



## WHERE'S THAT EXOPLANET

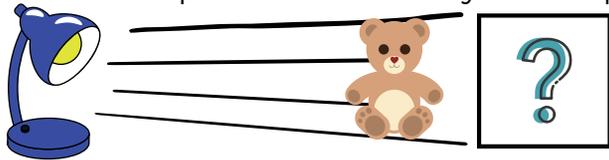
Simulate one method scientists use to discover planets orbiting distant stars.

### Materials

- Desk lamp
- Shoe box
- Black Marker
- Ruler
- 3 objects (small, medium and large)
- Scissors
- Paper
- Tape

### Results

The light from the lamp dimmed when something was passing in front of it. By observing the light through your grid, you could make an educated guess on what kind of item passed in front of your lamp.



### Procedure

- For this activity, choose a location close to an electrical outlet. Plug in your lamp and set up your other materials.
- Use your scissors to cut out the bottom of the shoe box. If you need help, ask a parent.
- On your sheet of paper, draw a 4 X 3 inch grid (think of a tic-tac-toe box with an extra row in one direction). Use your ruler to make your lines straight and even. Tape this paper to cover one end of your shoe box. Make sure your grid is in the center!
- Place the shoe box at the edge of the table. Turn on your desk lamp and position it so the light is shining directly into the open end of your shoe box. Leave 1-2 feet of space between the lamp and the shoe box.
- Sit or stand close enough to your shoe box so that you can't see much of what's going on behind it (cupping your hands around your eyes might help). Ask a parent to take one of your objects (no peeking!) and pass it in front of the lamp so that its shadow briefly passes over the inside of your box. Have your parents keep passing your objects in front of the lamp and see if you can guess which one they're holding. Feel free to use a piece of paper to take notes and record data.

### Why?

The desk lamp is a model for a distant star and your objects are different-sized planets that might orbit that star. The grid screen is a model for how we collect and analyze observations from Earth or from a space telescope.

Exoplanets can be detected using a variety of methods. The one most closely modeled in this activity is called the transit method. With the transit method, astronomers first scour the universe to find stars "blink," indicating that there might be a planet passing between the star and Earth. Then scientists study the light curve coming from the star and look for dips. The size of a planet is directly proportional to the dip in the light curve. Scientists also measure the speed of the transit across a star to approximate how far out it orbits. Planets closer to a star have faster orbits.

To learn more about space science, check out the Sun, Earth, Universe exhibit at the Pink Palace Museum.