

## ASTR 121 – Spring 2016

### **Uncertainty Activity**

Answer the following questions on a separate sheet of paper. You are encouraged to work with a partner, but each person should make their own measurements and turn in their own work.

1. In your own words, describe the difference between random and systematic errors, and give an example of each.
2. Describe the difference between accuracy and precision.
3. You will be given a ruler to make measurements for this activity. What is the intrinsic uncertainty of the ruler? How did you determine this?
4. Take out your cell phone. As best as you can, use the ruler to measure the volume of your phone, and determine the uncertainty of your measurement (using error propagation). Describe how you did this, show any relevant equations, and report your final value (using correct significant figures). Write your volume and uncertainty on the board.
5. Consider sources of error in your measurement. What random errors affected your result? Systematic errors? How could you improve your measurement?
6. Look at the class's values for their phone measurements. Determine the mean, median, mode, and standard deviation of the volumes. What is the uncertainty in the mean?