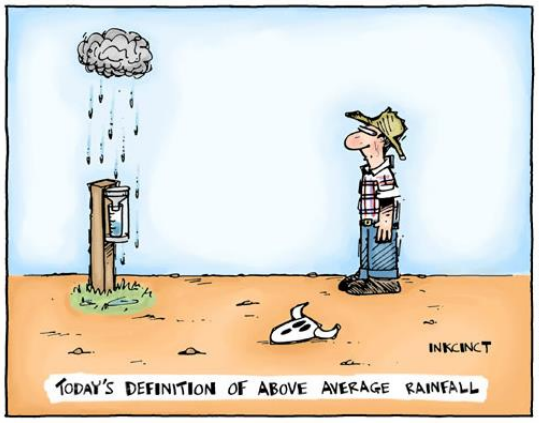
Name: _____ Date: _____

Measures of Central Tendency

1. Some people use "average" interchangeably for both mean and median. Consider this statement:

   "Just think of how stupid the average person is, and then realize half of them are even stupider?" George Carlin

   What type of "average" is George Carlin referring to, mean or median? Is it possible to have more than half of a population above this kind of average?



2. What is the difference between mean and median?

3. Give an example of data when the mean and median might have the same value.

   Give an example when the mean and the median do NOT have the same value.

4. Can the following statement be true? Why or why not?
   "Welcome to Lake Wobegon, where all the women are strong, all the men are good-looking, and all the children are above average." Garrison Keillor

5. Is it possible to have more than half of data values above (or below) the mean? Give an example.

6. Find the mean, median, and mode for this set of data. (Mode is the number that appears the most)
   5, 11, 16, 8, 4, 7, 15, 6, 11, 7

7. What number added to the data set will make the: **2, 5, 4, 3, 8, 3**

a) Median = 4 (show how)

b) Mean = 5 (show how)

Adapted from: Mathematics Vision Project

Measures of Spread – Range, IQR, and Mean Absolute Deviation

Mean Absolute Deviation of a numerical data set is the average positive deviations of the data from the mean.

$$Mean\ Absolute\ Deviation = \frac{\left|x_1 - \bar{x}\right| + \left|x_2 - \bar{x}\right| + ... + \left|x_n - \bar{x}\right|}{n}$$

A measure of distribution is a measure of how spread out data is, or how the data is distributed from its smallest values to its largest values. Suppose, for instance, that Joe has test scores of 60, 68, 69, 78, 90, 95, and 100. Sammy scores 78, 78, 79, 79, 82, 82, and 82.

7. Calculate Joe's mean test score. Then calculate Sam's mean test score. What do you notice about Joe's scores compared to Sammy's?

Measuring the mean will not tell you much about the characteristics of the test takers. A measure of distribution, or spread, will help you see that Sam consistently scores near 80, while Joe's scores are spread out, or distributed, over a much larger range.

8. To examine the distribution of test scores, find the mean absolute deviation. Follow the steps below to find the mean absolute deviation of Sam's test scores (Joe's example is given).

Steps	**Joe**	**Sam**
a) Calculate the mean, symbolically, $\bar{x}$, of the data.	Mean: $\bar{x} = \frac{60+68+69+78+90+95+100}{7}$, $\bar{x} = 80$	
b) Find the deviation, or distance from the mean, for each piece of data.	Deviation: $60-80=-20$ $68-80=-12$ $69-80=-11$ $78-80=-2$ $90-80=10$ $95-80=15$ $100-80=20$	
c) Find the absolute value of the mean deviations.	20 12 11 2 10 15 20	
d) Find the average of the positive deviations found in part c.	MAD: $\frac{20+12+11+2+10+15+20}{7}$ = 12.86	

9. Why do you think the MAD of Joe's test scores is higher than the MAD of Sammy's test scores?

Adapted from: Mathematics Vision Project