

Light and Color

By Sharon Fabian



¹ The very first people on Earth depended on sunlight. Sunlight allowed them to see the world around them. Early people used sunlight to look for food and to keep a lookout for dangerous animals or other people. Sunlight has produced heat for the Earth since earliest times. It is what plants use to produce food in the process called photosynthesis. Sunlight also began the process of forming our fossil fuels long before the first people arrived on Earth.



² Sunlight was so popular that soon creatures on Earth began finding ways to produce light for themselves. Fireflies and a few other creatures produce their own light naturally. This is called bioluminescence. People found ways to make light for themselves using campfires, candles, and oil lamps. Later, gaslights were developed to light city streets. Even later electric lights were developed. Today electricity provides most of our man-made light.

³ Light is a form of energy. It is one part of the whole spectrum of energy called the electromagnetic spectrum. This type of energy is also called radiant energy. Besides light energy, the electromagnetic spectrum also includes radio waves, microwaves, infrared waves, ultraviolet waves, and other waves. The visible light part of the spectrum is the part that includes light that humans can see. One interesting fact about the visible light spectrum is that it is not the same for all creatures. For example, bees can see ultraviolet light, but they can't see the color red that we see. Crocodiles miss out on a lot -- they can only see black, white, and shades of gray.

⁴ Most people can see the colors in the visible light spectrum that range from red to violet (purple). These are the colors of the rainbow; starting with red, each one gradually blends into the next color. The unusual name Roy G Biv is often used to remember the colors of the spectrum - **r**ed, **o**range, **y**ellow, **g**reen, **b**lue, **i**ndigo, and **v**iolet.

⁵ One way to see the colors of light is by using a prism. A prism is a little piece of glass with many sides that are cut at certain angles. A prism bends a ray of light and separates it into its different wavelengths, or different colors. Sir Isaac Newton used prisms to make some important discoveries about light way back in the 1600s.

6 There are many materials that let light pass through. In fact, materials can be grouped, or classified, according to how well light passes through them. Materials such as a window that allow light to pass through clearly are called transparent. Materials that let light rays pass through but mix them up so that we can't see clearly, such as frosted glass, are called translucent. Any material that does not allow light to pass through is called opaque. A wooden board, a sheet of construction paper, and a metal frying pan are all opaque.

7 Light from the sun, or from a flashlight, is called white light. It is a mixture of all of the colors together. Light also has primary colors. The primary colors of light are red, green, and blue. The colors can be combined to make other colors; for example, red plus blue produces magenta, a purplish color. Red plus green produces yellow. This is called color addition, because you are adding colors of light together. You may be surprised to learn that mixing colors of paint or crayon is called color subtraction. But it makes more sense once you know that paint and crayon actually absorb certain colors of light. They subtract colors from the white light, leaving the remaining colors for us to see.

8 Today, we still depend on sunlight just as much as the first people did, and we can also enjoy the many beautiful colors it produces. Today we can also enjoy creating all kinds of artwork with colors, thanks to color addition and color subtraction. What are some ways that you like to use color?

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<p>1. Light is a form of:</p> <p><input type="radio"/> A Energy</p> <p><input type="radio"/> B Heat</p> <p><input type="radio"/> C Color</p> <p><input type="radio"/> D Sound</p>	<p>2. To remember the colors of the spectrum, just remember the name:</p> <p><input type="radio"/> A Isaac Newton</p> <p><input type="radio"/> B Leonardo</p> <p><input type="radio"/> C Roy G Biv</p> <p><input type="radio"/> D Magenta</p>
<p>3. This is used to separate white light into colors.</p> <p><input type="radio"/> A Sunlight</p> <p><input type="radio"/> B Bioluminescence</p> <p><input type="radio"/> C Spectrum</p> <p><input type="radio"/> D Prism</p>	<p>4. This is the name for the way that fireflies produce light.</p> <p><input type="radio"/> A Bioluminescence</p> <p><input type="radio"/> B Prism</p> <p><input type="radio"/> C Spectrum</p> <p><input type="radio"/> D Sunlight</p>
<p>5. Mixing colors of paint together is called:</p> <p><input type="radio"/> A Color subtraction</p> <p><input type="radio"/> B Color addition</p>	<p>6. Mixing colors together with colored pencils would be called:</p> <p><input type="radio"/> A Color subtraction</p> <p><input type="radio"/> B Color addition</p>
<p>7. Describe an art project that you have done, or would like to do, that involves color subtraction.</p> <p>_____</p> <p>_____</p>	<p>8. You can experiment with color addition using a flashlight and colored cellophane. Describe one experiment that you could do.</p> <p>_____</p> <p>_____</p>

Light and Color - Answer Key

- 1 (A) Energy
- 2 (C) Roy G Biv
- 3 (D) Prism
- 4 (A) Bioluminescence
- 5 (A) Color subtraction
- 6 (A) Color subtraction
- 7 Answers will vary.
- 8 Answers will vary.