

ABSORBANCE

Materials:

- White paper on a vertical stand
- Flashlight
- Transparent colored filters (For example, red, blue, green, magenta, yellow, cyan, etc.)
- 531 lines/mm diffraction grating from Rainbow Symphony, mounted to a second white paper on a vertical stand

Instructions:

1. Shine the flashlight onto the stand-up white paper. Note what happens when you place different colored filters between the flashlight and the paper. (It helps to press the filters right against the surface of the flashlight.)
2. Overlay different colored filters in front of the flashlight and note how this changes the transmitted color of the light. How do these colors compare to what you expected and to the transmission data sheets that accompany the color filters.
3. Now shine the flashlight onto the diffraction grating and note the different colors of the white light that the flashlight separates into.
4. Shine the flashlight through the different colored filters and combinations of them onto the diffraction grating. How do the transmitted colors compare to what you expected and to the transmission data sheets that accompany the color filters?
5. In a contest with your partner, see who can combine the maximum number of colored filters without completely blocking out the transmitted light. Using the diffraction grating, watch how each part of the flashlight's spectrum disappears as you add additional colored filters.
6. In another contest with your partner, determine who can combine the fewest number of colored filters to completely block out all transmitted light. Using the diffraction grating, watch how each part of the flashlight's spectrum disappears as you add additional colored filters.