Name: _____   Partner(s): _____

_____

Homework Questions for Investigation #14

1. Based on your observations from **Station #1**, what color of light is perceived when BLUE light and RED light of equal intensities are added? How does your observation compare with the "textbook result?" (Look it up if necessary.)

2. In terms of absorption and transmission, describe why a piece of blue glass appears blue when held up to white light. Use your observations from **Station #2**.

3. In terms of absorption and reflection, describe why an object painted red appears red in white light. Use your observations from **Station #2**.

4. What are the respective "textbook" complementary colors of cyan, yellow, and green? (Look these up if necessary.) How do these colors compare with your observed results from **Station #3**?

5. If you wanted to see an <u>afterimage</u> of the American flag in its proper color scheme of RED, WHITE, and BLUE on a white background, what would be the <u>respective</u> colors of the flag that you would have to be viewing?

6. Light is passed through three consecutive Polaroid filters labeled A, B, and C. (Polaroid B is the middle filter.) Using your observations at **Station #5**, determine whether or not any appreciable amount of light penetrates the three filters under the following conditions by placing a check in correct space.

      1) A and B are aligned, and B and C are crossed. _____ Yes _____ No

      2) A and B are crossed, and B and C are aligned. _____ Yes _____ No

      3) A and B are crossed, and B and C are crossed. _____ Yes _____ No

      4) A and C are crossed, while A and B are neither _____ Yes _____ No
         aligned nor crossed.
      5) A and B are aligned, while B and C are neither _____ Yes _____ No
         aligned nor crossed.

7. According to your results from **Station #6 (Prism)**, what color of the visible spectrum appears to <u>refract</u> the most when white light is dispersed through the prism?

8. According to your results from **Station #6 (Mirrors)**, which mirror (concave or convex) focuses incoming parallel light rays and which mirror spreads them out?

9. According to your results from **Station #6 (Lenses)**, which lens (the concave or the convex) focuses incoming parallel light rays and which lens spreads them out?

10. On a separate sheet, use Snell's law to calculate the measured index of refraction for the Acrylic hemi-cylindrical lens. Put your results in an organized table for each of the data points in Table 4.1. Then calculate an average value for the index of refraction and compute a % error. (Use $n = 1.50$ as the accepted value of the refractive index for the hemi-cylindrical lens.)

$$\% \ Error \ = \ \frac{\left|Accepted \ \ value \ - \ Measured \ \ value\right|}{Accepted \ \ value} \times 100\%$$