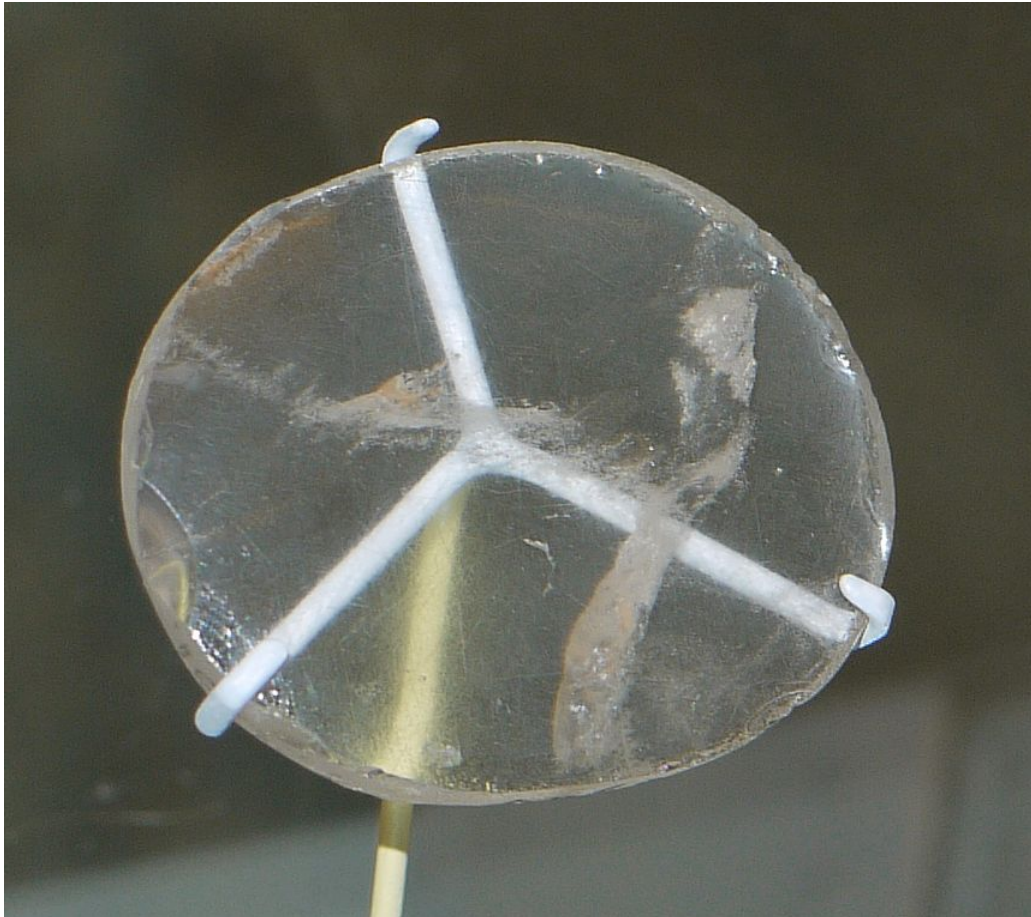


6.2: Lenses

Optics

Optics is the study of light and its interaction with various materials, called medium. We are all familiar with optics in the world around us. Whether you wear glasses or not, your eyes are a splendid example of optics, as detailed in Lab 4. About Your Eyes. Think of the application of optics; rearview mirrors on cars, lens systems in your smartphone, the atmosphere bending sunlight when the Sun rises and sets.

Lenses

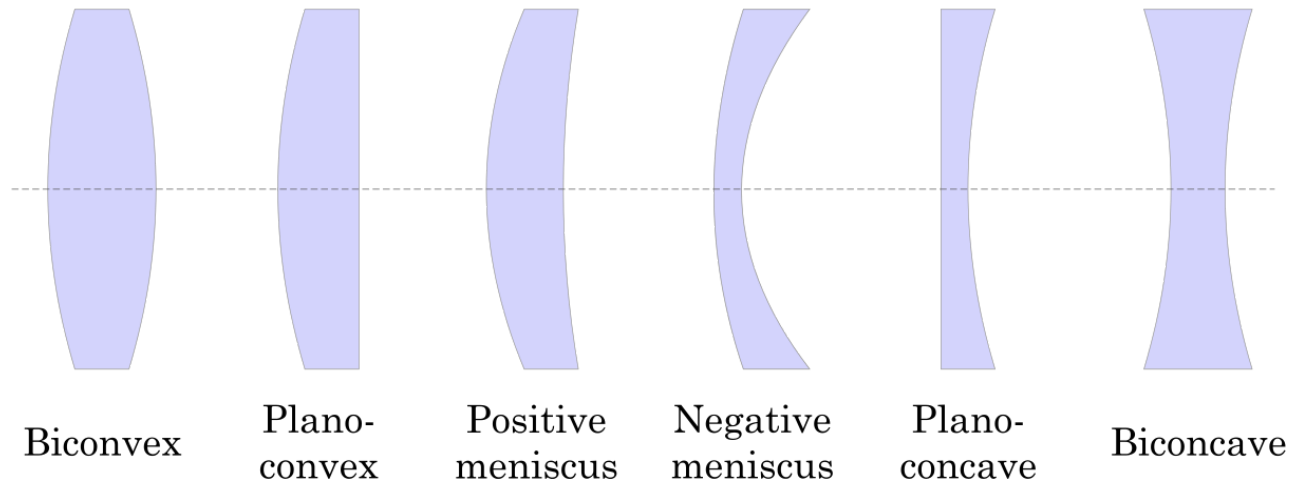


The Nimrud lens is a 3000-year-old portion of rock crystal. It is believed that the Nimrud lens was used as a magnifying glass. [”[Nimrud lens British Museum](#)” by Geni, licensed under [CC BY-SA 4.0](#)]

For this lab, we will first direct our attention to a couple of types of lenses and mirrors. The science of optics can be traced back to the ancient Egyptians and Mesopotamians. Some of the earliest recovered lenses were made from polished crystals, such as quartz.

The ancient Greeks and Romans, such as Pliny and others, wrote about liquid lenses: spheres filled with water. These developments led to furthering ideas about light and what is now called geometrical optics, describing the way light travels in the form of rays. The term optics is derived from the Greek *optikē*, meaning appearance, look.

You are most likely familiar with the magnifying glass; one is included in the Astronomy Lab Kit for Lab 8. Meteors, Meteorites, and Cratering. Magnifiers are optically known as a convex lens; convex referring to bending outward. Lenses can also be described as concave – caving inward, and plane or plano – flat. Since a single lens has two surfaces, a combination of shapes can occur. Different names are assigned to the lens, depending on the two shapes. For example, if the lens is convex on both sides, it can be called biconvex or double convex. If it is convex only on one side and flat on the other, it is said to be plano-convex.



Types of lenses, lens shapes [” [Lenses en](#) ” by ElfQrin , licensed under [CC BY-SA 3.0](#)]

If a convex lens magnifies, what do you think a primarily-concave lens would do? Consider this for now, and you will cover this as a part of the Lab exercise.

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