**Significant Figures (Sig Figs=SF)**

Why do we need to do this?

This is how scientists ________
their numbers to show the
___________ of the ________ &
account for ____________________

What is uncertainty?

When measuring the person
using the measuring instrument
and the actual instrument are
____________________________

2 types of number

1. ____________ -
No margin of error/uncertainty

**Ex.** How much money you have
in your account

2. __________________ -
Measurements aren’t perfect

**Ex.** Weight, height, anything
MEASURED.

When do you use Sig Figs?

When something is _________

How do you know which place value
to use for your measurement?

Look at the measuring
instrument & use the__________ it can measure

Place values

Ruler or Meter Stick place value?

* **Ex.** 1.0 cm or 4.6 cm

**Artwork:**

- Ruler or Meter Stick place value?
- Significant Figures (Sig Figs=SF) diagram
- Place values diagram
10 mL Graduated Cylinder? 50 mL?

** (0.1 mL) ** (1 mL)

Ex. 8.7 mL 42 mL

Centogram Balance place value?

* ___________ Ex. 120.05 g or 1.00 g

Q: What is the mass of the beaker?

A: (70 + 5 + .12) = ____________

Which numbers are significant?

___ numbers that are not zero (_______)

Where do I start?

#1 ___________with the _____________ number even if it comes after a decimal point

Ex. 1.9 = 2 sig figs (____) 0.0019 = _____

Are Zeros significant?

How do I know if a zero is a SF?

#2 All _____________the _____________ number are _____________ a ____ if there is a _____________

Ex. How many SF’s?

0.0000007 = 1 SF

(#1 ___________with the _____________ number.

These Zeros are all before the first non-zero number)
0.70 = 2 SF

(#2 All numbers _______ the first _______ number are always ____________ when there is a ____________.)

1.07 = ______

#2 All numbers _______ the first _______ number are always ____________ when there is a ____________. 

#3 Zeros in _________ numbers are ______________

0.007007 = ___________ 0.70070 = ______________

1.05 = ______________ 10.0300 = _____________

* ________ showing the ____________ of a measurement are ____________ as long as you know the accuracy of the measurement 

*This is for ______________ that ______________ a ______________.  

Ex. 40 mL = ______
( measured in the 50 mL graduated cylinder)

*If you ____________ the ____________ of the measurement, assume the ______________.  
All measurements for the Olympics are going to be very exact. So you know the zeros count.  

Ex. 100 m = 1 SF (random measurement)

100 m = 3 SF (Olympics measurement)

How to indicate a significant zero in a whole number for this class

Place a ______ over the top of the zero  
Ex. 10,000 = 2 SF

The number is accurate to the place value of the ______________ over it

How do I round my answers? It depends on what mathematical operation you are doing
Rounding for Addition (+) & Subtraction(-)

1) Determine the _______________ of your _______________ measurement
2) Round to _______________ for your answer only. Do not round the numbers you are adding or subtracting.

Ex. tenths + hundredths + thousandths = tenths place

1.2 + 1.45 + 3.568 = 6.018 = ___
*tenths place is less accurate

tenths + hundredths + thousandths = tenths place

3.568 - 1.2 - 1.45 = (0.918) = ___

Rounding for Multiplication (x) & Division (/)

1) Determine the _______________ in the numbers you are multiplying or dividing
2) Round to ______ of sig figs for your answer. Do not round the numbers before your answer

Ex.

1.2 x 1.45 x 3.568 = (6.20832) = ___

1.2 / 1.45 = (0.82758621) = ___

Rounding Averages

1. Add all of your numbers and divide by the amount of numbers you added together
2. The __________ you ____________ is not a measured number, you ______________.
3. The numbers you add together follow the ________________. (round to least accurate PLACE VALUE)
4. Your will be to the _______________ of the numbers you are adding together. Round your final answer.

_______ + tens + tens + hundreds =

Ex. 100 + 80 + 10 + 200 = 390

390/3 = (97.5) = ___
Practice:

1. What is the name of this piece of lab equipment?
2. What is the place value accuracy of this measurement?
3. What units are used to measure volume of a liquid?
4. What is the volume of liquid inside?
5. How many SF’s does your answer have?

<table>
<thead>
<tr>
<th>Day</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>43° F</td>
</tr>
<tr>
<td>2</td>
<td>53° F</td>
</tr>
<tr>
<td>3</td>
<td>50° F</td>
</tr>
<tr>
<td>4</td>
<td>57° F</td>
</tr>
<tr>
<td>5</td>
<td>59° F</td>
</tr>
<tr>
<td>6</td>
<td>67° F</td>
</tr>
</tbody>
</table>

**Addition & Subtraction** = round to least accurate place value
*Write the place value above each number including your answer.

1. 
2. 

**Multiplication & Division** = round to least amount of SF’s
*Write the amount of SF’s above each number including your answer.

1. 
2. 

#1_________ with the _____________ number. These zeros are all before the first non-zero number.

#2 All numbers the first __________ number are ALWAYS __________ when there is a ____________.

#3 Zeros in ____________________________ numbers are __________________________.