



Introduction

Thank you for hosting the Light and Color exhibit! Light and Color provides a hands-on opportunity for children age 6 – 12 to learn about refraction, color, reflection, sources of light, holograms and how we see color. The exhibit comes with activity kits which use art and literature to further investigate these topics.

This manual contains the instructions for setting up, maintaining and breaking down the Light and Color exhibit. If at any time you have questions or concerns, please contact us. We are committed to giving you a high quality, hands on exhibit for your site.

HOP Host Responsibilities

Hosting a HOP exhibit is a rewarding experience. To ensure a quality experience for all renters, exhibit hosts are asked to assume certain responsibilities listed below. Most of these are self evident and are included below only as a matter of form. Host sites are encouraged to form a committee of community partners to help fulfill the responsibilities of hosting an exhibit. In addition to being a work group, a diverse group of participants will provide a wide network to better outreach to the community.

- Select a contact person who will maintain communication with the HOP Coordinator.
- Select a sponsoring organization that will sign the contract with HOP.
- Secure a date and location for the HOP exhibit and reserve that with the HOP coordinator.
- Pick up the exhibit trailer from the previous location.
 - The exhibit travels in a 16 foot trailer and must be pulled by a larger pickup or larger SUV. The vehicle must have a 2⁵/₁₆ inch ball hitch and the driver must be 21 or older.
- Unload the exhibit at library or other designated location.
 - The exhibit is a turn-key operation needing approximately three people to set up the display pieces. The pieces are on wheels to be roll into your venue with care. An Exhibit Manual accompanies each exhibit.

- Designate volunteers or staff to use the activities and programs provided in the kits.
 - It is recommended that you schedule weekly (or more) activities/story times for local children and families. Consider offering programs for scout groups, after school programs, schools and preschools. The activities and books in the kit should make it simple for volunteers to lead these activities.
- Maintain simple volunteer and attendance records. These, plus some basic evaluation comments are requested at the end of your exhibit time.
 - All forms are provided in the manual.
- Check the exhibit daily for cleanliness and proper operations.
- Clean exhibit before packing into trailer.
- Load exhibit back into trailer, ready for the next location. This should take four people approximately 1 to 1 ½ hours.
- Promote the exhibit's visit and related activities at least a week prior to exhibit opening date.
 - It is possible that a member of the local media will join your committee and serve this role.
 - A sample press release, PSA and poster are in the Exhibit Manual.
- (Libraries and Schools) Design additional Backpack Loan Programs for the library.
 - Each venue will be given a Light and Color Backpack which includes science, literature and art activities that are appropriate for at-home use. This can be a start of a permanent HOP Backpack Loan Program in your community. The Exhibit Manual contains directions on how to develop HOP Backpacks.
- Secure funding in the form of sponsorship fees for the exhibit and program. Check with the HOP coordinator, grant funding is often available from statewide sponsors to help bring the exhibit to your community.
 - All sponsors should be noted as often as possible in your publicity.

Exhibit Overview

Technical and Design Details

The exhibit consists of 9 exhibit tables each 5 foot high by 1 ft. 10 in. high by 3 ½ ft. long. Each of the 9 tables has two interactive exhibits. Electricity is required for 6 of the tables. Power strips and extension cords are included. The exhibit requires 300 – 500 square feet of floor space which need not be continuous.



Figure 1: Light and Color exhibit tables

The exhibit also features a dichroic light sculpture which requires a table and access to electricity.



Figure 2: Dichroic light sculpture

Procedures for Unloading, Loading and Maintaining Exhibit

Trailer

1. Before removing the exhibits, be sure the trailer is in a stable position. As exhibits move from the back of the trailer, the balance of weight will shift to the front.
2. Open the trailer door in the back, which forms a ramp.
3. Once the trailer is unloaded, move the trailer to a location where the trailer signage can serve as a billboard for the exhibit.
4. Place the hitch, and any items that could get lost in the trailer and lock it.
5. Be sure the trailer is blocked and stabilized for the safety of people passing by.

The Kits

- The activity kits accompany the display. Unload the tubs and keep in a secure place until used by the volunteers or teachers. Remove these first.
- Keep the Exhibit Manual with the kits and referred to as needed.

Unloading Trailer Instructions

- Stabilize the trailer.
- Before you begin to unload the display pieces, check to see how they are set in their places. This will be helpful when you reload the display.
- Remove the boards along the front of the exhibits. Lay them on the floor on the right side of the trailer with the bungee cords.
- Unlock all exhibit wheels.
- Beginning at the back of the trailer (closest to the ramp) roll each display out of the trailer. Two people must move each piece. One person rolls the exhibit and the other stabilizes the top of the display to prevent damage.

Loading Trailer Instructions

- Stabilize the trailer.
- Reload the exhibit in the reverse order that you took the display pieces out of the trailer. Be sure the numbers on the display pieces correspond with the number on the trailer floor. Use the schematic below to help you position exhibits.
- Secure the exhibits by locking the wheels and repositioning the boards and bungee cords.
- Load the activity kits and exhibit manual.
- Fill out the evaluation, gather the volunteer sheets and return to the HOP director as soon as the exhibit leaves for the next city.

Light and Color Trailer

<p>Look A Lights</p> <p>Instant Lighting</p> <p>Exhibit 7</p>	<p>Light w/In a Light</p> <p>What's In a Lightbulb</p> <p>Exhibit 8</p>	<p>Holograms on Parade</p> <p>Do You See What I See</p> <p>Exhibit 9</p>
<p>Pink Pig Cheek to Cheek</p> <p>Exhibit 6</p>		
<p>Mouse Multiplier</p> <p>Up Periscope</p> <p>Exhibit 5</p>	<p>TUBS</p>	
<p>Now you See It</p> <p>Spinning Discs</p> <p>Exhibit 4</p>	<p>TUBS</p>	
<p>Color Shadows</p> <p>Color on Color</p> <p>Exhibit 3</p>	<p>TUBS</p>	
<p>Rainbow Effect</p> <p>Refraction in Action</p> <p>Exhibit 2</p>		
<p>What's Up Look Through Lenses</p> <p>Exhibit 1</p>		



Exhibit Set-up Instructions

Roll the exhibits into place and lock wheels. Open the cupboard in the bottom front of the exhibit. The power strips, extension cords and exhibit pieces should be stored here. You may wish to arrange exhibits so that electrified ones are together.

Exhibits do not have to be displayed in one spot. You may display groupings of exhibits in different spots as your space allows. Use the pedagogy section to group like exhibits together.

Exhibits are most effective when set up in a room with little natural light. A bright sunny room will overpower some of the activities that use light.

NOTE: The top part of UP PERISCOPE is stored in the cupboard below.

Clean exhibit using recommended materials. Do not spray exhibit directly but rather spray the towel first. Do not clean hot light bulbs!

Dichroic Light Sculpture. The 12 inch square metal rectangle is an original art piece by Ray Howlett, on loan for this particular experience. The exterior of the metal light sculpture needs to have dirt and finger prints removed with rubbing alcohol. Place the 12 inch metal light sculpture on a flat, sturdy surface at eye level for the participants with lots of room to move around the sculpture glass face.

Participants will need to move around light box sculpture to get the full effect, make sure the space is available around the sturdy surface you have placed the light sculpture box on.

Cleaning Kit

Recommended cleaning supplies.

- **Multi-Surface Cleanser.** For all wood, laminate, glass and plexiglass surfaces. Do not use on Dichroic Light Sculpture
- **Soft paper towels.** Use two ply paper towels or clean, soft cloth. Do not use single ply, brown, commercial grade paper towels.
- **Rubbing alcohol.** Use with soft paper towels on Dichroic Light Sculpture.

Exhibit Break Down Instructions

Clean the exhibits. Inventory all the parts and pieces on the exhibit condition report. Place the exhibit pieces such as rainbow glasses and color paddles in the cupboards in the base of the exhibit.

Unlock the wheels before rolling to the trailer.

Exhibit Maintenance

General

Use a mild soap solution to clean the exhibits. Pledge MultiSurface or a similar cleanser should be used on all surfaces. Do not use abrasive cleaners or cleaners with ammonia. (Ajax or a similar abrasive powder may be used on to remove really dark smudges from white Formica tabletops only. Do not use it on painted surfaces or Plexiglas.)

When cleaning the exhibit instruction panels, lightly dampen a paper towel with cleaner. Do not spray directly onto panels or it may leak behind the Plexiglas.

To remove the window or top panel of the exhibit, use a $\frac{3}{32}$ nd Hex wrench.

Replacing Light Bulbs

Replacement light bulbs for an exhibit can be found inside the base of exhibit table. To open the access panel use one of the keys in the tool kit. (All doors are keyed the same.)

If you cannot find a replacement light bulb, please contact HOP coordinator at 605-224-8295.

Maintaining Specific Exhibits

Look Through Lenses

To replace bulb:

- Unplug exhibit
- Unscrew window panel and remove
- Twist burned out bulb and replace with new one
- Reverse steps

The Rainbow Effect/Refraction in Action (Same for both sides)

To replace bulb:

- Unplug exhibit
- Remove access door
- Remove tub by loosening screws with Philips head screwdriver.
- Remove light bulb holder using square screwdriver bit.
- Detach bulb holder and unscrew bulb
- To reassemble, reverse steps

Color on Color

To replace bulb:

- Unplug exhibit
- Looking down on the top of the projector, find the lever next to the bulb - pull lever up which will push the bulb out (sideways)
- Remove bulb
- Place new bulb on holder and slide sideways into socket while pushing lever down
- Plug in exhibit

Color Shadows

To replace bulb:

- Unplug exhibit
- Remove four thumbscrews holding wire mesh heat shield to cabinet and
- Remove heat shield
- Turn bulb fixture perpendicular to vertical surface to allow slack wire to be pulled through fixture
- Pull out black light socket. Socket, filter and bulb should come out of fixture together as slack wire is pulled through top of fixture
- Remove socket and filter from bulb
- Unplug bulb and replace with new from spares - re-assemble in reverse order. Verify bulb aim.
- Plug in exhibit

Spinning Disks

If disk will not spin when handle is turned:

- Make sure shaft in table is engaging the shaft in the window
- If it still will not turn, remove the panel on the other side of the exhibit by removing the screws
- Make sure belt is on the pulleys
- Replace belt if necessary

Look-A-Lights (Neon/Argon)

To replace bulb:

- Unplug exhibit
- Remove four screws on window and remove panel
- Unscrew bulb and replace it

Please use extra caution with neon/argon tubes. They are custom-designed and fragile. Replacements are not included – call Hands-On Partnership (HOP) in case of breakage at 605-224-8295.

What's in a Light Bulb

To replace bulb:

- Unplug exhibit
- Remove screen on the top of the “window”
- Unscrew bulb and replace screen

Replacement of small bulbs not included -- call Hands-On Partnership (HOP) 605-224-8295

Light within a Light (fluorescent)

To replace fluorescent bulb:

- Unplug exhibit
- Unscrew panel on window with Hex wrench
- Remove burned-out tube and replace (the tubes twist and then slide out or in).

Holograms on Parade

To replace bulb:

- Unplug exhibit.
- Remove front panel with hex wrench.
- Replace light bulb
- Plug in exhibit

Call HOP at 605-224-8295 for problems or repairs needed on other exhibits.