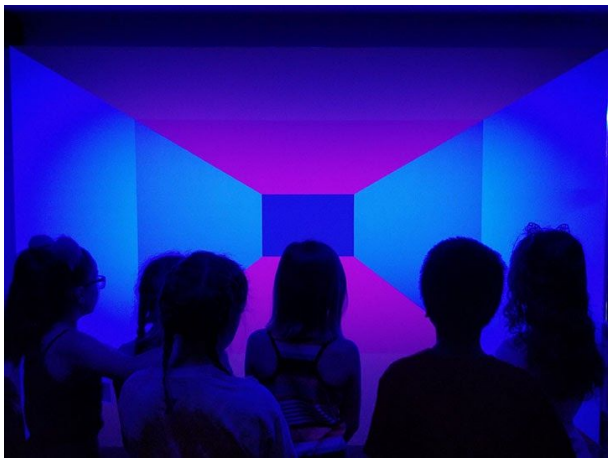
ELMHURST ART MUSEUM

ART, EDUCATION & ARCHITECTURE

Color



Summer campers view of Luftwerk *One point Perspective Study No 1*, 2019. Paint on drywall, RGB LED

In 2019, the Elmhurst Art Museum hosted the exhibition *Luftwerk: Parallel Perspectives,* a site-specific exhibition that used color and light interventions to activate and interpret the McCormick House, designed by Mies van der Rohe. The installation by Luftwerk—the Chicago-based artistic collaborative of Petra Bachmaier and Sean Gallero—heightened the senses and altered perception while celebrating the use of geometry in the mid-Century prefab prototype.

The installation included several light and color works with static and dynamic changing color relationships, including an immersive light piece that transforms a bedroom in the home, neon pieces with mirrored effects, pulsing lightboxes, and colorful glass panes. The visual effects of color impact viewers' experiences throughout the McCormick House's domestic environment and shifts traditional spatial perceptions of the home while celebrating Mies' signs of the modular prototype for prefab housing.

In this activity, participants will learn about color by experimenting with red, green, and blue light to produce different colored shadows. Check out our website for more information and images from *Luftwerk: Parallel Perspectives.* Share your creations and tag us on social media! #MuseumFromHome

Sincerely,

Joseph Hladik, Director of Education & Grants Administrator

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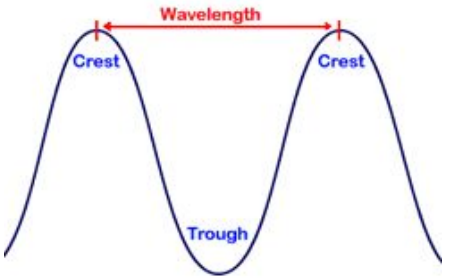
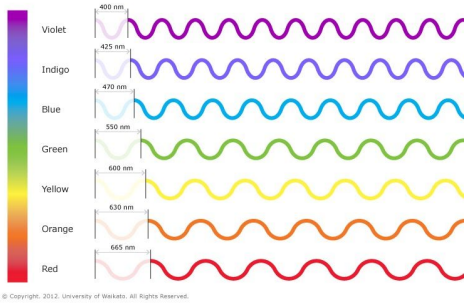
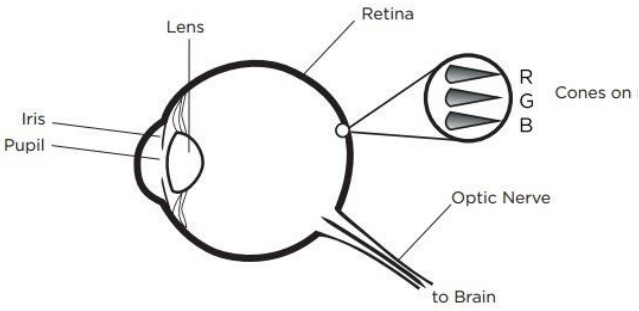
Physics of Light

Light is a continuous spectrum of all the wavelengths that can be detected by the human eye.

- One of the characteristics of light is that it behaves like a wave
    - A **wavelength** is the distance between two identical adjacent points in a wave.
    - The closer the peaks of the wave are to each other, the more energy the waves have. The opposite is also true: when the wavelength is longer, the waves have less energy.
- Wavelength of light is what helps our eyes perceive different colors







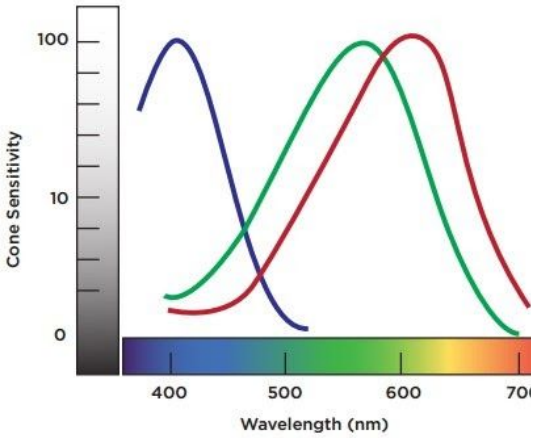
The human eye normally contains three different types of receptors, or **cones**, that help us perceive different colors.

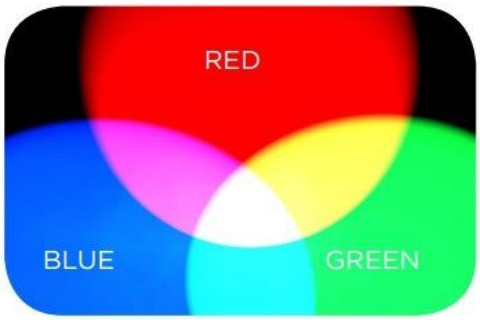
- **Cones** are located along the inside back of the eyeball, or the retina

The three types of cones are **R (red), G (green), and blue (B)**. While each type is most sensitive to red, green, and blue, respectively, they also pick up other hues with similar wavelengths.

- B cones also pick up purple, blue, and green hues
- G cones also pick up purple, blue, green, yellow, and orange hues
- R cones will also pick up purple, blue, green, yellow, orange, and red hues.

The sensitivities of the three cones overlap to let us perceive all visible colors





When red light, blue light, and green light stimulate the three colors on our retinas equally, the signal gets blended in our brain and we see “white” light. This is why we see sunlight as white instead of individual colors

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Any inequalities in these three colors of light, even slightly, help us see different color combinations, which is why we perceive more than just three colors.

- In this activity, we will experiment with these three different colors of light to better understand how they interact with each other and help us see the colorful world around us

Color filters are usually constructed using transparent pieces of dyed glass or plastic that have been treated to selectively transmit the desired wavelengths while restricting others. The two most common types of filters in use today are **absorption filters** that absorb unwanted wavelengths and **interference filters** that remove selected wavelengths by internal destructive interference and reflection.

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In the activity you will:

- Study the work of Luftwerk
- Learn about our perception of color through light
- Experiment with how different colors of light mix to help us see new colors
- Learn about the anatomy of the human eye
- Introduce physics concepts that help us study light

You will need:

- Scissors
- 3 Flashlights(colored flashlights can be purchased online)
- Tape and/or rubber bands
- 3 colored cellophane sheets in red, green, and blue OR lenses
- An object to cast a shadow
- A white wall
    - A dry-erase board, poster board, or any other flat white surface will work
- A dark room

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INSTRUCTIONS

Activity:Light & Shadows	
Cut out a red, green, and blue square out of a piece of cellophane. If you have colored lenses, this will also work. ● Many online stores sell tactical flashlights in Red, Blue, and Green for hunting purposes, this also works great!	
Using a rubber band or tape, secure the colored film over the lens of the flashlight. ● For safety, please be sure and use a lightbulb that does not heat up. Something like LED will work best.	

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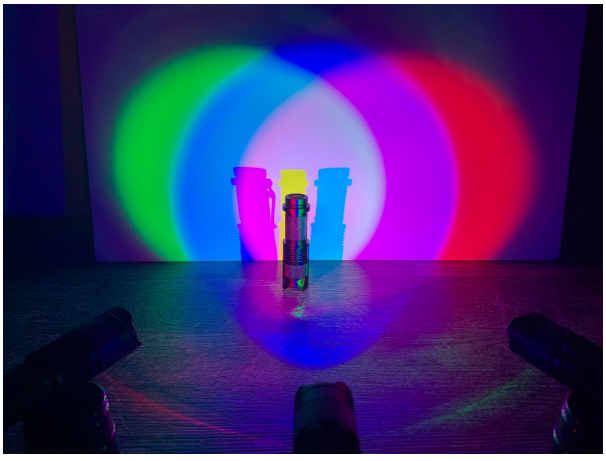
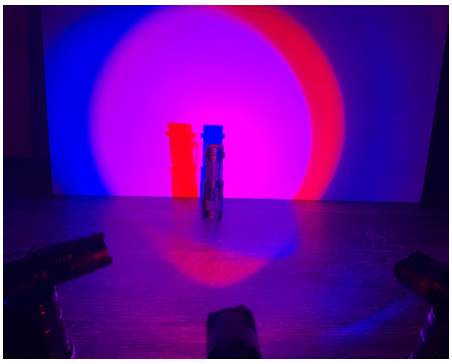
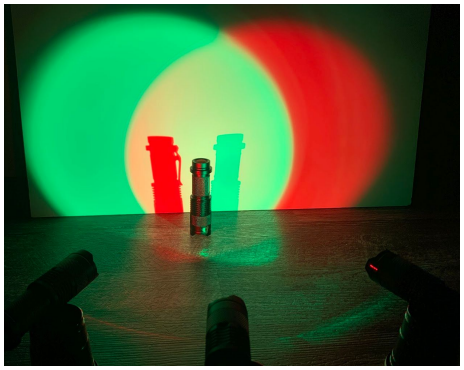
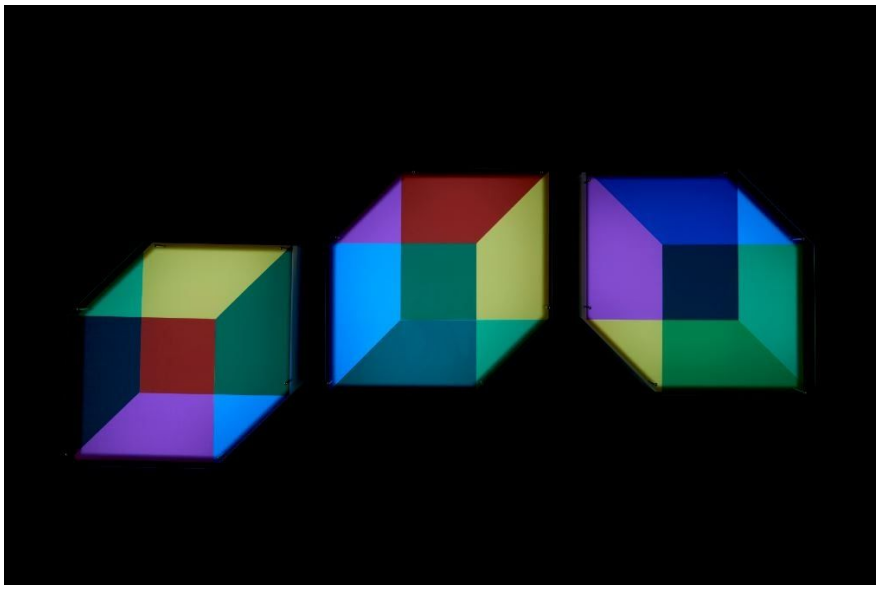
Arrange the flashlights so that they all are directed to a singular point on the wall or poster board. ● It may help to elevate the flashlights ● Depending on the strength of your flashlights and what type of lenses you use, you may need to adjust the distance between the flashlights and the white surface.	
Stand up a pencil (or other object) between the flashlight and the wall. ● This object should cast a crisp shadow on the wall	
Turn on all 3 flashlights (and the lights off) and observe what happens when they are all shining equally in the same spot. ● What color do you see? ● What color are the shadows? ● What colors are created when the lights overlap ○ Is it different than what you expected?	

Experiment by blocking different combinations of the three lights. Try and predict the colors of the object's shadow. • How does this compare to the light behind around the object's shadow?	 



Luftwerk, *Spatial Animation No 1*, 2019. MDF, RGB LED, acrylic diffuser, color film on clear acrylic