In this lab we will build a scale model of the Solar System! Take a couple photos of your final model, and email Emily (ejense11@uwyo.edu) a very brief electronic lab report (in PDF format) that includes the photo and answers to the questions (and table) below. You may work in groups, but everyone should submit their own lab report.

Calculations and Modeling

Shrink down our solar system such that the distance between the Sun and Neptune is approximately the full length of a hallway in the STEM building. Use the available materials to create labels for each planet, and place them at the pre-determined separations.

Object	Actual distance from Sun	Scale model distance from Sun (m)
Mercury	0.39 AU	
Venus	0.72 AU	
Earth	1.00 AU	
Mars	1.52 AU	
Jupiter	5.20 AU	
Saturn	9.54 AU	
Uranus	19.19 AU	
Neptune	30.06 AU	

Take Solar System strolls

Check out the model Solar Systems for each group.

1. How do the gaps between planets change as you move towards or away from the Sun?
2. Is there anything that surprised you?

The Sizes of the Planets

3. How big would the Earth, the Moon, Jupiter, and the Sun be in your model?
4. If we model the Earth as a marble, how large would an AU be?
5. Which is more empty, percentage-wise in terms of volume: an atom or the Solar System? Model the atom as a nucleus with radius 10^{-15} m and a single electron orbiting at a fixed distance of 10^{-10} m. Model the Solar System as just Neptune orbiting the Sun. Ignore the volumes of the electron and Neptune in your calculation.

1 AU = 149×10^6 km
Diameter of Earth = 12756 km
Diameter of the Moon = 3476 km
Diameter of Jupiter = 140000 km
Diameter of the Sun = 1.39×10^6 km