

FLASHLIGHT MOVIE LAB: LIGHT AND PROJECTION



Kids use a flashlight, a paper shape, and a white wall to make a mini projected picture, then see why the room light changes how clear it looks. It connects straight to why outdoor movies start after sunset.

Learning goal Kids will explain that light travels in straight lines and that extra light around a screen makes a projected picture harder to see.	Ages 6-11	Time 10-15 minutes
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Group: 1-6 kids with one grown-up holding or supervising the flashlight

Materials

- One flashlight (a grown-up handles it or supervises closely)
- A sheet of white paper taped to a wall, or a plain light-colored wall
- A small paper cutout (star, heart, animal) taped to a craft stick or pencil
- Tape
- A room where you can turn the lights off or close the blinds
- Flashlight Activity printable (optional)

Before you start

- Tape the white paper to the wall at kid height and clear the floor in front of it so nobody trips in the dark.
- Cut out the paper shape ahead of time for younger kids.
- Test the flashlight and decide where the grown-up will stand, about 3 to 4 feet from the paper.
- Plug in a night-light or keep a door cracked so the room is dim, not pitch black, for walking around.

Step by step

- 1 Set the rules out loud before the light goes on: the flashlight points only at the paper, never at anyone's face or eyes, and pets count too.
- 2 With the room lights on, the grown-up shines the flashlight at the paper. A kid holds the cutout between the light and the paper to make a shadow picture. Ask: how easy is it to see?
- 3 Turn the room lights off or close the blinds. Shine the flashlight the same way. Ask: what changed?
- 4 Explain it plainly: the flashlight was putting the same picture on the paper both times. With the room lights on, extra light also lands on the paper and makes the dark parts less dark. That lowers the contrast, so the picture looks washed out.
- 5 Look at the shadow's shape. It matches the cutout because light travels in straight lines, and the cutout blocks the lines that hit it.
- 6 Have kids predict, then test: what happens to the shadow when the cutout moves closer to the flashlight? Farther away?
- 7 Connect it to outdoor movies. A projector's picture is on the screen whether it's day or night, but daylight floods the screen and washes it out. That's why outdoor shows start after sunset, and often a bit later, since the sky stays fairly bright for a while after the sun goes down.

- 8 Share the star idea: stars are in the sky during the day too. The bright sky hides them the same way daylight hides a movie.
- 9 Wrap up with the Flashlight Activity printable: kids draw the picture with lights on and lights off and circle the clearer one.

Safety

- Do the flashlight activity only with a grown-up.
- Never shine a flashlight or any light into anyone's eyes, including pets.
- Never look into a projector lens, at home or at a movie night. The bright light can hurt your eyes.
- Keep the floor clear and leave a little light on so nobody trips in the dark.
- Some older flashlight bulbs get warm. Don't hold a flashlight against skin or paper for a long time.

Talk about it

- Why did the shadow picture look clearer with the lights off, even though the flashlight didn't change?
- Why does the shadow have the same shape as the cutout?
- Why do you think outdoor movie nights start after sunset instead of at lunchtime?
- Where else have you seen light make a picture? Think about shadows at sunset or a light on a ceiling.
- Why should nobody ever look into a projector lens, even during a movie?

Make it easier

For younger kids, skip the closer-and-farther test. Just do lights on and lights off and ask which one is easier to see.

Take it further

Look up tonight's sunset time and the end of evening civil twilight on a weather site, then guess when an outdoor movie in your town could start. Older kids can also use two or three cutouts to make a shadow scene and tell a short story with it.

No screen? No problem

No flashlight? Show contrast with crayons. Draw the same shape in yellow crayon on white paper and on black paper, then ask which one pops. Extra light on a screen works like the white paper: it makes the picture harder to pick out.

Sources

Light travels in straight lines outwards from its source, Science Learning Hub, University of Waikato.

<https://www.sciencelearn.org.nz/images/4011-light-travels-in-straight-lines-outwards-from-its-source>

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Cosmicopia: Stars Q&A, NASA Goddard Space Flight Center. https://cosmicopia.gsfc.nasa.gov/qa_star.html

Important Safety Instructions (projector user guide), Epson America.

https://files.support.epson.com/docid/cpd5/cpd57752/source/notices/reference/important_safety_instructions.html

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