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PINHOLE CAMERA

CAT NO. PH0592

Experimental Notes

Pinhole Camera

1. DESCRIPTION

The Pinhole Camera consists of two wooden boxes, one smaller than the other. The smaller box fits inside the larger box, which has a round metal plate with different dia hole in it at the end opposite the opening for the small box. One end of the small box is open for viewing, the other, which is placed inside the large box, is fitted with a ground glass screen.

2. OPERATION

To use the Pinhole Camera, hold it up as close to the face as possible and look into the small box. Point the other end of the box toward a bright light source, with an object for viewing between you and the light. An image should be visible on the screen at the end of the box. Move the larger box in and out, and observe any change in the appearance of the image.

3. THEORY

One of the basic assumptions in geometric ray optics is that light travels in a straight line. Devices such as the lens make use of refraction to bend and focus light, but unimpeded light will follow a straight-line course. The pinhole camera takes an approach opposite that of the lens: it uses the straight, undiverted path of light to focus the light and create an image.

If light reflected off an object passes through a large aperture, too many divergent rays come in for a discrete image to be formed. However, if a very small hole is used, it creates an artificial focal point, a single place where the light rays cross. This point is analogous to the focal point of a lens. And just like a lens, a pinhole camera forms an image on the other side.

The most important difference between the pinhole camera and the lens is the location of the local point. The distance is directly related to the distance from the optical instrument (that is, the lens). This distance is directly related to the distance at which the image is created. In the pinhole camera, however, the focal point is in the plane of the instrument itself. It is therefore impossible to draw principal rays and determine an image point. The effect that this has is that an image can be seen at many distances from the focal point. In this pinhole camera, the image is cast on a ground glass screen. As the distance between the hole and the screen is changed, an image is always visible, but it changes in size as the box is telescoped in and out.

Manufactured by :



U.S. Distributor :

Eisco Scientific

850 St Paul St, Suite 15, Rochester, NY 14605

Website : www.eicolabs.com