Common Core Math 1 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Univariate Data Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Boxplots and Outliers

1. Given the following grades on an English 11 test:

91, 98, 87, 76, 100, 45, 72, 85, 92, 88, 87, 90, 91, 66, 100, 99, 67, 85, 79, 80, 85

Do you think there will be an outlier?

Calculate the 5 number summary and any outliers.

Remove the outlier and recalculate the 5 number summary. What changes have occurred?

Why would it be useful to remove the outlier to look at this data? Explain a scenario in which we would want to leave the outlier in and a scenario in which we would want to remove the outlier.

2. Given the box plot below, create a scenario that would produce this data.



3. In the table below, the public high school graduation rates for 1992-1993 are given for each state, including the District of Columbia. (Note: the rates are listed in ascending order)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **State** | **Rate** | **State** | **Rate** | **State** | **Rate** |
| Louisiana | 56.3 | Oregon | 72.6 | Arkansas | 78.4 |
| South Carolina | 59.2 | Kentucky | 72.7 | New Hampshire | 78.4 |
| Texas | 59.4 | Missouri | 72.8 | Kansas | 80.3 |
| Florida | 61.4 | Alaska | 73.4 | Pennsylvania | 80.6 |
| Georgia | 61.6 | Virginia | 74.2 | Utah | 80.7 |
| Alabama | 61.7 | Maine | 74.3 | Connecticut | 80.8 |
| Mississippi | 63.5 | Hawaii | 74.9 | Vermont | 82.0 |
| DC | 64.6 | Ohio | 75.0 | Idaho | 82.3 |
| New York | 65.4 | Indiana | 75.1 | Wisconsin | 83.5 |
| Tennessee | 67.4 | Colorado | 75.3 | New Jersey | 85.8 |
| North Carolina | 67.6 | Rhode Island | 75.5 | North Dakota | 85.8 |
| California | 67.9 | Maryland | 75.6 | Montana | 86.7 |
| New Mexico | 68.2 | Washington | 75.6 | Nebraska | 86.9 |
| Nevada | 69.6 | Oklahoma | 75.9 | Wyoming | 86.9 |
| Michigan | 69.9 | West Virginia | 77.9 | Iowa | 87.5 |
| Deleware | 70.2 | Illinois | 78.0 | Minnesota | 89.1 |
| Arizona | 72.0 | Massachusetts | 78.1 | South Dakota | 89.1 |

1. Find the mean
2. Find the median
3. Which measure of center would be the most appropriate to use? Support your answer with a reason.
4. Calculate the 5 number summary
5. Find the range.
6. Find the interquartile range. Interpret what this gives you.
7. List the 7 states that have the highest graduation rates. What region of the country to they represent?
8. List the 7 states that have the lowest graduation rates. What region of the country do they represent?
9. Name some factors that might account for your answers to “g” and “h.”
10. Are there any outliers?
11. What graduation rate would a state have to be over or under to be considered an outlier?
12. Create an outlier. Identify it here and explain (good or bad graduation rate?).
13. Add this outlier to the data. Recalculate the mean and median.
14. As a North Carolinian, what does this outlier do for the “standing” of your state?