

AVERAGING DATA – RANGE MEAN MEDIAN MODE

LABORATORY (29 POINTS)

BACKGROUND

The three most common methods to determine an average is mean, median, and mode. The mean is calculated by taking the sum of all values divided by the number of values. The middle number in a list of sequential numbers is the median. Mode is the value that most commonly appears in the data set. The range is the difference between the lowest and highest value of the set. Refer to www.MrRast.com for a complete background lesson on *averaging data* that will help you answer questions pertaining to this laboratory.

PRE-LAB QUESTIONS

Complete the table below for the data set given: (2 pts)

#	Data Set	Ordered (smallest to largest)	Mean	Median	Mode	Range
1	7, 6, 8, 1, 9, 8, 9, 5, 4					
2	6, 7, 4, 8, 7, 5, 7, 6					

Scratch Work Area

3. Which number has the **most precise** data set? (1 pt)

a. How do you know? (1 pt)

4. What would be the **best method** to report the average for data set:

a. 1? (1 pt)

b. 2? (1 pt)

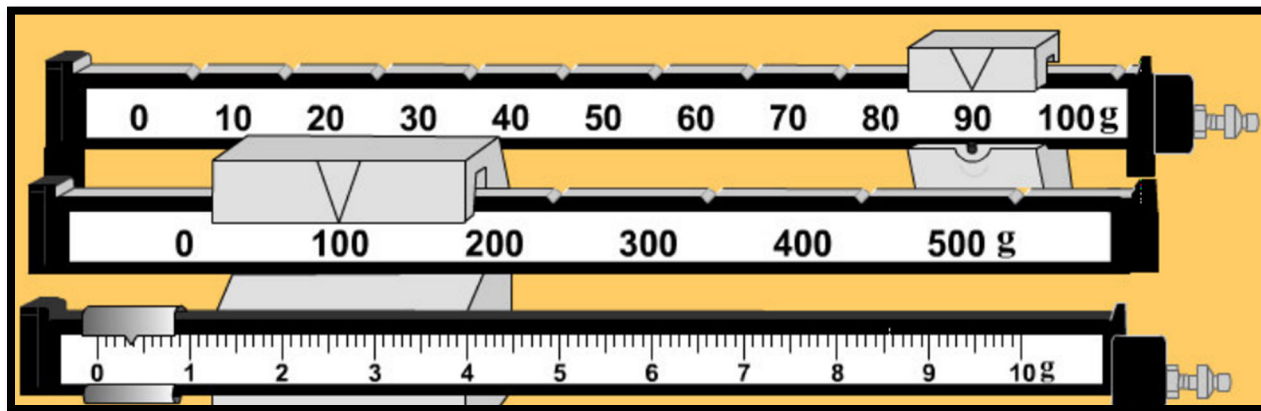
MATERIALS

- 150 mL beaker
- Triple beam balance
- Tap water
- Paper towels

TECHNIQUE

To read a triple beam balance, sum all three slides. The smallest slide may land between numbers. You must *estimate* the last digit which is the 0.01 place.

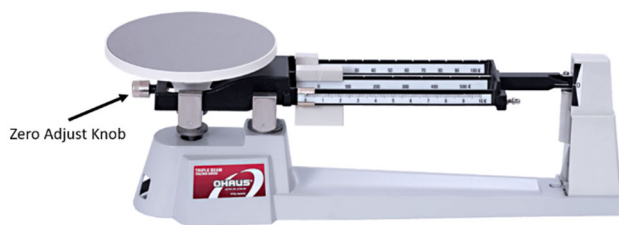
Examples



Some might read the above measurement as **190.36**, **190.37**, or even **190.38**. They are all correct. The final digit in a measurement is an estimated value.

PROCEDURE

1. Make sure your triple beam balance is calibrated seeing if it balances at zero while nothing is placed on it. Turn the *zero adjust knob* until the balance sits at zero while nothing is on it.
2. Record the mass of a dry 150-mL beaker in the data section to the 0.01 g place
3. Fill the 150-mL beaker to the 100 mL mark with tap water.
4. Record the mass of the water filled beaker to the 0.01 g place.
5. Empty the beaker and dry it with a paper towel.
6. Repeat the procedure as many times as directed by your instructor.



DATA

Record all measurements to the 0.01 g. If the balance lands exactly on a line, record the value with zero placeholders. *Example: 5.00 g.* Repeat the procedure and share data with your class until the following table is complete: (5 pts)

Trial	Dry beaker (g)	Water filled beaker (g)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Trial	Dry beaker (g)	Water filled beaker (g)
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

CALCULATIONS

- Determine the mass of the water added to each beaker by subtracting the value of the dry beaker from the mass of the water filled beaker. (5 pts)

$$mass_{water} = mass_{water\ filled\ beaker} - mass_{dry\ beaker}$$

Trial	Mass of water (g)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Trial	Mass of water (g)
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	

NAME: _____ DATE: _____ PERIOD: _____

2. Write the values as a sequential list from lowest to highest value. (2 pts)

3. Determine the range of your data list. (1 pt)

4. Determine the mean for your data list. (2 pts)

5. Determine the median for your data list. (2 pts)

6. Determine the mode AND indicate if your data is a binomial or trinomial list. (2 pts)

7. Is your data symmetric or skewed? (1 pt)
 - a. If your data is skewed, is it right or left-skewed? (1 pt)

 - b. How would you know if your data is right verse left-skewed? (1 pt)

 - c. What would be the best method to report the average for this data list? (1 pt)