CSC4130
Introduction to Human-Computer Interaction

Lecture 14
Color Theory

Outline

- What color is
- Why we see color
- Color theory
- Color modes
- Color systems
- Why color changes
- How to use color
- Color symbolism

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What is color

In the fall, do the leaves change color if on one is there to see them?

What is color

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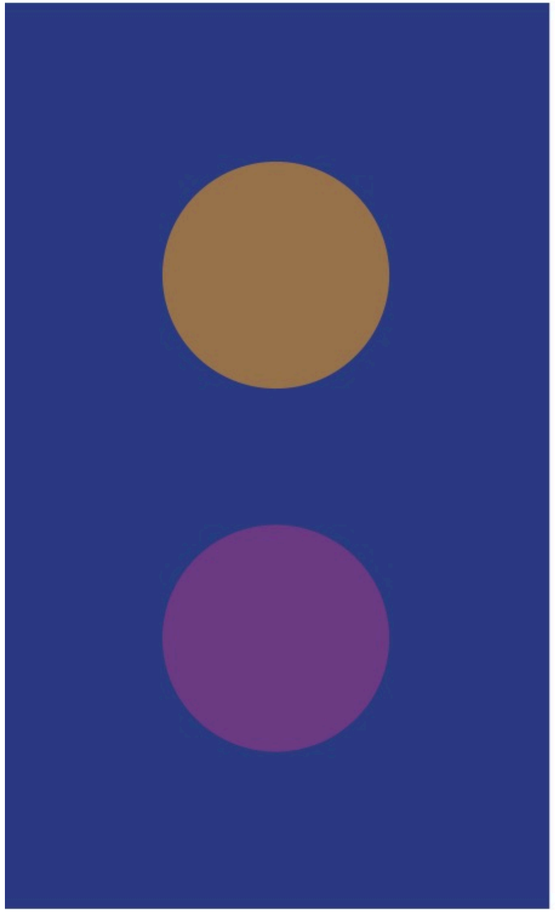
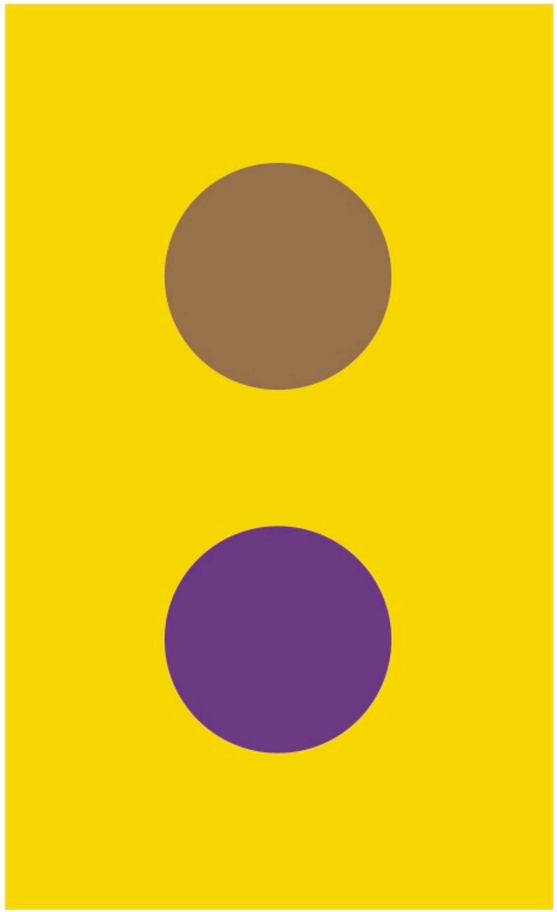
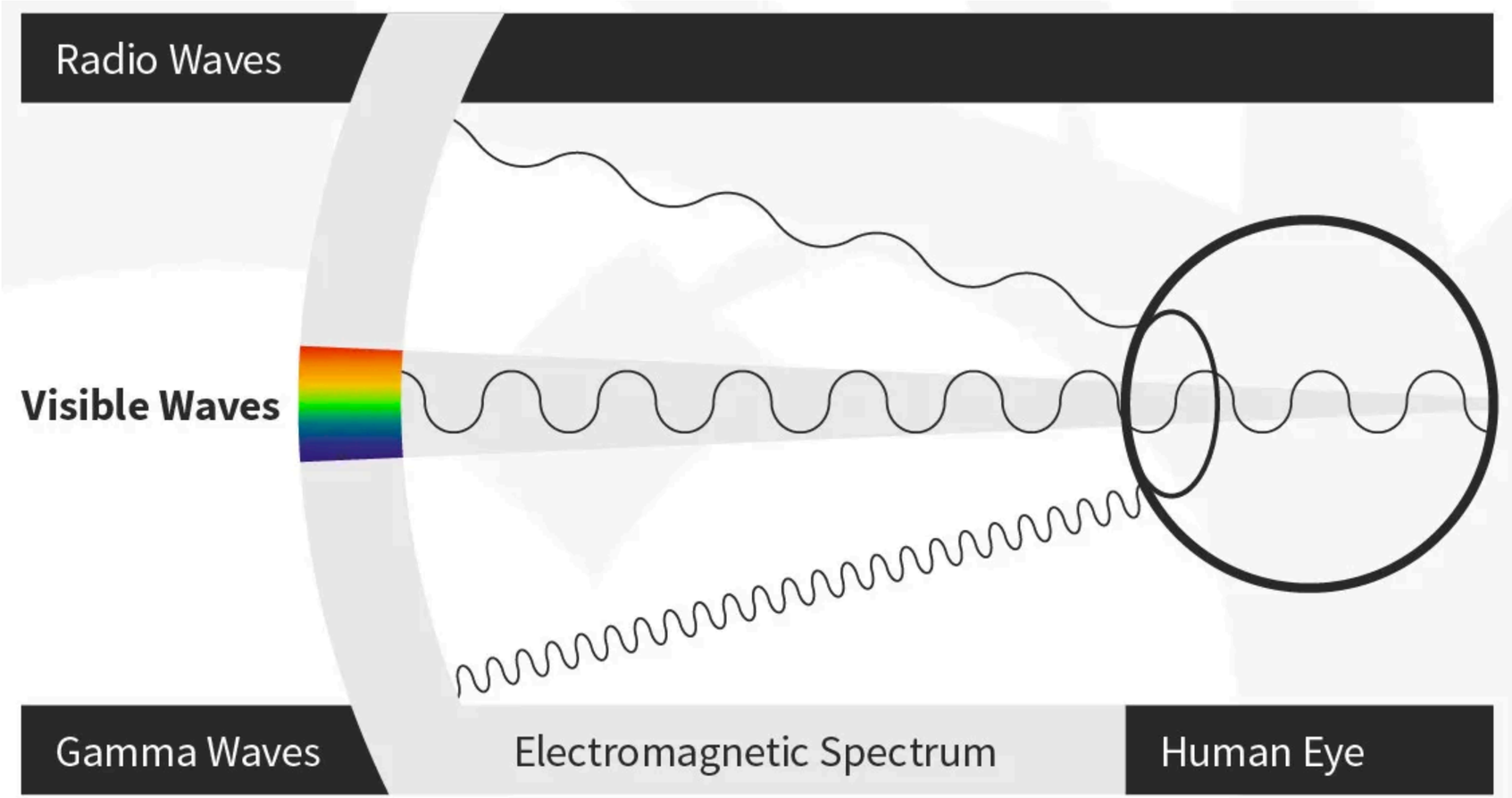
- No such thing as color without the eyes an the brain
- Different brains process visual information differently





What is color

- Color is the light reflected back to our eyes, which have cones inside them to help people see reflection of light off the things around us



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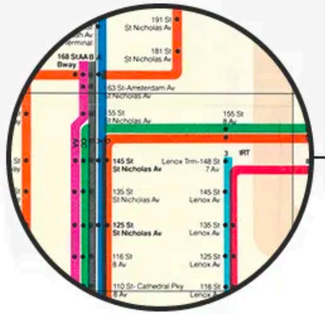
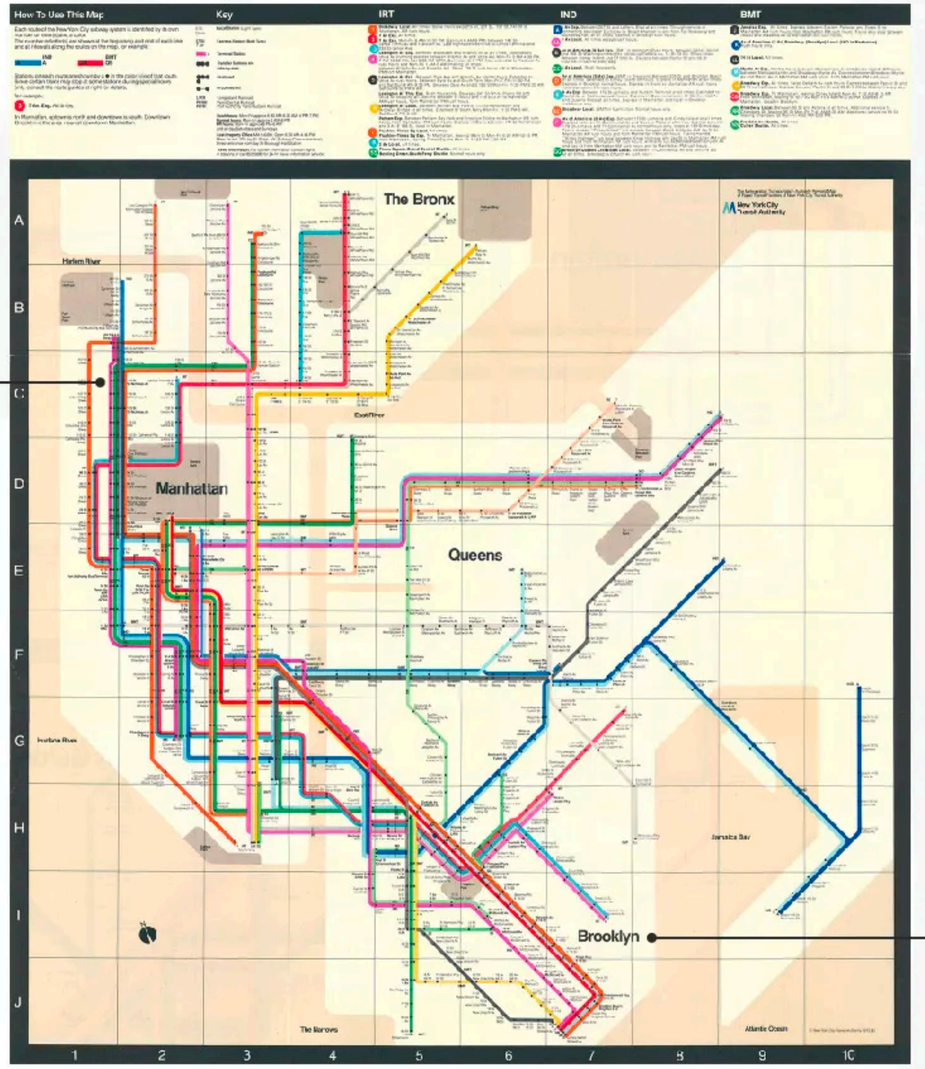
Why we see color

- Distinguish one thing from another
- Understand the thing itself

Why we see color

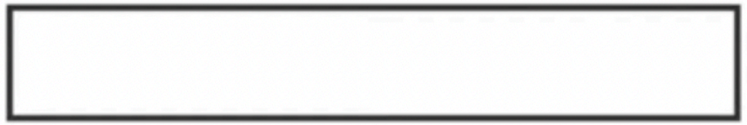
Color





Contrast

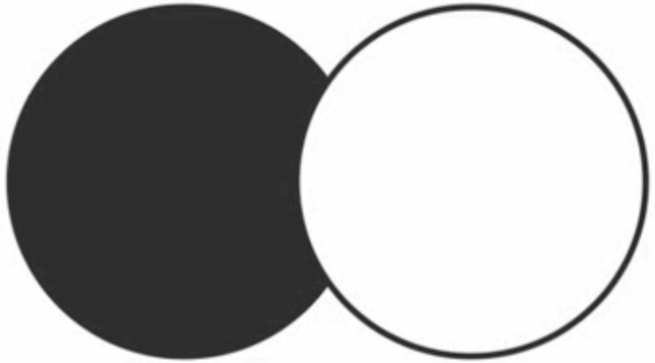
Why we see color



Shape

Texture

Movement



Dark Value

Light Value

Why we see color

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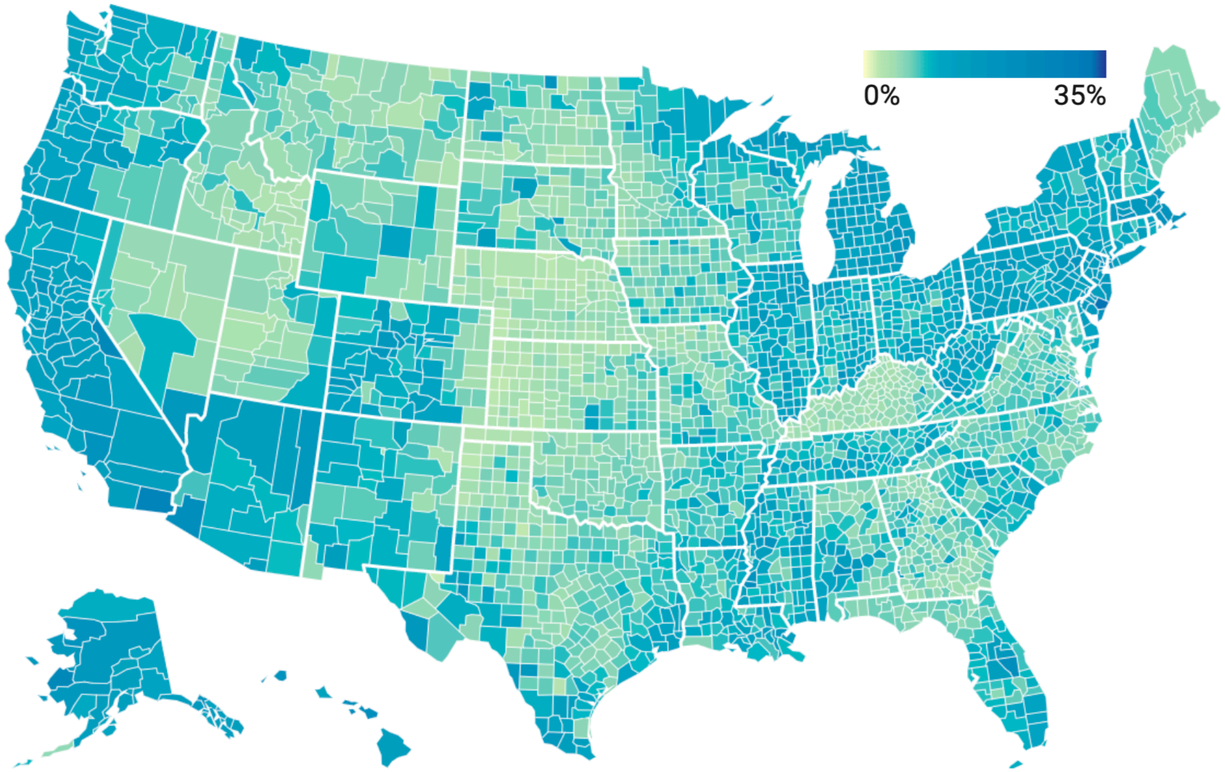
- By using color, designers are giving people a shorthand for how to use the products that they are designing

Why we see color

Color options

- Confuse people if millions of colors coming into
- Cannot distinguish information if few colors are selected



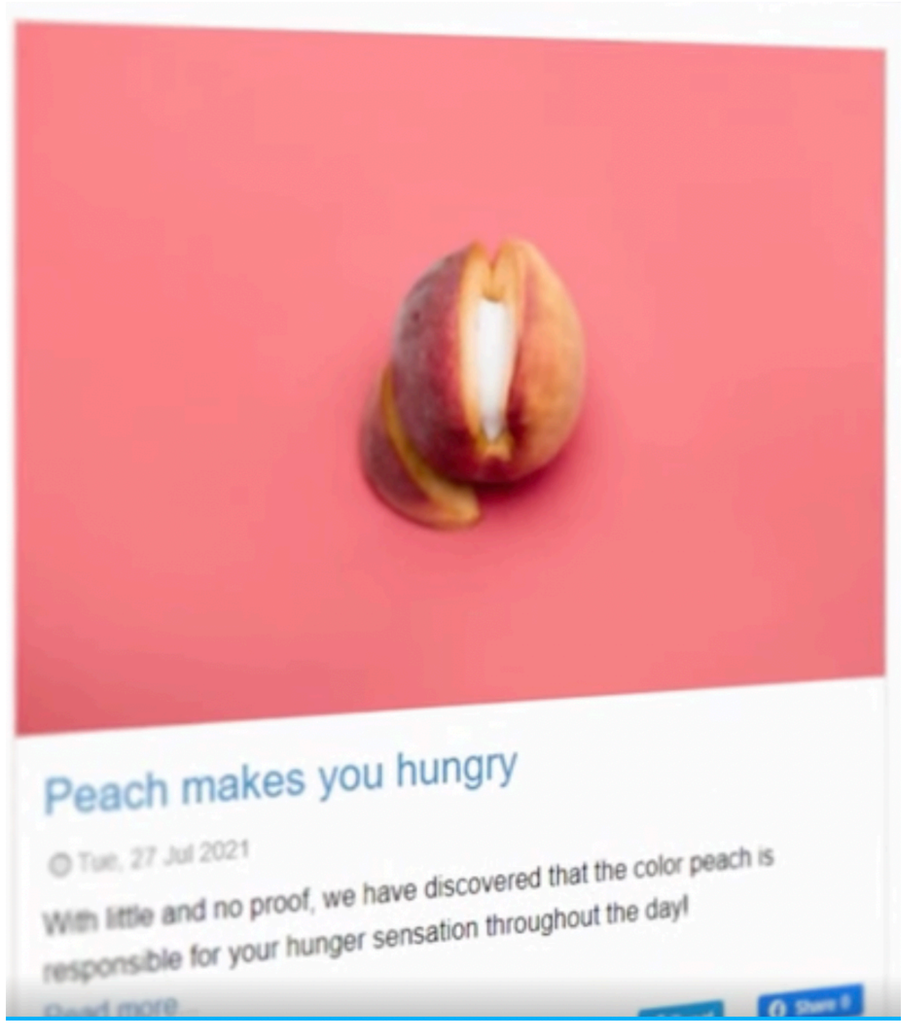
Color clues

- Cultural
- Personal
- Biological

Cultural

Personal


WARM
COOL


Peach makes you hungry
Tue, 27 Jul 2021
With little and no proof, we have discovered that the color peach is responsible for your hunger sensation throughout the day!

Biological

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Color wheel

Hue

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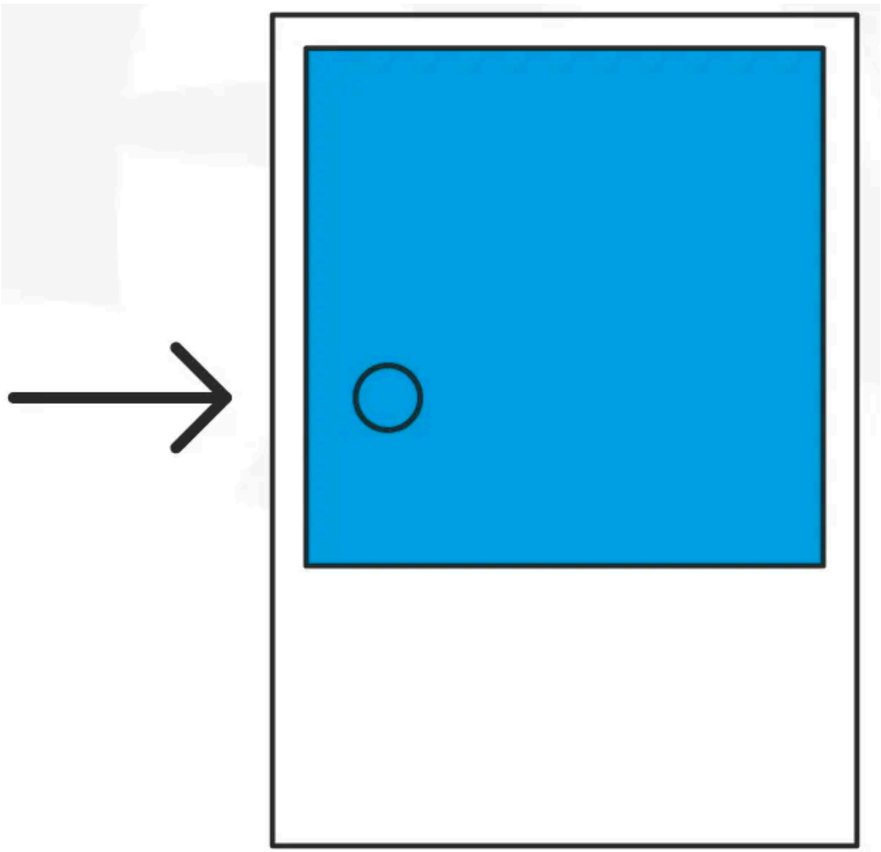
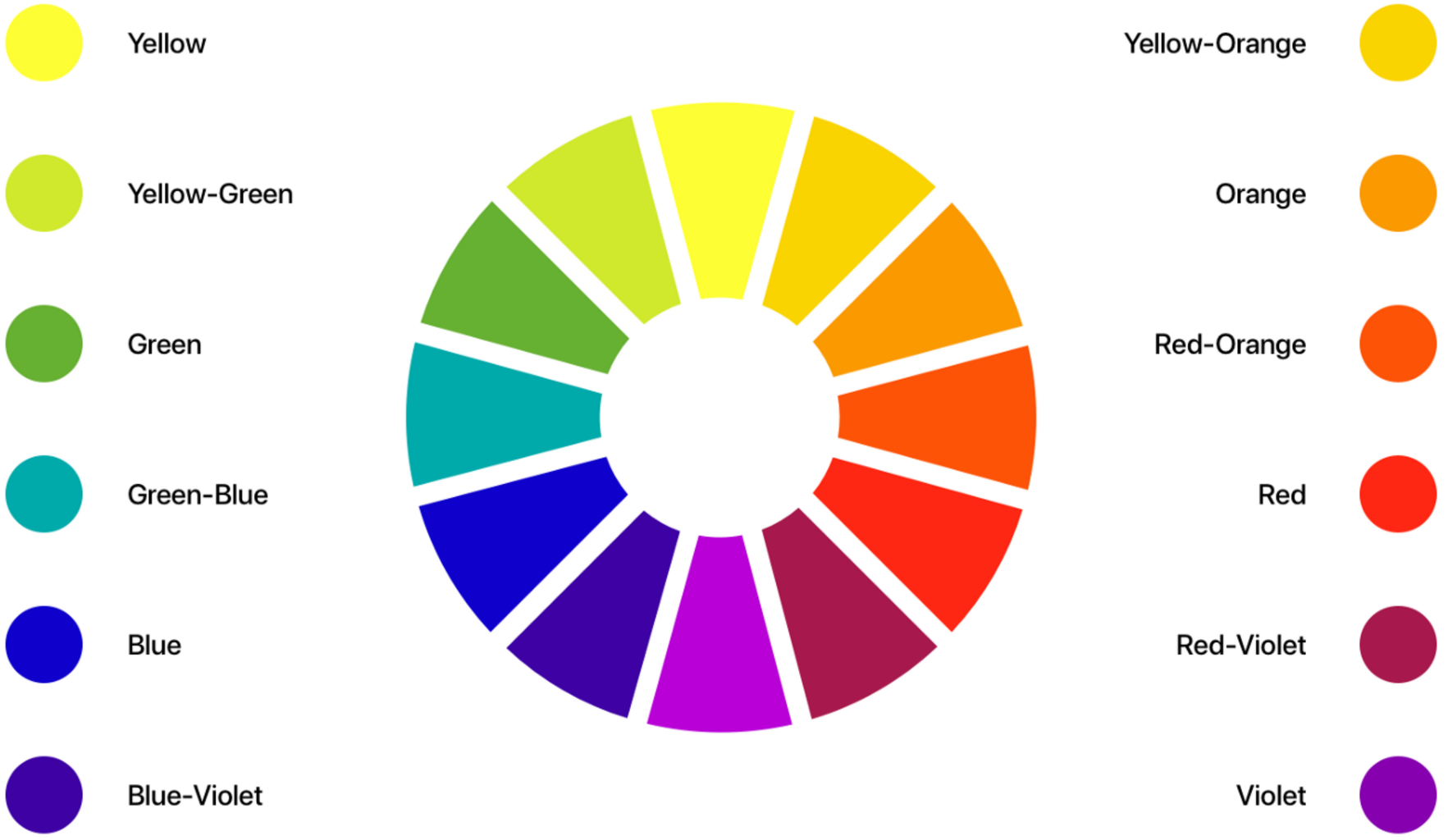
- Represent a color without reference to how dull or saturated, dark or light, that color is

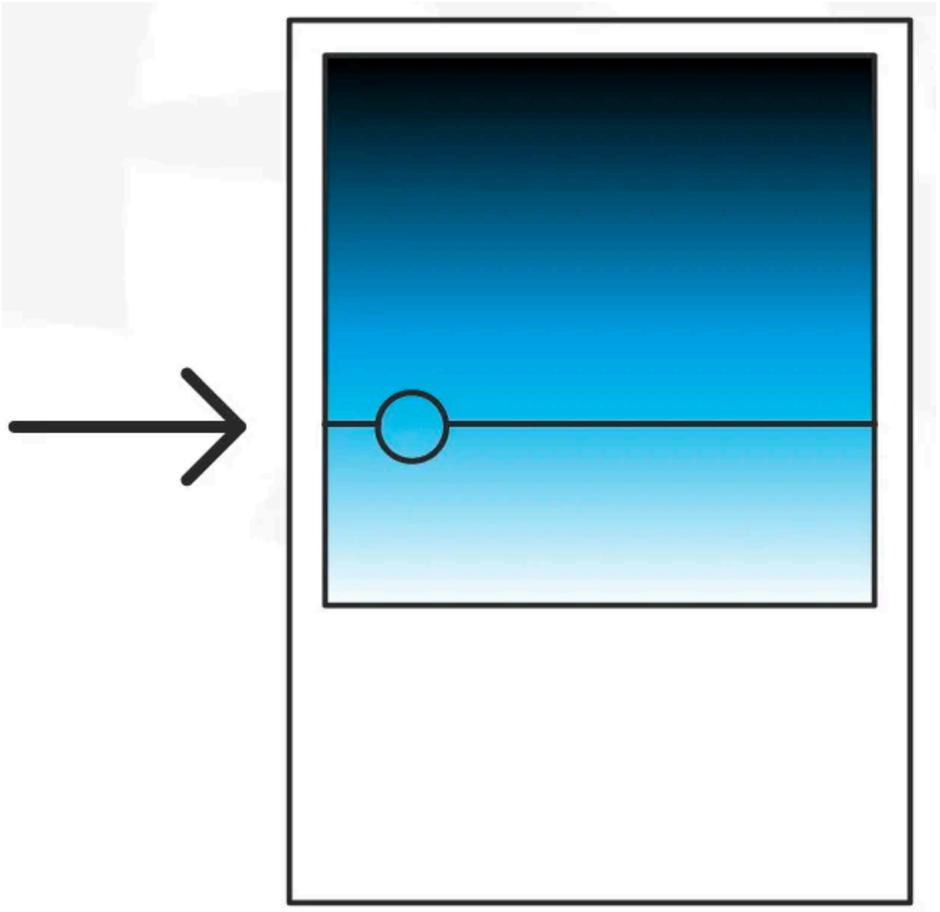


Hue

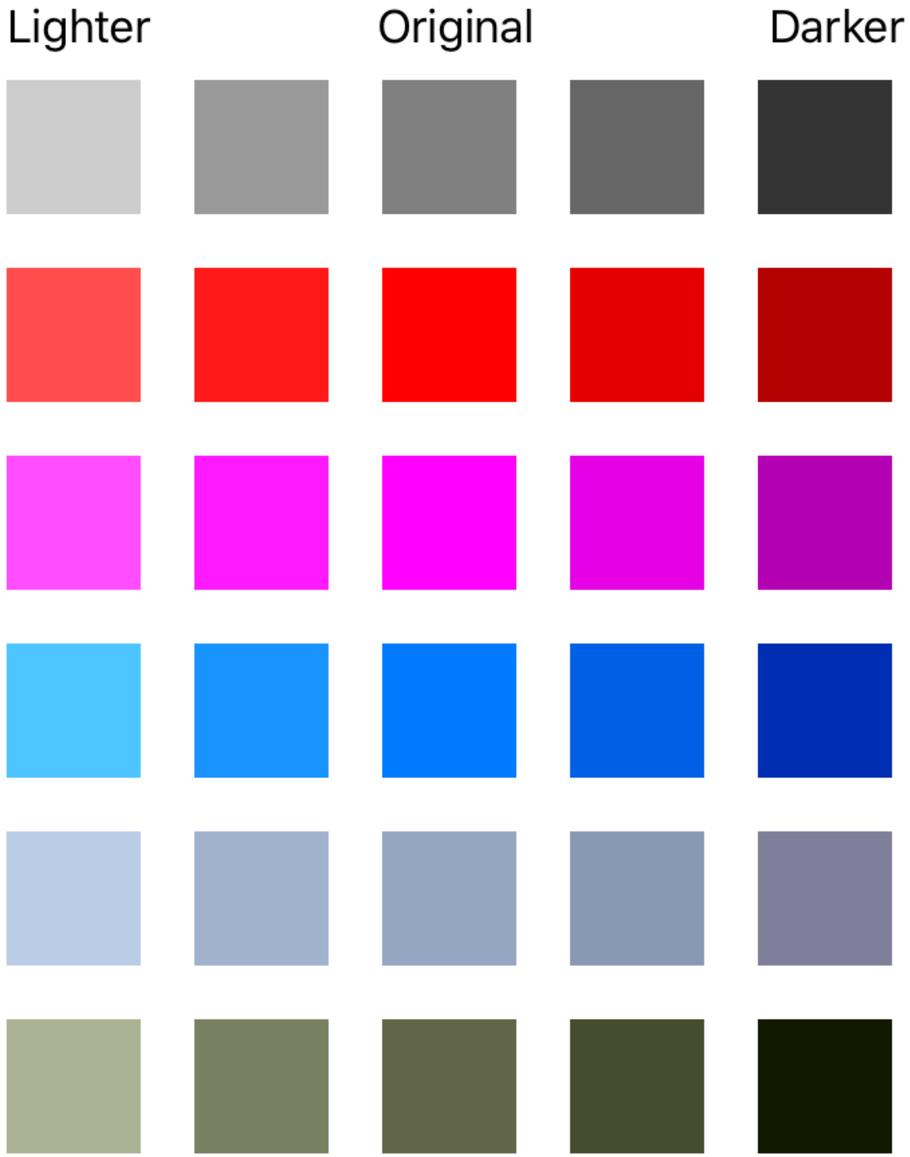

Yellow
Yellow-Green
Green
Green-Blue
Blue
Blue-Violet
Yellow-Orange
Orange
Red-Orange
Red
Red-Violet
Violet

Value

- Describe how light or dark a color appears



Value



Value: photo editing

https://www.fiverr.com/?source=top_nav

Saturation

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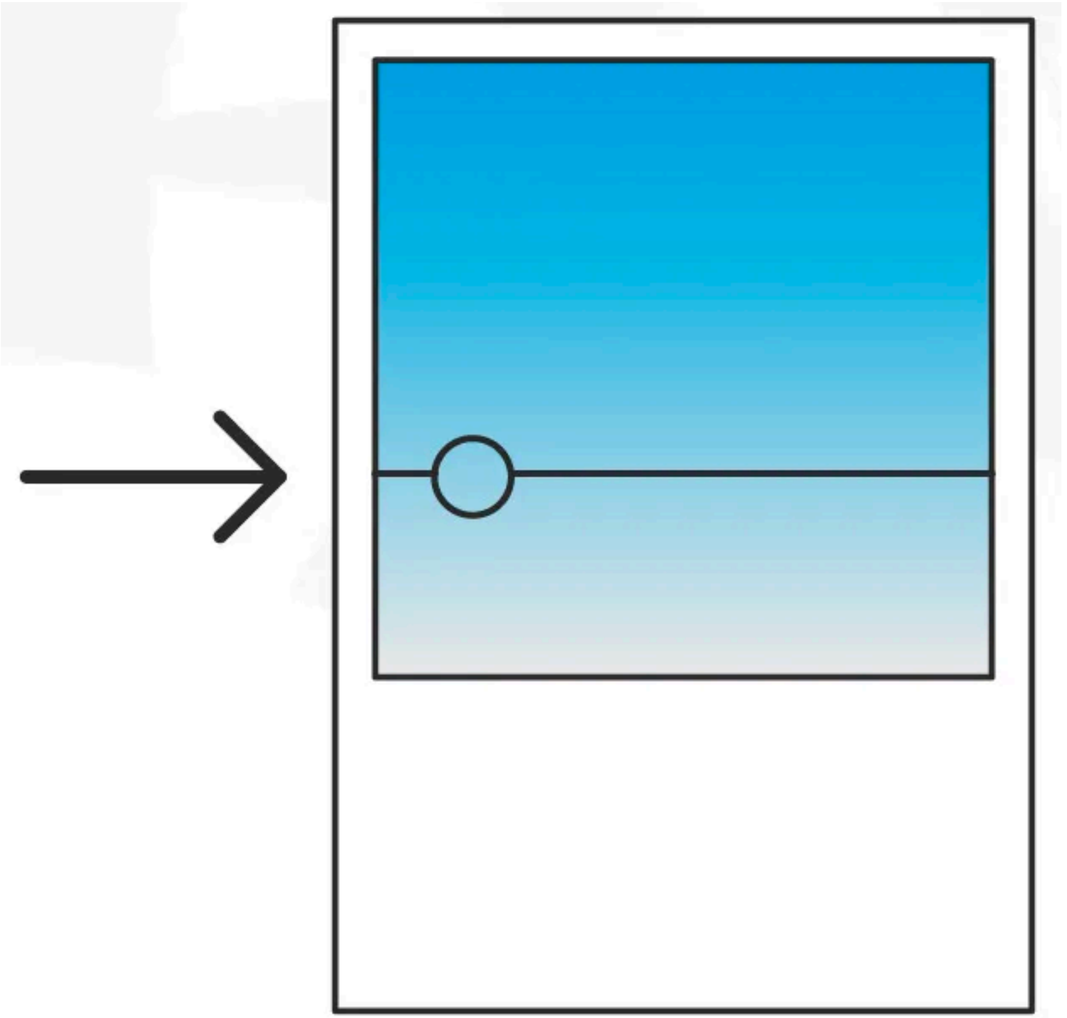
- Refer to the intensity of a color

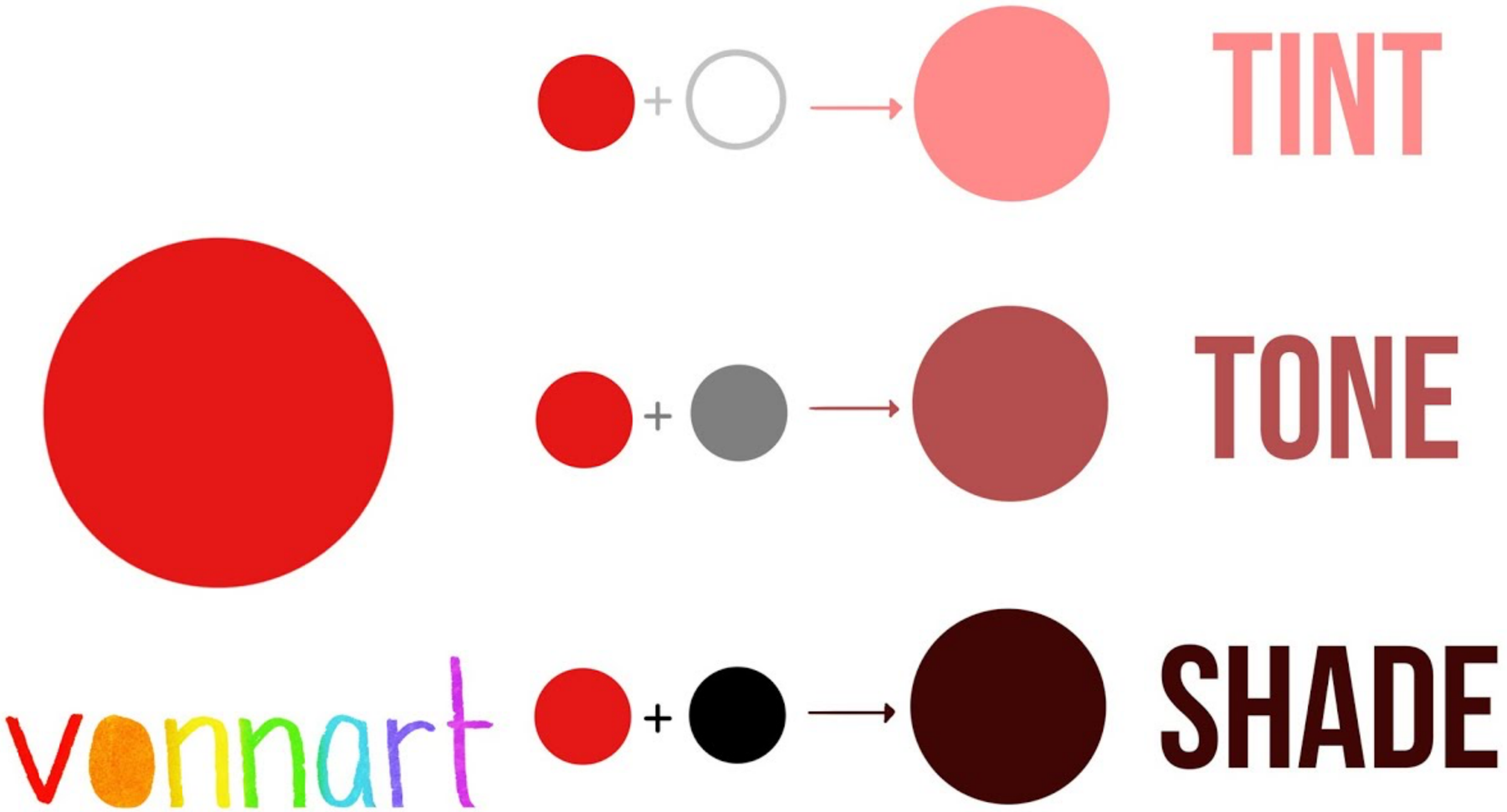


Saturation

Saturation: photo editing

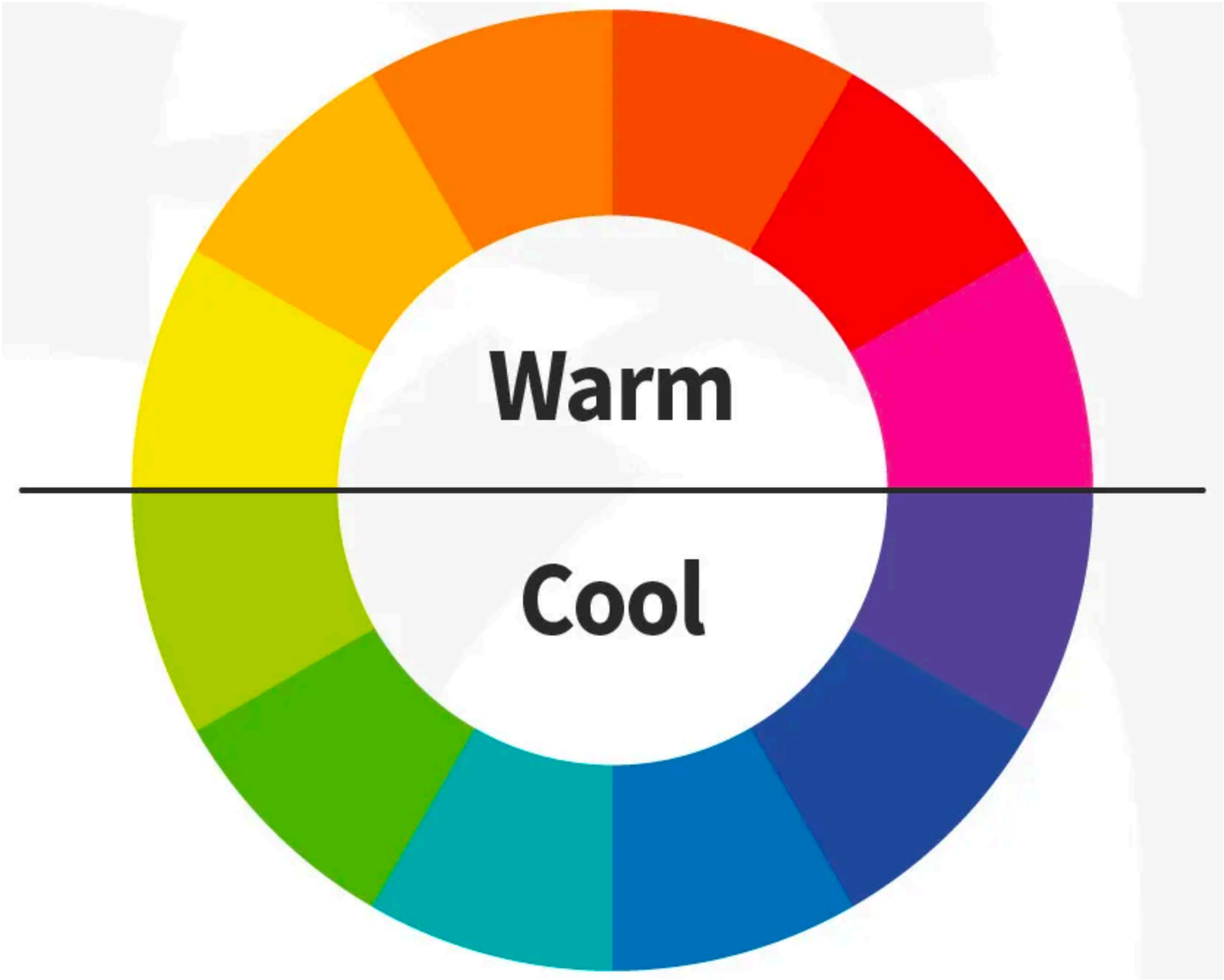
https://photovideocreative.com/en

Tint, tone, and shade

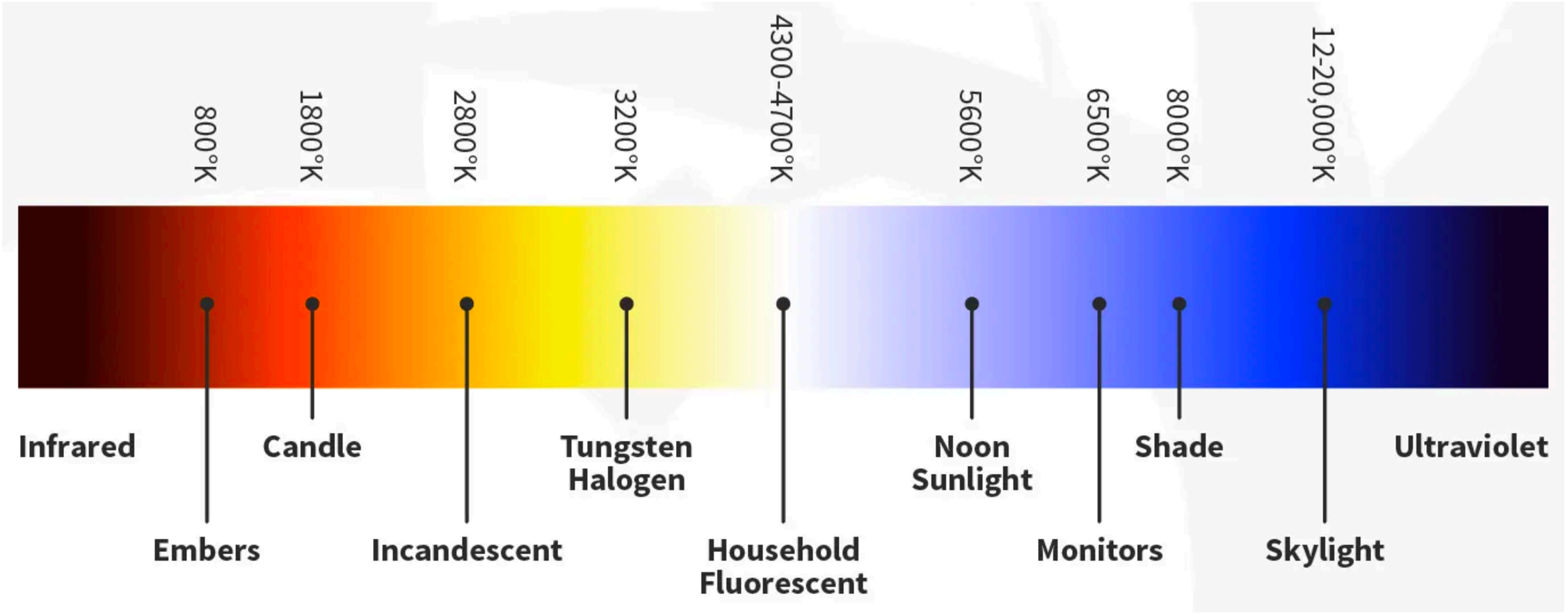


https://www.youtube.com/watch?v=dSf_C40iI6o

Warm and cool colors



Color temperature



Color schemes

- Monochromatic
- Analogous
- Complementary
- Triadic
- Split-complemetary
- Tetradic

Monochromatic

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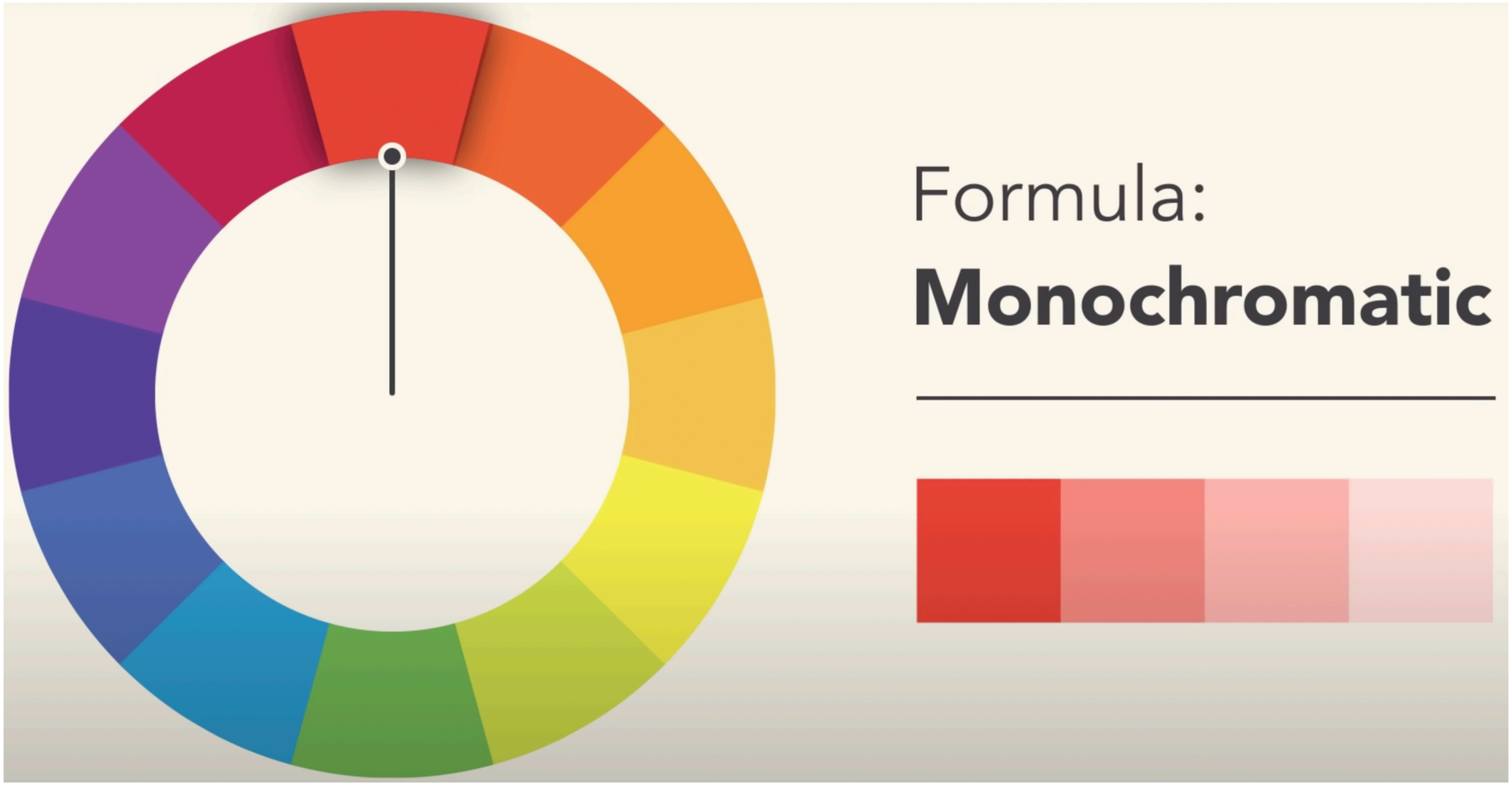
- Based on the colors created from different tints



Analogous

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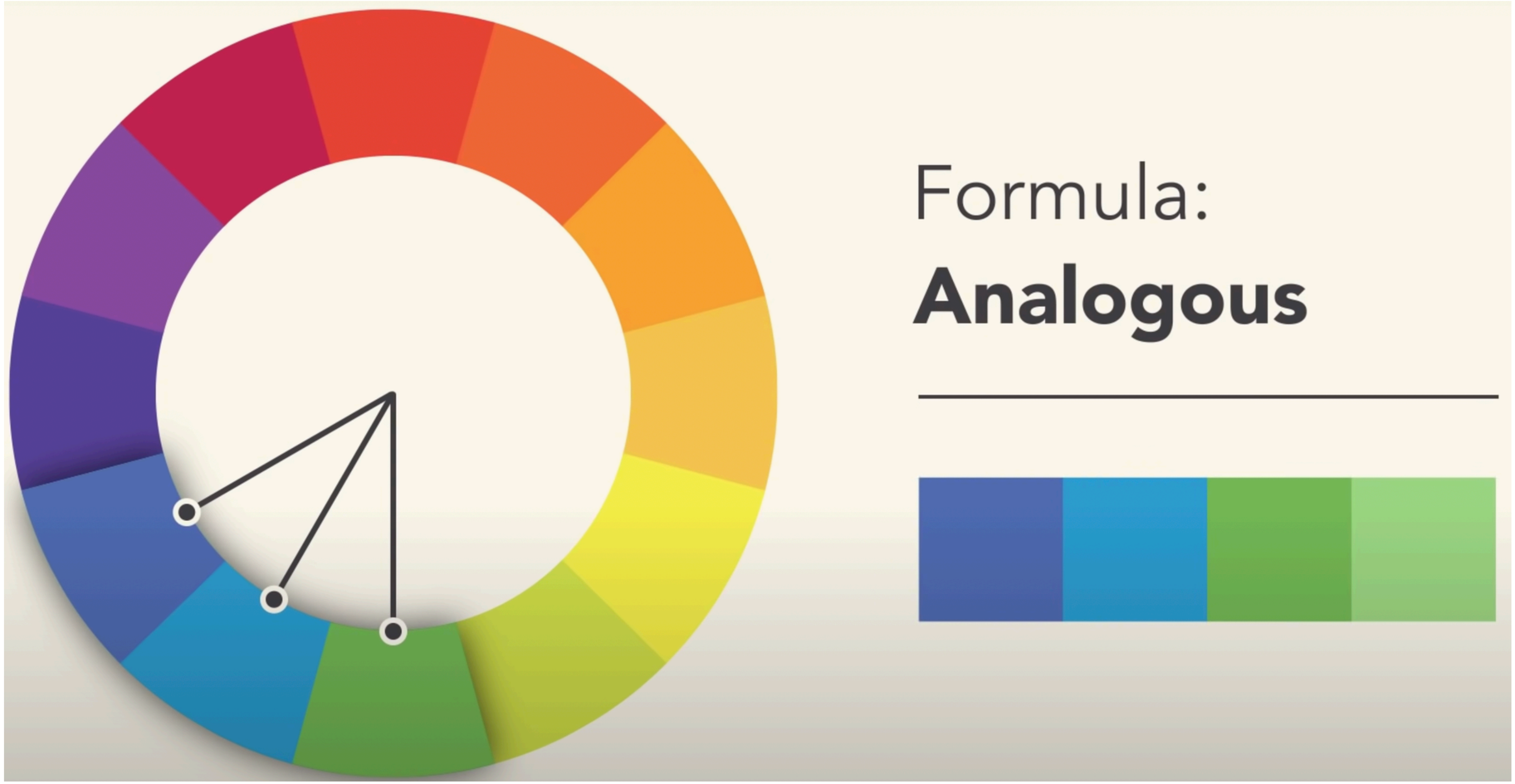
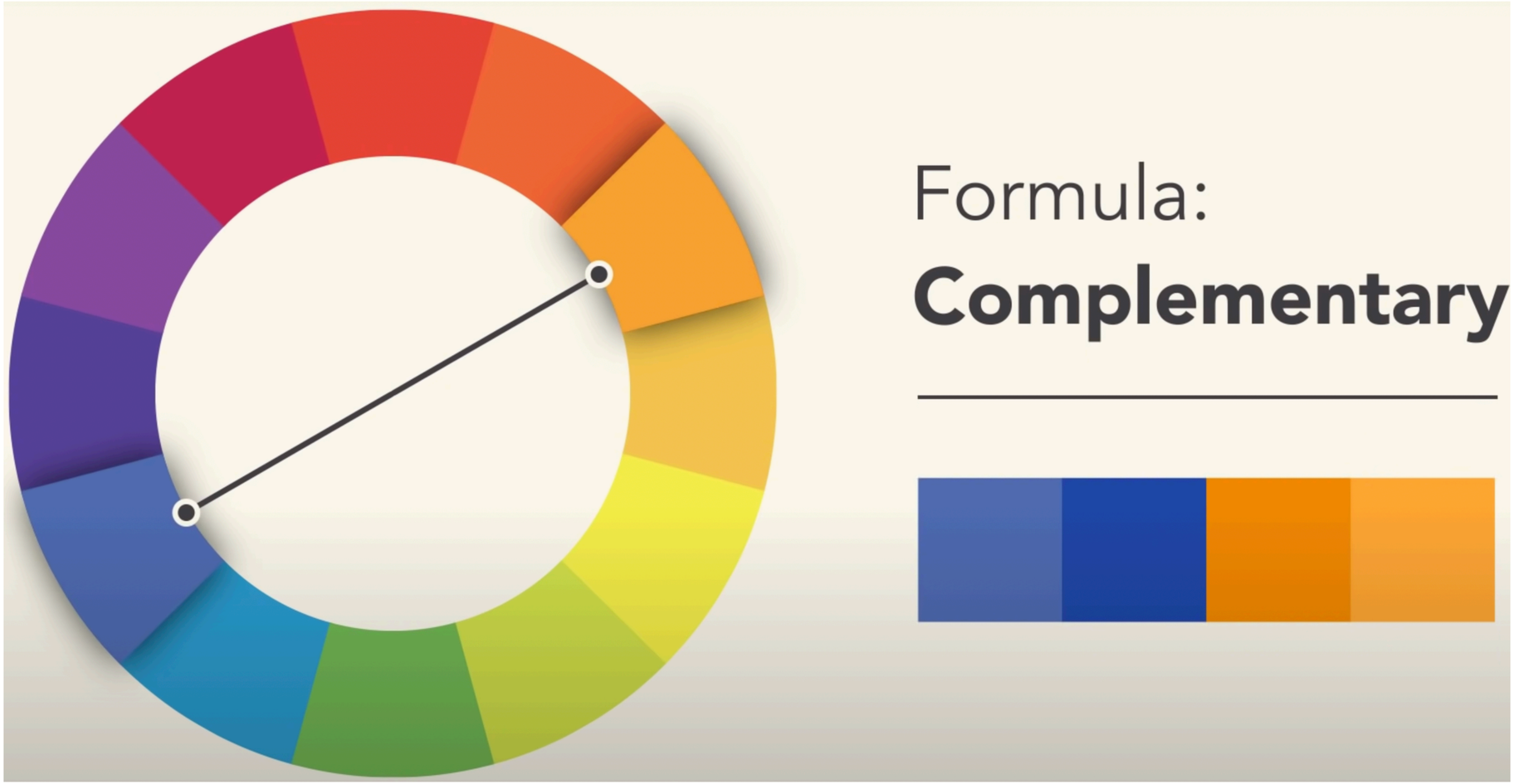
- Based on three colors located next to each other on the color wheel



Complementary

- Use one or more pairs of colors that cancel each other or neutralize one another



Triadic

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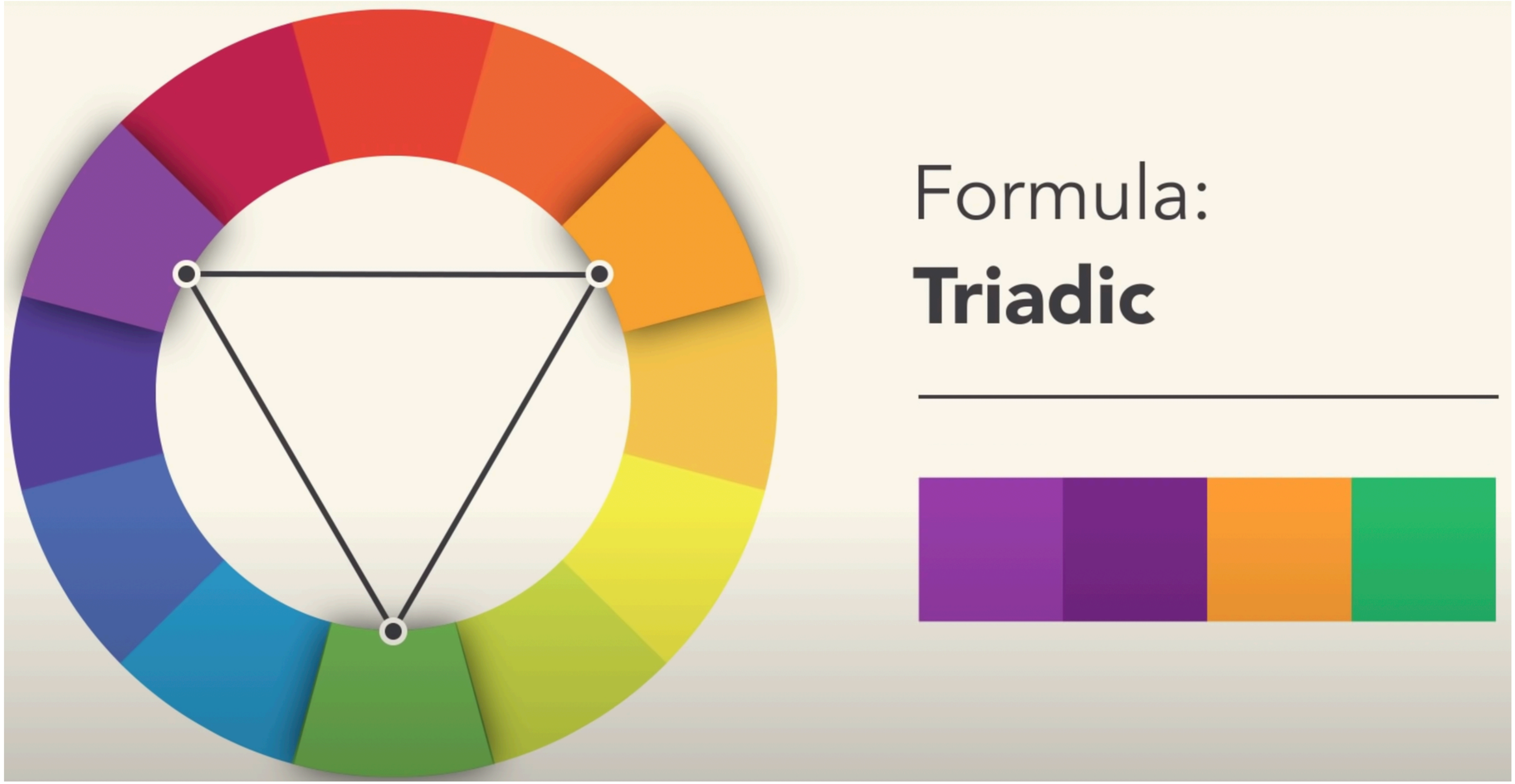
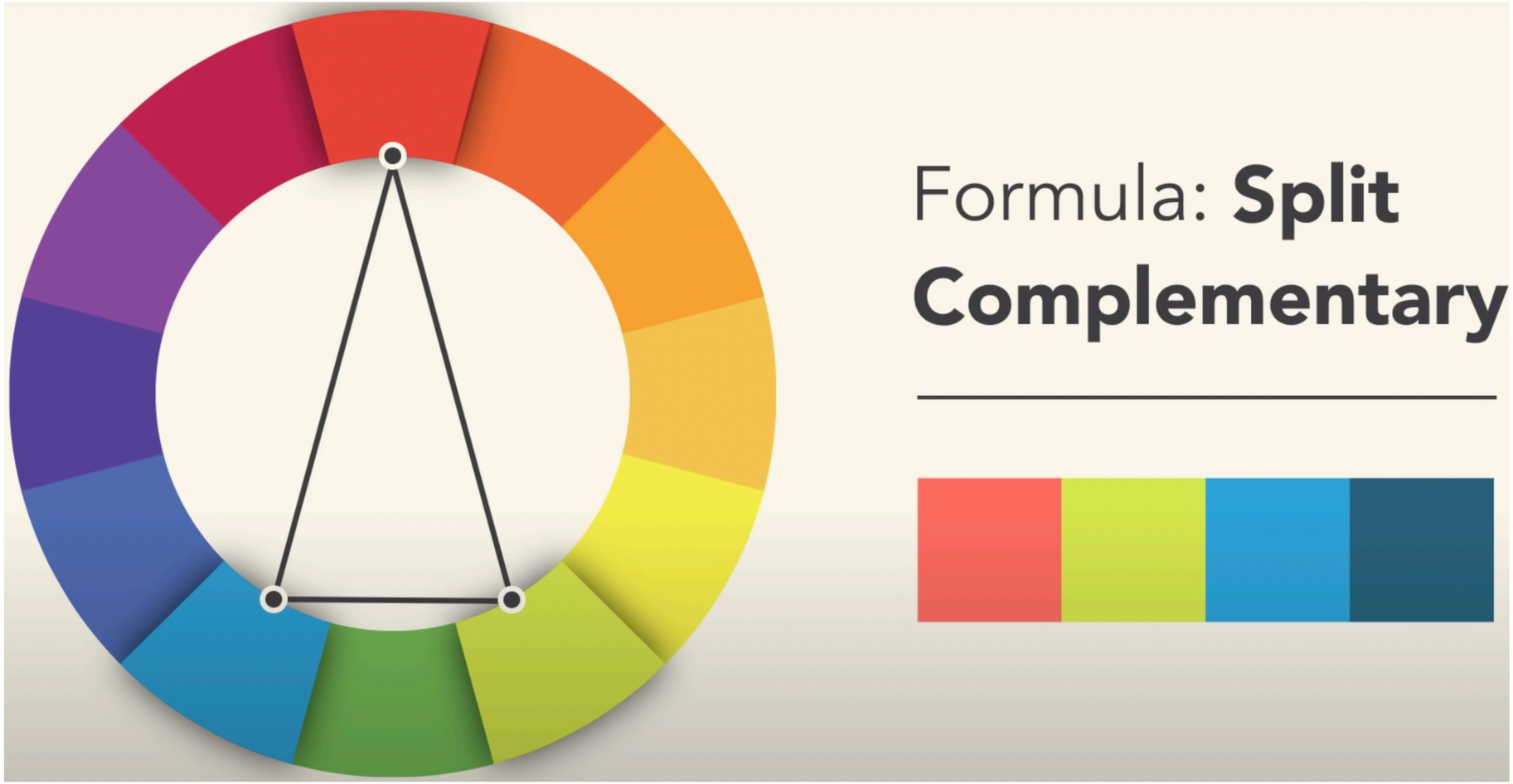
- Based on the use of three colors at equal distances from each other on the color wheel



Split-complementary

- Combine of the use of a complementary color scheme and an analogous color scheme



Tetradic

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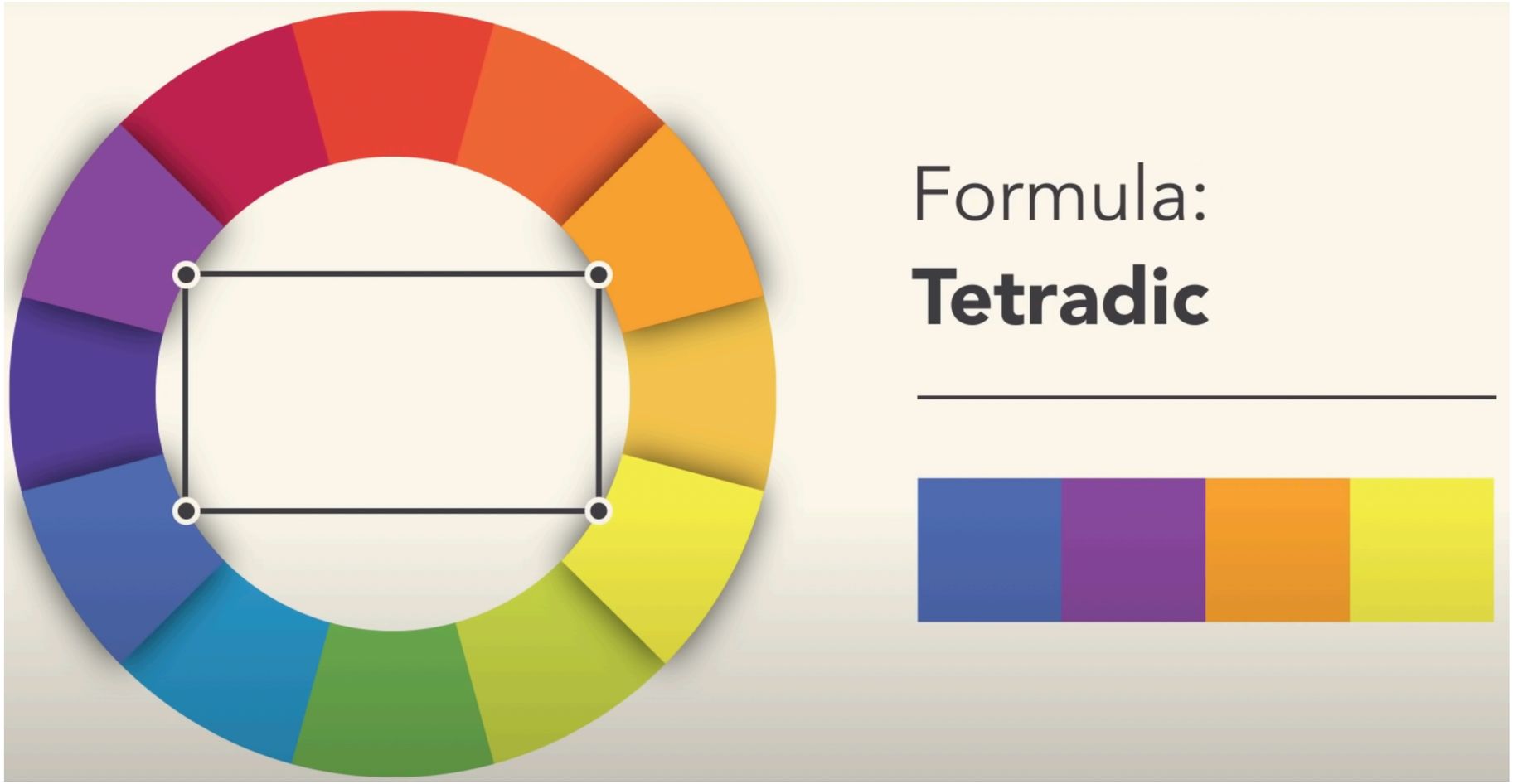
- Utilize two sets of complementary pairs (four colors total)



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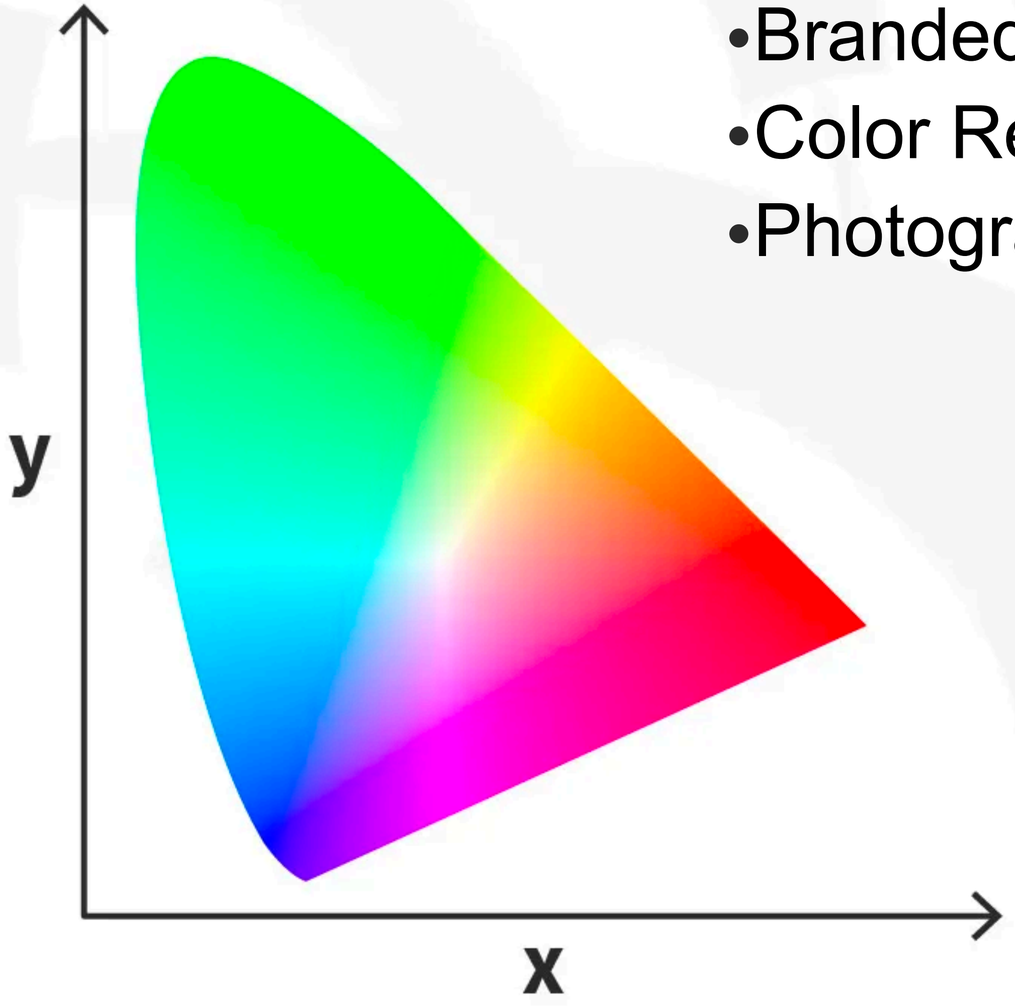
Color modes

LAB

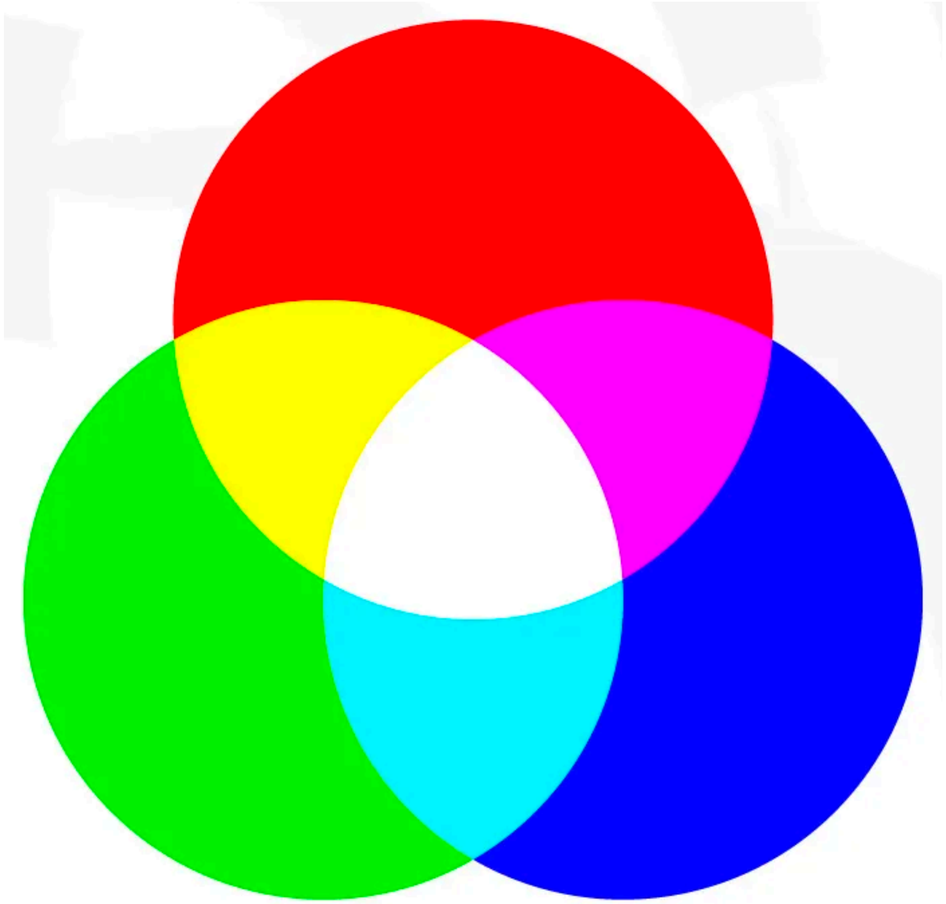
- Based on the human perception of color



- Branded Products (e.g., t-shirts, coffee mugs)
- Color Reference
- Photography

RGB

- Consist of red, green, and blue hues that combines to create extensive variations of colors.



- Web & App Design
- Digital Design
- Social Media
- Online Advertisements

CMYK

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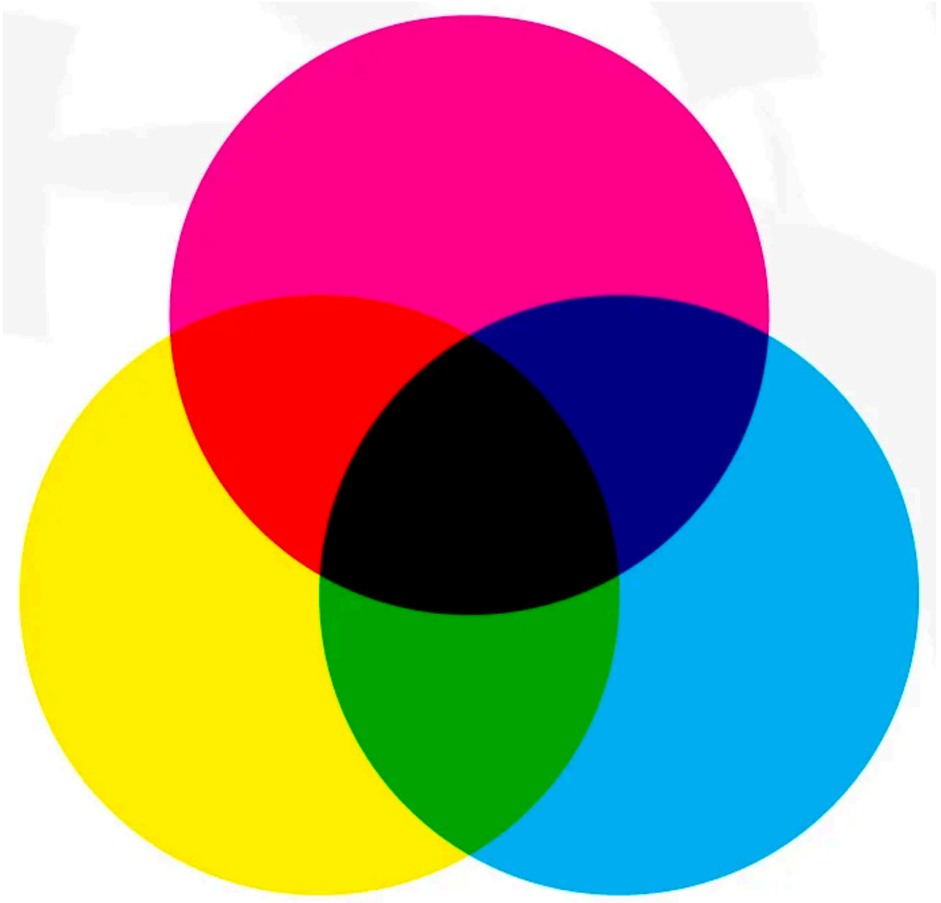
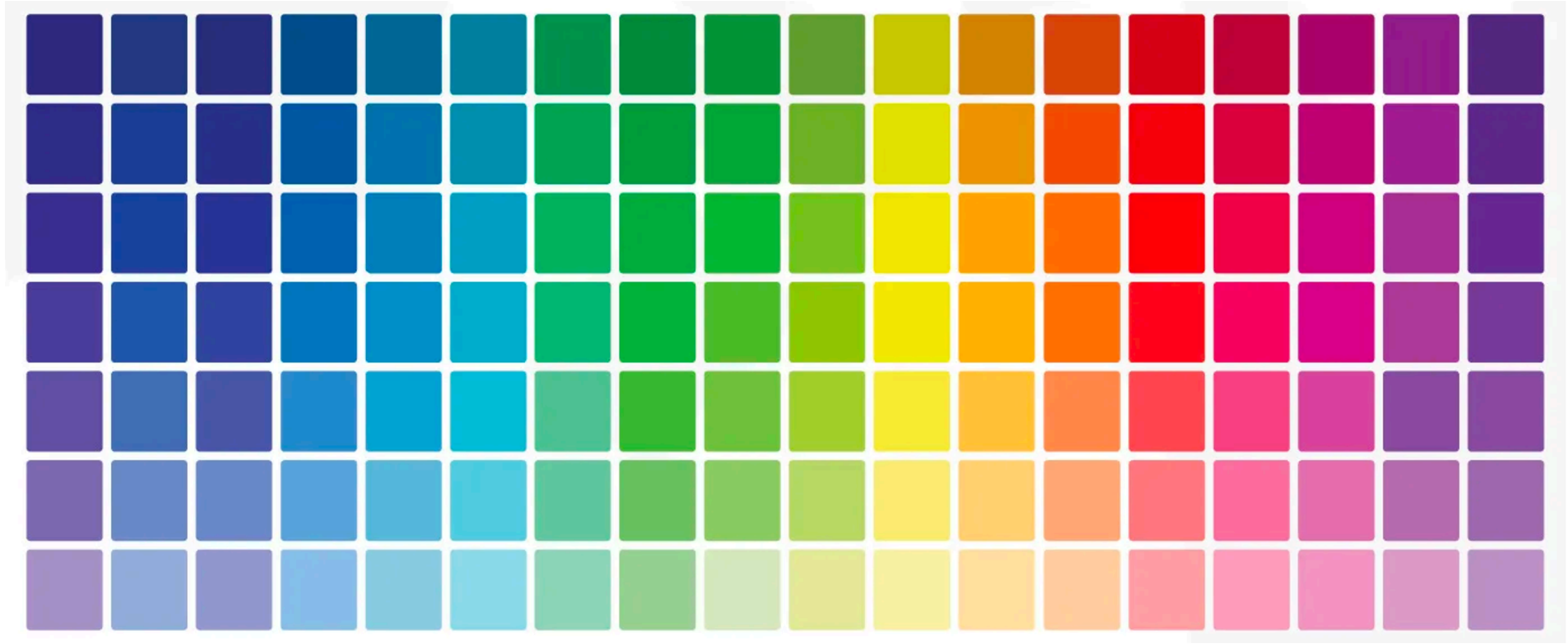
- Consist of cyan, magenta, yellow, and key (black) that combine to produce a range of hues



- Stationery (e.g., business cards, letterhead)
- Advertising (e.g., posters, flyers, brochures)
- Product Packaging

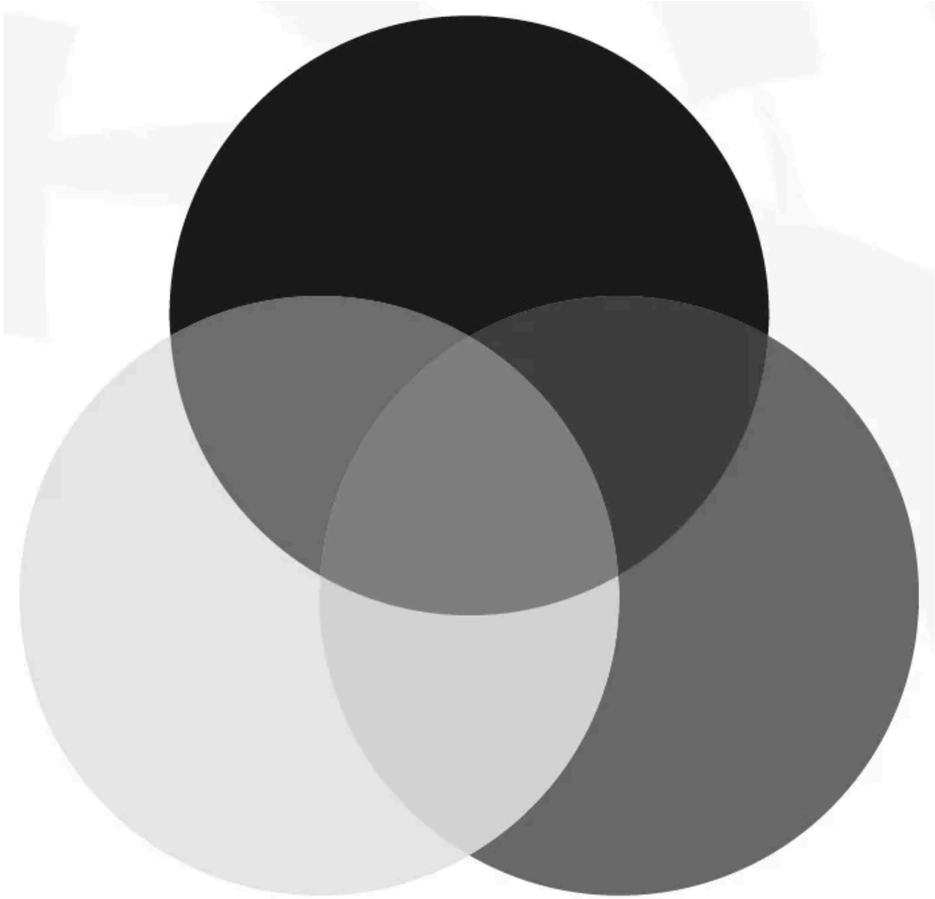
- Produces 8 bit image files with up to 256 colors



- Websites
- Digital Presentations
- Mobile Applications

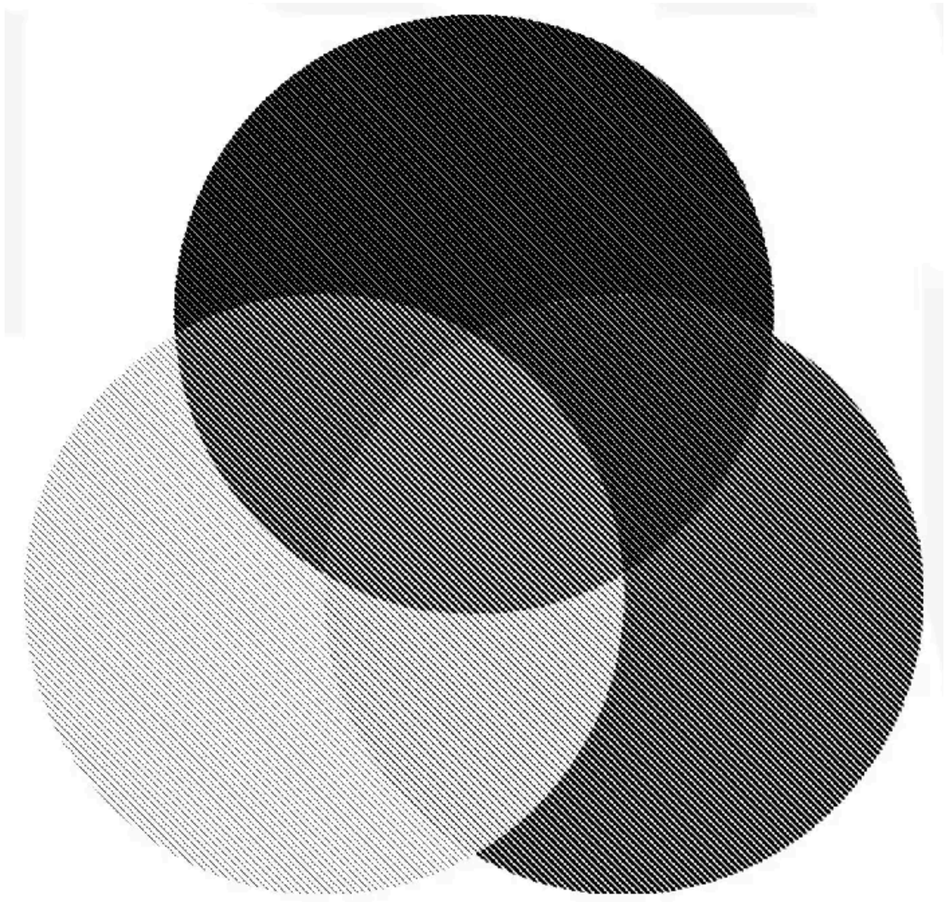
Grayscale

- Consist of different shades of grey within an image



Bitmap

- Consist of black and white pixels



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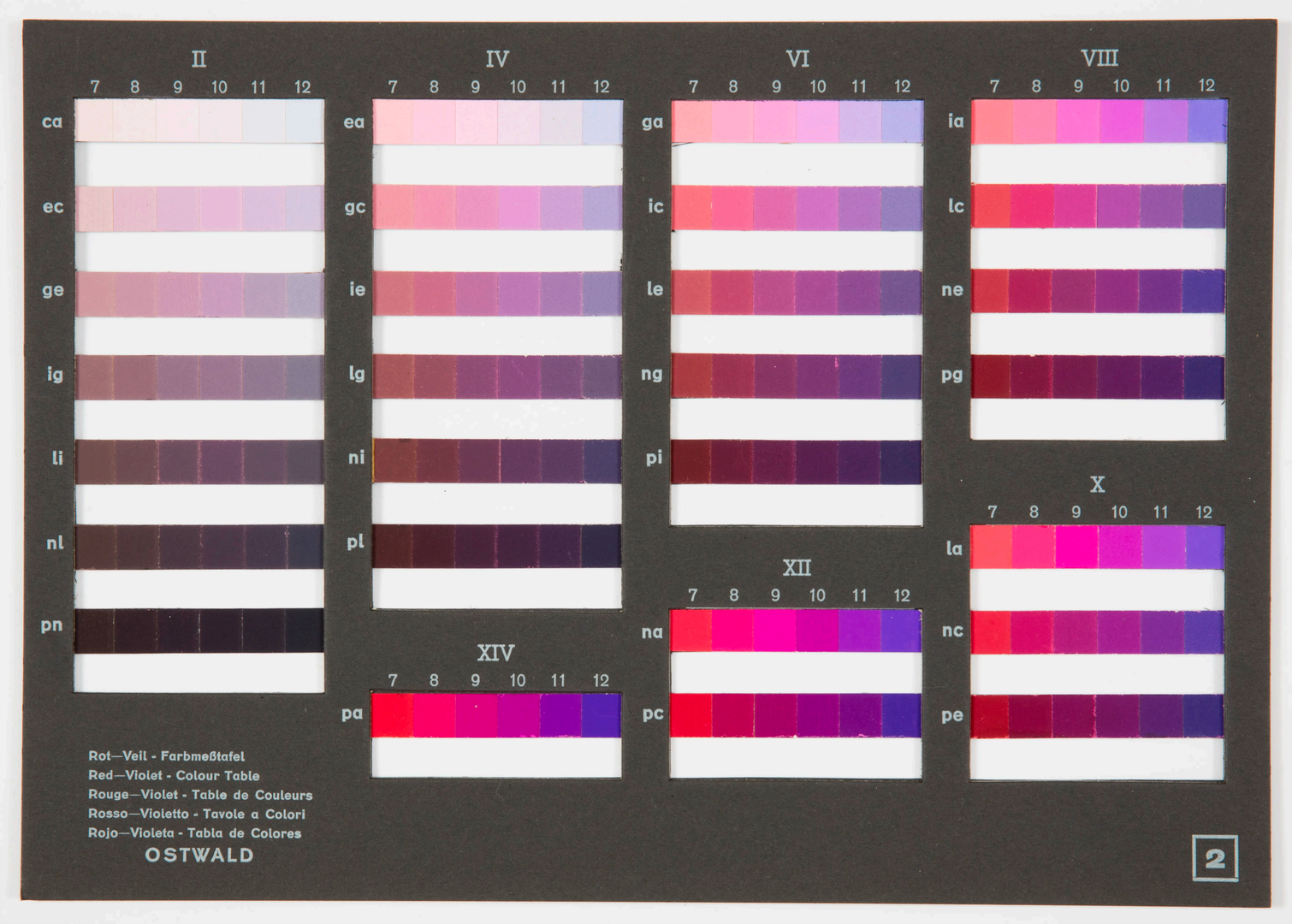
Color systems

- Ostwald color system (1916)
- Munsell color system (1930s)
- The color harmony manual (1942)
- Pantone matching system (1963)

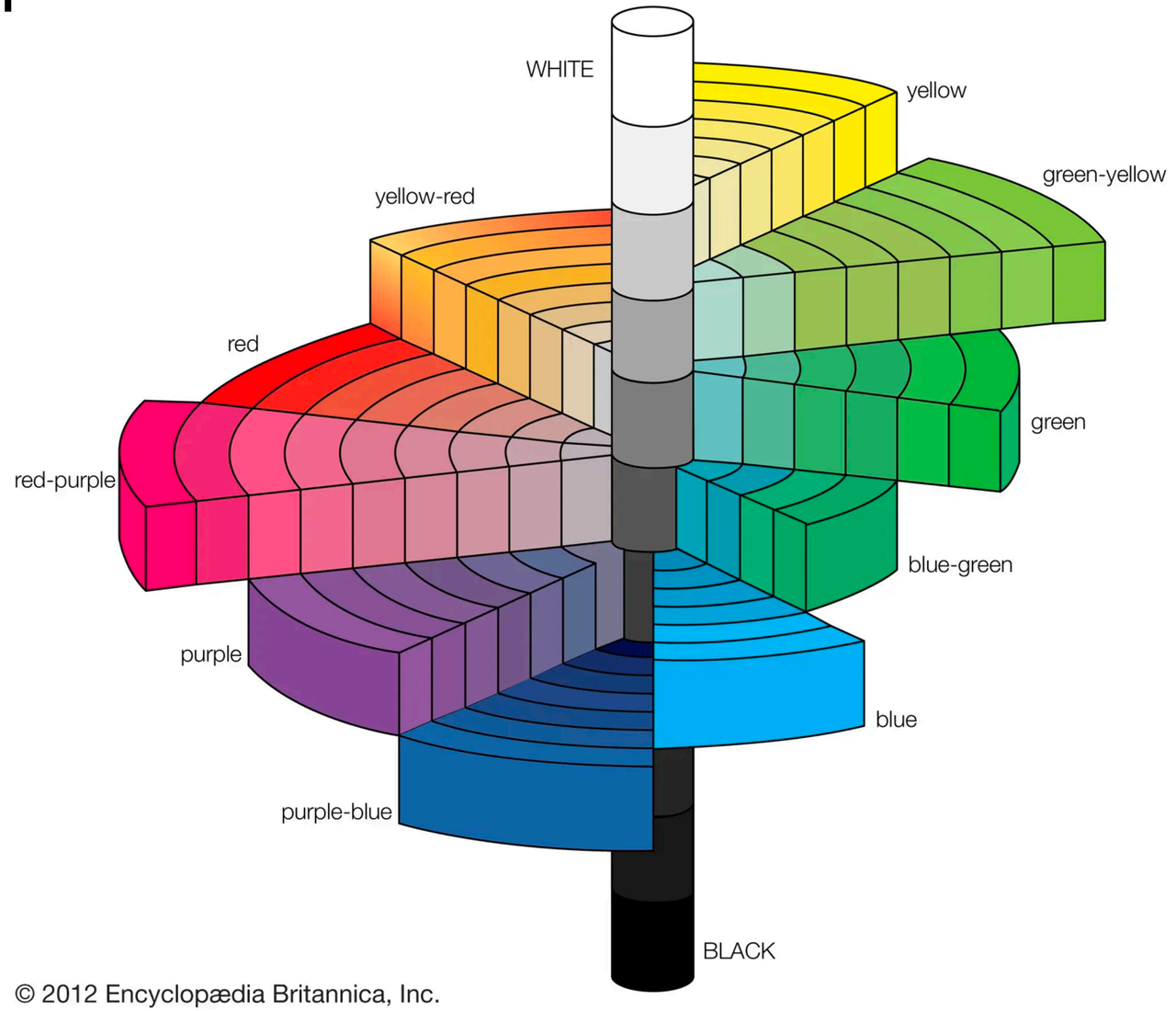
Ostwald color system

- Organize color into tables, scales, charts and atlases



Munsell color system

- Quantify color



The color harmony manual

- Used for color selection and specification

Pantone matching system (PMS)

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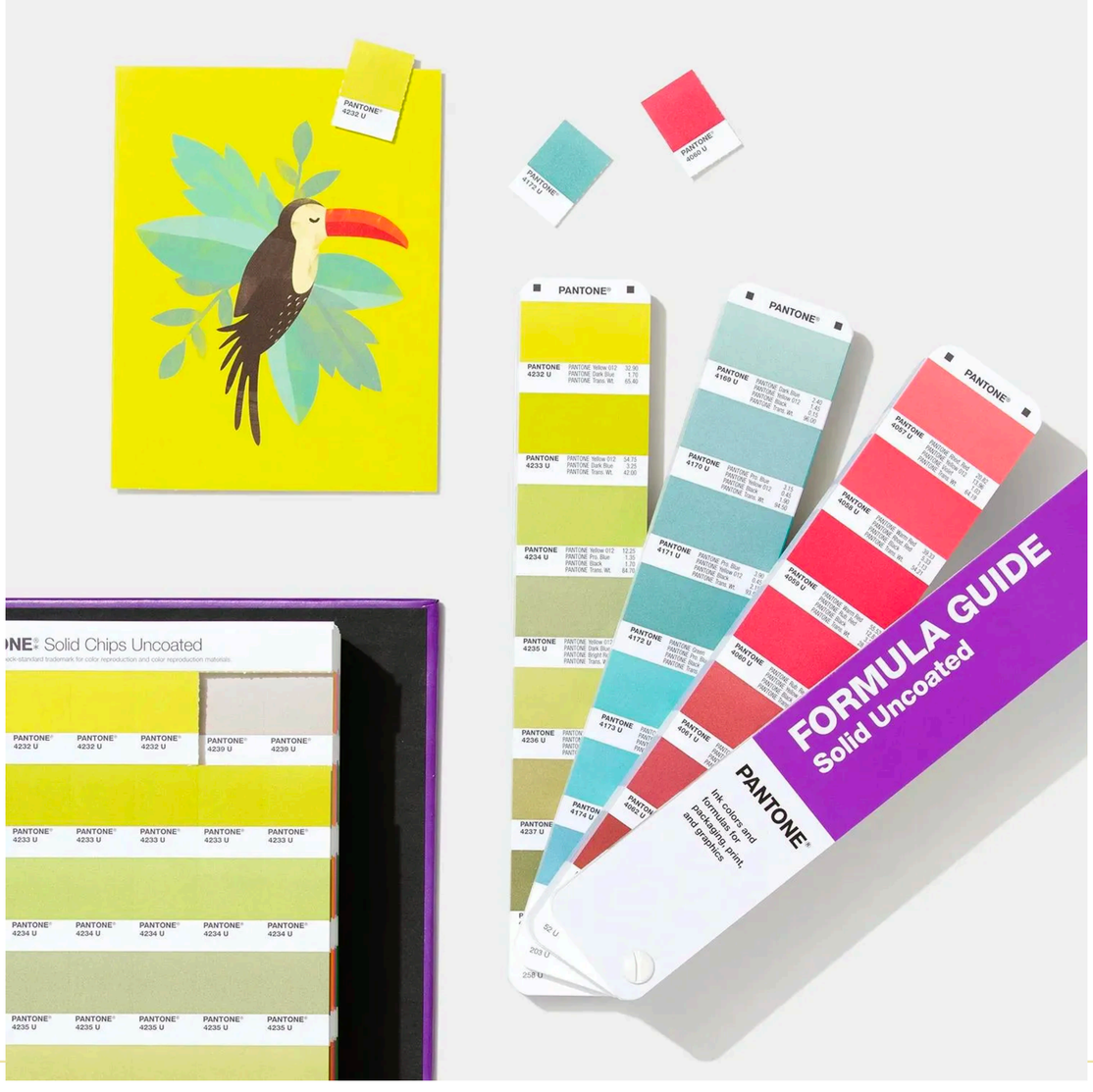
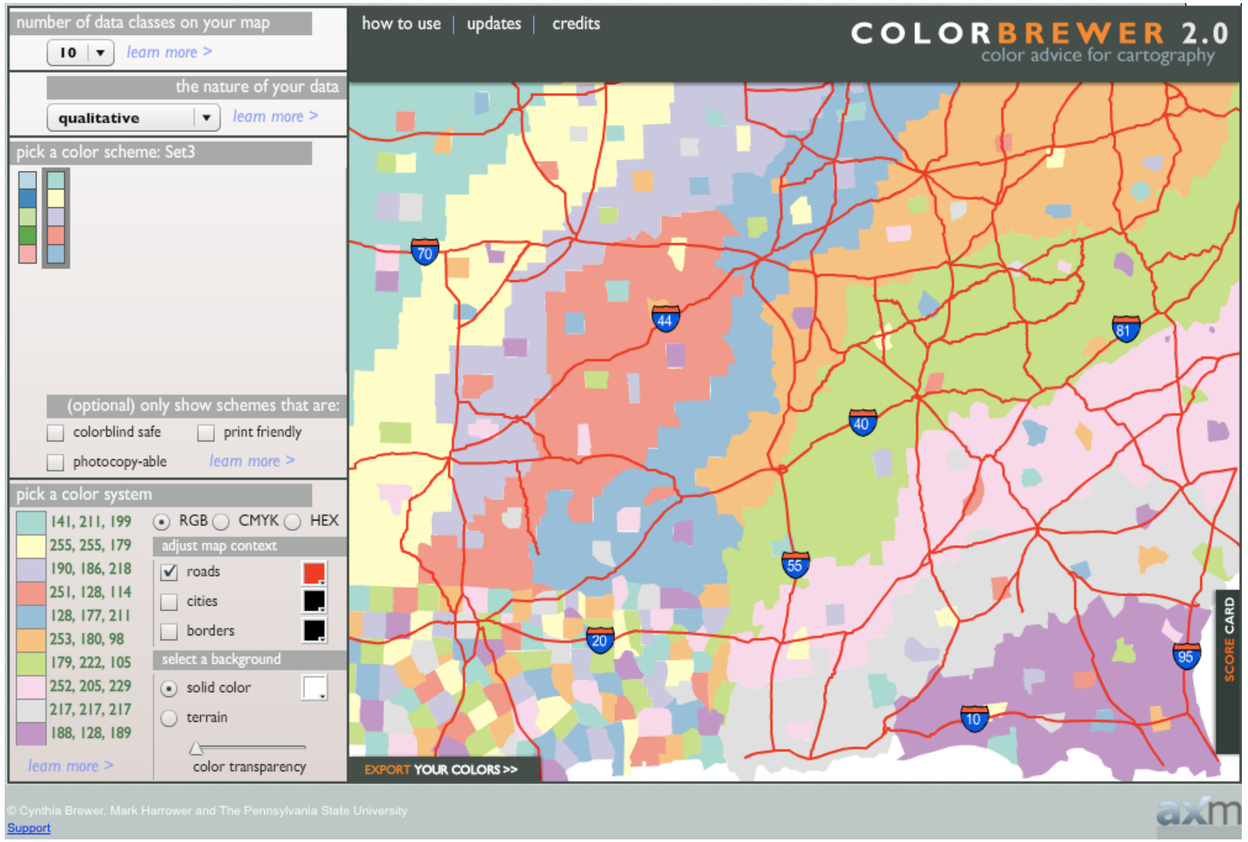
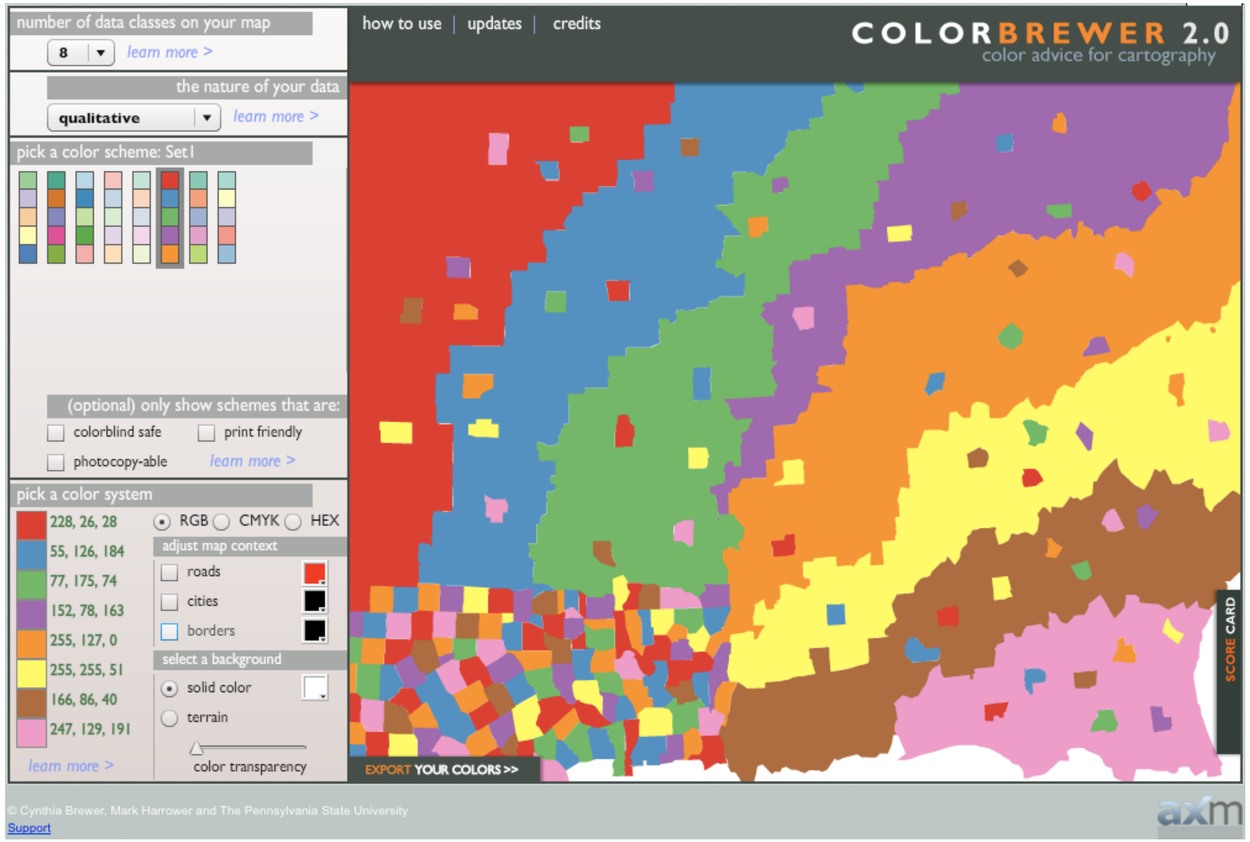
- Standardize colors for printing



ColorBrewer





http://www.colorbrewer2.org

Adobe color picker

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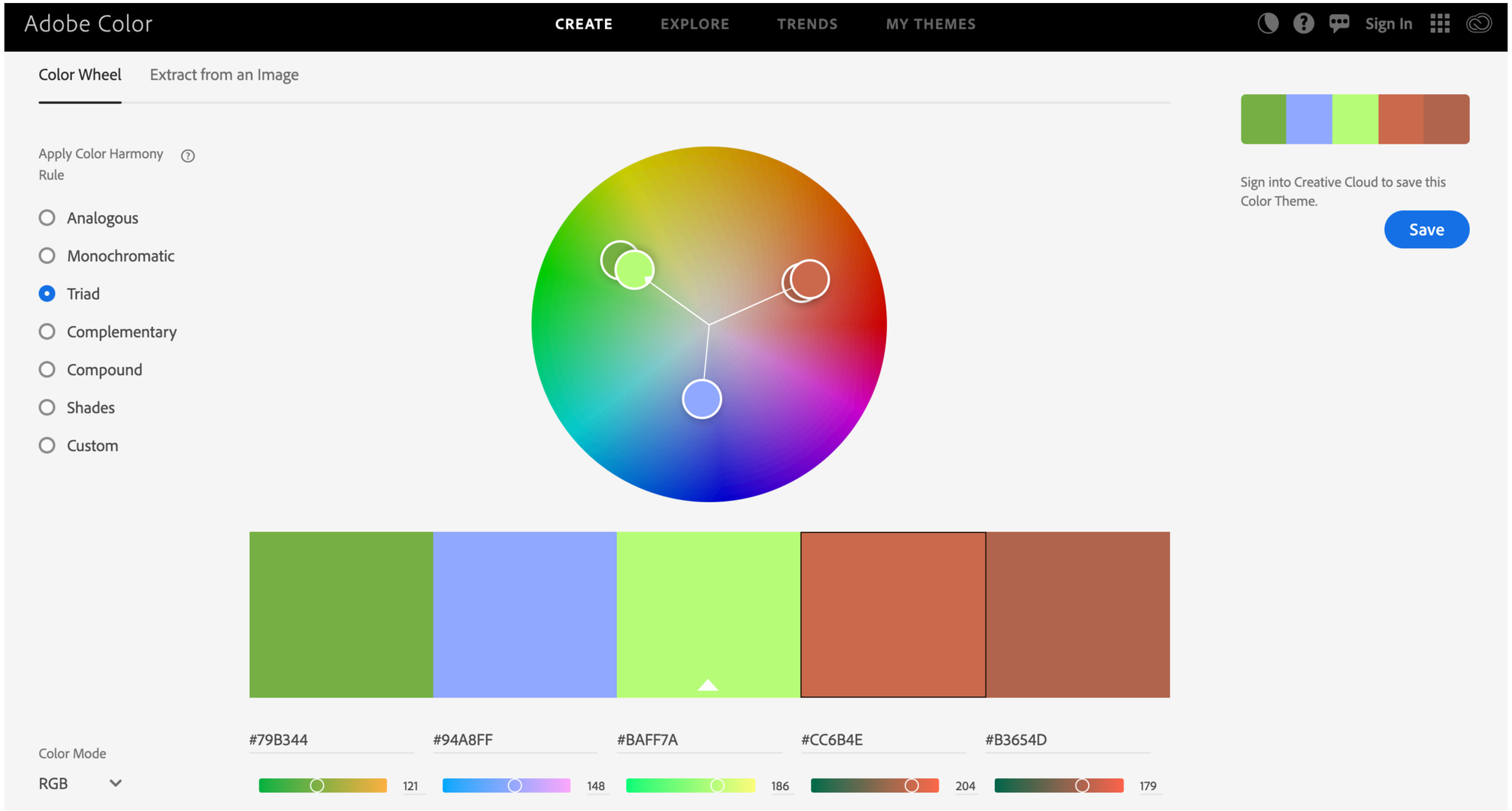
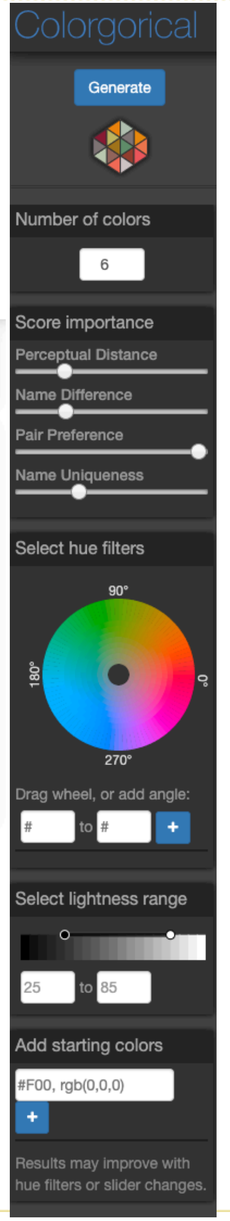


https://color.adobe.com/create

Colorgorical



http://vrl.cs.brown.edu/color

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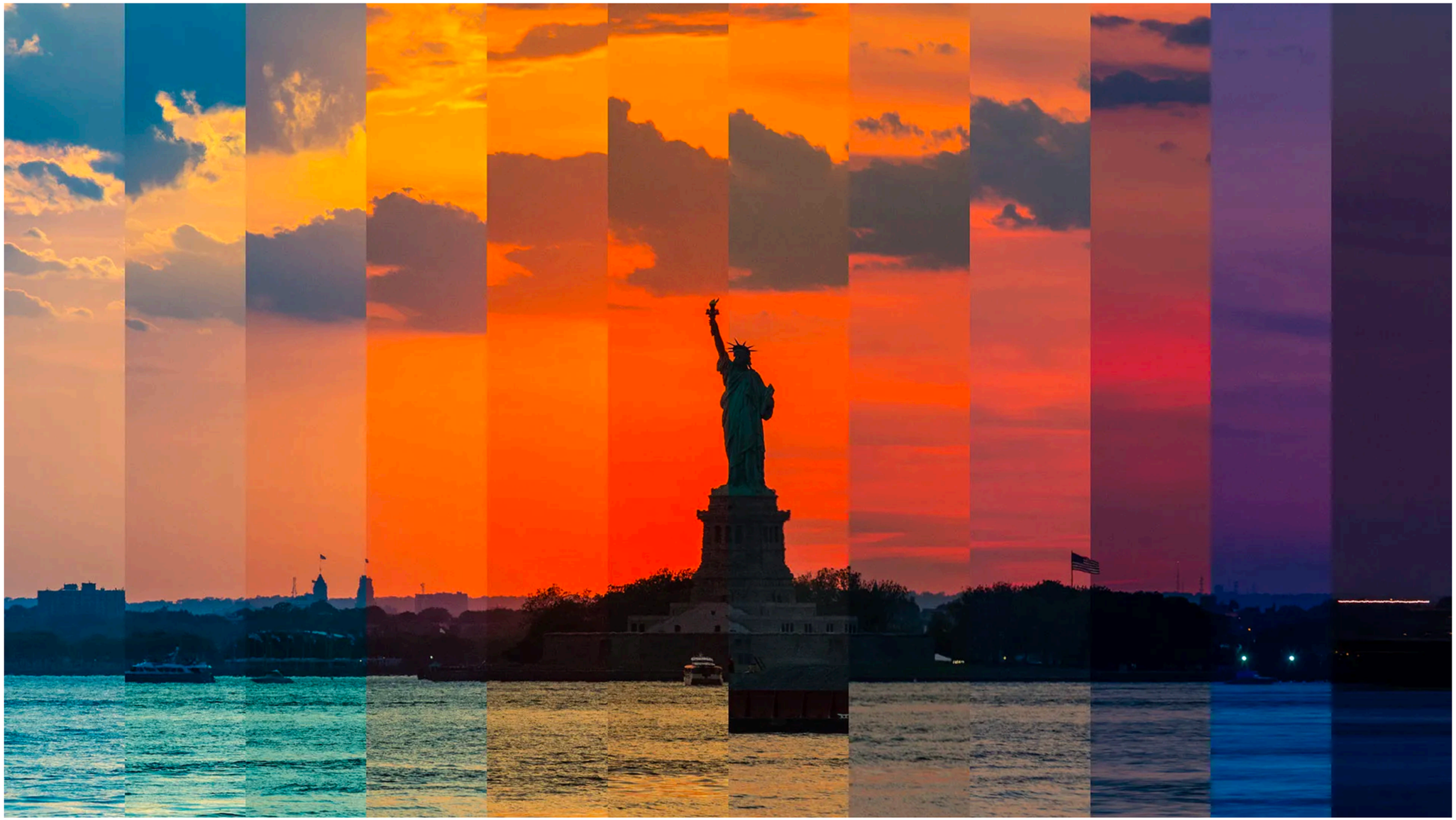
Why color changes

- Daylight is constantly changing
- Changing a light source changes what colors we see
- Colors appear to change depending on what colors surround them
- Colors that appear to match in one setting do not match in another

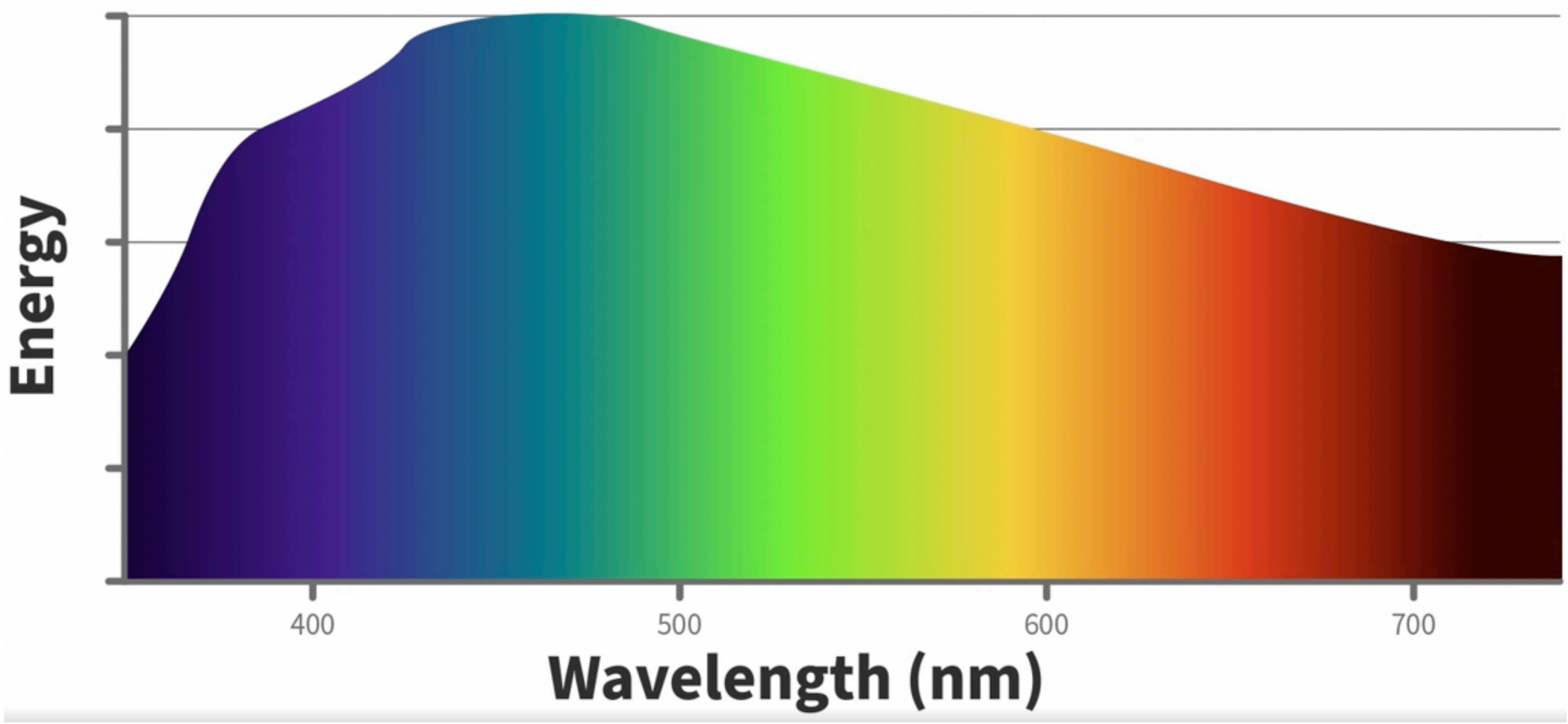
Daylight changes



Daylight changes

Light source changes

daylight



Light source changes

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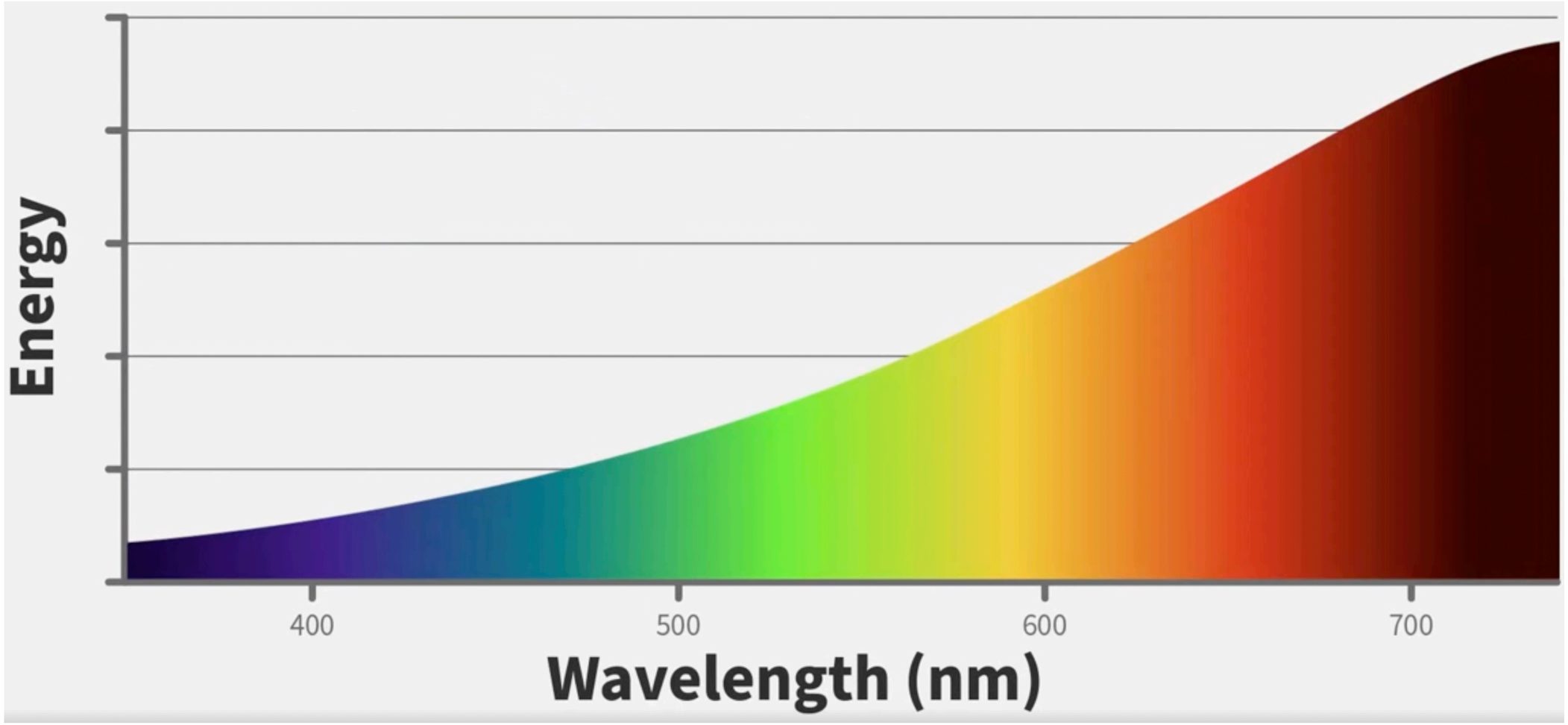
incandescent



Light source changes

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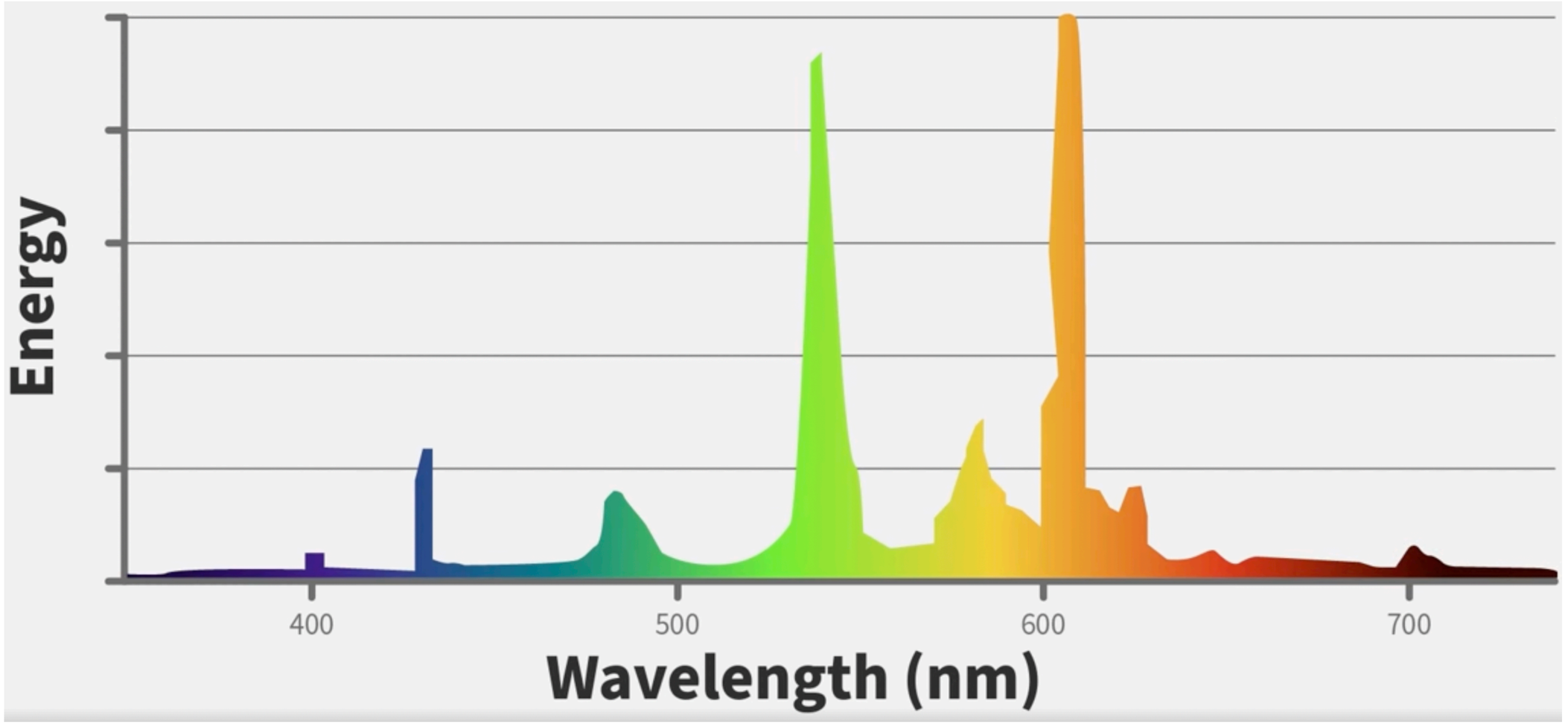
Fluorescent



Light source changes

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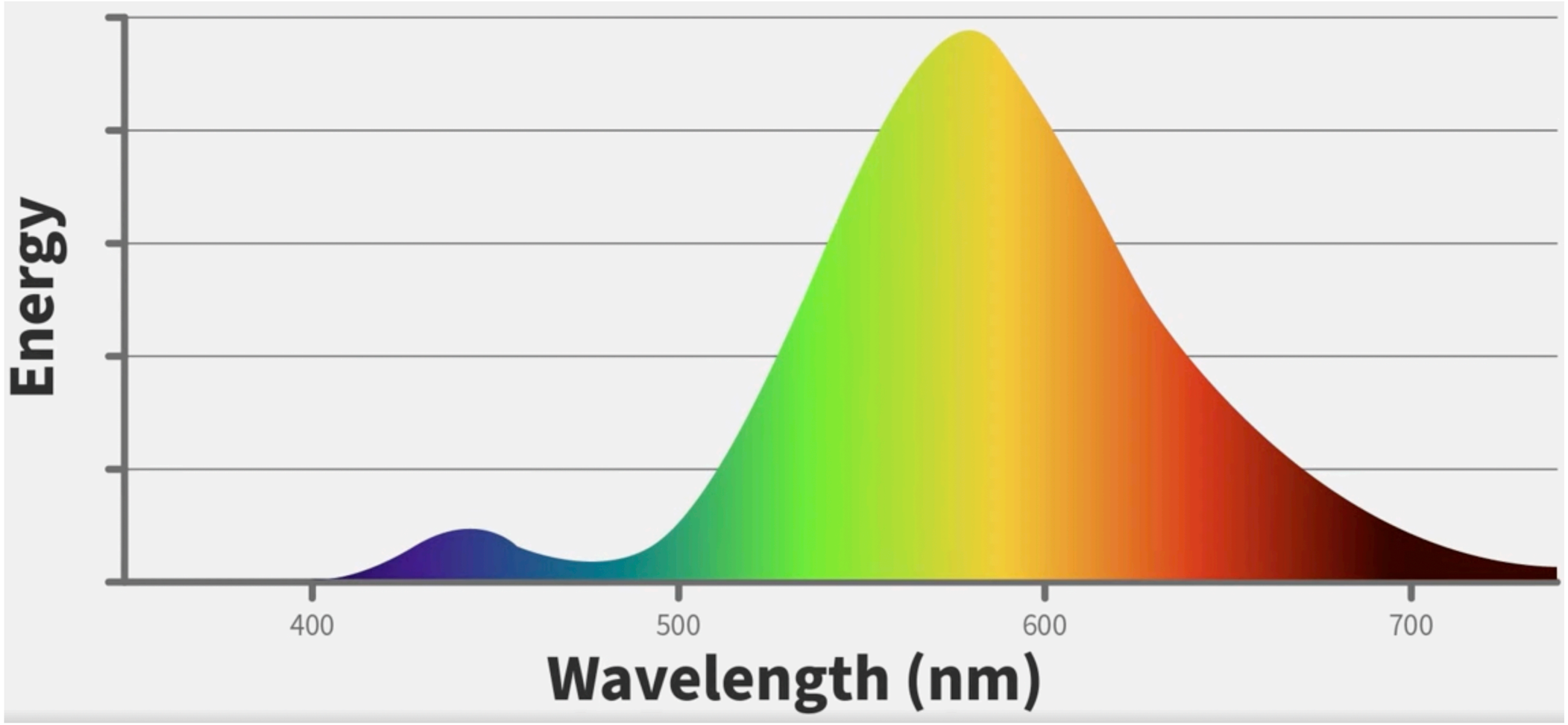
white light LED



Light source changes

Incandescent

LED

Fluorescent

Depending on the surrounding colors

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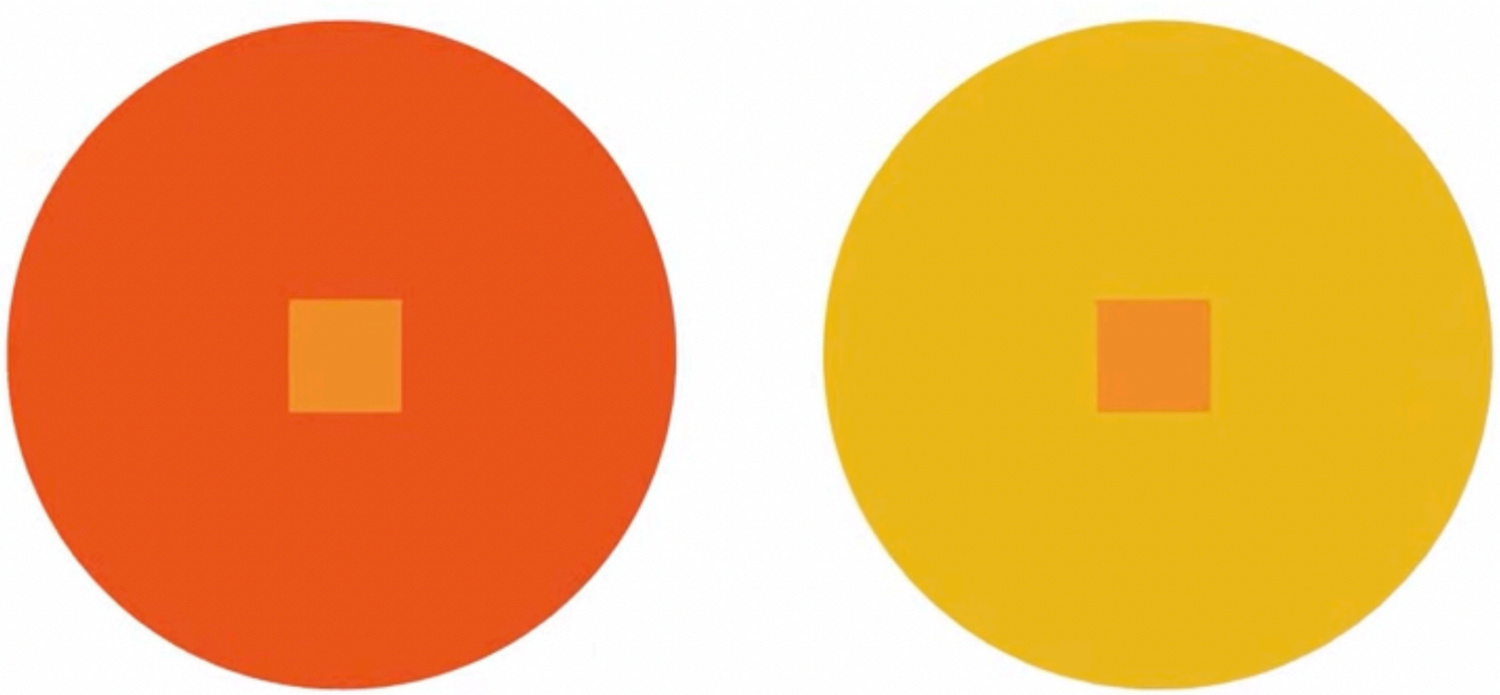
- Simultaneous contrast



Depending on the surrounding colors

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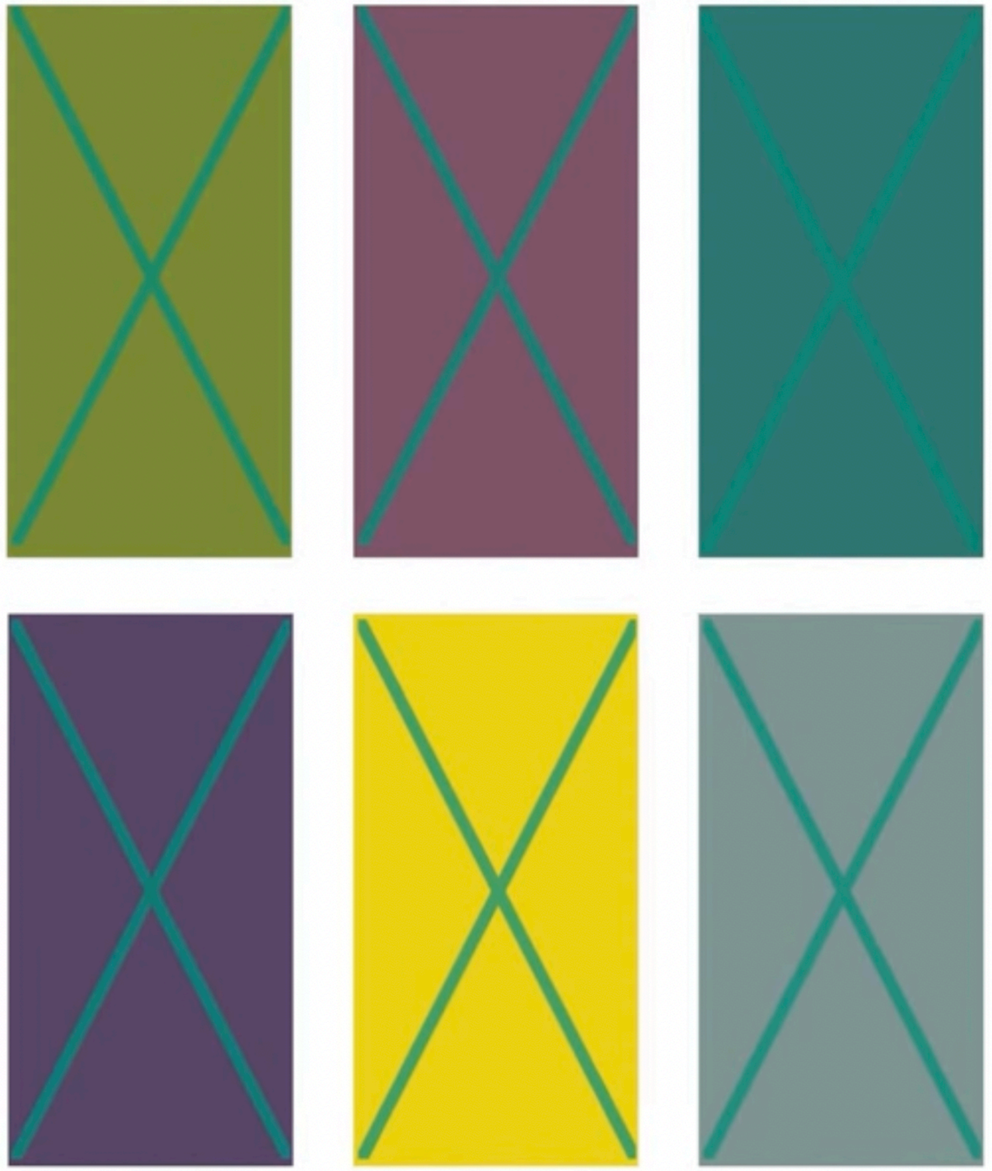
- Simultaneous contrast



Depending on the surrounding colors

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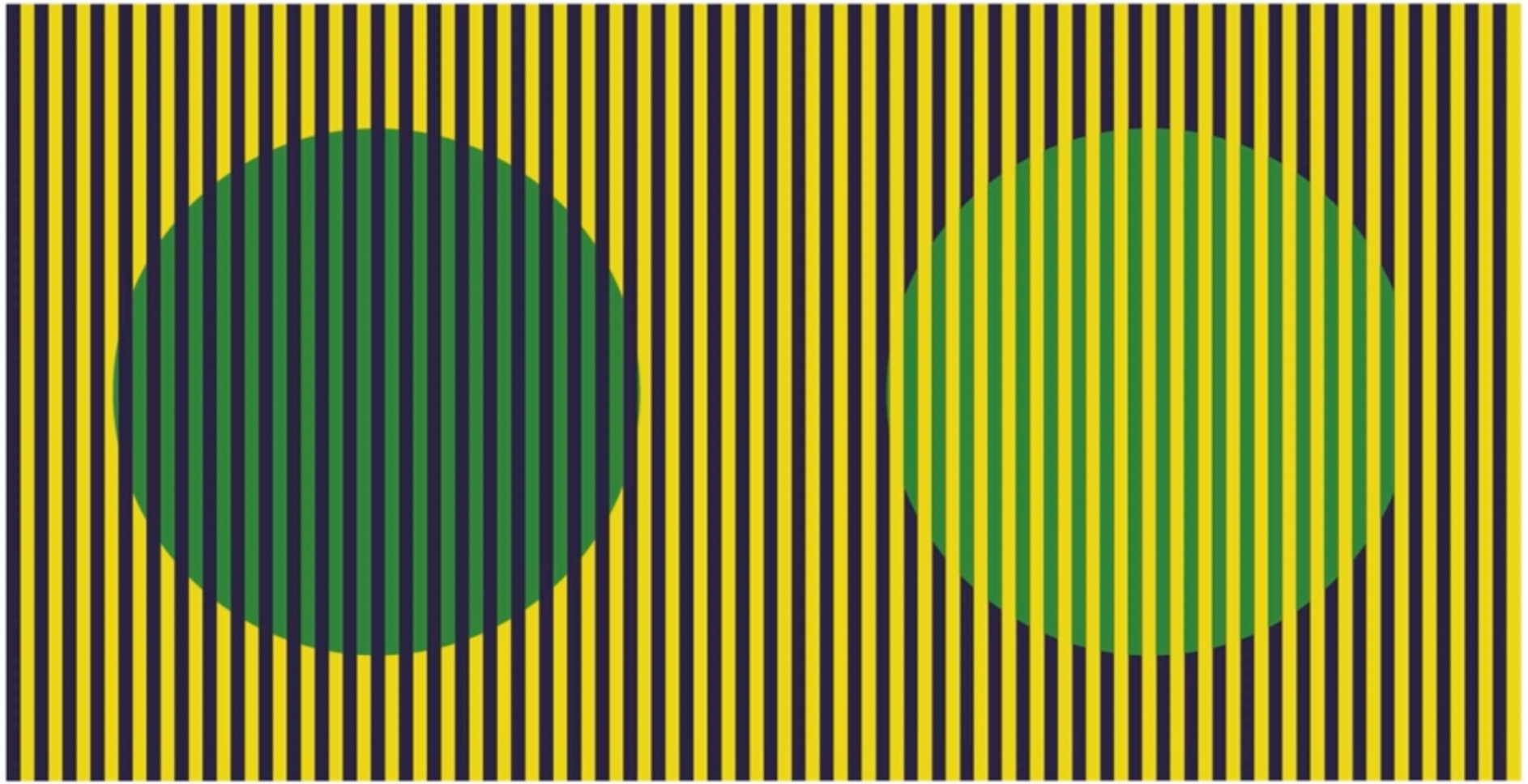
- Simultaneous contrast



Matching

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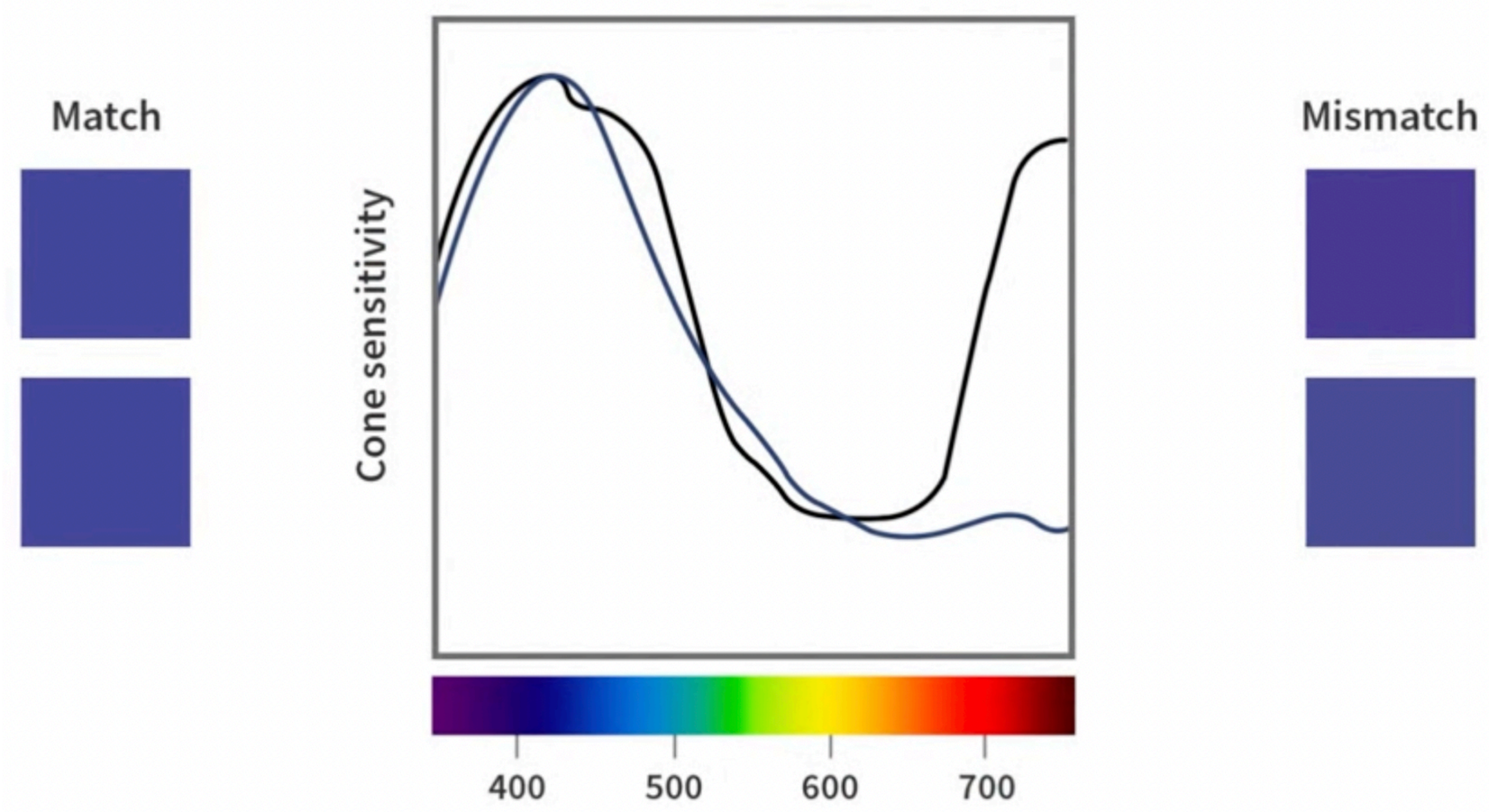
- Metamerism



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How to use color

- Light quality
- Usage
- Architectural emphasis
- Space configuration

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Color symbolism

Red

- Love
- Passion
- Strength
- Power
- Danger
- Excitement
- Energy

Orange

- Warmth
- Creativity
- Adventure
- Freshness
- Happiness
- Attraction
- Success

Yellow

- Optimism
- Cheer
- Happiness
- Warmth
- Caution
- Energy
- Intellect

Green

- Nature
- Growth
- Wealth
- Luck
- Envy
- Freshness
- Quality

Blue

- Trust
- Calm
- Sadness
- Peace
- Loyalty
- Depth
- Authenticity

Purple

- Royalty
- Nobility
- Wisdom
- Luxury
- Imagination
- Mystery
- Spirituality

White

- Purity
- Simplicity
- Innocence
- Peace
- Cleanliness
- Emptiness
- Goodness

Black

- Sophistication
- Formality
- Sorrow
- Blodness
- Elegance
- Death
- Mystery

Thank Mrs. Arielle Eckstut for many of the slides!