Additive Color Mixture

The earliest experiments on color perception were done by spinning colored papers like these on a wheel. Unlike mixing paints (subtractive color mixing), mixing colors on a wheel adds the two colors together. What color do you get when you mix red and green paint? What color do you get when you mix yellow and blue paint? See how the additive mixture of these colors is different than the subtractive paint mixtures by using the colored disks below. Experiments like these show that only three additive primaries, red, green, and blue, are needed to produce any color. (Look closely at a TV or computer screen and you will see that each pixel is made up of a red, green, and blue colored area.) For this reason, human color vision is called trichromatic. What happens when you mix these three primaries?

**To do:** Cut out the colored circles. Put a dab of glue on the top of a pencil's eraser and press the eraser onto the center of the back of the circle. Spin the pencil between the palms of your hands and see what colors you get when the different colors are added together.

**Explanation:**

Light is focused inside of the eye onto a layer of tiny light sensors called rods and cones. The rods are responsible for vision at low light levels and do not see color. Color vision starts at the cones. There are three cone types and each one is more sensitive to a particular region of the spectrum (the colors of the rainbow). The S-Cones (S for short) are more sensitive to blue light; the M-Cones (M for Middle) are more sensitive to green light; and the L-Cones (L for long) are more sensitive to red light. By activating the cones in the right proportions, any color can be created.