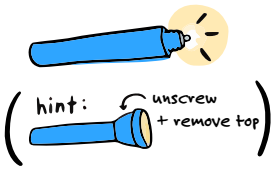
SETTING UP

YOUR OWN LIGHT AND SHADOW PLAYGROUND

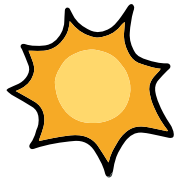
All you need is a **light source**, a **surface**, and **materials** to explore!

1. LIGHT SOURCE

It's important to have lights that can be easily moved and adjusted to support explorations of shadow size and position. We always try to use **point sources*** as lights to create clean, crisp shadows. Here are some solutions we've tried out...



MAGLITE FLASHLIGHT



THE SUN!

PHONE FLASHLIGHT

2. SURFACE

Think about the space. What projection surfaces will **support different kinds of investigations**? Hanging up a big sheet or using a blank wall supports large-scale dramatic play and working together. Smaller, individual stations can feel like personal and protected spaces for building.

3. MATERIALS TO EXPLORE

COLORFUL MATERIALS

MATERIALS THAT BEND LIGHT
(see **Bending Light**)

REFLECTIVE MATERIALS
(see **Bouncing Light**)

SHADOW CASTERS
(see **Blocking Light**)

*A **point source** is a light source that creates sharp shadows. Many LEDs and flashlights have lenses and diffusers that soften the shadows, or are made up of multiple LEDs instead of just one. Sometimes these can be removed to access the point source underneath.

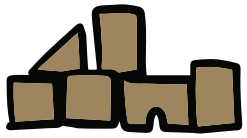
BLOCKING LIGHT

BLOCKING LIGHT IN ACTION

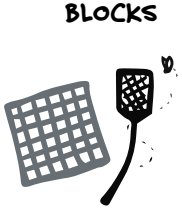
"but where are the stripes?!"
– Marco, age 5

A shadow is made by **blocking** light. If children are noticing how some objects block light, you might offer them the word **opaque** to describe these materials.

MATERIAL IDEAS



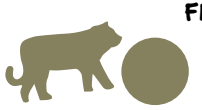
BLOCKS



GRIDS

WIRE SHAPES

FIGURINES



CARDBOARD CUTOUTS

WHAT CHILDREN MIGHT DO

- Make observations about shadows (like when Marco noticed that the tiger's shadow didn't have stripes).
- Move around the objects and light sources. Notice how shadows become bigger or smaller and change shape.
- Use their own hands and bodies to block light and make their shadows dance!

WHAT YOU MIGHT DO

- Ask children questions like:
  - How big do you want your shadow to be?
  - Where should we place the light?
  - Where should we place the object?
- Go on a search for other objects that can **block** light. What do children notice as they test out different materials? Is all of the light blocked?
- Build on an interest in using hands to make shadows by hanging up a white sheet to make large-scale shadow performances!
- Follow the learner who starts telling stories by offering supplies to make cardboard cutouts and shadow puppets.

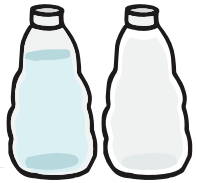
BENDING LIGHT

Light **bends through** some materials. This isn't the same as a reflection, when light bounces back. Instead, light moves through the object or material, but it changes direction.

MATERIAL IDEAS

GLASSES
(BOTH KINDS)

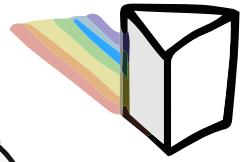
MAGNIFYING GLASSES



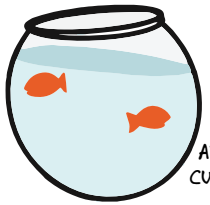
BOTTLES
TRY WITH AND WITHOUT WATER INSIDE

LENSES

FRESNEL LENSES



PRISMS



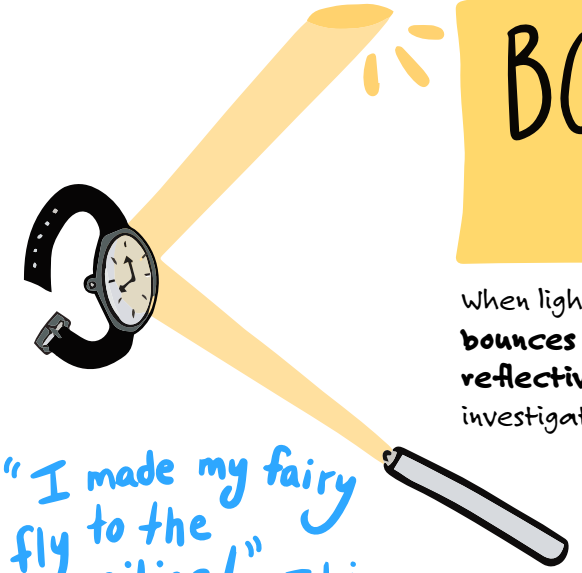
FISHBOWLS
AND OTHER CLEAR, CURVED CONTAINERS

WHAT CHILDREN MIGHT DO

- Notice how funny faces look when you see them through a lens or a fishbowl!
- Try to make a rainbow by shining a light at a prism from all different angles.
- Comment on how the shape of the light changes while moving a lens around.

WHAT YOU MIGHT DO

- Ask children questions like:
  - Where is your light going?
  - Where is the light brightest?
  - What colors do you notice?
- Go on a search for other objects that light can **bend through**. What do children notice as they test out different materials?
- Compare differently shaped bottles and cups. Some cups even have cut facets like crystals that might change how the light moves through them.



BOUNCING LIGHT

When light hits certain materials, it **bounces back**. By playing with **reflective** materials, children can investigate the relationship between a light source, a reflective object, and how light bounces.

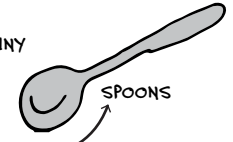
"I made my fairy fly to the ceiling!" -Talei, age 5

MATERIAL IDEAS

MYLAR
TRY THE SHINY INSIDE OF A BAG OF CHIPS

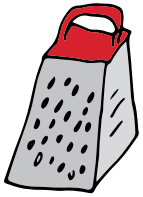
DISCO BALLS
OR SEQUINS AND SHINY ORNAMENTS

MIRRORS

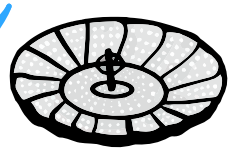


SPOONS

METAL OBJECTS



CHEESE GRATERS



STEAMERS

WHAT CHILDREN MIGHT DO

- Try to **direct light** to bounce up onto the ceiling or over onto the wall.
- Explore how changing the placement of a light source or shiny object affects the path of the light.
- Compare their reflections in a mirror and in mylar.
- Use disco balls or fabric with sequins to make a party scene.

WHAT YOU MIGHT DO

- Ask children questions like:
  - **Where is the light going?**
  - **Can you trace its path with your finger?**
  - **Where do you want the light to go?**
  - **Can you bounce it onto the ceiling?**
- Go on a search for other shiny objects that can **bounce** light. What do children notice as they test out different materials?
- Follow the learner in telling a story by offering materials to support building a scene, like blocks, figurines, tape, and cardboard.