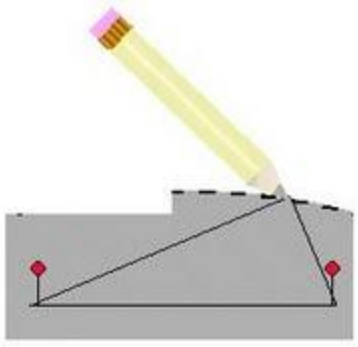
Kepler's 1st Law: Planet Orbits

Tape a piece of graph paper to one of the white board with holes.
Then...



1. Place nails in any 2 holes. Make a loop of string and place it around the nails. Keeping the string tight, draw a shape on the graph paper. What is this shape called?
2. Look up an ellipse on the internet and write the equation for the eccentricity and describe in words how to calculate it.
3. Place the nails close together and draw another. Measure and calculate the eccentricity, ε.
4. Place the nails far apart, draw and find ε.
5. Draw the orbits of 2 planets and show how you figured that out. Label your orbits.
6. Of all the planets, which has an orbit that is the most circular? Explain your answer.
7. Which planet has an orbit that is the most oblong? Explain.
8. Why do the outer planets have longer periods than the inner planets?

Extra Credit: *Why can the eccentricity of an ellipse never be greater than 1? Detailed answer please.*