



Curiosity Guide #705

Color Science

Accompanies Curious Crew, Season 7, Episode 5 (#705)

Flashy Combinations

Investigation #8

Description

Flashlights are fantastic, and you just might learn something cool, too!

Materials

- 3 colored LED flashlights that can shine red, green, and blue
- White wall or paper
- A friend
- Small object

Procedure

- 1) Shine one of the lights on a white piece of paper or wall and click through the flashlight's settings to demonstrate that the flashlight can change colors.
- 2) Set a flashlight to each of the primary colors, red, green, and blue.
- 3) Ask your friend what will happen when two of the colored lights overlap their beams on the paper.
- 4) Try overlapping two flashlight beams with two different colors. What do you notice? Was your friend right?
- 5) What happens if all three beams are combined?
- 6) Hold a small object in the beams of light. You can also have your friend wave a hand through the combined light beams.
- 7) What do you and your friend notice about the shadows?

My Results

Explanation

Overlapping primary additive colors will produce the primary subtractive colors. For example, red and green combine to make yellow, while green and blue make cyan, and blue and red make magenta. When the object is placed in the beam of light, some of the angled light hits the paper and changes the color of the remaining shadows. **Are you wondering how to use this light behavior?** If you have ever been to a play, you may have noticed large lights that shine on the stage so we can see the actors, sets, costumes, and the subtractive reflected colors. A lighting designer can change the way things look on stage by using different colored lenses or filters. Imagine if there were three spotlights, one red, one green, and one blue. Then the colored lights, which are additive, could overlap and make new colors on the stage around an actor. If the actor stood in the middle of the beams, then the lights would combine to white. Amazing!

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