

# Star Light, Star Bright?

Learn about light pollution and then engineer a solution that will help you see the stars shine bright!

## Collect

- 2 flashlights (mini-Maglite or something similar)
- Playdough
- Black cardstock
- Pushpin
- Variety of materials such as paper, aluminum foil, thin cardboard, fabric scraps, bottle caps, or cups
- Masking tape
- Scissors
- Dark room



## Make a star show

1. Cut out a circle of cardstock about the same diameter as the flashlight.
2. Use the pushpin to make several small holes in the circle.
3. Secure the cardstock to the front of one of the flashlights with tape.
4. Roll half of the playdough into a ball and place it on a flat surface in the middle of the room. Press the end of the flashlight into the dough to hold it in place.
5. Turn out the lights in the room and turn the flashlight on to see the stars. How many dots of light can you see on the ceiling? Are they bright or dim?

## Add a street light

6. Unscrew and remove the cap, lens, and reflector from the other flashlight until the bare bulb is exposed. This will simulate light pollution that you might see in a city or suburban neighborhood.
7. Roll the remaining playdough into another ball and press the end of the flashlight into the dough.
8. Turn on the second flashlight and place it near the first flashlight.
9. How many dots of light can you see on the ceiling now? How has the intensity of the star light changed?

## Design a solution!

Your goal is to design a fixture that directs the light down towards the ground rather than allowing it to shine up in the sky. Look at the materials you collected and think about how they could be used to create a shield that changes where the light is shining. Materials that are opaque could be used to help block the light. Reflective materials might be useful if you want to direct the light in a different direction. Test out a few designs and see how they work.

## What is light pollution?

Light pollution is caused by excess amounts of man-made light. One thing that contributes to this type of pollution is the physical design of exterior lights like street lamps and security lights. Older light fixtures often have exposed bulbs which allow the light to scatter in lots of directions, including up towards the sky. This scattering of light creates sky glow and glare. Many newer fixtures are designed with shields that angle the light down to the street. By directing the light, they keep the road brighter while eliminating glare and reducing light pollution.