

Descriptive statistics

Student Activity Sheet 2; *Exploring “Measures of center”*

1. **REVIEW** Mercedes measured the heights of the 7 tomato plants she is growing in the back yard. The heights of the plants are 33, 24, 28, 23, 37, 29, and 36 inches.
 - a. What is the mean plant height? What does this number represent in the context of the problem?
 - b. What is the median plant height? What does this number represent in the context of the problem?
 - c. What is the range of plant heights? What does this number represent in the context of the problem?

2. **REVIEW** To create a boxplot of the tomato plant height data, you need a five-number summary: the minimum, lower quartile, median, upper quartile, and the maximum. You already found the median.
 - a. What is the minimum value of the data?
 - b. What is the lower quartile? What does this number represent in the context of the problem? Remember, the lower quartile is the median of the lower half of the data set.

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- c. What is the upper quartile? What does this number represent in the context of the problem? Remember, the upper quartile is the median of the upper half of the data set.
- d. What is the maximum?
3. **REVIEW** Another statistic you can compute for the tomato plant height data is the interquartile range (IQR). Remember, to find the IQR, subtract the lower quartile from the upper quartile. What is the IQR of the data set?
4. **REVIEW** The birth weight (in pounds) of 8 babies is shown.
- 5, 8.8, 5.8, 7.1, 7.9, 6.6, 8, 7.6
- a. What is the mean of the data? What does this number represent in the context of the problem?
- b. What is the median of the data? What does this number represent in the context of the problem?
- c. What is the lower quartile? What does this number represent in the context of the problem?

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- d. What is the upper quartile? What does this number represent in the context of the problem?

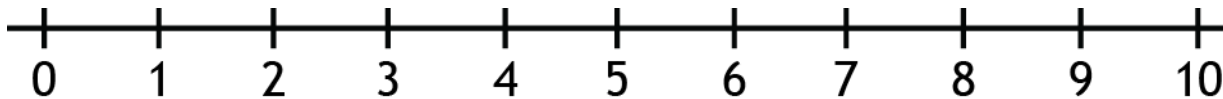
- e. What is the IQR? What does this number represent in the context of the problem?

Use the following data set for questions 5-10.

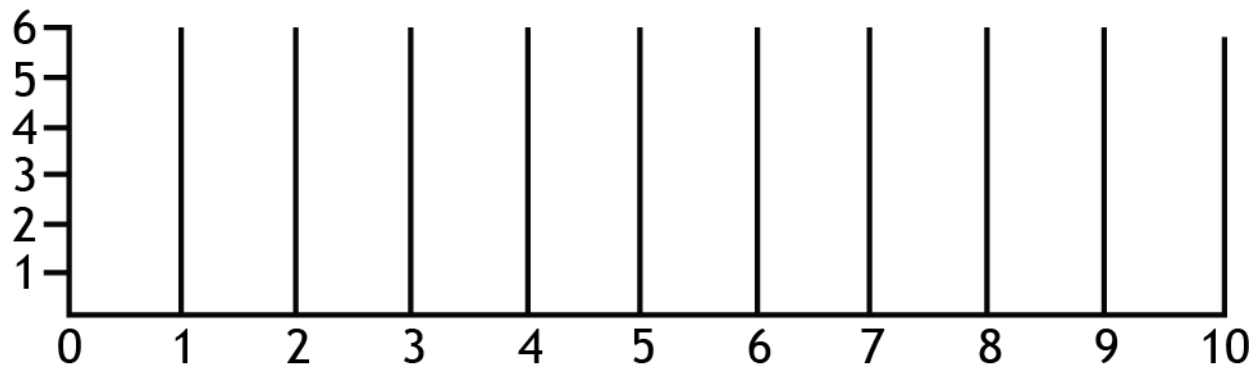
Reaction Time when Writing a Text Message

Reaction time (in seconds)				
5	2.2	5.3	5.5	4.4
2.1	3.3	5.6	8	6.3
4.7	6.9	7.6	3.1	4.5
2.8	3.6	4	3	4.2

5. Construct a dotplot for the data.



6. Construct a histogram for the data.



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7. Create a five-number summary for the data.
 - a. Order the data from smallest to largest.

 - b. Minimum:

 - c. Lower quartile:

 - d. Median:

 - e. Upper quartile:

 - f. Maximum:

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8. Use the five-number summary to construct a boxplot of the data.

9. Compute the mean for the data.

10. What do you notice about the mean and median? What conclusions can you draw?

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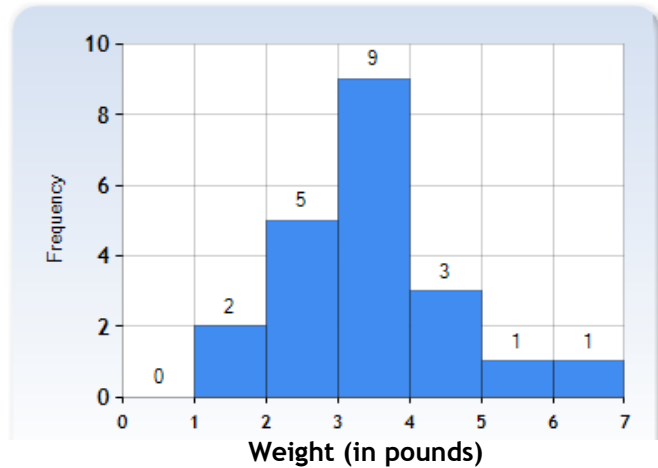
11. Construct a graphical representation of your choice for each data set, then find the mean and median of each data set. Which value do you think is more representative of a “typical” data point? Explain.

Home prices in neighborhood A (dollars)		Home prices in neighborhood B (dollars)	
146,500	225,000	525,000	500,000
239,500	350,000	475,000	450,000
350,000	359,000	435,900	425,000
369,900	399,000	415,000	410,000
437,000	445,000	400,000	399,000
4,750,000	9,950,000	390,900	375,000

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12. **REINFORCE** This histogram was created from a set of data showing the weights of teacup Chihuahuas adopted out by a Chihuahua rescue.



- How many dogs weighed at least 4 pounds?
- Between which two numbers will the median fall?
- Can you use this graph to determine the mean and median? If so, describe how. If not, explain why.
- The weights (in pounds) of the teacup Chihuahuas displayed in the histogram were 1.25, 2.5, 2.25, 3, 2.75, 2.75, 3.25, 3.5, 3.5, 3.5, 4, 4.25, 4, 5, 2.25, 1.5, 6, 3.5, 3.75, 3.75, and 3.75. Calculate the mean and median of the data set.

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- e. The Chihuahua rescue adopted out some more teacup Chihuahuas! They weighed 2, 2.25, 2.5, 2, 2.25, and 2 pounds. Without doing any actual calculations, predict how the mean and median might change. Explain your reasoning.
- f. Calculate the new mean and median to check your prediction.

13. **REINFORCE** Create three sets of data, each with at least 10 data points, such that the following statements are true. Calculate the mean and median for each data set.

- a. For one data set, the mean is much less than the median.
- b. For one data set, the mean is much greater than the median.
- c. For one data set, the mean and median are about the same.

14. What is an outlier in a set of data?

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15. Compute the median and mean for the data after you add the outlier of 20 seconds. How does the median compare to the median of the data before the outlier was added? How does the mean compare?

Reaction Time when Writing a Text Message

Reaction time (in seconds)		
5.0	3.6	3.1
2.1	5.3	3.0
4.7	5.6	4.4
2.8	7.6	6.3
2.2	4.0	4.5
3.3	5.5	4.2
6.9	8.0	20

16. In your own words, describe how outliers impact the mean and median.

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Use the following data set for questions 17-18.

Reaction Time with No Distractions

Reaction time (in seconds)				
2.7	1.0	3.0	1.4	3.0
2.0	0.8	1.2	2.1	2.2
0.7	2.4	1.1	0.8	1.0
2.2	2.5	3.1	1.7	3.3

17. Which type of graph would be best to represent these data? Why?
18. The terms in each of the following pairs are related. Describe the relationship by defining each term and giving a real-life example for each term. Your examples should be related.
- Population and sample**
 - Parameter and statistic**
 - Census and survey**

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19. A sample survey concludes that 20% of adults indicated that they believe there is intelligent life on other planets, with a margin of error of 6%. Estimate the true population percentage that believe in intelligent life on other planets.
20. **REINFORCE** In a random survey of 100 adults, 50% responded “Yes” to the question “Should parents monitor teens’ cell phone usage?” The survey resulted in a margin of error of 3%. Estimate the true percentage of adults who believe that parents should monitor teens’ cell phone usage.