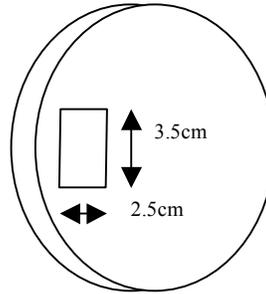


Student Directions

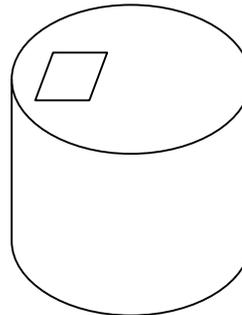
1. Cut a small slit off center in the lid of the container approximately 2.5 cm wide by 3.5 cm high.

Cut hole in lid off to one side.



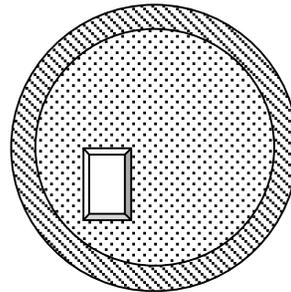
2. Cut a hole the same size roughly opposite the hole in the lid on the opposite side of the container.

Cut hole in container off to one side so that when lid is on, holes are roughly opposite one another.



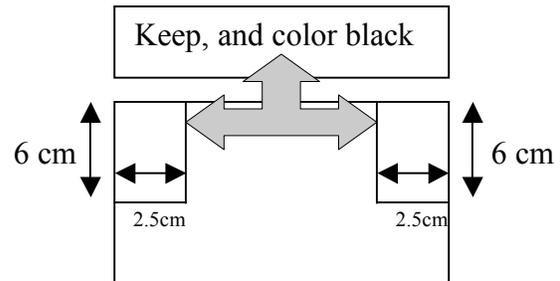
3. Careful not to cover any portion of the hole with tape, gently tape the diffraction grating to the inside of the lid.

Tape grating to hole on the inside of lid.



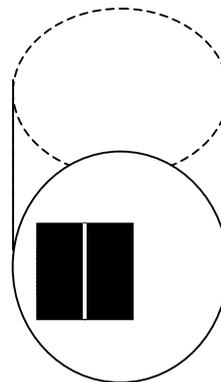
- Cut the index card 6cm long by 2.5cm wide. Use the straight edges of the card. You may have to trim this piece to fit your spectrograph later on.
- Color the index card pieces black using black marker.

Cut ends off of index cards, keep, trim, and color black



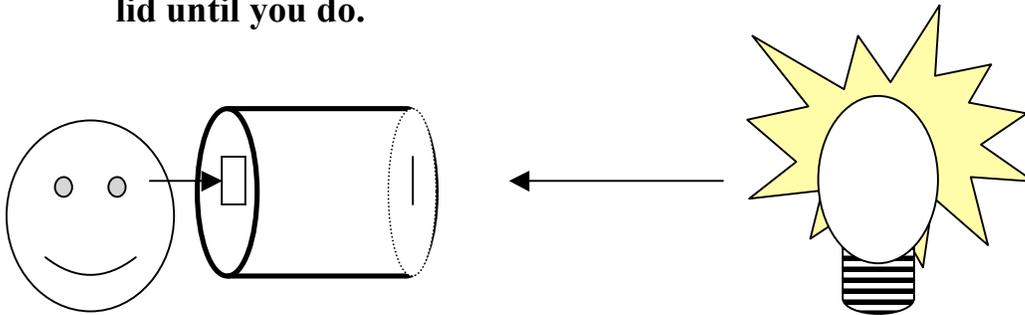
- Using the straightest edge of the index card pieces, tape over the hole in the bottom of the container so that they are almost touching, but not quite. Make a gap of less than 1 mm, as straight as possible. Tape using masking tape so that no light leaks into the box aside from the light coming through the gap (slit).

Tape index card pieces to bottom of box so that they make a very small slit < 1mm. Make sure to use the straightest edge to make the slit.



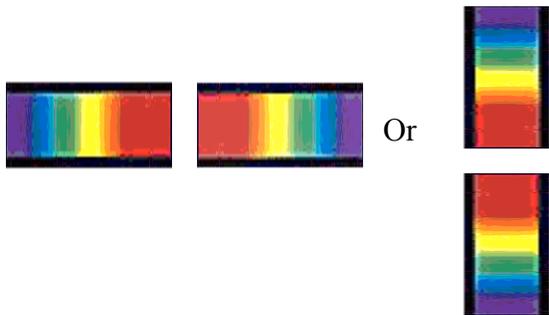
7. Put the lid back on, look through the lid, and point your spectrograph at the light source. You should see a continuous spectrum (a rainbow) very clearly. If you do not see a continuous spectrum clearly, rotate just the lid until you can see one.

Put the lid back on and look through the lid toward the light source. If you do not clearly see a rainbow, rotate the lid until you do.

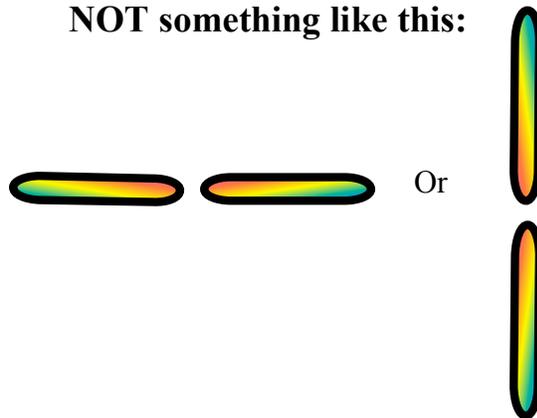


8. Once your spectrograph is finished, decorate the outside of your container.

You should see something like:



NOT something like this:



This is called a continuous spectrum. Both sides of the slit show a full continuous spectrum. When you are drawing the spectrum, just choose one or the other. Do not draw both.



Building a Fancy Spectrograph

Questions

1. Draw the spectrum you see when you look at the light source.

2. When you look at the light bulb without using the spectrograph, what color is it? Can you see the colors of the spectrum with your naked eye?
3. If a spectrograph is a special tool that shows us what light is made from, what do you think makes up this light source?
4. Do you think that there are kinds of light that cannot be seen with the naked eye?
5. If light exists that cannot be seen, how could it be possible to observe it?



Building a Fancy Spectrograph

Homework

Name _____

Take your spectrograph home with you and look at *eight* light sources. Make sure to look at at least three *different kinds* of light. For example, you could look at a normal light bulb, a street lamp, and a florescent light (like the kind found in most kitchens and some bathrooms). Other examples of light are bug zappers, candles, glow sticks, neon signs etc. You can use the Sun, but **NEVER** point your spectrograph directly at the Sun. Instead, place a piece of white paper on the ground or taped to a wall so that the Sun's light is shining on it, and point your spectrograph very close to the paper.

Record your observations in the table below. Be prepared to share your results with your class.

Light Source	Color of Light with Naked Eye	Spectrum (draw here, with calibration numbers if applicable)



Building a Fancy Spectrograph

Light Source	Color of Light with Naked Eye	Spectrum (draw here, with calibration numbers if applicable)