



What is Light?

Family Art and Science Activity



INTRODUCTION

A scientist who studies matter, energy, and light properties is called a physicist. As physicists during this activity, we will be looking at how light works.

How fast is the speed of light?

In a single second, light travels 299,792,458 meters or 186,282 miles. If you could run as fast as light, you could travel around the entire world 7 times in a single second!

How does light travel?

Light travels in waves. Longer waves of light have less energy. Red has the longest waves, because it has the least energy. While, blue has more energy and shorter waves.

Think of the order of colors in a rainbow!

Red - longest, weakest energy

Orange

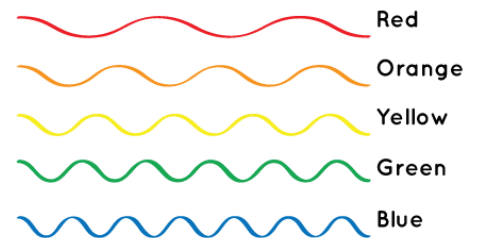
Yellow

Green

Blue

Violet - shortest wave, strongest energy

Visible Light



From: <https://spaceplace.nasa.gov/blue-sky/en/>

What color is the Sunlight?

Sunlight is actually white. The color 'white' is made up of all colors! We can observe all of its colors when these colors are separated, such as when we see a rainbow or a sunset in the sky. Light can be separated in three ways; reflection, diffraction, or refraction.

Reflection is when light waves bounce off an object. If the surface is smooth, shiny, water, or polished, light will reflect.

Diffraction is the spreading of light waves. It occurs when light passes through another light or an obstacle. For example, when observing a sunset, you are seeing the sunlight diffract along the edges of the Earth.

Refraction is when light waves change direction. When light passes through water or glass, the light is refracting through the object. This happens when sunlight passes through water vapor or clouds in the sky to create rainbows.

MATERIALS - ART ACTIVITY

- White paper
- Black crayon
- Water colors
- Water

MATERIALS - EXPERIMENT

- Variety of objects that are different colors
- Paper or journal

INSTRUCTIONS

Before you start your project, think about the characteristics of a sunset and share with a family member. What colors are close to the Sun? What colors are further away from the Sun? Remember, you don't want to look directly at the Sun.

1. Using a black crayon, draw a landscape. Plan ahead, see the examples.
2. Use red watercolor to paint the area above your landscape red.
3. Use yellow watercolor to paint the area above the red light. Try to blend the yellow partially into the red to create orange.
4. Use blue watercolor to paint the area above the yellow light. Try to blend the blue partially into the yellow to create a faint green.
5. Use purple watercolor to paint the area above the blue light.
6. Finally, use black water color to paint the landscape and the rest of the sky black.

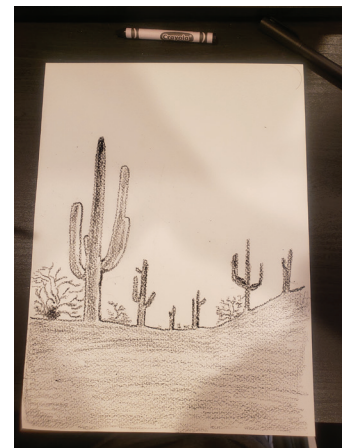
INTRODUCTION TO EXPERIMENT

When light strikes a surface, some of its energy is reflected and some is absorbed. The color a person sees is the color or wavelength of light that is being reflected off the surface.

White light contains all colors or wavelengths of the visible light. So when the color white is being reflected, that means all wavelengths (energy) are being reflected and none of them absorbed, making white the most reflective color. While a black surface absorbs most light and does not reflect the wavelengths (energy).

EXPERIMENT

1. Collect a rainbow of objects from your house that are all different colors.
2. Before your experiment, make a prediction about which object you think will become hotter faster? Which object will be the coolest?
3. Put your objects in the direct sunlight for 15 minutes.
4. Record and rank which items were the hottest to the coolest.
5. How did this compare to your prediction?
6. Share your results with a family member.



QUESTIONS

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