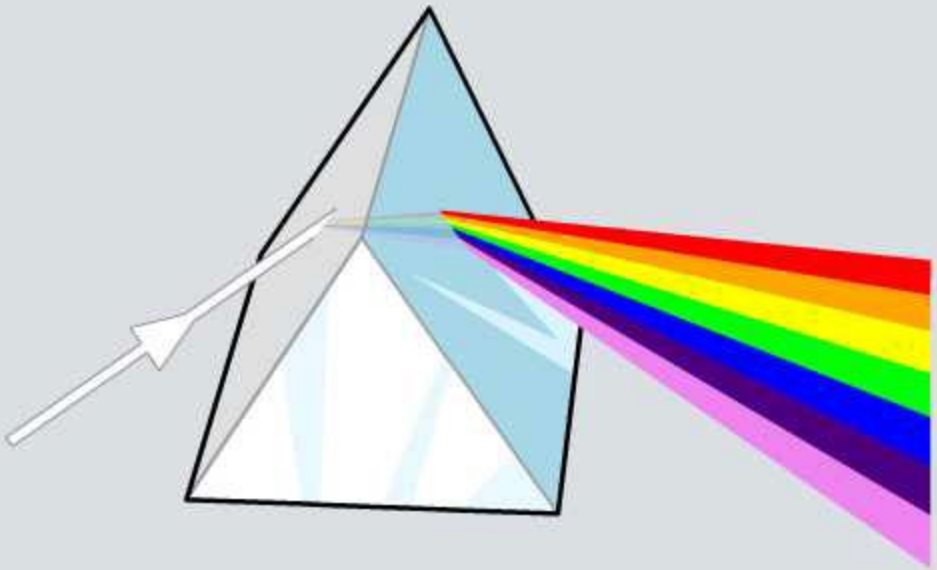
Color



Passing white light through a prism

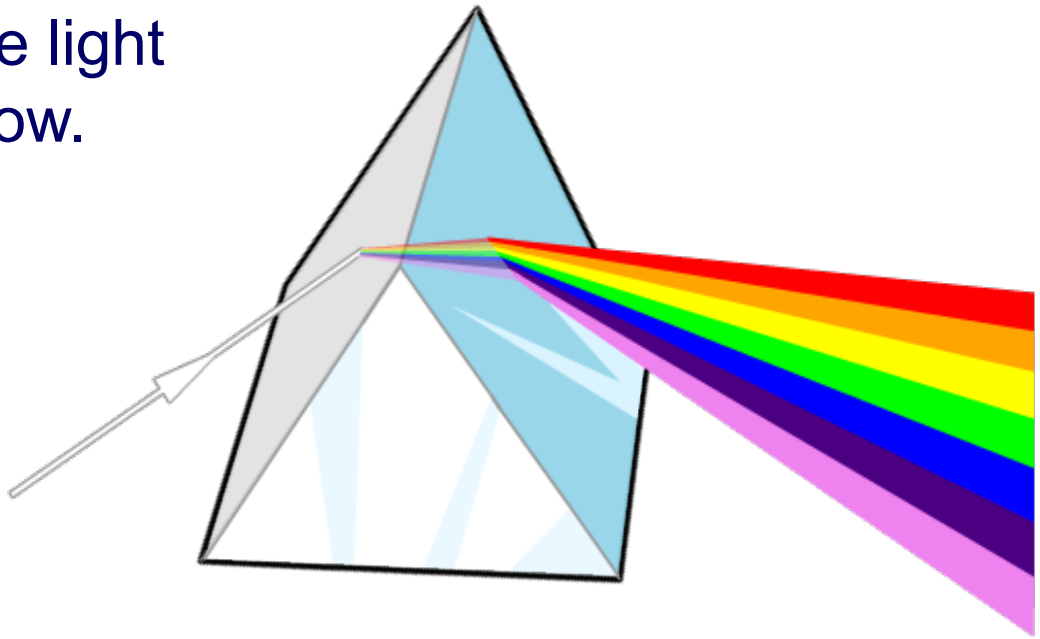
What happens when white light passes through a prism?

Splitting white light

A prism splits a ray of white light into the colors of the rainbow.

This process is known as **dispersion**.

The colors that make up white light are called the **spectrum**.



Dispersion occurs because different colors of light refract differently. Red light refracts the least; violet light the most.

The order of the colors in the spectrum is always the same. Use the name “Roy G. Biv” to remember the order of colors:

Red Orange Yellow Green Blue Indigo Violet

Natural dispersion

If there are water droplets in the air and the sun is illuminating them from behind, then you may see a rainbow in the air.

Light enters the water droplets and refracts. It then reflects off the back of the rain drop.

The red light refracts the least and the violet the most. This causes dispersion of the sunlight.

The visible light spectrum

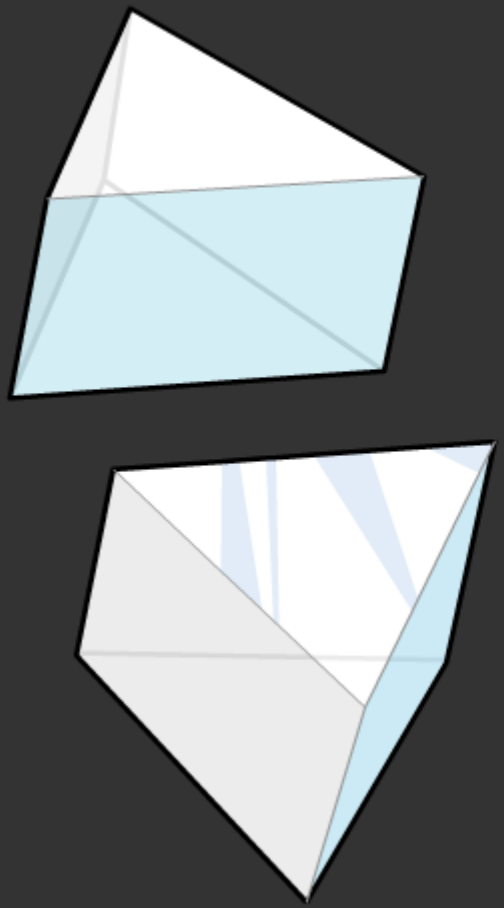
Order the colors from least refracting to most refracting

1. indigo
2. green
3. blue
4. red
5. violet
6. yellow
7. orange

solve

Recombining colors

What happens when the spectrum passes through a prism?



Mixing colored light

What happens when the primary colors of light combine?

red light

blue light

green light

How do we see different colors?

Seeing different colors

How do we see the different colors in this frog and lily?

The frog's red skin absorbs all of the colors except red and so it appears red.

The black skin absorbs all colors. No colors are reflected and so it appears black.

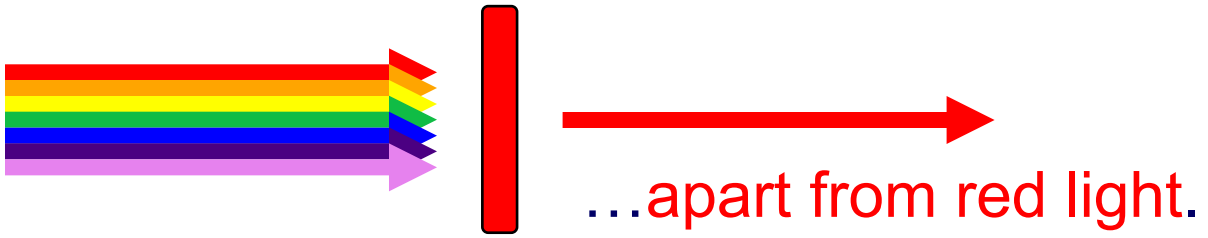
The lily's center absorbs all colors except red and green. It reflects red and green light, and so appears yellow.

The leaves reflect all the colors and so appear white.

Using filters of primary colors

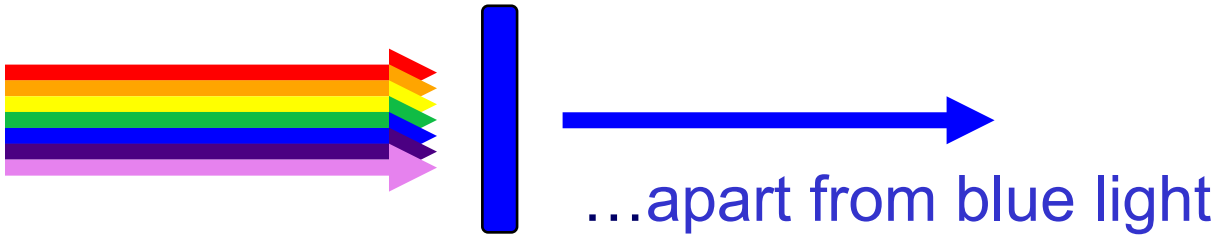
A filter absorbs some colors of white light and lets other colors through to create colored light.

A **red filter** absorbs all colors…



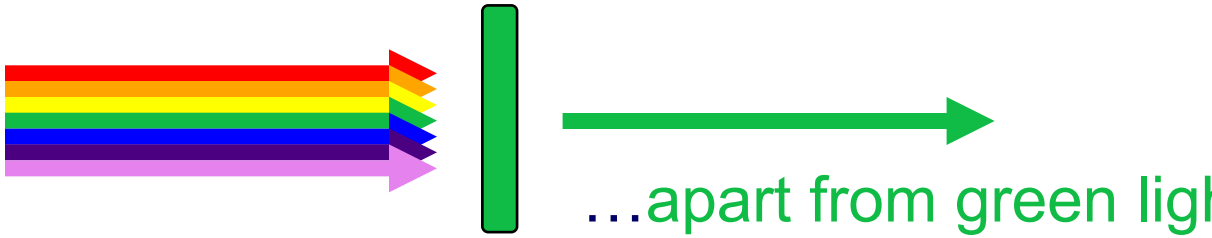
…apart from red light.

A **blue filter** absorbs all colors…



…apart from blue light.

A **green filter** absorbs all colors...



…apart from green light.

Using filters of secondary colors

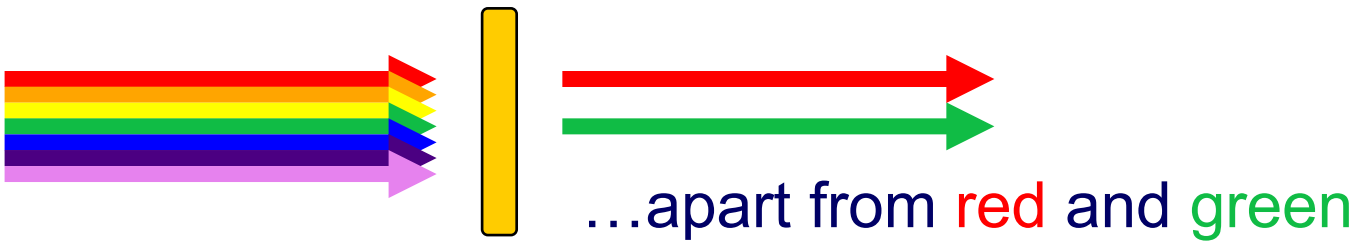
A **magenta filter** absorbs all colors…

…apart from red and blue.

A **cyan filter** absorbs all colors…

…apart from green and blue.

A **yellow filter** absorbs all colors...



…apart from red and green.

Seeing colors in colored light

What colors will the clothes be in each colored light?

white

red

blue

yellow

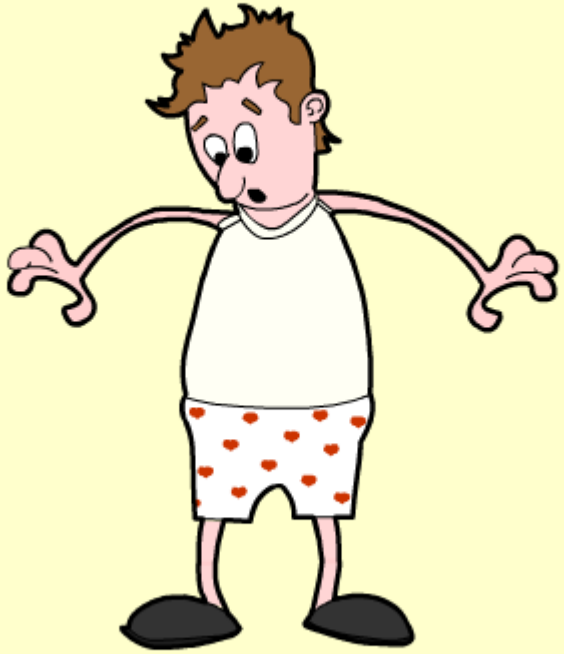
cyan

How do we see colors in colored light?

The electromagnetic spectrum

How will the boy's clothes appear under colored lights compared to white light?

start



Color summary

What are the missing words about color?

1. Objects look white because they reflect [?] of the visible light spectrum.

2. A green filter only [?] green light.

3. Yellow light can be made by mixing [?] light.

4. If you shine green light onto a red object it will look [?].

solve