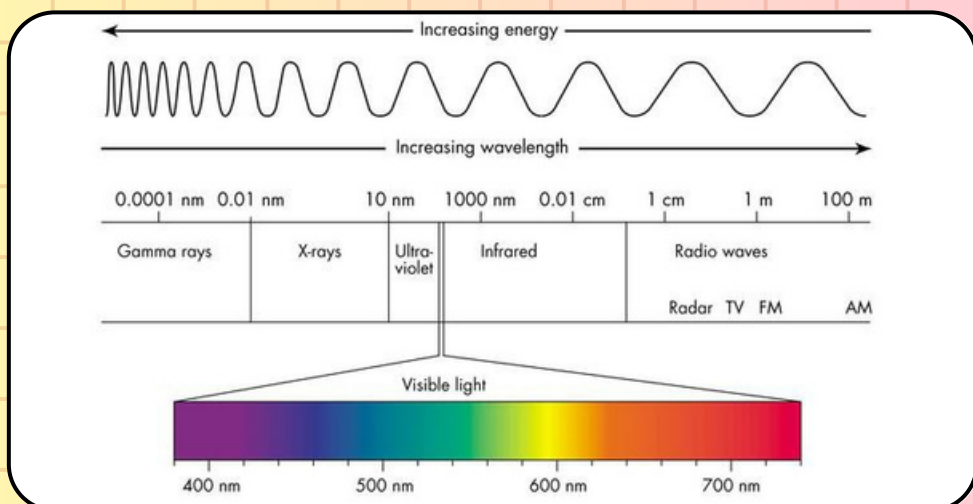


Week 7

Light & Color

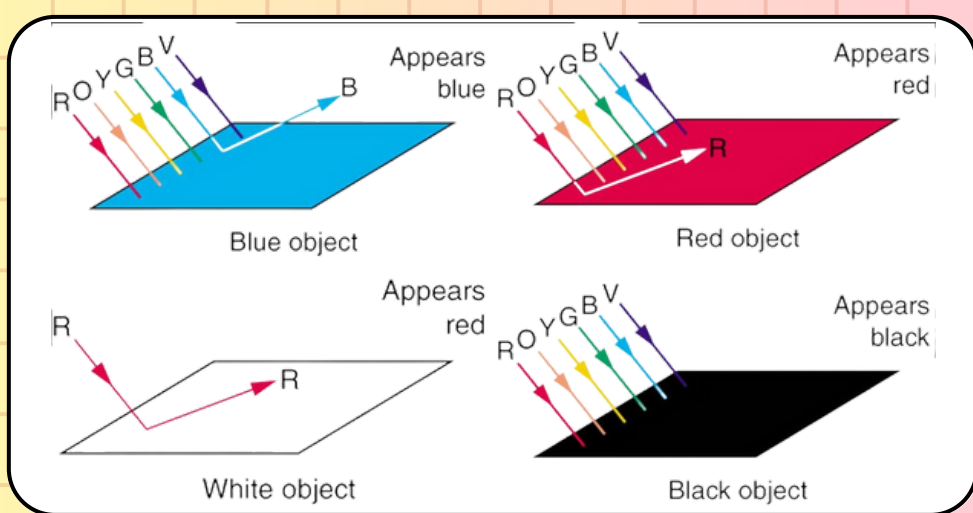
Light Definition



Wavelength

Light is made up of wavelengths of light, and each wavelength is a particular colour.

The visible spectrum shows the wavelengths of each of the component colors. The spectrum ranges from dark red at 700 nm to violet at 400 nm.



Light

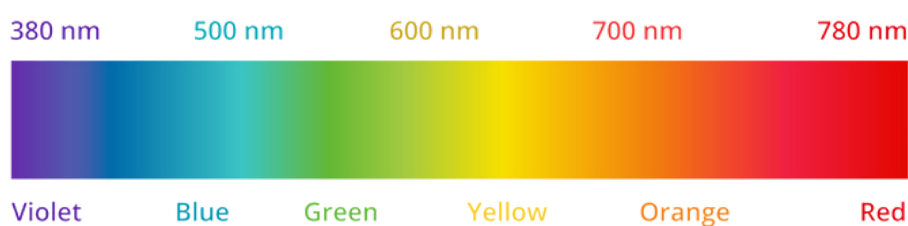
Colour is a wavelength or mixture of wavelengths of light.

The color we see is a result of which wavelengths are reflected back to our eyes.

Ex: white contains all the colours

7 Spectral color

VISIBLE SPECTRUM



Non Spectral

Non spectral colours can not be created with light of a single wavelength, but rather by a combination of wavelengths

Ex: Magenta - a mix of blue and red
Purple - a darker mixture of blue and red

Color and Surroundings

FIGURE 1



FIGURE 2

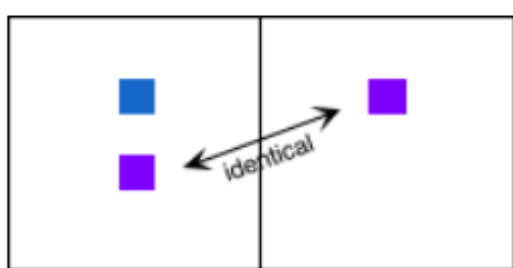
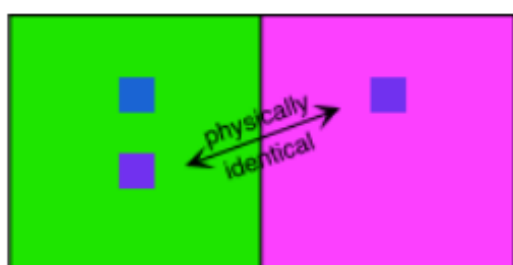


FIGURE 3



Simultaneous Contrast

It's a optical illusion, perceptual contrast effect, when complementary colors are immediately adjacent to one another, they visually influence each other and their chroma levels appear dramatically intensified.

Additional Exercise

In Figure 1: the grey square is the same color but did appear different shades of grey under different backgrounds.

In Figure 2: the "purple" block are identical as you can see, but under a green and magenta background, two physically identical "purple" block looks different. The right "purple" block appears same with the "blue" block.

My reflection

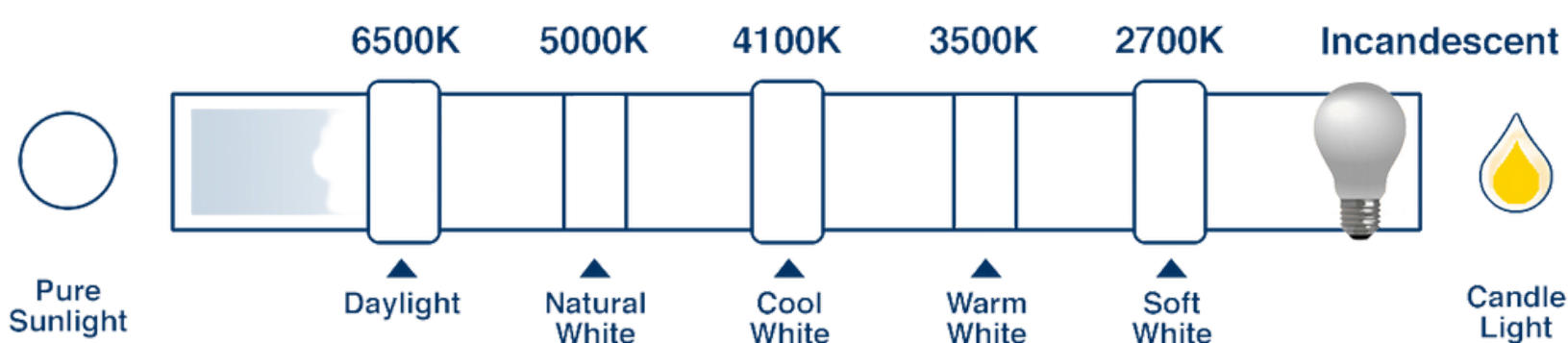
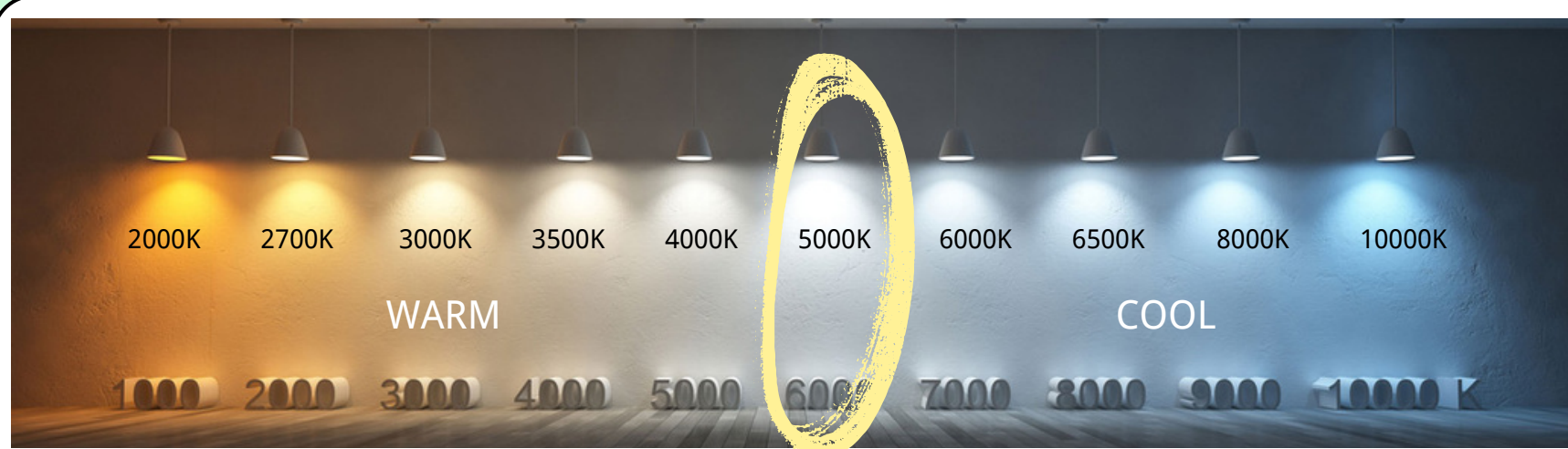
The same color will be judged as different colors by sight under different backgrounds, and different colors will be regarded as the same color under different backgrounds.

Additional 2 essays I found about Contrast Effect:

<https://jov.arvojournals.org/article.aspx?articleid=2121588>

<https://www.uxmatters.com/mt/archives/2006/01/color-theory-for-digital-displays-a-quick-reference-part-ii.php#:~:text=The%20interaction%20of%20hues%20results,chroma%20levels%20appear%20dramatically%20intensified.>

Color Temperature



Additional Research:

Light therapy studies have found that different light colours affect moods, heart rates and circadian rhythms. Different intensities of light cause the body to release different hormones. A high colour temperature triggers the release of Serotonin which effects our mood and energy levels.

This is referred to as blue light or a cool temperature and occurs naturally from the sun during the day. If you want to increase productivity and promote a positive environment, short blue wavelengths are the best.

A low colour temperature triggers the production and release of Melatonin which causes us to unwind, relax then become sleepy. Low colour temperature is often referred to as warm, red light and occurs naturally at the end of the day.

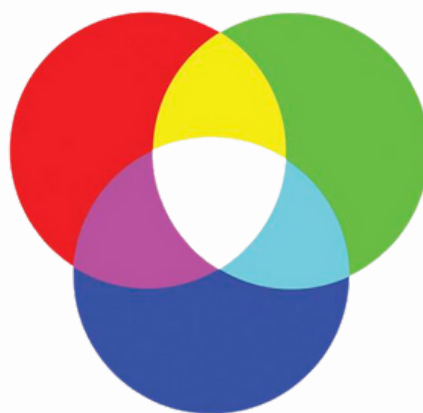
Reference:

<https://edisonlightglobes.com/Shop/light-colour-temperature-affects-mood/?ph=b01ae608b5bb3ad1c04cebe3#:~:text=Light%20therapy%20studies%20have%20found,our%20mood%20and%20energy%20levels.>

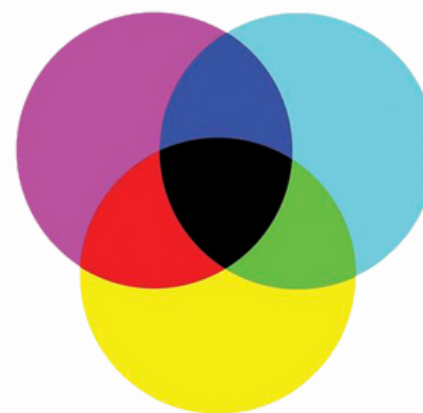
COLOR

RGB Color Model

1. The **RGB color model** is an additive color model in which the red, green and blue primary colors of light are added together in various ways to reproduce a broad array of colors.
2. **Subtractive Color Mixing:** use for print
3. **Additive Color Mixing** is the process of mixing color of light



Additive color mixing

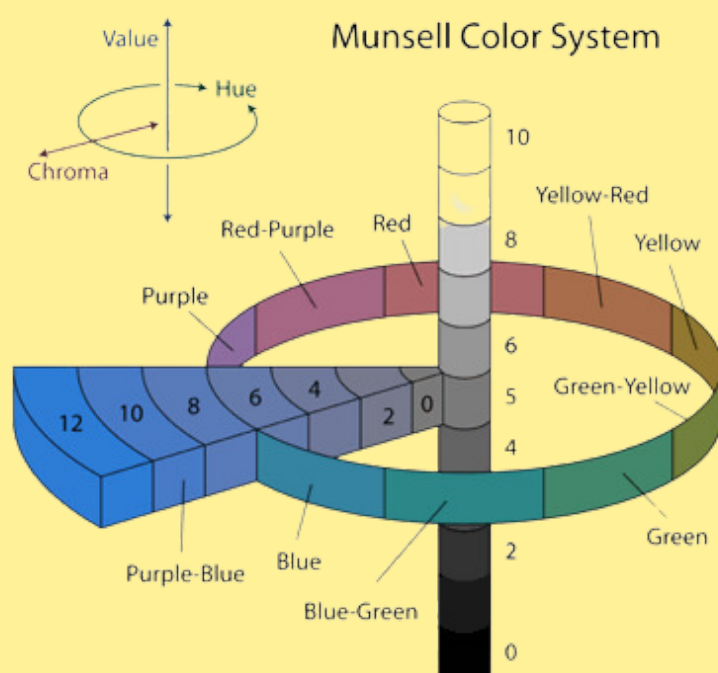


Subtractive color mixing

Describing Color

Hue / Saturation / Value or Lightness

- **Hue:** Hues are the three primary colors (red, blue, and yellow) and the three secondary colors (orange, green, and violet) . **means color**
- **Saturation:** Color saturation is the purity and intensity of a color as displayed in an image. **the higher, the more vivid**
- **Value/lightness:** Color value refers to the relative lightness or darkness of a color.



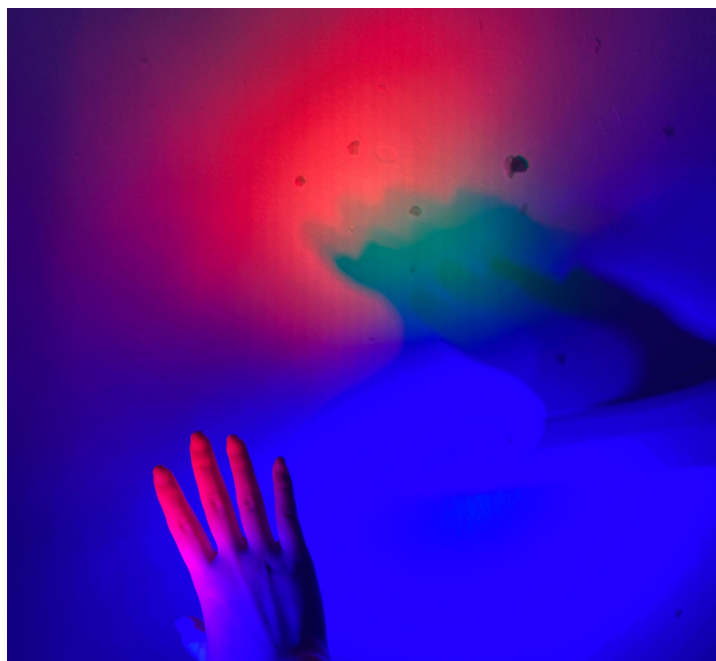
WEEK 7 Class exercise



**Addictive
Color Mixing**



**Subtractive
Color Mixing**



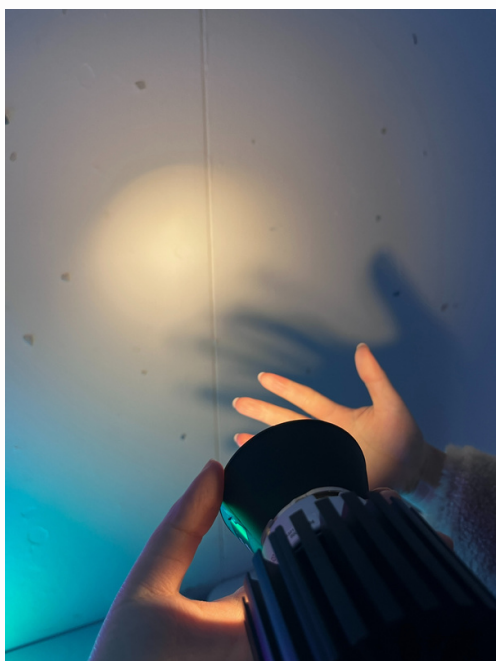
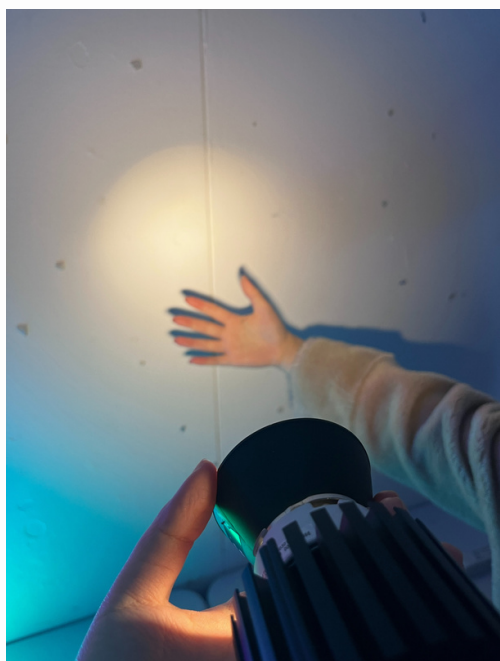
Subtractive Color Mixing

Black is shown when three primary color subtract



Addictive Color Mixing

White is shown when three primary color mixing together



Shadow

Light Source → **Object** → **Surface**

My Observation

Depending on how far the object is from the light source, the shadow of the object will show different changes. For example, in the two pictures on the left, my team members and I tried to detect the effect of the distance of the hand from the light on the shadow, and found that the farther the hand is from the light (the closer to the plane that reflects the shadow), the more obvious the shadow will be with sharp edges. And the closer the hand is to the light (the farther it is from the plane of the shadow), the shadow of the hand will be less clear, the shadow will be lighter, and the edges will be softer.

My Reflection For Week 7

Lighting plays an essential role in our daily lives and can significantly impact our mood, energy levels, and productivity. As mentioned, different light colors or color temperatures can affect our bodies in different ways. Therefore, it is crucial to choose the right color temperature for different spaces and situations.

For instance, a high color temperature or blue light is ideal for workplaces or areas where you need to be alert and focused. The cool temperature triggers the release of serotonin, which helps to improve mood and energy levels. Therefore, it can promote productivity and positivity, making it ideal for an office or study room.

On the other hand, a low color temperature or warm, red light is suitable for relaxing environments, such as a bedroom or living room. This type of light triggers the production and release of melatonin, which helps us to unwind and relax. Therefore, it can promote a calm and peaceful atmosphere, making it ideal for a space where you want to unwind and rest.