Project Exploration creates transformative learning opportunities for youth underrepresented in the sciences --particularly students of color and girls -- by equipping them with the skills, practices, and mindset needed for a lifelong pursuit of learning. STEM@Home makes activities around science, technology, engineering, and math accessible and fun to do at home. This STEMbook activity, resources, and more are available at www.projectexploration.org/stemathome.

In this activity, you will:

transform your home into a movie theater! Using materials found in your home, you will be able to build a projector to take your favorite shows to the big screen!

Supplies Required:

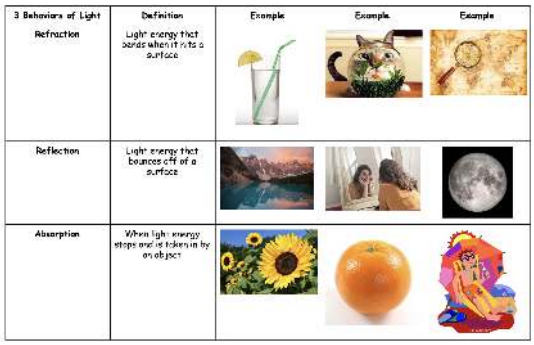
- A small cardboard box (a shoebox could wo
- Extra cardboard for phone stand
- Magnifying glass or camera lens
- Scissors
- Tape
- Smart phone

Video

Explore the behavior of light before your get started: https://tinyurl.com/vwmphf8

Overview

When you go to the movies, have you ever wondered how they get the movie to show up on the big screen? Today, we're going to build a model to see how it works. Light is a form of energy, and it is always in motion. This also means that light can behave in certain ways. Light can reflect (bounce back), refract (bend), and absorb (be taken in). Projectors cause light to refract, or bend, because the lens on the front of the projector is curved. The curvature causes the light to move in a way that magnifies the picture. Just like glasses or a magnifying glass! The lens on a projector is convex, or curved outward, like the human eye. The lens catches the light and bends it upside down. That's why when we build our projector, we have to place our smart phone upside down inside.



Instructions

1. Trace the magnifying glass onto the one wall of the cardboard box.
2. Cut the traced image out, or have an adult cut it out for you.
3. Create a stand for the smart phone by bending a piece of cardboard in thirds, like a prism. Tape ends together if necessary
4. Place stand on opposite end of the side with the hole.
5. Tape magnifying lens on inside of the box, making sure to align it with the hole that was cut.
6. Place smart phone upside down on stand.
7. This is the finished product! To use the projector, play a video on the phone and close up the box. Point the projector at a blank wall. Play around with the distance between the projector and the wall to get the best image.

Additional Resources

1. Find more directions for the projector here: https://thestemlaboratory.com/smart-phone-projector/

Share It Out

Invite your family to a movie night and take a picture of your setup! Make popcorn and pretend you're at the movies.

Share on social media: take a picture of your projector and movie night and share it to social media! Use these hashtags to share your creations:

#DIYProjector
#ProjectExploration
#StemAtHome

Share via PE's website: Students who complete STEM@home activities and share what they learned with the PE team via our website will earn points which can be traded in for cash prizes at the Explore Store. Your project number is 206. Learn more at www.projectexploration.org/explore-store

Join PE's character contest!
Design a STEM character who will lead kids through activities and be featured on our website and in our STEMbooks. Cash prizes will be awarded to the top 3 finalists. Learn more at www.projectexploration.org/character-contest.