STEM ACTIVITY

The Widows Mite

Total Time: 15 minutes
In Class Time: 10 minutes

You will need:

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- Cardboard tubes
- Tape
- Aluminum foil
- Wax paper
- Rubber bands
- Safety pin
- Lamp

STEP 1: Use two cardboard tubes like the ones from the center of paper towel rolls. Cut one of the rolls lengthwise (end-to-end), and overlap one side about an eighth of an inch (3 mm) to decrease the diameter of the tube. Tape the overlapped seam to secure it, and insert that tube halfway into the other tube to form your 'telescope'. Remove the shade from your lamp, place it on a table, and plug it in.

STEP 2: Gather the children. TEACH: Chris wanted to use his money to buy an expensive telescope. We're going to make something like a telescope on our own!

STEP 3: Wrap the end of the outer tube in a square of aluminum foil and secure it there with a rubber band. Open a safety pin and poke a tiny hole in the center of the aluminum foil end cap you just made. Make sure you get a round hole in the foil, not a short tear.

STEP 4: Wrap the other end of your telescope (the smaller end) with a square of wax paper and secure it in place with a rubber band.

STEP 5: Darken the room, and turn on the lamp. Hold the telescope so the aluminum foil–and pinhole–faces the light bulb, a few feet (about 1 meter) away. Try to focus image of the lightbulb on the wax paper by lengthening or shortening the telescope.

STEP 6: Repeat the activity, changing the distance of the telescope from the light bulb each time. Note how changing the distance affects the ability to focus the image.

EXPLAINING THE SCIENCE:

A projected image comes into focus when it is at the point where the light rays come together, or converge. The pinhole you made forced the light rays viewed to come together into a small point. By changing the length of the telescope, you find the pinhole's point of focus.