Outlier Activity-Teacher

**Goal:** The goal of this activity is for students to interpret measures of central tendency when an outlier is present. They will also be able to identify which value is an outlier and create a boxplot as well.

**Materials Needed:** This worksheet and pencil.

**Directions:** Have students get into groups of 2 or 3. Pass out the worksheet and have them complete the following questions.

You just took a test in your math class and want to know if the distribution of grades follows a normal distribution. Your teacher gave you the scores of all the students in your class.

|  |  |  |  |
| --- | --- | --- | --- |
| 100 | 68 | 75 | 74 |
| 74 | 73 | 88 | 85 |
| 81 | 79 | 65 | 97 |
| 35 | 93 | 91 | 85 |
| 78 | 69 | 87 | 95 |

1. How many students do you have in your class?

**20**

1. What was the class mean?

**79.6**

1. What was the class median?

**80**

1. Find the five-number summary

**Low: 35**

**Q1: 73.5**

**Q2: 80**

**Q3: 89.5**

**High: 100**

1. Calculate the interquartile range.

**Interquartile Range (IQR) = Q3 – Q1**

**= 89.5-73.5**

**= 16**

1. Are there any outliers?

**Q1-1.5(IQR) = 49.5**

**Q3+1.5(IQR) = 113.5**

**Yes. 35 is an outlier**

1. Create a boxplot.
2. Does the data appear to be normally distributed? Explain why it is or is not?

**With the outlier, it does not appear that the data is normally distributed. The outlier would skew to the left and move the mean lower than it should be.**

1. Which measure of central tendency (the mean or median) better reflects how the class performed?

**With an outlier in our data, the median would be the measure of central tendency that would best reflect how the class did. The mean and the median are very close in this case, but we still tend to use the median when an outlier is in the data set.**