

Separating White Light Into Colors



How does a prism separate white light?



As white light passes through a prism, shorter wavelengths refract more than longer wavelengths, and the colors separate.

Separating White Light Into Colors

The process in which white light separates into colors is called **dispersion**. A rainbow forms when droplets of water in the air act like prisms.

- When light enters a raindrop, it slows down and refracts. Then it reflects off the far inner surface of the raindrop.
- It refracts again as it exits the raindrop, speeds up, and travels back toward the source of the light.
- **DOK Question**

Formulate a visual model of dispersion.

The Colors of Objects



What determines the color of an object?



The color of any object depends on what the object is made of and on the color of light that strikes the object.

The Colors of Objects

What happens if you change the color of the light shining on an object?

Only the colors that are in the light can be reflected.

DOK Question

Hypothesize why this is.

Mixing Colors of Light



What are the primary colors of light?

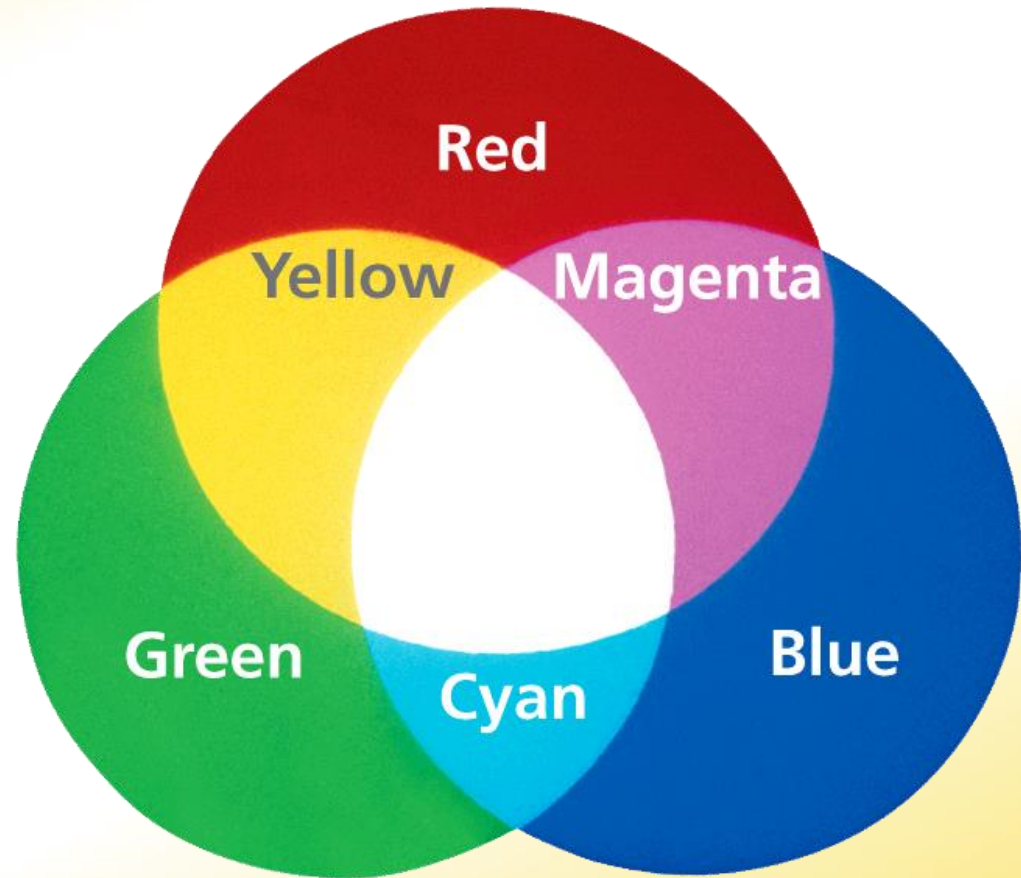
Primary colors are three specific colors that can be combined in varying amounts to create all possible colors.



The primary colors of light are red, green, and blue.

Mixing Colors of Light

The three primary colors of light are red, green, and blue. When any two primary colors combine, a secondary color is formed.



Mixing Pigments



What are the primary colors of pigments?



The primary colors of pigments are cyan, yellow, and magenta.

Mixing Pigments

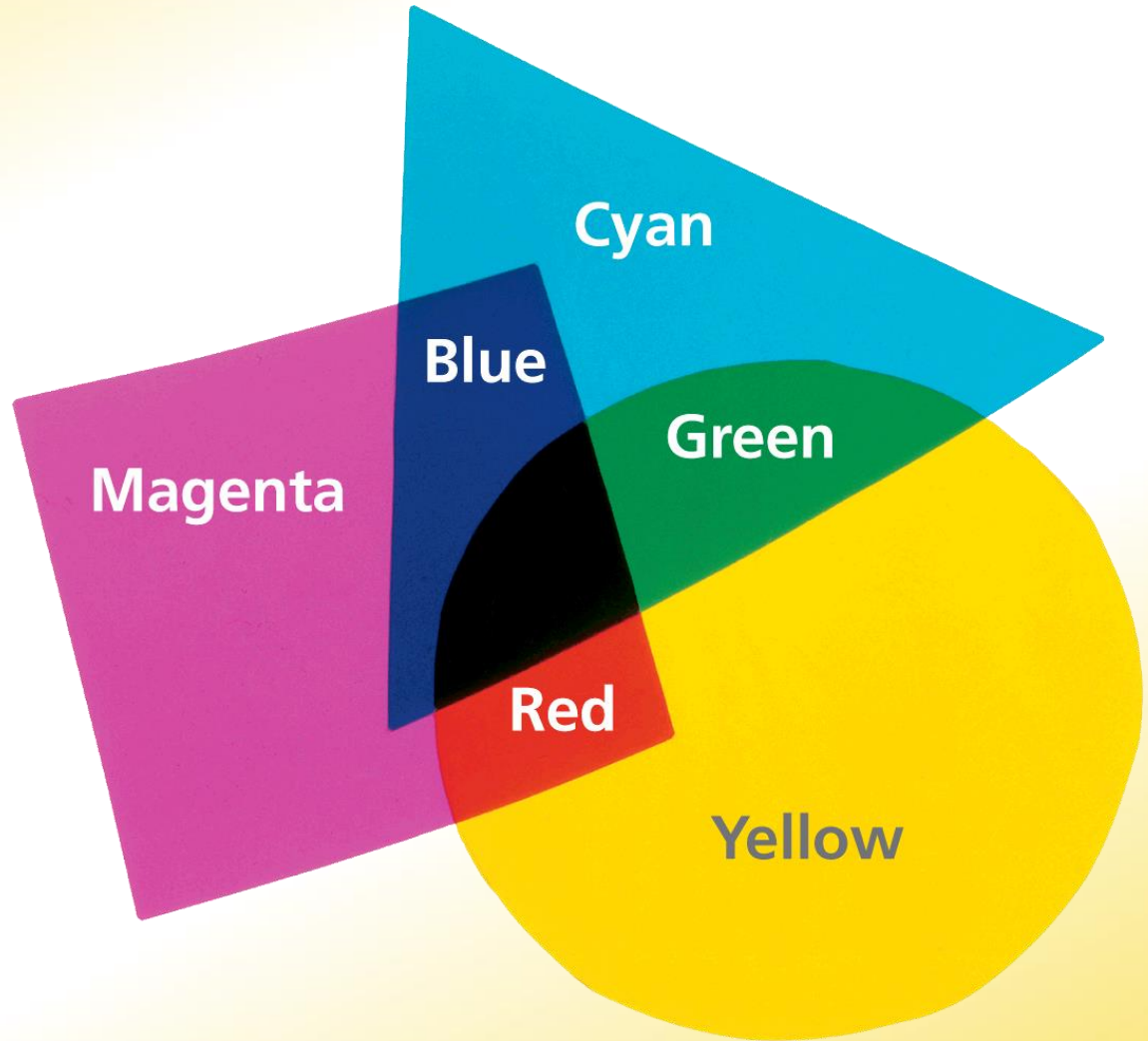
A **pigment** is a material that absorbs some colors of light and reflects other colors.

- Paints, inks, photographs, and dyes get their colors from pigments.
- Color printers and photocopiers use three colors—cyan, magenta, and yellow—plus black.
- You can mix varying amounts of these primary pigment colors to make almost any other color.

18.4 Color

Mixing Pigments

The three primary colors of pigments are cyan, yellow, and magenta. When the three primary colors of pigments are combined, the secondary colors of pigments are formed.



DOK Question

Compare and Contrast pigments and primary colors.

Assessment Questions

1. A prism separates white light into the visible spectrum because
 - a. longer wavelengths are absorbed more than shorter wavelengths.
 - b. shorter wavelengths refract more than longer wavelengths.
 - c. shorter wavelengths reflect more than longer wavelengths.
 - d. longer wavelengths experience more interference.

ANS: B

Assessment Questions

2. The color of an object depends on what the object is made of and on
- the intensity of light that strikes the object.
 - the color of light that strikes the object.
 - the direction of the light that strikes the object.
 - the speed of the light that strikes the object.

ANS: B

Assessment Questions

3. Which of these colors is one of the primary colors of light?
- a. green
 - b. magenta
 - c. yellow
 - d. white

ANS: A