## Mean, Median and Standard Deviation WS

Part One. For a summer job, you were working in the quality control department for a computer company that manufactures computer parts. The specific part that you are to evaluate the quality of is supposed to be 8 micrometers in thickness. You obtained samples of four of these parts manufactured by the day shift and four parts manufactured by the night shift workers. Here are the findings:
$\begin{array}{lllll}\text { Day Shift } & 7.9 & 8.0 & \text { 8.2 } & \text { 8.3 Mean }=\end{array}$ $\qquad$ Median = $\qquad$
Night Shift $2412 \quad 14$ Mean $=\quad$ Median $=$ $\qquad$

1. Determine the mean and median for each shift and compare these with the desired level of 8 micrometers. Which shifts average was closer to the target? $\qquad$
2. If you needed to use one of these parts in your own computer on which shift would you prefer the part to have been manufactured? $\qquad$ Why?

## Part Two.

3. In order to describe the variability of a set of data, a simple measure is to compute the Range. In statistical jargon, the Range is the gap between the largest and smallest value in the data set. Calculate the range for each shift.

Day shift: Range = $\qquad$ Night shift: Range $=$ $\qquad$
4. A more sophisticated way of describing the variability of a data set is based on the notion of "deviation from the mean". For example: If the class average on a history test is 70 , but you made a score of 87 , your deviation would be +17 . If your friend scored a 60 on the test, his or her deviation would be -10 . Give the deviation from the mean for each part made on the night shift.
$\begin{array}{lllll}\text { Data value: } & 2 & 4 & 12 & 14\end{array}$
Deviation:
5. What properties do you notice about these deviations? And do you think these are true for all data sets, or just certain types?

## Part Three.

6. The commonly used measure of variability is called the 'standard deviation'. Supposedly, the standard deviation tells us the size of a typical deviation from the mean for a particular set of data. Based on you answers to \#4, guess at the value of the standard deviation. $\qquad$ . Use your notes to review how standard deviation is calculated.
7. On the back or a separate sheet of paper, calculate the standard deviation for
a. night shift workers
b. day shift workers
