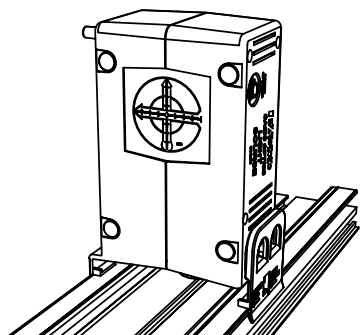


Basic Optics Light Source

OS-8470

Introduction

The Basic Optics Light Source is suitable for a variety of optics-focused experiments and demonstrations. It can be mounted on a flat surface in three different orientations, as well as on an Optics Bench (OS-8541) or a Dynamics Track Optics Carriage (OS-8472A). The device functions as a bright point source, an illuminated crossed-arrow object, a primary-color source, and a ray box with up to five parallel rays.



Included equipment

- Basic Optics Light Source (OS-8470)
- Universal AC adapter
- Spare bulb (stored under access cover)

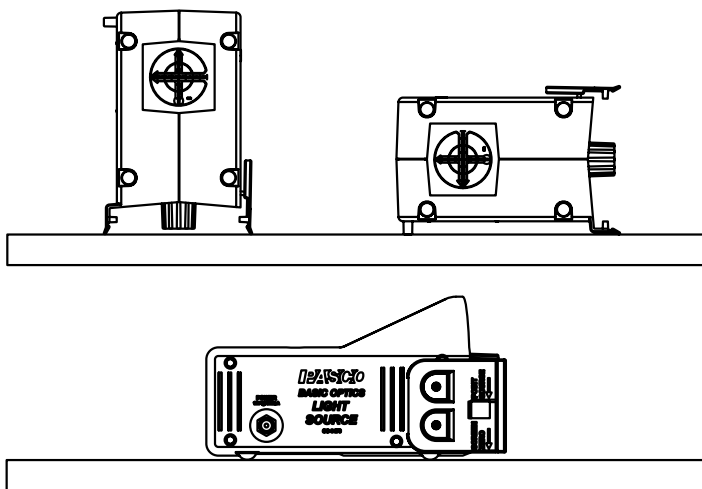
Equipment setup

Power

Connect the included universal AC adapter to the Basic Optics Light Source's power port. Plug the adapter into a 100 to 240 VAC power outlet to power the device.

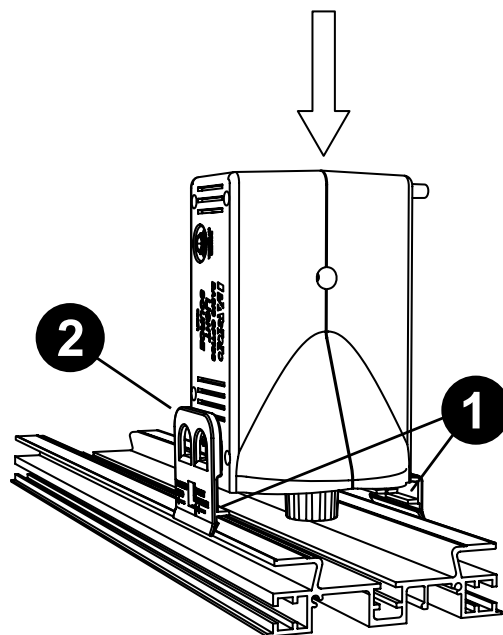
Tabletop placement

As shown below, the Basic Optics Light Source can be placed on a tabletop in three ways: vertically (top left), horizontally (top right), and flat (bottom).



Optics Bench or Carriage mounting

To mount the Basic Optics Light Source on an Optics Bench (OS-8541) or to a Dynamics Track Optics Carriage (OS-8472A), place the device vertically on the bench or carriage and press down, as shown below. The outer tabs (1 in the image below) of the Light Source will snap into the side slots of the bench or carriage. Marks on the tabs indicate the horizontal positions of the point source and object screen. To detach the device, squeeze the release lever (2) and pull upward.



Point source

When viewed "end-on", the halogen bulb's filament approximates a true point source. It projects light through the round opening in the case, but its actual location is about 3 cm behind the outer surface of the case, as indicated by marks on the tabs.

To use the point source, mount the unit on an optics bench or carriage (see **Optics Bench or Carriage mounting**), or place it vertically or horizontally on a tabletop, as shown below.

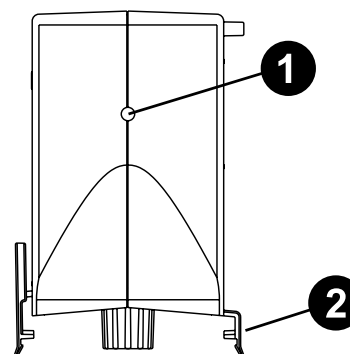
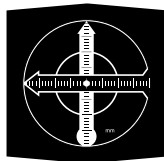


Figure 1: Position of point source (1) and the position mark on the tab (2).

Illuminated object

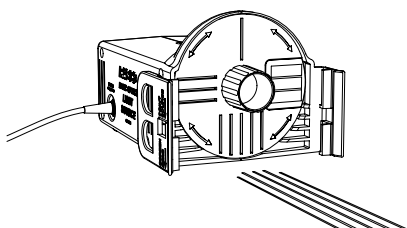
The Basic Optics Light Source's case includes a backlit, translucent screen with crossed arrows printed on it. The pattern is asymmetrical, allowing you to easily tell if images formed with lenses and mirrors are reversed or inverted. Millimeter scales on both arrows allow you to measure the magnification of an image even if part of the image is not visible.



To use the illuminated object, mount the Light Source on an Optics Bench or Carriage (see **Optics Bench or Carriage mounting**), or place it vertically or horizontally on a tabletop.

Ray box

To use the Basic Optics Light Source as a ray box, place the device flat on a tabletop. Turn the wheel to select one, three, or five parallel rays to be projected onto the table. (See below.) A sheet of white paper placed flat onto the table makes the rays easier to see and allows you to trace them with a pencil.

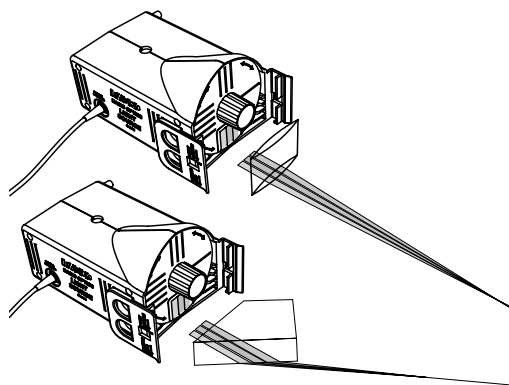


Use prisms, mirrors, and cylindrical lenses, such as those included with the Ray Optics Kit (OS-8516A), to study how the rays are refracted and reflected.

Primary colors

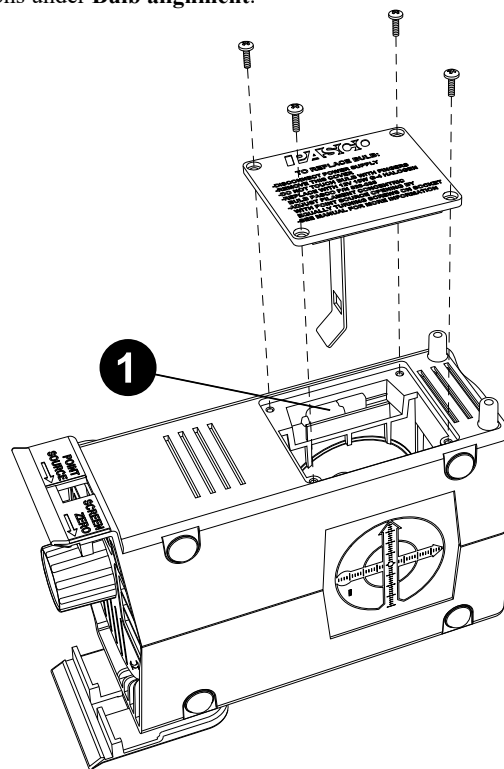
Place the Basic Optics Light Source flat on a sheet of white paper and turn the wheel so that the colored bars are in the lowest position. Red, green, and blue parallel beams will be projected onto the paper or a vertical surface placed in front of the Light Source.

Use a prism or convergent cylindrical lens to combine all three colors, as shown below. Try blocking one of the beams with a pencil to observe the combination of two colors.



Bulb replacement

The Basics Optics Light Source includes a spare bulb, which is stored under the access cover (indicated by the ❶ in the image below). Use a #0 Phillips screwdriver to unfasten the screws securing the access cover, then remove the cover. Remove the old bulb by pulling it straight out. Install the new bulb by pushing it straight into the socket. Align the new bulb approximately with the round opening in the case, then follow the instructions under **Bulb alignment**.



⚠ CAUTION: If the burned-out bulb has been in use recently, it may be hot. Allow the bulb to cool before removing it.

❗ IMPORTANT: Handle the replacement bulb with clean tissue and avoid touching it. Oils transferred from your skin to the bulb may cause the glass to overheat and break while in use. If the new bulb has been touched, clean it with alcohol and dry it with a lint-free cloth before installing it.

Bulb alignment

To produce parallel rays, the filament of the bulb *must* be located on the imaginary line running from the center of the round opening to the center of the crossed-arrow object screen.

To check the bulb's alignment, *unplug the Light Source* and look into the unit through the round opening. Viewed end-on, the filament looks like a small loop. Look through the filament to the center of the reversed side of the crossed-arrow object. If the filament does not appear in the center of the round opening, then the bulb is out of alignment and needs to be aligned. (See Figure 1.)

💡 TIP: Try taping a pair of crossed threads over the opening to mark its center.

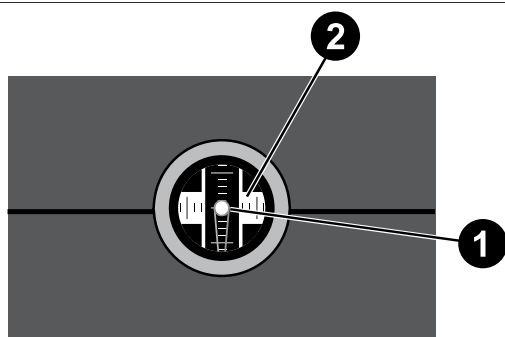
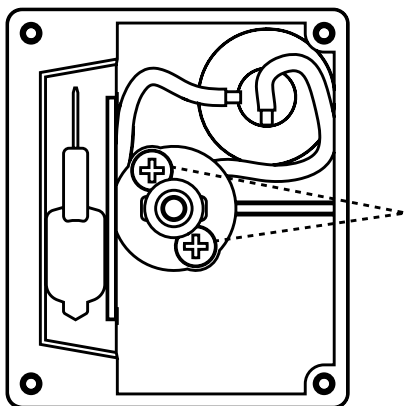


Figure 1: Proper positioning of the filament (1), as seen against the back of the object screen (2) through the round opening.

To adjust the alignment, remove the access cover (if you have not already done so) and use a Phillips screwdriver to turn the screws on the light bulb socket. To move the filament up or down (from the perspective of looking down through the access hatch, as shown below), twist both screws equally in the same direction. To move the filament side-to-side, twist the screws equally in *opposite* direction. The position of the alignment screws is marked by the dotted lines below.



Troubleshooting

- If the bulb does not illuminate when the AC adapter is connected, check that the AC adapter is securely plugged into an operating power outlet. If the problem persists, test the output of the adapter to ensure it is 12 VDC. If the adapter seems to be working but the bulb still does not illuminate, replace the bulb with the included spare. (See **Bulb replacement**.)
- If the rays are not parallel or do not appear as thin, straight lines of light, check the bulb alignment and adjust as necessary. (See **Bulb alignment**.)

Specifications and accessories

Visit the product page at [pasco.com/product/OS-8470](https://www.pasco.com/product/OS-8470) to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include editable student handouts and teacher notes. Visit [pasco.com/freelabs/OS-8470](https://www.pasco.com/freelabs/OS-8470).

Technical support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

Web	pasco.com/support
Chat	pasco.com
Email	support@pasco.com
Phone	1-800-772-8700 x1004 (USA) +1 916 462 8384 (outside USA)

Limited warranty

For a description of the product warranty, see the Warranty and Returns page at www.pasco.com/legal.

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Product end-of-life disposal



This electronic product is subject to disposal and recycling regulations that vary by country and region. It is your responsibility to recycle your electronic equipment per your local environmental laws and regulations to ensure that it will be recycled in a manner that protects human health and the environment. To find out where you can drop off your waste equipment for recycling, please contact your local waste recycle or disposal service, or the place where you purchased the product. The European Union WEEE (Waste Electronic and Electrical Equipment) symbol on the product or its packaging indicates that this product must not be disposed of in a standard waste container.

CE statement

This device has been tested and found to comply with the essential requirements and other relevant provisions of the applicable EU Directives.