

In today's activity, you will be conducting a virtual laboratory to examine how different colors of light are created due to color addition, and how different colors of light are seen after color subtraction takes place.

Virtual Lab: PhET Wave Interference

You can find this simulation at <https://phet.colorado.edu/en/simulation/color-vision>.

Part One: Color Addition

1. When you open the simulation, choose RGB Bulbs.

2. Why are the three bulbs used red, green, and blue?

3. Slide up the intensity of the red light to some place. What color does the person see?

4. Keep the red light at the same intensity, and increase the green light to the same intensity. What color does the person see?

5. Complete the following statement:

Red Light + Green Light = _____
6. Decrease the green light back to zero, and raise the blue light to the same intensity as the red light. What color does the person see?

7. Complete the following statement:

Red Light + Blue Light = _____
8. Decrease the red light to zero, and raise the green light to the same intensity as the blue light. What color does the person see?

9. Complete the following statement:

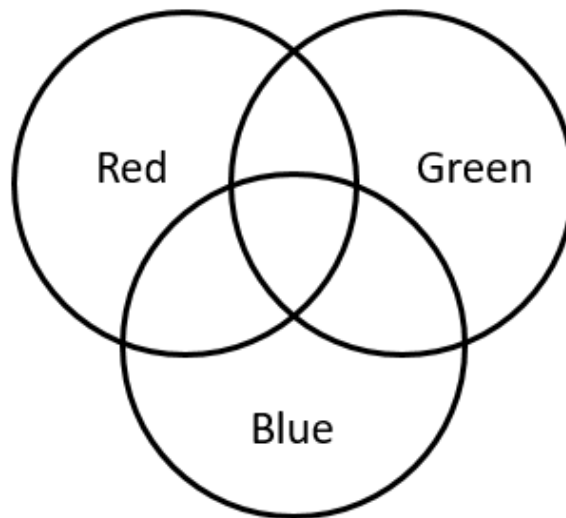
Blue Light + Green Light = _____

10. Finally, raise the intensity of the red light to the same intensity as the blue and green light. What color does the person see?

11. Complete the following statement:

Red Light + Blue Light + Green Light = _____

12. Complete the diagram below for light:



Part Two: Color Subtraction

1. Click on Single Bulb at the bottom of the screen.
2. Click on the yellow light bulb, which means only one color is emitted, and the light beam.
3. Filters work on the idea of color subtraction- the color that passes through the filter is the color that is not absorbed; all other colors are subtracted.
4. Click on the button that is overlaid on the filter to turn on the filter.

5. The initial setting has yellow light being shown upon a yellow filter. What color light does the person perceive?

6. Keep the color of the filter as yellow, and slide the color scale for the light back and forth. What color does the person perceive once you move to either side of the yellow light?

7. Click on the white light bulb, which means white light is shown upon the filter. Slide the filter back and forth, from violet to red. What happens to the color that the person perceives as you change the color of the filter?

8. What does the changing color perceived by the person as the filter changes indicate to you about white light?

9. Why does the person perceive only black when the color of the light and the color of the filter are different?
