Table Number:_____   Group Name: _____

Group Members:_____   _____   _____

What does a *Mean* Mean?

Things to Think About: Discuss with your group:

- Suppose the average age (mean) for students in the class is 21 years. Then what do we know about the distribution of students' ages for this class (e.g., Are they all about 21 years old?)? Explain.

- Where does that number (21) come from? Explain.

Dot Plots

In your small group, open the applet "Mean and Median" and type in "17" for lower limit and "25" for upper limit. Click "Update."   Click above the axis and find a point as close to 21 as possible.   If you put the cursor on your dot, you can move it from left to right.   Then form dot plots according to the directions below. Each dot plot will be created so that 10 dots average to 21 years.

1. Of course, the easiest way to do this is to stack them all above the value of 21. If we do this first, what does the plot look like in terms of shape, center, and spread?

2. Move one dot to 24 years. How can you move *one or more* of the other dots so that you keep the mean at 21 years? Is there more than one way to do this? Give at least three different ways. Explain in detail.
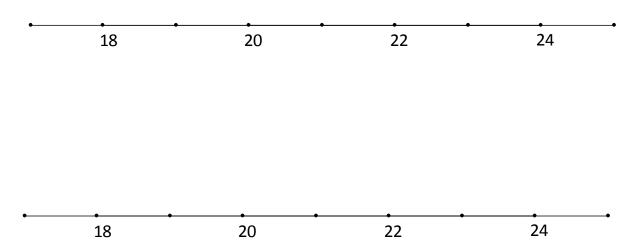
3. Now, clear the graph by clicking "Trash" and start with the original distribution with all dots on (or near) 21. Next, move one dot to 17 years. Describe what else you had to do to keep the mean at 21 years.

4. Next, move all the dots so that none of the ages are 21 years, yet the mean age is still 21 years. Describe what you did.

Part II

Draw graphs of *two* different dot plots below such that:

- Each graph has 10 values (10 dots).

- The mean of the values in each dot plot is 21.

- One dot plot has a *little spread* and the other dot plot has *a lot of spread*.

18   20   22   24

18   20   22   24

Adapted from AIMS http://www.tc.umn.edu/~aims/aimstopics.htm

Things to Consider: Discuss with your group

- What strategies did you use to keep a mean of 21 in each plot?

- Was it important to pay attention to the distance of each dot from the mean value of 21? How did this help you to keep the mean of 21 years?

Part III

We will use the term "**deviation**" to represent the distance of each data value from the mean. This can also be viewed as the number of units to the left or right of the mean for each data value.

1. Look at your last dot plot, and write down the deviations for each data point on the graph. List the deviations neatly, separated by a comma.

2. If you change one value so it has a deviation of -3, what do you have to do one or more values to keep the mean at 21 years?