

Quick Lab

Prescription Glasses

MATERIALS LIST

- several pairs of prescription eyeglasses

Hold a pair of prescription glasses at various distances from your eye, and look at different objects through the lenses. Try this with different types of glasses, such as those for farsightedness and nearsightedness, and describe what effect the differences have on the image you see. If you have bifocals, how do the images produced by the top and bottom portions of the bifocal lens compare?

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Topic: Abnormalities of the Eye

Code: HF60002

EYEGASSES AND CONTACT LENSES

The transparent front of the eye, called the *cornea*, acts like a lens, directing light rays toward the light-sensitive *retina* in the back of the eye. Although most of the refraction of light occurs at the cornea, the eye also contains a small lens, called the *crystalline lens*, that refracts light as well.

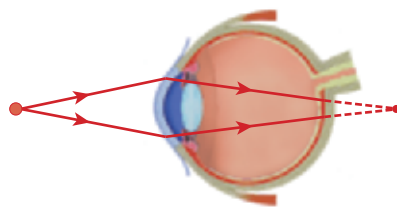
When the eye attempts to produce a focused image of a nearby object but the image position is behind the retina, the abnormality is known as *hyperopia*, and the person is said to be *farsighted*. With this defect, distant objects are seen clearly, but near objects are blurred. Either the hyperopic eye is too short or the ciliary muscle that adjusts the shape of the lens cannot adjust enough to properly focus the image. **Table 5** shows how hyperopia can be corrected with a converging lens.

Another condition, known as *myopia*, or *nearsightedness*, occurs either when the eye is longer than normal or when the maximum focal length of the lens is insufficient to produce a clear image on the retina. In this case, light from a distant object is focused in front of the retina. The distinguishing feature of this imperfection is that distant objects are not seen clearly. Nearsightedness can be corrected with a diverging lens, as shown in **Table 5**.

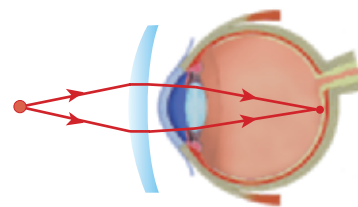
A contact lens is simply a lens worn directly over the cornea of the eye. The lens floats on a thin layer of tears.

Table 5 Farsighted and Nearsighted

Farsighted

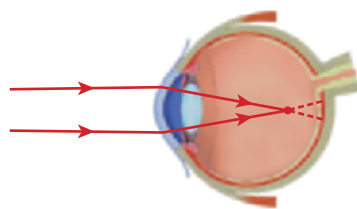


Hyperopia

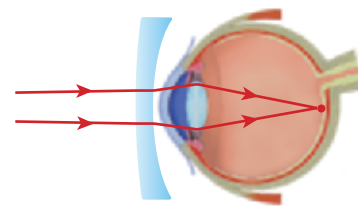


Corrected with a converging lens

Nearsighted



Myopia



Corrected with a diverging lens