

Building a Spectroscope: Light from Space

Name: _____ Date: _____

LEARNING OBJECTIVE

Students will build a simple spectroscope to observe how light separates into a spectrum, and relate this to how astronomers study distant stars.

MATERIALS NEEDED

- an old CD or DVD
- cardboard box or cereal box
- scissors or utility knife (adult help)
- ruler
- black tape or black construction paper
- pencil

HANDS-ON ACTIVITY

1. Cut a narrow slit (about 1-2 mm wide, 3-4 cm long) in one end of your cardboard box using scissors or a utility knife (adult supervision), lined with black tape/paper to block stray light around the slit.
2. Cut a small square viewing hole in an adjacent side of the box, angled so you can look through it toward the slit.
3. Tape the CD/DVD inside the box at an angle opposite the viewing hole, positioned so light entering the slit will hit the shiny/grooved side of the disc and reflect toward the viewing hole.
4. Point the slit end of your spectroscope toward a bright light source (NOT the Sun directly -- use a lamp or bright indoor light) and look through the viewing hole, adjusting the disc angle until you see a rainbow spectrum.
5. Draw and color what you observed in the spectrum, noting the order of colors from one edge to the other.

QUESTIONS

1. What did the CD do to the light entering the slit?

2. In what order did the colors appear in your spectrum, from one side to the other?

3. How do real astronomers use spectroscopes (spectroscopy) to study stars that are trillions of miles away?

4. Why is it important that this activity used a lamp instead of pointing the spectroscope directly at the Sun?
