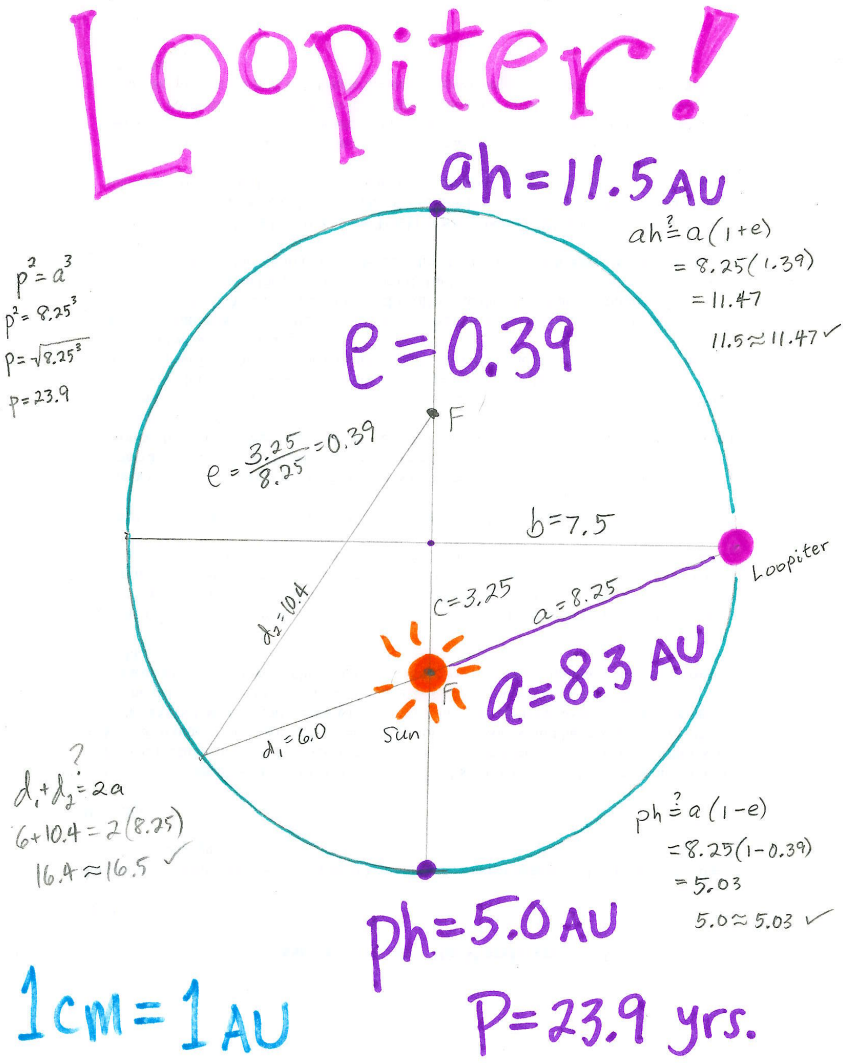
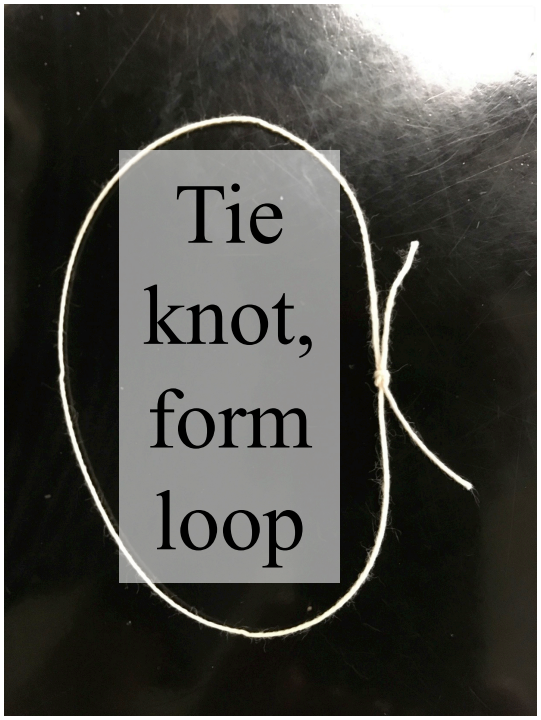
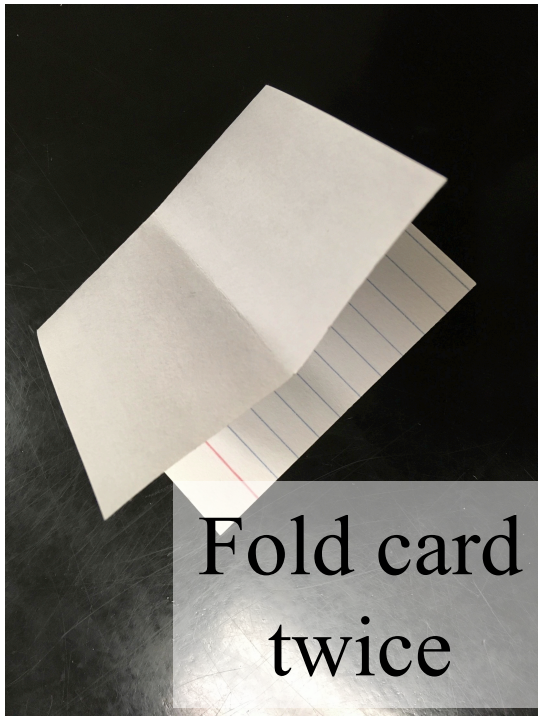
Goals:

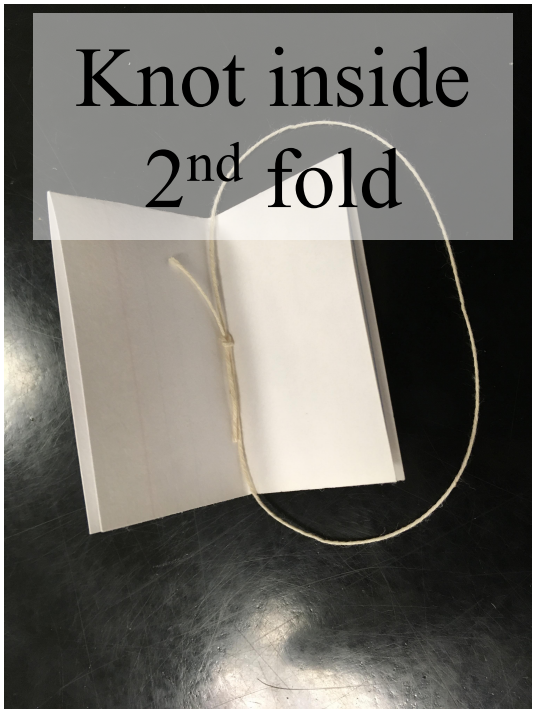
Learn properties of ellipses and terminology. Apply Kepler's 1st and 3rd Laws of Planetary Motion.

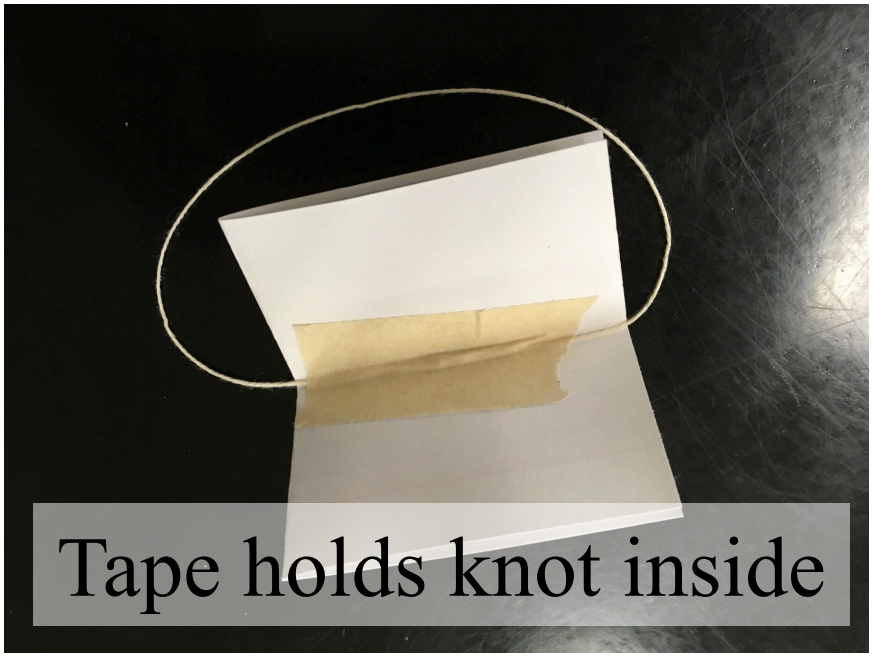
Create colorful mini-poster of your own planet!

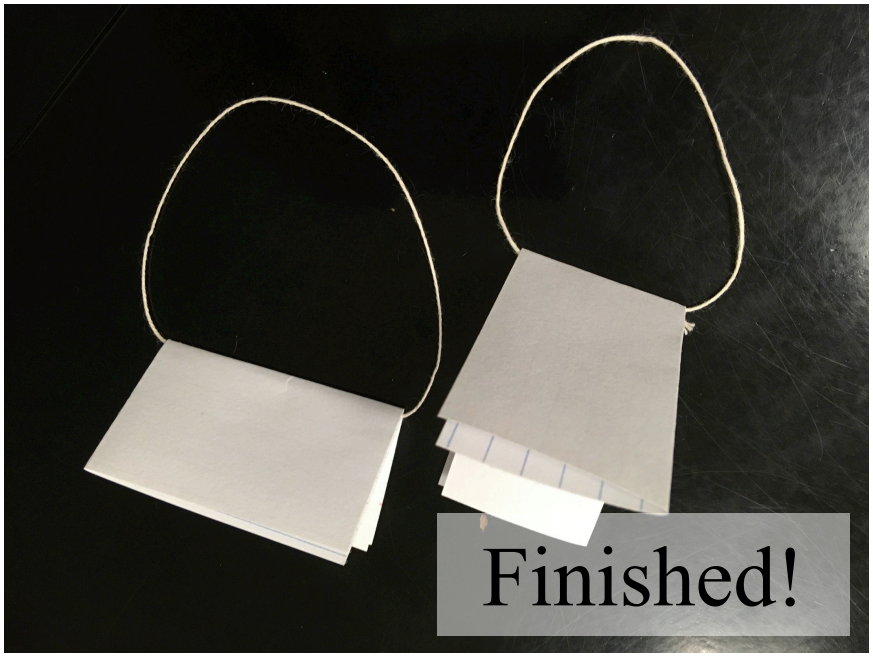



Tie knot, form loop

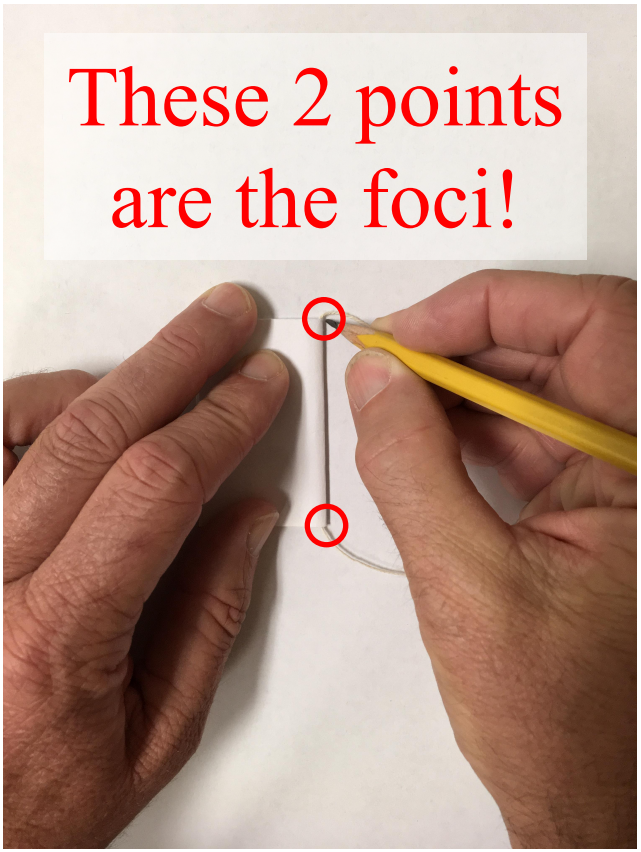

Fold card twice


Knot inside 2nd fold

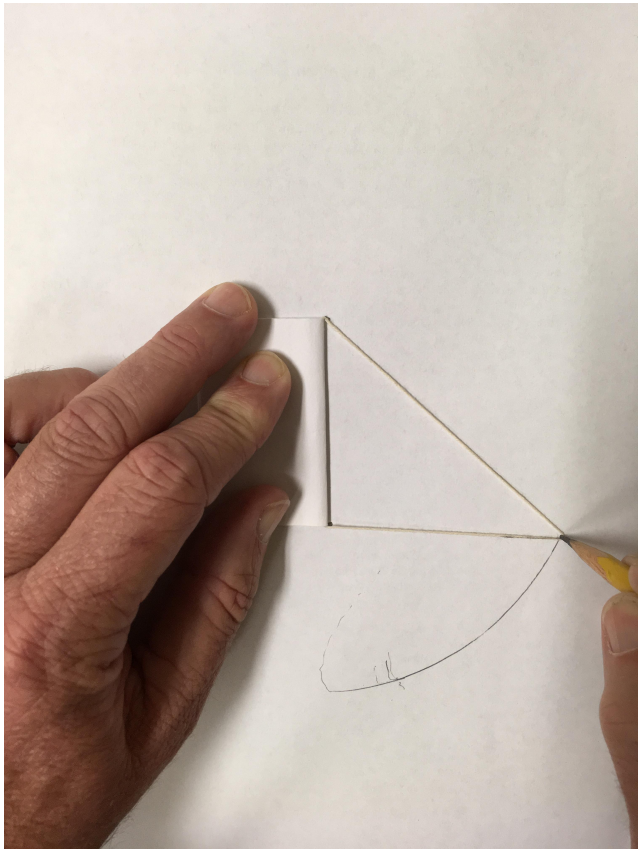

Tape holds knot inside

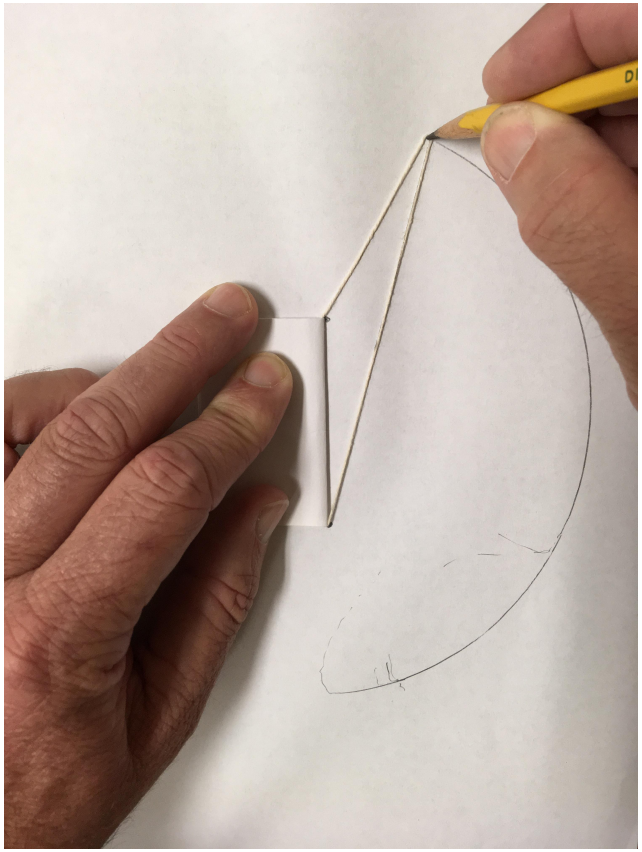

Finished!

Hold folded card,
mark each end.



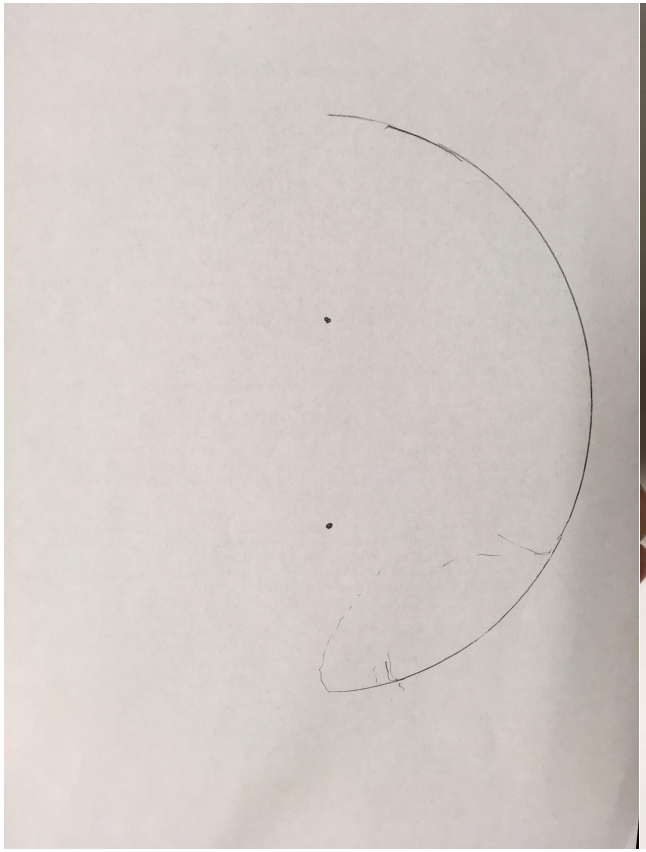
Pencil inside loop,
draw half of ellipse.

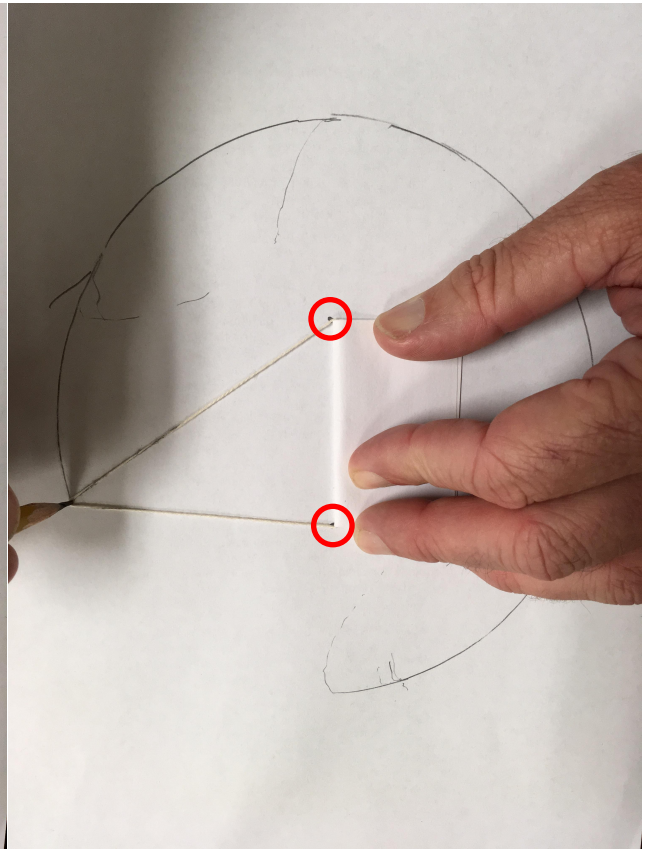


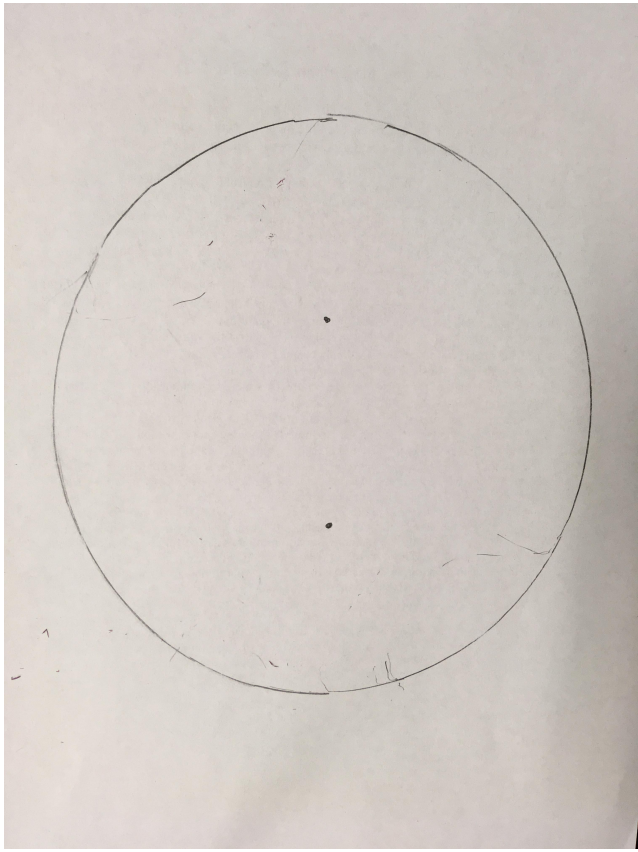


1st half done:

Reposition folded card against the two marks, draw 2nd half:







Finished!

Planet Poster Directions - detailed

1. Name your planet – be creative. Pick a focus and make it the Sun. Make diagram colorful and interesting. Include labels.
2. Use a ruler, measure and record a, b, and c.
   Use a scale of: 1 cm = 1 AU
3. Pick a random point on the ellipse. Measure, label, and record d_1 and d_2. Confirm the relations: $d_1 + d_2 = 2a$ and $b^2 + c^2 = a^2$. Show your work.
4. Calculate the eccentricity: $e = c/a$ Show your work.
5. Measure the aphelion and perihelion distances. Confirm the relations: $ah = a(1 + e)$ and $ph = a(1 - e)$. Show your work.
6. Determine the period in years using Kepler's 3rd Law. Show your work.

Directions – brief:

1. Name planet, label diagram, be creative!
2. Measure *a*, *b*, *c*.
3. Confirm:
   $d_1 + d_2 = 2a$
   $b^2 + c^2 = a^2$
4. Calculate the eccentricity:
   $e = c/a$
5. Use 1 cm = 1 AU
   calculate *ph* and *ah* distances.
6. Determine period.