COLOR

DESIGN’S MOST EXCITING ELEMENT

COMPILED BY HOWIE BAUM
White light is not a single color; it is made up of a mixture of the seven colors of the rainbow.

We can demonstrate this by splitting white light with a prism:
COLOR EMOTION GUIDE

OPTIMISM
FRIENDLY
EXCITEMENT
CREATIVE
TRUST
PEACEFUL
BALANCE

CLARITY
WARMTH
CHEERFUL
CONFIDENCE
YOUTHFUL
BOLD
IMAGINATIVE
WISE
DEPENDABLE
STRENGTH
GROWTH
HEALTH
NEUTRAL
CALM

DIVERSITY

Nikon
UPS
Denay's
NBC
Google
Payless
Subway
Nature
Nike
Monster
Syfy
Amazon
CNN
Google Chrome
Nike
Yahoo
Facebook
Toyota
Instagram
Samsung
Ikea
Best Buy
Fedex
Dhl
Heinz
Starbucks
Halloween

Love
COLOR HAS THREE DIMENSIONS OR QUALITIES

Hue

Value

Intensity (Chroma)
THE THREE QUALITIES of color

hue
cool  blue-green  green  yellow-green  yellow  yellow-orange  orange  orange-red  warm

value
light  light green  green  dark green  deep

chroma
clear  light red  dark red  soft
HUE

The name given to a color.

RED       YELLOW       VIOLET
Hue (color) is the dimension of color determined by the wavelength of the light.

Wavelength is the distance from the peak of one wave to the peak of the next.

Short wavelength = high frequency (bluish colors, high-pitched sounds)

Long wavelength = low frequency (reddish colors, low-pitched sounds)
Different wavelengths of light result in different colors.

(1 nanometer is a billionth of a meter)
VALUE

The lightness or darkness of a color
TINT

Made by adding white to a color so that it is lighter.

HUE + WHITE = TINT
SHADE

Made by adding black to a color so that it is darker.
Intensity (Brightness)

Blue color with varying levels of intensity.

As intensity increases or decreases, blue color looks more “washed out” or “darkened.”
INTENSITY

The brightness or dullness of a color.

OLIVE - LOW INTENSITY
FUSCHIA - HIGH INTENSITY
<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>No color</td>
</tr>
<tr>
<td>Black</td>
<td>All colors</td>
</tr>
<tr>
<td>Gray</td>
<td>White + Black</td>
</tr>
<tr>
<td>Beige</td>
<td>Can be used with most colors</td>
</tr>
</tbody>
</table>
The 2 different color systems are referred to as: Additive and Subtractive.

Additive - pertains to self-luminous light sources, such as computer monitors, TV’s, etc..

Mixing equal amounts of red, green, and blue (RGB) light produces "white" light.

Additive Color
Subtractive - pertains to an illuminated object that reflect lights, but does not produce its own, such as colors we see reflected from an object.

The color descriptions for this are Cyan, Magenta, Yellow, and Black (CMYK). The K is used to represent Black since the letter B is already used for Blue.

Black" is the absorption of all colors and White is the reflection of all colors.

Applies to Reflected Light, Printed Images, Pigments & Paint
COLOR WHEEL

A GUIDE TO STUDY HOW TO CHOOSE AND COMBINE COLORS
Standard Color Harmonies

Color Theory is a set of principles used to create harmonious color combinations.

Color relationships can be visually represented with a color wheel — the color spectrum wrapped onto a circle.
PRIMARY HUES

- Pure and basic
- Cannot be made from any other colors
- All other colors are made from these
- Equal distance from each other on color wheel
SECONDARY COLORS

- Made by mixing equal amounts of 2 primary colors
- Found halfway between the primary hues on the wheel

\[ \text{Red} + \text{Yellow} = \text{Orange} \]
\[ \text{Yellow} + \text{Blue} = \text{Green} \]
\[ \text{Blue} + \text{Red} = \text{Violet} \]
INTERMEDIATE (TERTIARY)

HUES

Made by mixing equal amounts of adjoining primary and secondary colors.
THE COLOR WHEEL CAN ALSO BE DIVIDED INTO WARM AND COOL COLORS
WARM COLORS

❖ Appear hot like the sun or like fire
❖ Give feelings of gaiety, activity or cheerfulness
❖ Appear to advance—they make the body look larger
❖ Can give a nervous impression if overdone
COOL COLORS

- Remind us of water or sky
- Give feelings of quietness or restfulness
- Appear to recede and make the body look smaller
- Can be depressing if overdone
COLOR HARMONY

Harmony can be defined as a pleasing arrangement of parts, whether it be music, poetry, color, or even an ice cream sundae.

In visual experiences, harmony is something that is pleasing to the eye. It engages the viewer and it creates an inner sense of order, and balance in the visual experience.

A color scheme based on analogous colors (those that are next to each other)
Color Context

How color behaves in relation to other colors and shapes is a complex area of color theory.

Compare the contrast effects of different color backgrounds for the same red square.
These illustrations show the color of the different light bulbs, based on the degree Kelvin of their light source.
INTRODUCTION TO THE HSL COLOR SYSTEM

One of the most common ways to communicate color is through visual systems like charts, where each color has its own unique set of co-ordinates.

HSL stands for Hue, Saturation and Lightness.

For example, the RGB color system can be arranged as a cube with 255 discrete points per side:
The **RGB color space** or **RGB color system**, constructs all the colors from the combination of the **Red**, **Green** and **Blue** colors.

The red, green and blue use 8 digital bits each, which have number values from 0 to 255 that define the intensity of the color.

Since the number 0 is actually a value, this adds up to a total of 256 possibilities for each of the Red, Green, and Blue colors.

This makes $256 \times 256 \times 256 = 16,777,216$ possible colors!!

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**How to create colors with RGB?**

Combine parts of the three primary colors **red**, **green** and **blue**.

Each of the primary colors can have a value in the range from 0 to 255.

<table>
<thead>
<tr>
<th></th>
<th>R: 255</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>255</th>
</tr>
</thead>
<tbody>
<tr>
<td>G:</td>
<td>0</td>
<td>255</td>
<td>0</td>
<td>0</td>
<td>255</td>
</tr>
<tr>
<td>B:</td>
<td>0</td>
<td>0</td>
<td>255</td>
<td>0</td>
<td>255</td>
</tr>
</tbody>
</table>

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http://web.stanford.edu/class/cs101/image-rgb-explorer.html
Remember that most colors carry physiological, cultural, personal, emotional, and expressive implications.

Brands have certain colors that let people identify who they are and if different colors are used, it can be confusing.
OF ALL THE COLORS IN THE SPECTRUM, BLUE IS AN APPETITE SUPPRESSANT.

Weight loss plans suggest putting your food on a blue plate.

Blue food is a rare occurrence in nature. There are no leafy blue vegetables (blue lettuce?), no blue meats (blueburger, well-done please), and aside from blueberries and a few blue-purple potatoes from remote spots on the globe, blue just doesn't exist in any significant quantity as a natural food color. Consequently, we don't have an automatic appetite response to blue.

Furthermore, our primal nature avoids food that are poisonous. A million years ago, when our earliest ancestors were foraging for food, blue, purple and black were "color warning signs" of potentially lethal food.
COLOR PALLETTE FOR CHANGING THE COLOR OF YOUR FONT (LETTERS) IN MICROSOFT WORD
THIS IS WHAT YOU GET WHEN YOU CLICK ON MORE COLORS. NOTE THE RANGE OF COLORS FROM 0 TO 255.
PANTONE MATCHING SYSTEM

Since 1963, Pantone has been an innovative system of matching, communicating and identifying colors in a coherent way.

What makes Pantone unique is that its founder Lawrence Herbert understood that each person sees and interprets color differently.
PANTONE MATCHING SYSTEM

The Pantone color finder system incorporates the needs of color critical industries like digital technology, textiles, plastics, architecture and contract interiors and paint.

It is known worldwide as the standard language for color communication from designers to manufacturer to retailer to customer.
Past Colors of the Year

**2018**
PANTONE®
Ultra Violet
18-3838

**2017**
PANTONE®
Greenery
15-0343

**2016**
PANTONE®
Rose Quartz
13-1520

**2016**
PANTONE®
Serenity
15-3919

**2015**
PANTONE®
Marsala
18-1438

**2014**
PANTONE®
Radiant Orchid
18-3224

**2013**
PANTONE®
Emerald
17-5641
Names of the Colors

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>cherry</td>
<td>red</td>
</tr>
<tr>
<td>cinnamon</td>
<td>purple</td>
</tr>
<tr>
<td>wine</td>
<td>pink</td>
</tr>
<tr>
<td>plum</td>
<td>orange</td>
</tr>
<tr>
<td>eggplant</td>
<td>yellow</td>
</tr>
<tr>
<td>grape</td>
<td>green</td>
</tr>
<tr>
<td>orchid</td>
<td></td>
</tr>
<tr>
<td>lavender</td>
<td></td>
</tr>
<tr>
<td>gillyflower</td>
<td></td>
</tr>
<tr>
<td>pink</td>
<td></td>
</tr>
<tr>
<td>baby</td>
<td></td>
</tr>
<tr>
<td>violet</td>
<td></td>
</tr>
<tr>
<td>salmon</td>
<td></td>
</tr>
<tr>
<td>tangerine</td>
<td></td>
</tr>
<tr>
<td>melon</td>
<td></td>
</tr>
<tr>
<td>gold</td>
<td></td>
</tr>
<tr>
<td>sunflower</td>
<td></td>
</tr>
<tr>
<td>lime</td>
<td></td>
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<tr>
<td>avocado</td>
<td></td>
</tr>
<tr>
<td>limon</td>
<td></td>
</tr>
<tr>
<td>laurel</td>
<td></td>
</tr>
<tr>
<td>chlorophyll</td>
<td></td>
</tr>
<tr>
<td>moss</td>
<td></td>
</tr>
<tr>
<td>mint</td>
<td></td>
</tr>
<tr>
<td>emerald</td>
<td></td>
</tr>
<tr>
<td>pool</td>
<td></td>
</tr>
<tr>
<td>petroleum</td>
<td></td>
</tr>
<tr>
<td>sky</td>
<td></td>
</tr>
<tr>
<td>turquoise</td>
<td></td>
</tr>
</tbody>
</table>
HIS AND HER COLORS

http://www.datapointed.net/visualizations/color/men-women-color-names-d3/
THE GOOGLE CHROME LOGO AND HOW COOL IT LOOKS ON HIS HAIR!!
Synesthesia is a condition in which one sense (for example, hearing) is simultaneously perceived as if by one or more additional senses such as sight.

Another form of synesthesia joins objects such as letters, shapes, numbers or people's names with a sensory perception such as smell, color or flavor.

How someone with synesthesia might perceive certain letters and numbers.
Tetrachromacy
Tetrachromacy is the ability to see light from four distinct sources.

An example of this in the animal kingdom is the zebrafish (Danio rerio), which can see light from the red, green, blue, and ultraviolet sections of the light spectrum.

True tetrachromacy in humans is much rarer however. Like supertasting, it is thought to be much more common in women than men – estimates range from 2 – 3% to 50% of women. Interestingly, color-blindness in men (much more common than in women) may be inherited from women with tetrachromacy.
BRAIN SIDE COLOR DOMINANCE

if your right brain is dominant you will see a combination of pink and white color, and if your left brain is dominant, you will see it in a grey and green color.

A fun test you can do to see what percent of your brain is dominant

https://memorado.com/yourbetterhalf
After Images

When our eyes are exposed to a hue for a prolonged period, the rods & cones become fatigued. You might notice this if you are reading something on colored paper, and then look away—you often see the inverse, or complement, of the image.

Every color has an opposite, and although individual's perceptions do vary, the range of after images seen is consistent.

Take the After Image Test.

Stare at this image for at least 20 seconds. When finished, the screen will go to a white slide and you should be able to see the opposite colors, as After Images.
These are the after image colors many/most people will see. People see the opposite colors or a negative image because staring at one color for an extended period will fatigue the eyes rods & cones. There is some constancy with after images as people see images within the same general hue families.
Colors And Their Meaning In Graphic Designs

Infographic by: www.yourdesignpick.com

- **Orange**
  - Warmth
  - Health
  - Happiness
  - Energy
  - Enthusiasm
  - Confidence

- **Yellow**
  - Warmth
  - Imagination
  - Friendliness
  - Knowledgeable
  - Childish
  - Growth

- **Green**
  - Growth
  - Peace
  - Health
  - Liveliness
  - Harmony
  - Nature

- **White**
  - Calm
  - Peace
  - Innovative
  - Balance
  - Neutrality
  - Simplicity
  - Minimalism
  - Virtue

- **Red**
  - Anger
  - Love
  - Life
  - Energy
  - Excitement
  - Youth
  - Evilness

- **Black**
  - Serious
  - Sophistication
  - Elegance
  - Sharpness
  - Authority
  - Power
  - Modern

- **Blue**
  - Confidence
  - Wellness
  - Professionalism
  - Trust
  - Responsibility
  - Passion
  - Strength

- **Purple**
  - Sensitive
  - Passionate
  - Innovative
  - Wisdom
  - Grace
  - Luxury
  - Care

© www.yourdesignpick.com
THE COLORS OF SUCCESS

Respondents selected the colors they associate with business success.

In order of popularity:

- Blue: 57%
- Green: 35%
- White: 32%
- Black: 29%
- Red: 21%
- Yellow: 14%
- Orange: 12%
- Gray: 12%
- Purple: 10%

Purple is the color men associate LEAST with business success.

Orange is the color women associate LEAST with business success.
Color Meanings & Symbolism: Red

Worldly Color Meanings of Red
China & India: good luck, used in dresses, chair, parasol, cup lace, firecrackers in a wedding
Russia & China: revolution, communism
England: buses, phone booths
Spain: bull fighting, flamenco dresses
Red

Any of various colors resembling the color of blood

Increases pulse rate and breathing and causes blood pressure to rise.

Infants and children respond well to red. Red is for the amorous, outspoken, and optimistic. People who love red, love life.

The food color. Ever notice that restaurants use red a lot? It makes you hungry by increasing your body's metabolism.

Hot, passionate, urgent, danger, blood, devil, angry, enraged, amorous, outspoken, optimistic
A color varying from light crimson to pale reddish purple,

Makes one feel prosperous, a bit pampered. "Baker Miller" pink (deep shade of pink, similar to Pepto Bismol) is used in jail holding cells to calm prisoners.

Pink is also used to treat patients suffering from headache disorders.

Femininity, sweetness, prime, left-wing
One of the most interesting examples of color effects is Baker-Miller Pink - R:255, G:145, B:175.

Also known as "Drunk tank pink," this color has been used to calm violent prisoners in jails.
Color Meanings & Symbolism: Yellow

Worldly Color Meanings of Yellow
Egypt: happiness, prosperity
China: Imperial color to worship, the sky
Futbol: yellow card, warning
Other: truth
A color like that of egg yolk, ripe lemons, etc.

The primary color between green and orange in the visible spectrum

The color of the sunny disposition, the idealist. Intellectuals love yellow. It takes more chemicals in the eye to see the color yellow.

Yellow can have some negative effects -- babies cry more often and longer in yellow rooms; in convalescent homes it makes older people shake as it affects their minor motor movement. As you get older you tend to dislike yellow because it can make you feel anxious or angry.

Yellow enhances concentration and speeds metabolism.

Warm, cowardice, caution, fearful, bright
Color Meanings & Symbolism: Blue

- Confidence
- Control
- Freedom
- Calmness

- Tradition
- Peace
- Authority
- Honesty

- Tradition
- Virtue
- Respect

- Tradition
- Unity
- Balance
- Loyalty

- Caution
- Piety
- Ice

- Infinity
- Dignity
- Responsibility

Worldly Color Meanings of Blue
Catholicism: Virgin Mary, God Father
Islam: Mosque decorations
UN Flag: peace, cooperation
India: mercy
Jewish: Holiness
The pure color of a clear sky; the primary color between green and violet in the visible spectrum

The number one color choice of the introspective and educated. Blue causes the brain to send off 11 chemical tranquilizers and is a wonderful calming color.

Or it can pump people up. Proven to increase energy. Weight lifters should lift in a blue room. Production people will produce more in a blue room. Not a good color for hospitals.

Responsibility, trustworthiness, compassion, those are the attributes of royal blue.

Honest, integrity, righteous, puritanical, moral, severe, prudish, cool, melancholy, sad, glum, downcast, gloomy, unhappy, quality, first place
Several years ago, the makers of M&Ms, added a new color to its candy bag: Blue.

Why Blue? Although they reported that this was the result of a vote by M&M's fans it raises a few questions. It may very well be the last color left in the bag after the novelty wears off.
Color Meanings & Symbolism: Orange

Worldly Color Meanings of Orange
Buddhism: humility, renunciation, desirelessness
China & Japan: love, happiness, plenitude
Other: treason, Halloween
A color between yellow and red in the spectrum

reddish yellow.

Not a color that everyone loves, but those who do are generally social and fun loving.

Confident, creative, adventurous, fun loving, sociable
Color Meanings & Symbolism: Green

Worldly Color Meanings of Green
Islam: Allah in nature
Northern Europe: The Green Man
A color intermediate in the spectrum between yellow and blue

Found in nature as the color of most grasses and leaves while growing, of some fruits while ripening, and of the sea.

A secondary color that has been formed by the mixture of blue and yellow pigments.

A good color for people in transition. Green is Mother Nature's color, lover's of green may be fickle.

The money color--bound to influence.

In Celtic myths the Green man was the God of fertility.

Universal symbolism: Nature, freshness

Contemporary symbolism: Ecologically beneficial

Nature, health, regeneration, contentment, harmony, cheerful, lively, friendly, fresh, sickly, unripe, immature, simple, unsophisticated, gullible, new
Color Meanings & Symbolism: Purple

Worldly Color Meanings of Purple
Ancient Cultures: wealth
Catholicism: contrition, penitence, color of Lent
Any color having components of both red and blue, such as lavender, esp. one deep in tone.

The color of fantasy.

Most men dislike purple.

Royalty, intelligence, wealth, beauty, inspiration, sophistication, high rank, exalted, imperial, princely, excessively ornate rhetoric, profane, shocking
A color between white and black, having a neutral hue.

A good color for offices. It promotes productivity and stimulates creativity.

Neutral, ambiguous, intermediate, apathetic, dull, drab, monotonous, mature, sober, somber, mousy, smoky
Lacking hue and brightness; absorbing light without reflecting any of the rays composing it. The color at one extreme end of the scale of grays, opposite to white.

Produces a feeling of solidarity and formality.

Black is a natural classic.

The color of authority and power, yet also implies submission.

Aloof, evil, death, unknown, fear, mystery, dark, night, sad, murky, sinful, inhuman, fiendish, devilish, infernal, monstrous, horrible, nefarious, treacherous, traitorous, villainous, depressing, somber, doleful, mournful, funereal, disastrous, calamitous, harmful, deliberate, pessimistic, dismal, hostile, threatening, wicked, disgrace, morbid, grotesque, undesirable, dangerous, false
A color without hue at one extreme end of the scale of grays, opposite to black.

A white surface reflects light of all hues completely and diffusely. Most so-called whites are very light grays: fresh snow, for example, reflects about 80 percent of the incident light, but to be strictly white, snow would have to reflect 100 percent of the incident light.

Never underestimate the power of this super neutral. It works with any other color, in any context, anywhere. One color plus white equals an almost foolproof color scheme.

White would be an inappropriate color for a wedding in China. It is the color of mourning. If a bride chooses a white wedding gown, her parents would probably not allow her to get married.

Innocence, purity, virginal, sterility, fairness, snow, frost, milk, ghostly, ultraconservative, blank, empty, transparent, honorable, dependable, auspicious, fortunate, harmless
A dark tertiary color with a yellowish or reddish hue

Solid, reliable brown is the color of earth and is abundant in nature.

Light brown implies genuineness while dark brown is similar to wood or leather.

Brown can also be sad and wistful.

Men are more apt to say brown is one of their favorite colors.

Earth, nature, dirt, tanned, drab, coffee, solid, sad
All colors are beautiful, depending on personal taste. Harmony results when hues, values and intensities are combined in a pleasing way.