Precision & Significant Figures DEMO

**Materials** 1-liter non-graduated cylinder 100 ml graduated cylinder

[Significant Figures: Precision Part 1](http://somup.com/cFQjrRVRSV) (3:28)  
  
[Significant Figures: Precision Part 2](http://somup.com/cFQj0cVRS6) (6:24)

##### Procedures

1. Place the non-graduated 1 L cylinder and the 100 ml grad cyl in front of the class.

2. Use the 100 ml graduated cylinder

1. Have a student add an amount of water to the 100 ml graduated cylinder that is more than 50 ml but less than 100 ml.
2. Have another student (or two or three) give the exact measurement of the amount of water in the 100 ml graduated cylinder to the most most precise measurement. (*the measurement will be to the nearest 0.01 ml*)

e.g. 74.3 ml

1. Convert this measurement to liters, indicating the precision of the measurement and asking about significant figures

e.g. 74.3 ml x 1 L / 1000 ml = 0.0743 L → 3 significant figures

* the zeroes are NOT significant because they were NOT part of the measurement. The first “0” is for decoration; the second is a placeholder.

3. Add this amount of water to the 1 L non-graduated cylinder and ask students to give you the amount of water in the 1 L non-graduated cylinder to the most precise measurement. (*the measurement will STILL be in 0.1 L*)

* Students will think: 0.0743 L → but they did not RE-measure.

4. Tell students to forget about the 100 ml cylinder; pretend you walked into the room and only saw the 1 L non-graduated cylinder and read the NEW measurement to the most precise measurement. (*the measurement will be in 0.1 L → one estimate*)

e.g. 0.1 L → 1 significant figure

* the zero is NOT significant because it is NOT part of the measurement
* the “743” from the 100 ml cylinder was NOT part of the measurement

5. The whole point of significant figures is to indicate precision of measurements in a rationale, accurate way.