

Color Mixer

OS-8496

Introduction

The Color Mixer is designed to be used in systems such as the Beginning Optics System (OS-8459) or the Basic Optics System (OS-8515D). The device includes a power adapter (100 to 240 V AC to 5 V DC). The mixer has three bright light-emitting diodes (LEDs) that produce red, green, and blue light. When the colors of light are mixed with the right intensity, the combination appears as white light.

The Color Mixer fits onto either the 60 cm Optics Bench (OS-8541) or the 1.2 m Optics Track (OS-8508). You can also mount the device and other PASCO optics components onto a PASCO dynamics track using the Dynamics Track Optics Carriages (OS-8472). The Color Mixer works best when used with the Basic Optics Viewing Screen (OS-8460).

Equipment

Included equipment:

- Color Mixer
- Single Port USB Wall Charger (PS-2575A)
- USB power cable

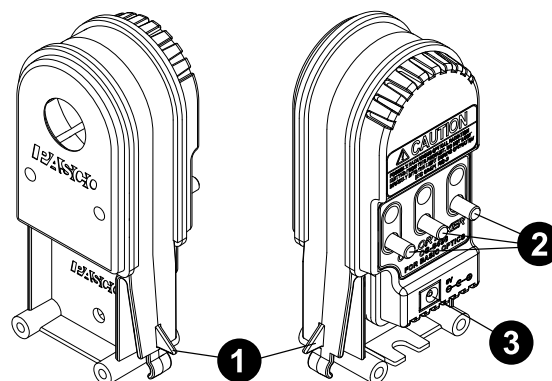
Recommended equipment:

- Basic Optics Geometric Lens Set (OS-8456)
- Basic Optics Viewing Screen (OS-8460)
- Color Mixer Accessory Kit (OS-8495)
- 1.2 m Optics Track (OS-8508) *or* 60 cm Optics Bench (OS-8541)

Recommended systems:

- Beginning Optics System (OS-8459)
 - Basic Optics Viewing Screen (OS-8460)
 - Geometric Lens Set (OS-8466A)
 - Basic Optics Light Source (OS-8470)
 - 2× Adjustable Lens Holders (OS-8474)
 - 1.2 m Optics Track (OS-8508)
- Basic Optics System (OS-8515D)
 - Basic Optics Geometric Lens Set (OS-8456)
 - Concave/Convex Mirror (OS-8457)
 - Basic Optics Viewing Screen (OS-8460)
 - Basic Optics Ray Table (OS-8465A)
 - Basic Optics Light Source (OS-8470)
 - Adjustable Lens Holder (OS-8474)
 - 1.2 m Optics Track (OS-8508)
 - Ray Optics Kit (OS-8516A)
 - Accessory Lens Set (OS-8519)

Features



- 1 Position adjustment tab
- 2 Brightness control knobs
- 3 Power input jack

About the equipment

The three knobs on the back of the Color Mixer can be used to control the light intensity of the individual LEDs as needed. The colored LED each knob controls is indicated by the color of the painted shape surrounding the knob. Turn a knob fully counterclockwise to turn the associated color off. Turn a knob fully clockwise to make that color as bright as possible.

CAUTION: The Color Mixer's LEDs produce intense light. For this reason, do NOT look directly into the LED when the device is turned on.

The three primary color lights produce three "secondary color" lights when mixed. The blue and red lights blend to form magenta, the blue and green lights blend to form cyan, and the red and green lights blend to form yellow. All three colors blend in the center to form white. You may need to adjust the intensity of the individual colors in order to produce the white light. (Note that blending primary color lights produces different results than blending primary color pigments, such as paints.) An example of this color blending is shown in Figure 1.

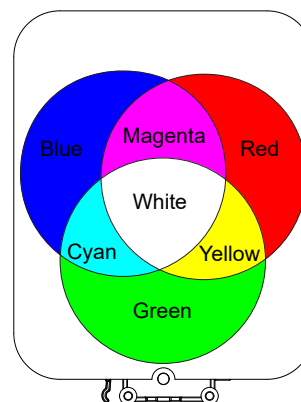


Figure 1

The ventilation slots in the Color Mixer housing help the LEDs operate at a low temperature, extending their useful life. Typically, an LED of the type in the Color Mixer has a lifespan of approximately 50,000 hours. However, because of the efficiency of the Color Mixer's circuitry, the LEDs may last much longer under optimal conditions.

Due to minor variations in the LEDs, the individual color wavelengths will vary from unit to unit. The peak wavelengths should fall within the following ranges:

Color	Peak Wavelength Range
Red	620 to 630 nm
Green	520 to 535 nm
Blue	450 to 465 nm

Usage

Optics bench with lens

1. Mount the Color Mixer at one end of a PASCO optics bench, as shown in Figure 2. To do so, place the component's base onto the bench and push down firmly to snap the Color Mixer into place.
2. Connect the USB power cable to the Single Port USB Wall Charger to complete the power supply.
3. Connect the power supply to the power input jack on the back of the Color Mixer. Plug the power supply into an appropriate electrical outlet.
4. Mount a Basic Optics Viewing Screen (OS-8460) near the other end of the optics bench.
5. Mount a +200 mm focal length double convex lens from the Basic Optics Geometric Lens Set (OS-8456) on the optics bench.
6. Adjust the position of the lens and viewing screen as needed until the overlapping circles of red, green, and blue color appear as large as possible on the viewing screen. To move a component, squeeze the position adjustment tab on the base and slide the component along the bench.
7. Use the knobs on the back of the Color Mixer to adjust the intensity of each color as needed.

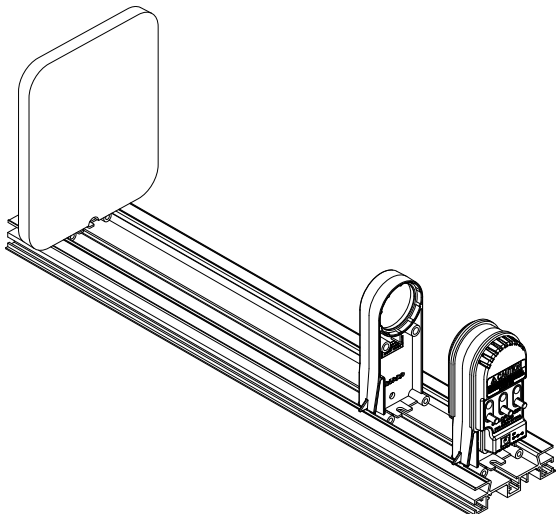


Figure 2

Optics bench without lens

1. Mount the Color Mixer at one end of a PASCO optics bench, as shown in Figure 3. To do so, place the component's base onto the bench and push down firmly to snap the Color Mixer into place.
2. Connect the USB power cable to the Single Port USB Wall Charger to complete the power supply.
3. Connect the power supply to the power input jack on the back of the Color Mixer. Plug the power supply into an appropriate electrical outlet.
4. Mount a Basic Optics Viewing Screen (OS-8460) near the other end of the optics bench.
5. Adjust the position of the Viewing Screen so that the overlapping circles of red, green, and blue light are as large as possible on the screen. To move a component, squeeze the position adjustment tab on the base and slide the component along the bench.
6. Use the knobs on the back of the Color Mixer to adjust the intensity of each color as needed.

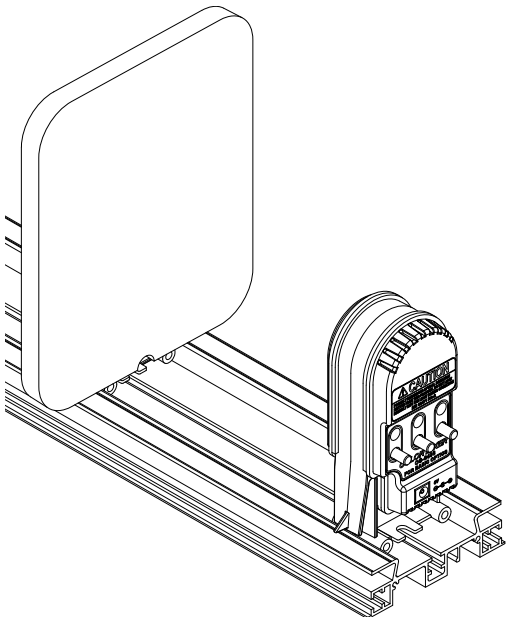


Figure 3

Standalone

1. Connect the USB power cable to the Single Port USB Wall Charger to complete the power supply.
2. Connect the power supply to the power input jack on the back of the Color Mixer. Plug the power supply into an appropriate electrical outlet.
3. Point the Color Mixer at a piece of white paper or another white surface so the front of the Color Mixer is parallel to the surface.
4. Use the knobs on the back of the Color Mixer to adjust the light intensity for each color as needed.

Color Mixer Accessory Kit (OS-8495)

The Color Mixer Accessory Kit includes seven filter cards and eleven printed color cards. Each card is 2.5 inches by 3.5 inches (64 mm by 89 mm) and has a graph showing its transmitted or reflected light spectrum. The manual for the Accessory Kit includes a wide variety of experiments which can be performed with the Color Mixer and the Accessory Kit, focusing on topics such as absorption, transmission, and fluorescence. Figure 4 shows a typical experiment setup for an experiment with the Accessory Kit, with light from the Color Mixer shining through one of the filter cards and onto a view screen made of white paper or cardboard.

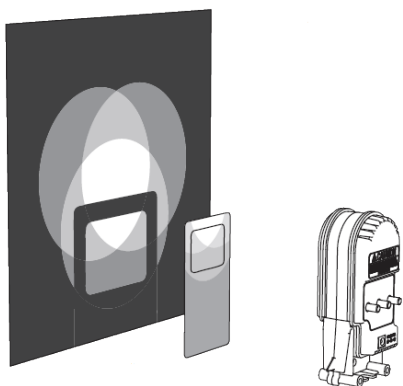


Figure 4

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include student handouts and teacher notes. Visit [pasco.com/freelabs/OS-8496](https://www.pasco.com/freelabs/OS-8496).

Technical support

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

- Chat [pasco.com](https://www.pasco.com)
- Phone 1-800-772-8700 x1004 (USA)
+1 916 462 8384 (outside USA)
- Email support@pasco.com

Limited warranty

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

Copyright

This document is copyrighted with all rights reserved. Permission is granted to non-profit educational institutions for reproduction of any part of this manual, providing the reproductions are used only in their laboratories and classrooms, and are not sold for profit. Reproduction under any other circumstances, without the written consent of PASCO scientific, is prohibited.

Trademarks

PASCO and PASCO scientific are trademarks or registered trademarks of PASCO scientific, in the United States and in other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of, their respective owners. For more information visit www.pasco.com/legal.

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.