



In these activities you will compare different measures of center and spread for a given distribution, interpret bar graphs, and compare different representations of the same data. After completing the activities, discuss and/or present your findings to the rest of the class.



Activity 1 [Page 1.3]

1. Suppose the heights of the three tallest dogs had been entered wrong and they were all 10 centimeters too high.
 - a. Make a conjecture about how the IQR and the mean \pm MAD will change. Then move the three dots to the suggested heights to check your reasoning. (Select the white space to deselect a dot.)

 - b. Look at the distribution of heights after the heights were adjusted. Which of the following words would you use to describe the new distribution of heights: skewed right, skewed left, symmetric, mound shaped? Explain why.

 - c. How do the mean and median of the adjusted distribution of the dog heights compare?

 - d. Reset. Which of the following words would you use to describe the original distribution of the dog heights: skewed right, skewed left, symmetric, mound shaped? Explain your reasoning.

 - e. How do the mean and median of the distribution of dog heights compare?



2. Which of the following do you think are true statements about a distribution of data? Use your answers for the previous question to support your thinking in each case.
- If a distribution is skewed, the mean and the median will be close together.
 - If a distribution is skewed, the median probably represents a better measure of the center than the mean.
 - In a symmetric mound shaped distribution, the mean and the median will be close together.
 - If a distribution is skewed, the measures that best summarize the data are the median and the IQR.
 - If a distribution is mound shaped, the measures that best summarize the data are the mean and mean \pm MAD.



Activity 2 [Page 2.2]

1. Reset. Choose **all animals, life span, bar graph**.
- What category has the life span of the most types of animals? How do you know? (Note that dogs are not included in the domestic animal category and that hovering over a bar shows the frequency of the types of animals represented in the bar.)
 - Which of the statements is true? Explain why.
 - The number of types of wild animals is more than twice as many as the number of types of domestic animals (excluding dogs).
 - The total number of types of fish and sea mammals is more than the total number of wild and domestic land animals (excluding dogs and cats).



Analyzing Distributions

Student Activity

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- iii. The difference between the number of types of birds and types of cats is more than the difference between the number of types of dogs and number of types of wild land animals.
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2. What is the difference between a bar graph and a histogram? Use examples from the TNS activity to support your reasoning.



Activity 3 [Page 3.2]

1. Choose **menu> Type> Birds**, and **menu> Attribute> Life Span**.
 - a. How wide are the bins in the histogram? Explain how you know.

 - b. What can you learn from each of kind of plot that you cannot learn from the others? Use examples from part a to support your thinking.

- c. What are the disadvantages of each plot?



Analyzing Distributions

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2. Reset. Choose **menu> Type> all**, **menu> Attribute> Max Speed**. Set the bin width of the histogram to 10. Which plot seems to be the best for displaying the data? Explain your reasoning.