

Optical aberrations correspond to the blurring and mis-formation of images formed by lenses and mirrors. Aberrations can be broken into two general classifications: chromatic and monochromatic.

Prisms:

Use equilateral prism and a single ray from a ray box to produce the spectrum. Which colors bend the most?

The bending of the different “colors” of light by varying degrees is known as **Dispersion**. Dispersion is a general term for the separation of the colors by some means. A diffraction grating also produces dispersion as does scattering. What is the implication and/or mechanism of the dispersion of white light by the prism?

Consider a converging lens and a point source. Given your answer to the first question and the lens maker’s equation, what is the impact on the focal length of the lens of the wavelength of light? Be specific about how you answer this question.

Try forming images using the point source, the rail and the shortest focal length converging lens. Look closely at the images formed and record your observations.

Replace the lens with a longer focal length converging lens and repeat your observations

Using the short focal length lens and the point source, arrange the lens so that it forms a small image of the point source. Next tilt the lens while keeping its distance from the source constant. What do you see on the screen? Sketch a picture.

Why do you think this image forms? Try keeping the lens angle fixed and move the lens back and forth. What happens?

The effect you observe is known as Coma. What do you think is causing Coma?