

Light's Mysteries

For ages 8 and older.

Have you ever noticed the colors of the rainbow or the colors that sometimes appear on the wall when light passes through a glass of water? In 1666, Sir Isaac Newton (1642–1727) conducted a series of experiments that showed that “white” light is actually a combination of colors mixed together. In 1704, Newton published his findings in a book titled *Opticks*.

You will need

- flashlight
- red, green, and blue transparent cellophane
- scissors
- sheet of white paper

What to do

1. Cut the cellophane into pieces large enough to be wrapped around the flashlight lens.
2. Darken the room but not so much that you cannot see the different colors of the light filters (the cellophane).
3. Turn on the flashlight and shine it on the paper. Note the color of the light.
4. Place a colored filter over the flashlight lens. Make sure the filter is placed flat (no bunches) over the lens. Hold the flashlight about 2 inches from the paper. What color do you see? How does it compare to the color of the cellophane?
5. Experiment with different-colored filters. Take notes about the different things you try. What happens to the color of the light when only one filter is used? Next, try holding two different filters over the lens. What happens? Try different color combinations.
6. Make a prediction. What do you think will happen to the color of the light if you place a red, green, and blue filter over the lens at the same time? What color is the light on the paper? Try placing the filters over the lens in a different order. Does the order change the color of the light in any way? Record and compare your results. Why do you think you got the color you did?

Learning More

Science for Fun: Light and Color

by Gary Gibson.

Copper Beech, 1995.

Includes simple experiments relating to the basic principles of light and lenses.

Science, Optics and You
micro.magnet.fsu.edu/optics/index.html

Provides background information, hands-on activities, and interactive simulations regarding several aspects of optics and light.

The Colors of White Light

Light is a form of energy. What we see as colors are actually different wavelengths of light. For example, light with a long wavelength appears red, while light with a short wavelength appears violet. White light contains all the different wavelengths of visible light.

