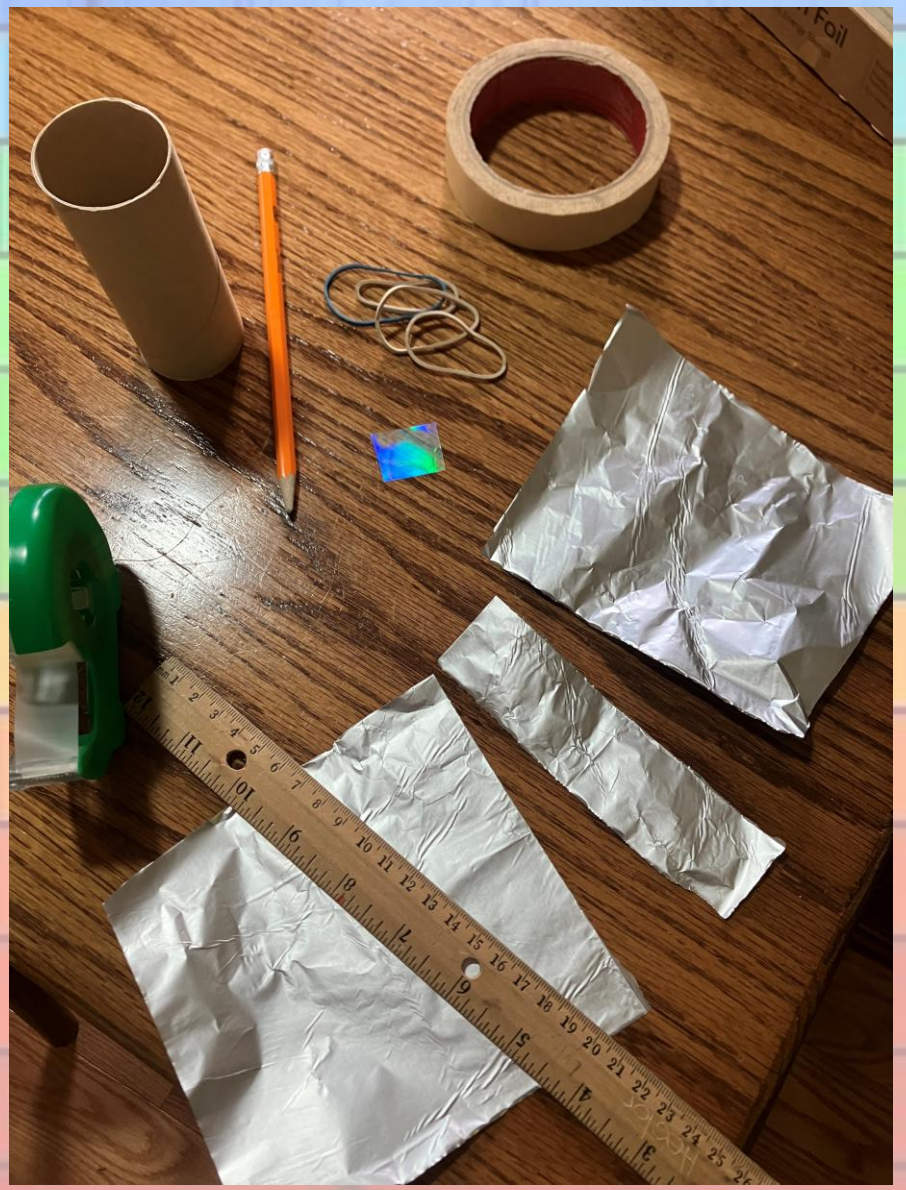
One way to make a spectroscope

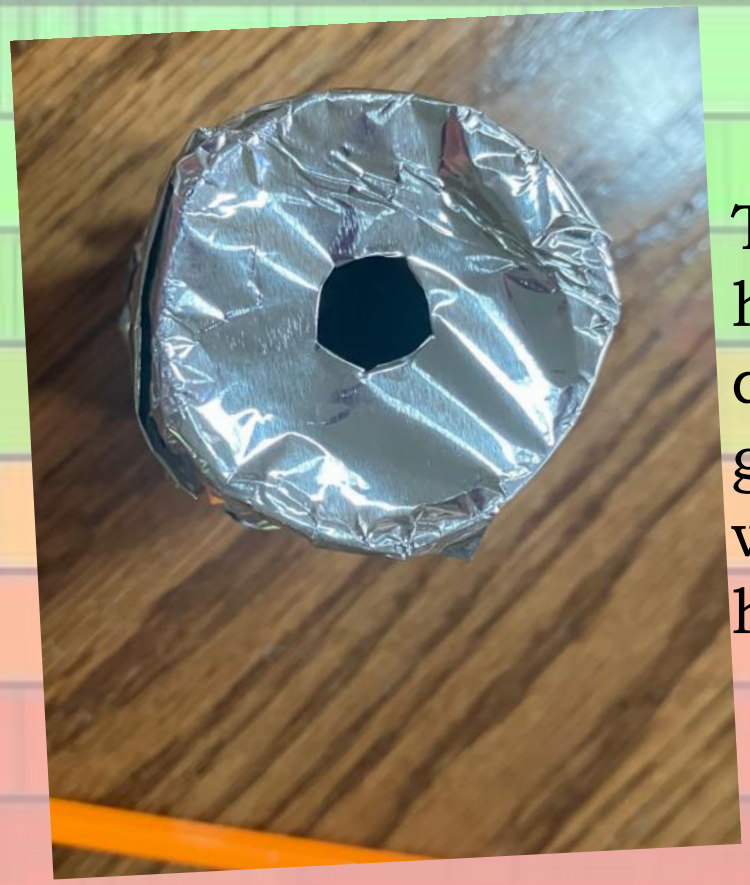
Materials Needed:

- **Aluminum foil** in 3 pieces as shown
- **Tube** (cardboard toilet paper rolls work well)
- **Diffraction grating** (you can peel it from an old DVD, but we bought a roll of the stuff and cut it into little squares) (Notice thedifferent colors reflecting off it at different angles)
- **Pencil** or pen for poking holes
- **Tape** (any type)
- Ruler, straightedge, or scissors for cutting the aluminum foil
- Rubber bands are helpful but not required



1. Fold the larger pieces of aluminum foil over the two ends of your tube, as neatly as you can

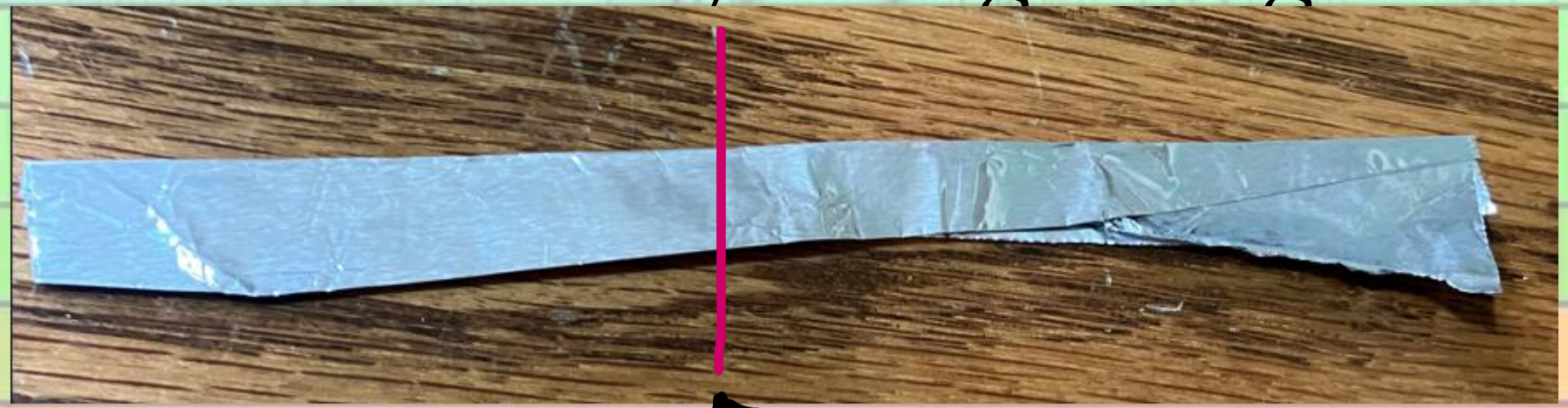
2. Use your pencil or pen to poke a hole in the foil at each end of the tube. One hole, which will be for the grating, will be round (ish) and the other one, which will be for the slit, will be longer and skinnier.



This round-ish hole is for the diffraction grating. You will look in here later on.

This longer hole is for the slit

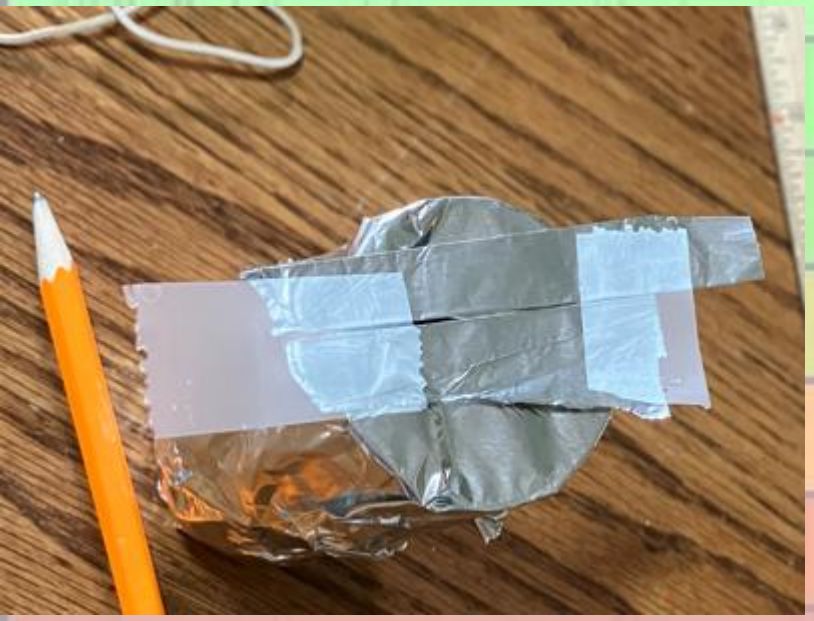
3. Fold the little piece of aluminum foil onto itself a few times, and smooth the folded edge, so you get a fairly stiff piece of foil with one fairly straight edge.



Then cut or tear your strip into two roughly equal pieces, using scissors or a straightedge.

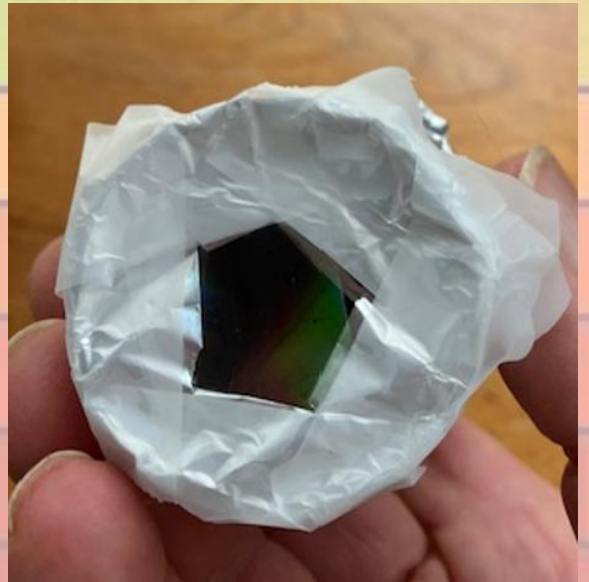
4. Make the slit by taping the two straight edges you made, as close together as you can, but not touching. The finer the slit, the better you can make out the different colors.

5. Tape your slit onto the slitty end of your spectroscope. Both slits, the rough one and the nice one, should be parallel. Make sure light can not pass around your slit, only through it.



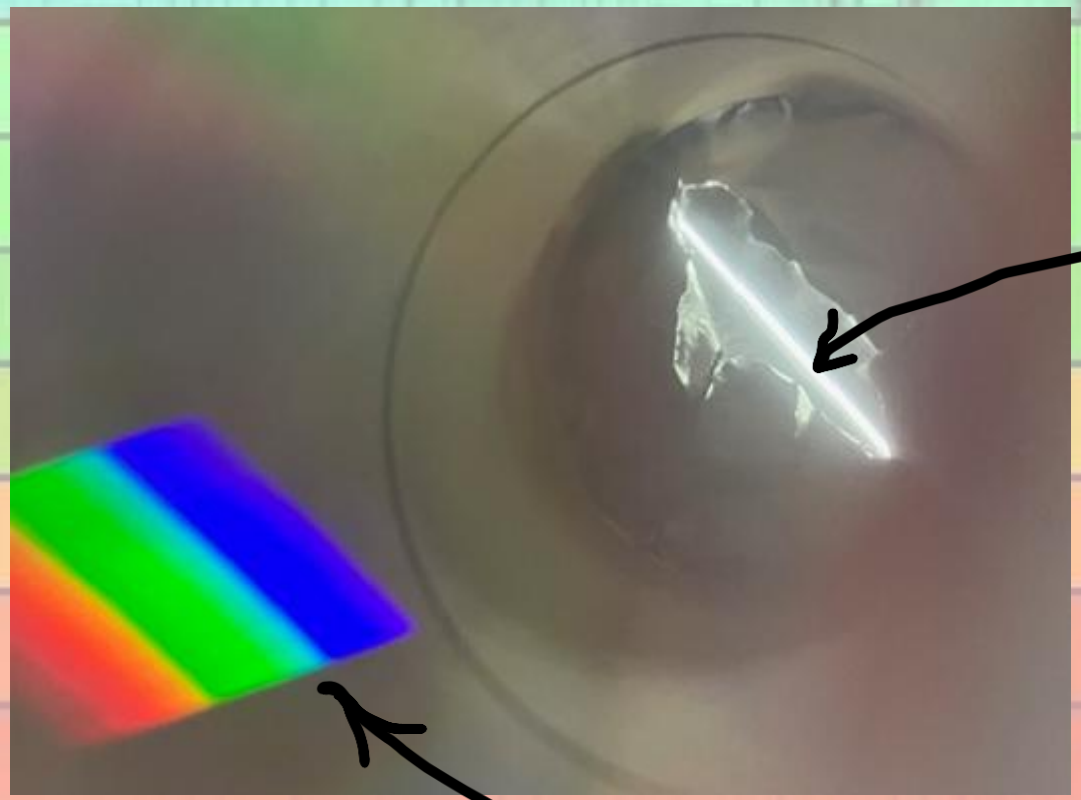
6. Tape your piece of diffraction grating over the round hole at the other end of the tube

- (This is where you look into)
- (If you want, you can first enlarge the hole in the foil a bit)



7. Rubber bands can now be used to hold the two ends secure. Don’t tape BOTH foil ends to the cardboard; let one end be able to rotate so you can find the best viewing angle

8. To see the rainbow (spectrum) aim the slit at a light source, but your eye has to look off to the side, as you see here



Here is my slit, seen from the other end of the tube. The slit was pointing at the sky.

Here is the spectrum I saw, off to one side of the slit. I should probably rotate the grating a little bit.

9. Not all spectra are the same!