Name: Answer Key Date: _____

# Performance Task: The Basketball Star
## Is Bob or Alan a Basketball Star?

**MCC9-12.S.ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).** Choose appropriate graphs to be consistent with numerical data: dot plots, histograms, and box plots.
**MCC9-12.S.ID.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation- Advanced Algebra) of two or more different data sets.** Include review of Mean Absolute Deviation as a measure of variation.
**MCC9-12.S.ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).** Students will examine graphical representations to determine if data are symmetric, skewed left, or skewed right and how the shape of the data affects descriptive statistics.

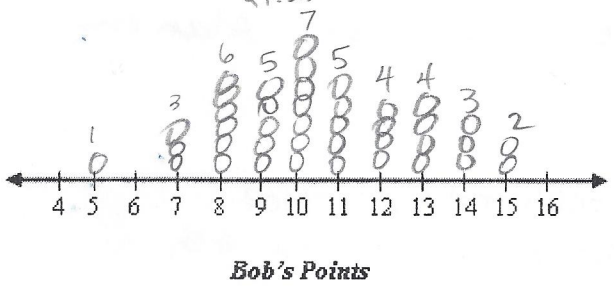
## Bob's Points per Game

8, 15, 10, 10, 10, 15, 7, 8, 10, 9, 12, 11, 11, 13, 7, 8, 9, 9, 8, 10,
11, 14, 11, 10, 9, 12, 14, 14, 12, 13, 13, 9, 11, 12, 13, 10, 8, 7, 8

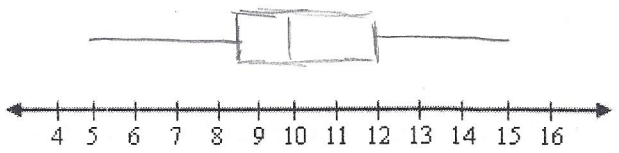
1. Bob believes he is a basketball star and so does his friend Alan. Create a dot plot and box plot of Bob's points for the last 40 games.

5,7,7,7,8,8,8,8,8,8,9,9,9,9,9,10,10,10,10,10,10,10,11,11,11,11,11,12,12,12,12,12,13,13,13,13,14,14,14,15,15

Q1: 8.5 Q2 = 10 Q3: 12




Bob's Points




Bob's Points

2. Describe Bob's data in terms of center, spread, and shape.

Center: Mean: $\frac{416}{40} = 10.4$ Median = 10

Center of the data is around 10 (based on Mean + Median)

Spread: IQR = 12 − 8.5 = 3.5
Q1 − 1.5(IQR) Q3 + 1.5(IQR)
8.5 − 1.5(3.5) 12 + 1.5(3.5)
3.25 17.25
No Outliers

Shape: Normal - fairly even on both sides of $\bar{x}$

MAD: $\frac{5.4 + 3(3.4) + 6(2.4) + 5(1.4) + 7(0.4) + 5(.6) + 4(1.6) + 4(2.6) + 3(3.6) + 2(4.6)}{40}$ MAD = 1.99

Bob's friend Alan has the following points:

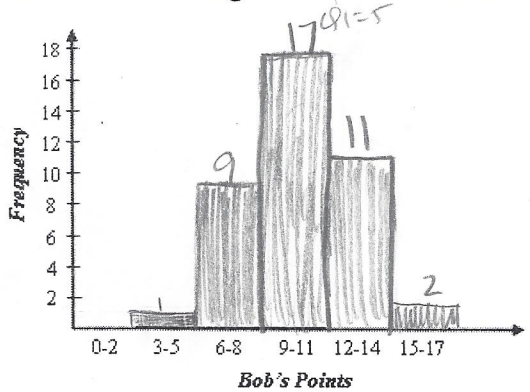
## Alan's Points per Game

1, 3, 0, 2, 4, 5, 7, 7, 8, 10, 4, 4, 3, 2, 5, 6, 6, 6, 8, 8, 10, 11, 11,
10, 12, 12, 5, 6, 8, 9, 10, 15, 10, 12, 11, 11, 6, 7, 7, 8

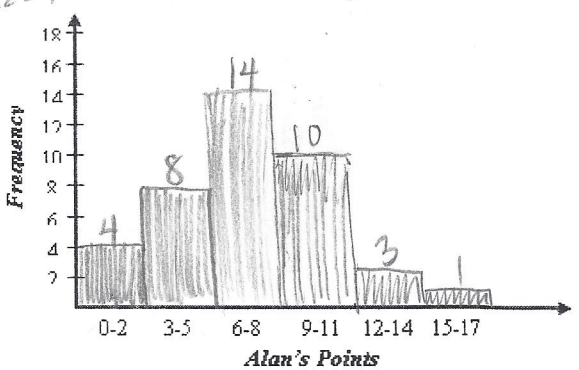
0,1,2,2,3,3,4,4,4,5,5,5,6,6,6,6,6,7,7,7,7,8,8,8,8,8,9,10,10,10,10,10,11,11,11,11,12,12,12,15

3. Create a histogram of both Bob's and Alan's data.

Q1 = 5 Q2 = 7 Q3 = 10




Bob's Points




Alan's Points

$\bar{x} = 7.25$

4. Describe the shape of the two histograms from problem #3.

Bob's is normal and Alan's has more data to the left

5. Use summary statistics to compare Bob and Alan's points per game.

| | Min | Quartile 1 (Q1) | Median (Q2) | Quartile 3 (Q3) | Max | Mean | Range | IQR | MAD |
|---|---|---|---|---|---|---|---|---|---|
| **Bob** | 5 | 8.5 | 10 | 12 | 15 | 10.4 | 10 | 3.5 | 1.99 |
| **Alan** | 0 | 5 | 7 | 10 | 15 | 7.25 | 15 | 5 | 2.81 |

Alan's minimum is lower than Bob's but their maxima are the same, Bob's median and mean (the center) are both higher than Alan's. Bob's MAD is smaller than Alan's which means that his scores are generally closer to the mean than Alan's. I would say that Bob is the more consistent player + is overall going to score more than Alan on a regular basis.

6. Which graphical representation best displayed Bob's and Alan's data?

The histogram shows what was explained in #5.

7. Based on the summary statistics is either friend a basketball star? Justify your answer.

See #5.