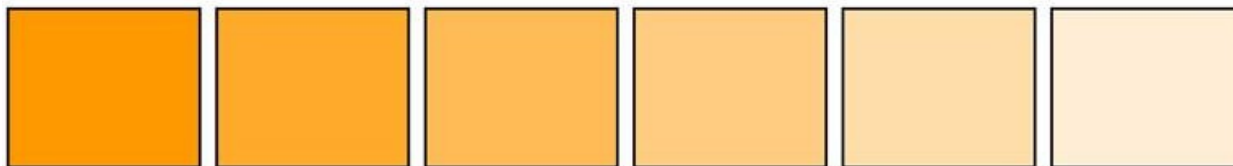


➤ TINT:

- **Tint** in the circle of colors **next to the hues** .
- **Result of adding more white to an existing color.**
- The hue may be mixed with just a touch of white or with so much white that the hue is very faint .



TINT - adding white to a pure hue

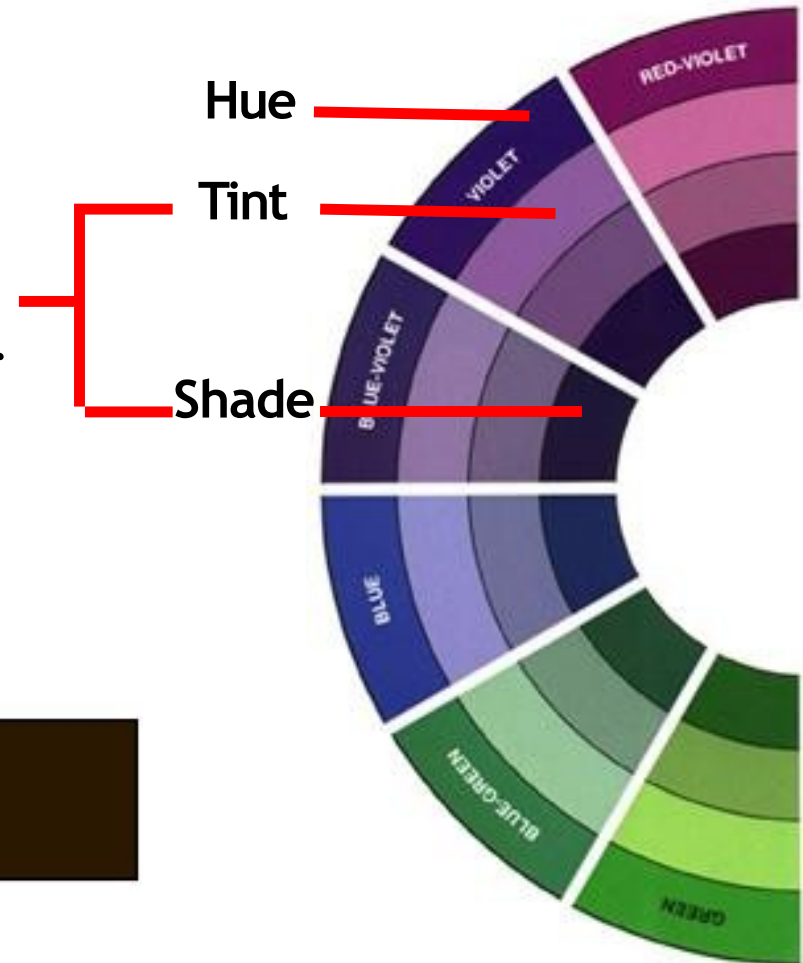
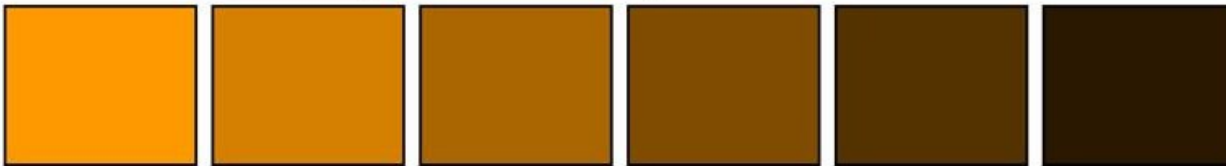


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➤ Shade :

- A shade is the hue mixed with black .
- Just as with the tint , the hue may be mixed (Value) with just a **touch of Black** or more .

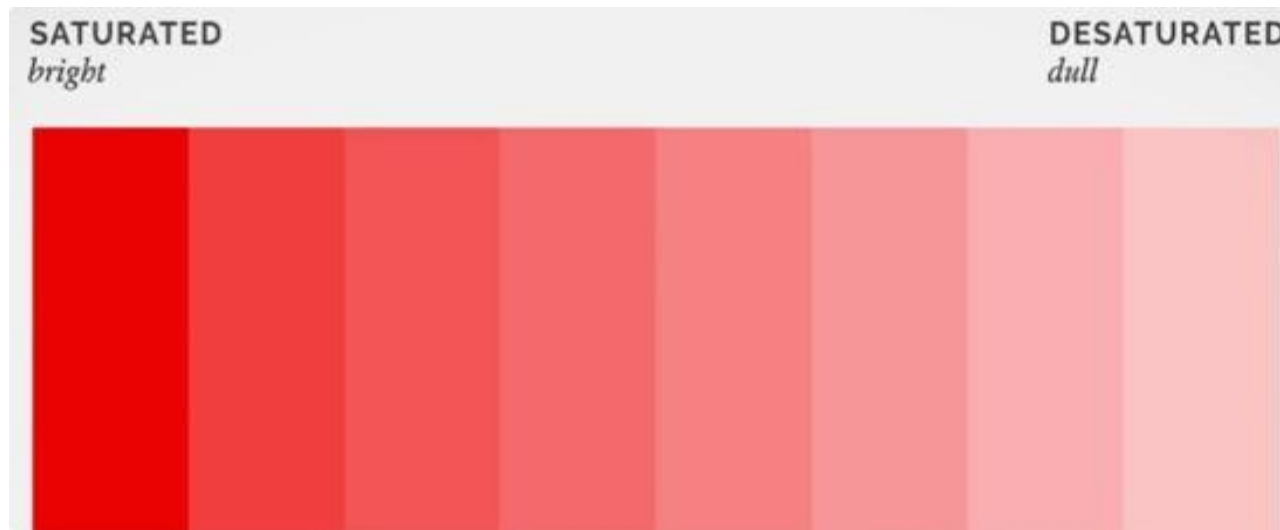
SHADE - adding black to a pure hue



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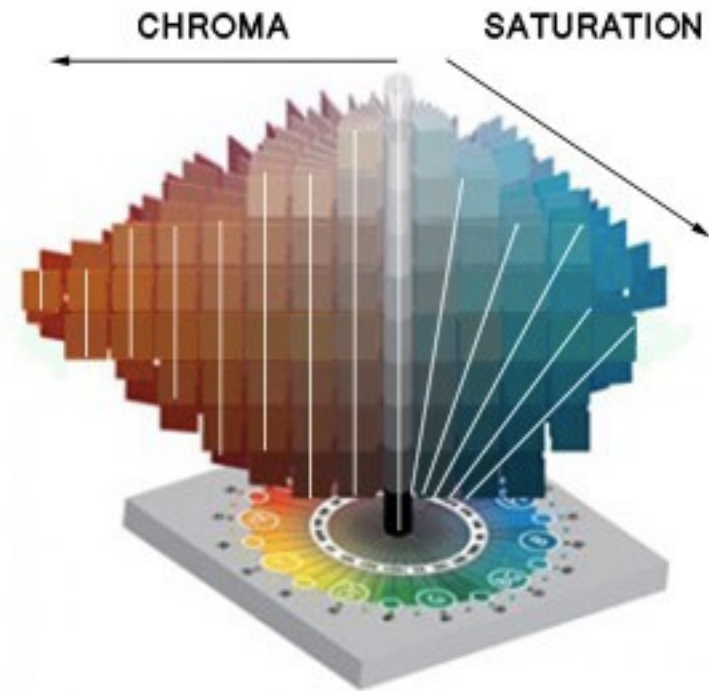
3. Saturation (Tone)

- Intensity is the **brightness or dullness of a color**. It is sometimes called “**chroma**”.
- The intensity changes by using the **complementary color**. The degree of brightness is referred to as “**saturation**”.
- It showed When a pigment hue is “toned,” both white and black (gray) are added to the color to reduce the color’s saturation.



Difference between saturation and chrome:

- Saturation is the “colourfulness of an area judged in proportion to its brightness”.
- Chroma is the “colourfulness of an area judged as a proportion of the brightness of a similarly illuminated area that appears white or highly transmitting”

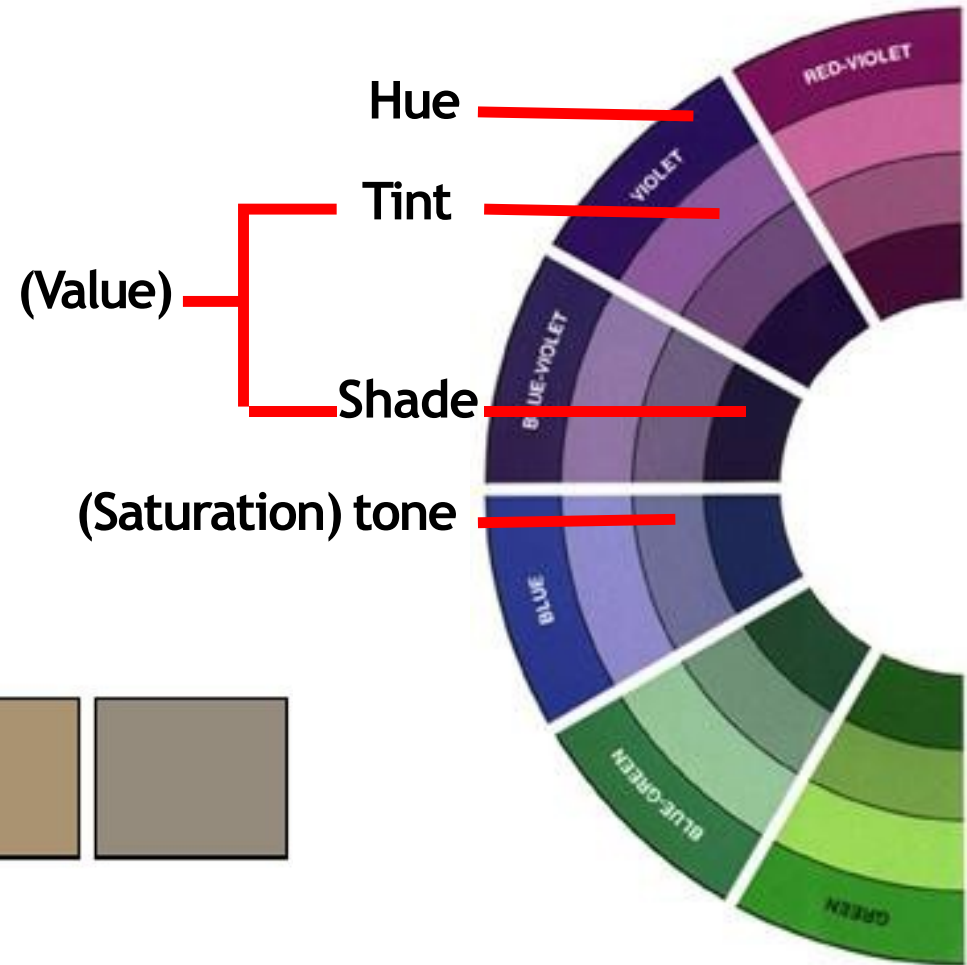
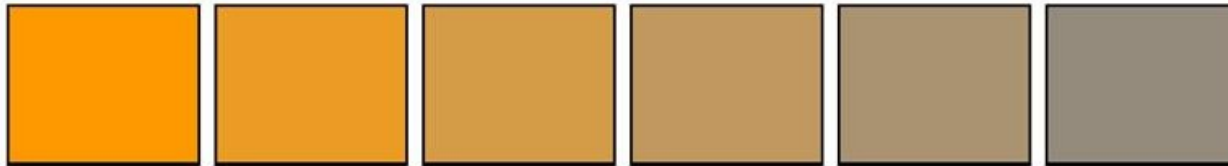


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➤ Tone :

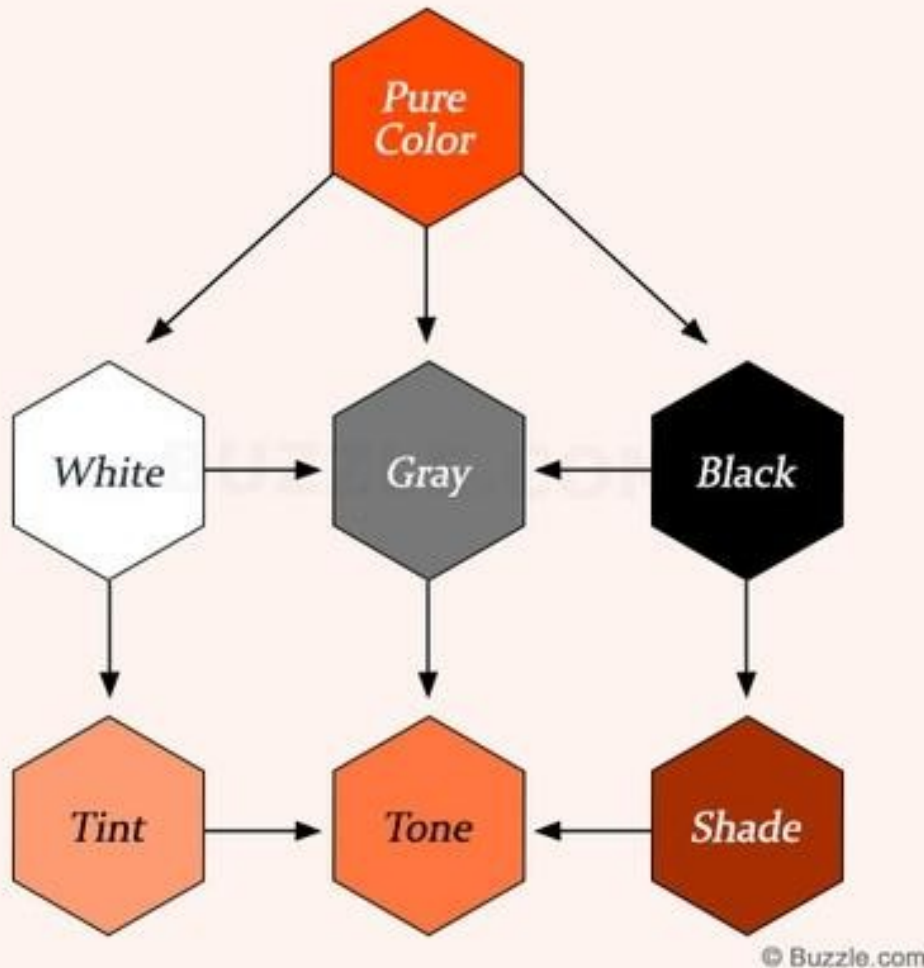
- A tone is the hue mixed with any amount of **gray**.

TONE - adding gray to a pure hue



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A SIMPLE DIAGRAM SHOWS THAT :



- Tints, tones, and shades can be produced by adding white, gray, or black to a pure hue.
- Remember... colors appear darker when placed on rough textures. Paint appears darker when it dries on the wall.
- Artificial incandescent and fluorescent lighting changes the appearance of some colors.

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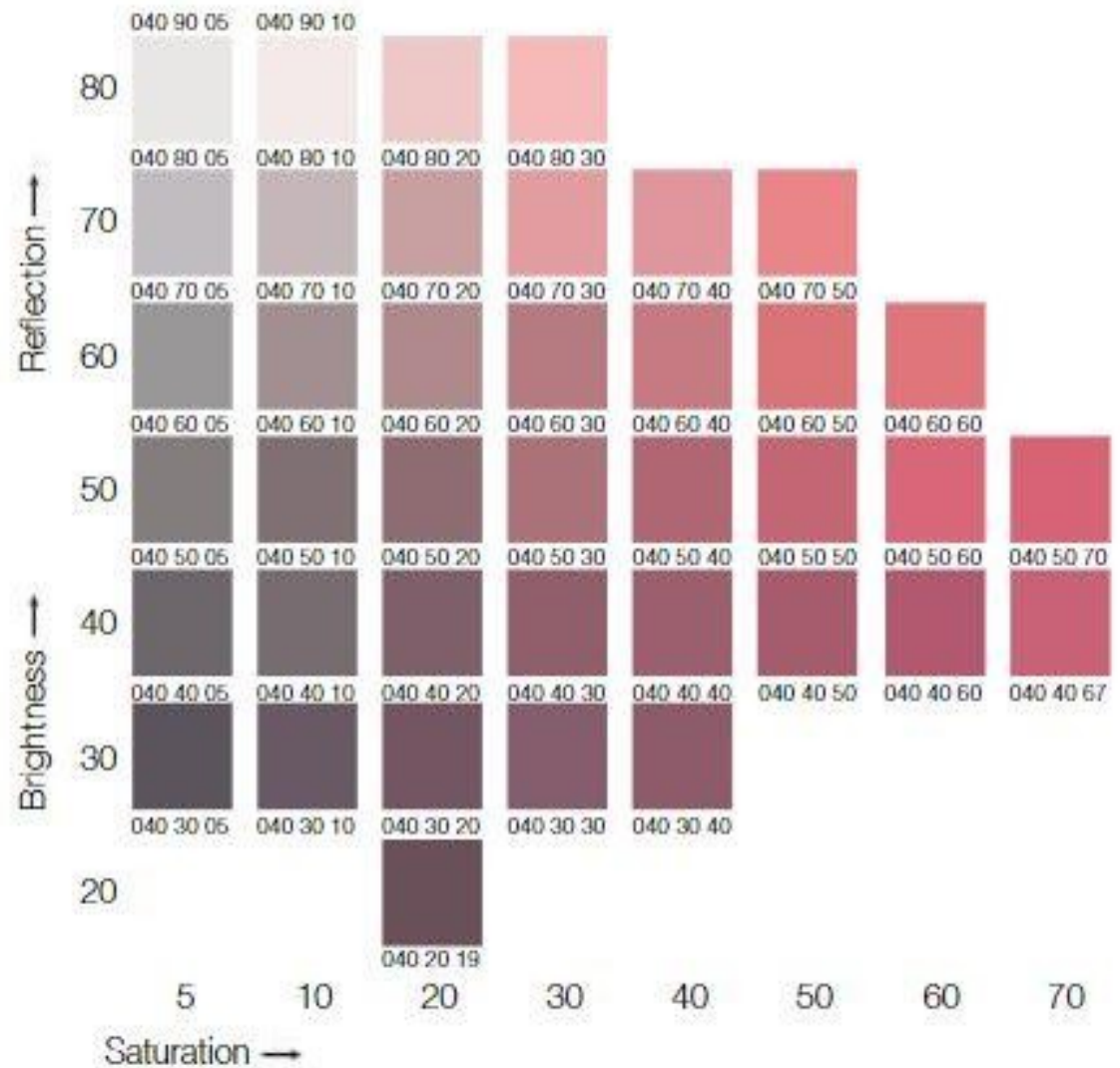
EXAMPLE ABOUT VALUE AND SATURATION

- Here the **Hue is (violet)**.
There are 60+ colors here, but all of them are Violet - hued colors.
- **Chroma changes from left-to-right** Low - chroma colors are on the left... Mid -chroma colors near the center... High - chroma colors on the right.
- **Value changes from bottom-to-top:** Low values (shades) near the bottom High values (tints) near the top.



CONT.

EXAMPLE ABOUT VALUE AND SATURATION



THANK YOU

