Analyzing Dot Plots

2 ways to analyze:
1. Mean, median, mode, range
2. Shape, center, spread

Example: Compare the dot plots

Softball Players' Heights
Basketball Players' Heights

Shape:
- Softball: All the data is ≤'6" or less.
- Basketball: Most of the data is ≤'8" or more.

As a group, the softball players are shorter than the basketball players.
Center: Softball - The data is centered at 5'4"
Basketball - The data is centered at 5'8"
The most common height for softball players is 5'4" and for basketball players it's 5'8"

Spread: Softball - The spread is from 4'11" to 6'0"
Basketball - The spread is from 5'2" to 6'1"
   (lowest height to highest height)

There is a greater spread in height for the basketball team.
The dot plots show the number of miles run per week for two different classes. For 1–5, use the dot plots shown.

1. Compare the shapes of the dot plots.

2. Compare the centers of the dot plots.

3. Compare the spreads of the dot plots.

4. Calculate the medians of the dot plots.

5. Calculate the ranges of the dot plots.

6. What do the medians and ranges of two dot plots tell you about the data?
The dot plot shows the number of letters in the spellings of the 12 months. Use the dot plot for 7–10.

7. Describe the shape of the dot plot.

8. Describe the center of the dot plot.

9. Describe the spread of the dot plot.

10. Calculate the mean, median, and range of the data in the dot plot.

The dot plots show the mean number of days with rain per month for two cities.

11. Compare the shapes of the dot plots.

12. Compare the centers of the dot plots.

13. Compare the spreads of the dot plots.

14. What do the dot plots tell you about the two cities with respect to their average monthly rainfall?
The dot plots show the shoe sizes of two different groups of people.

15. Compare the shapes of the dot plots.

16. Compare the medians of the dot plots.

17. Compare the ranges of the dot plots (with and without the outliers).

18. Make A Conjecture Provide a possible explanation for the results of the dot plots.

19. Analyze Relationships Can two dot plots have the same median and range but have completely different shapes? Justify your answer using examples.

20. Draw Conclusions What value is most affected by an outlier, the median or the range? Explain. Can you see these effects in a dot plot?
The dot plots show the number of miles run per week for two different classes. For 1–5, use the dot plots shown.

1. Compare the shapes of the dot plots.
   - **Class A**: No one ran between 6 and 12 miles.
   - **Class B**: Everyone ran between 3 and 9 miles.

2. Compare the centers of the dot plots.
   - **A**: The data is centered at 4 miles.
   - **B**: The data is centered at 5 miles.

3. Compare the spreads of the dot plots.
   - **A**: The spread is from 2–14 miles; larger spread.
   - **B**: The spread is from 3–9 miles.

4. Calculate the medians of the dot plots.
   - **A**: \[
   \text{Median} = \frac{4+4+4+5+6+6+8+12+13+13+13+14}{13} = 8.2
   \]
   - **B**: Median = 5

5. Calculate the ranges of the dot plots.
   - **A**: Range = 14 - 4 = 10
   - **B**: Range = 9 - 3 = 6

**ESSENTIAL QUESTION CHECK-IN**

6. What do the medians and ranges of two dot plots tell you about the data?
   - **Medians**: Class A has a higher mile average than Class B.
   - **Range**: Class A has a larger range of miles run than Class B.
11.2 Independent Practice

The dot plot shows the number of letters in the spellings of the 12 months. Use the dot plot for 7–10.

7. Describe the shape of the dot plot.
   
   All months have 9 or less letters in their spelling.

8. Describe the center of the dot plot.
   
   The data is centered at 8.

9. Describe the spread of the dot plot.
   
   The spread is from 3–9 letters.

10. Calculate the mean, median, and range of the data in the dot plot.
    
    \[ \text{Mean} = 6.2, \quad \text{Median} = \frac{4+7}{2} = 6.5, \quad \text{Range} = 9-3 = 6 \]

The dot plots show the mean number of days with rain per month for two cities.

11. Compare the shapes of the dot plots.
    
    Most months in AL had 8 or more days of rain.
    Every month in VA had between 8 and 12 days of rain.

12. Compare the centers of the dot plots.
    
    AL is centered at 8 days and VA at 9/10 days of rain.

13. Compare the spreads of the dot plots.
    
    The spread for AL is from 8–12 days, same spread, but VA has an outlier.
    The spread for VA is from 8–12 days.

14. What do the dot plots tell you about the two cities with respect to their average monthly rainfall?
    
    AL Median = 8.6, VA Median = 9.9
    On average, VA has more days of rain per month than AL.
The dot plots show the shoe sizes of two different groups of people.

15. Compare the shapes of the dot plots.
   A: Most shoe sizes are between 6 and 9
   B: Most shoe sizes are between 8.5 and 10.5

16. Compare the medians of the dot plots.
   A: Median = \( \frac{13 + 12 + 11 + 9 + 8 + 7 + 6}{7} = 9 \)
   B: Median = \( \frac{13 + 12 + 11 + 9 + 8 + 7 + 6}{7} = 8.8 \)

17. Compare the ranges of the dot plots (with and without the outliers).
   Without outliers,
   A: Range = 13 - 6 = 7
   B: Range = 13 - 7 = 6

   With outliers,
   A: Range = 13 - 6 = 7
   B: Range = 13 - 7 = 6

18. Make a Conjecture. Provide a possible explanation for the results of the dot plots.

   [H.O.T.] Focus on Higher Order Thinking

19. Analyze Relationships. Can two dot plots have the same median and range but have completely different shapes? Justify your answer using examples.

20. Draw Conclusions. What value is most affected by an outlier, the median or the range? Explain. Can you see these effects in a dot plot?