Box Plots

Vocabulary **box plot:** a plot displaying the spread or distribution of a data set using a five-number summary, the minimum, lower quartile, median, upper quartile and maximum; it is also called a box-and-whisker plot **distribution:** number of times each value occurs in a data set; may be described by its center, spread, and shape **interquartile range (IQR):** a measure of variation in a set of numerical data, the interquartile range is the distance between the first and third quartiles of the data set; see quartile and box plot **measure of center:** a numerical value used to describe the overall clustering of data in a set, or the overall central value of a set of data; the three most common measures of central tendency are the mean, median, and mode **quartile:** for a data set with median M, the first quartile is the median of the data values less than M and the third quartile is the median of the data values greater than M; the second quartile is the median M **skewed:** when more data is on one side of the median than the other **spread:** the variability of a data set when describing a distribution	
Using a Box Plot to Display Data page ___	A _____ _____ is a graph that displays the data _____ grouped into four sections. It shows only the _____ as a measure of center, and the reader can easily compare the data displayed. The data is broken into _____, and these values are displayed in the box plot. From the data, _____ values are shown in the box plot. This is often referred to as the five-number summary.
Five Number Summary	There are five pieces of information shown on a box plot. ● ● ● ● ● Explore the “Five-Number Summary” interactive
Finding the Five-Number Summary Values Using a Box Plot	What are the values of the minimum, lower quartile, median, upper quartile, and maximum that are represented in the box plot shown in the course? Minimum Lower quartile (Q1) Median Upper quartile (Q3) Maximum

Learn to Find the Five-Number Summary Using a Box Plot	The following values represent the ages of different animals at a local animal rescue. 4, 7.5, 8, 10.5, 11, 12, 12, 23.5, 30, 34 Use the box plot in the course to find the values for each item in the five-number summary. Minimum = Lower quartile (Q1) = Median = Upper quartile (Q3) = Maximum =
Important	When looking at a box plot or creating one on your own, you will want to be sure to _____ the box plot and to label the _____ _____. This will allow the reader to better understand the _____ and what data is included on the graph.
Please use a separate sheet of paper to complete your practice problems.	
Distribution of a Data Set page ____	The distribution of a data set can be described by its center_____, and shape. You may have noticed that a box plot only shows one measure of center, the _____.
Types of Spread, or Variability	Sketch and describe each type of box plot. High Variability Low Variability Large Range with Low Variability The interquartile range (IQR) is the difference between the upper and lower quartiles. It shows how the middle 50% varies. **IQR = Q3 – Q1**
Skewed Data	Skewness occurs when one-half of the data points are closer together and the other half of the data points are further apart. Left Skewed No Skew Right Skewed

<table>
<tr><td></td><td></td></tr>
<tr><td>Important</td><td>In addition to seeing the five-number summary values and the interquartile range, you can also see what _____ of data lies above or below certain values on the box plot.
Lower Quartile (Q1): _____ of the data is below this value, which means _____ is above it
Median (Q2): _____ of the data is either above or below this value
Upper Quartile (Q3): _____ of the data is below this value, which means _____ is above it
Sketch the box plot in the course.</td></tr>
<tr><td>Learn to find the Skewness and Percentages of Spread From a Box Plot</td><td>The box plot shows data collected about students' keyboarding speeds. Use the box plot in the course to complete the questions.
Part A: Find the five-number summary and the interquartile range for the data.<table><tr><th>Minimum</th><th>Q1</th><th>Median</th><th>Q3</th><th>Maximum</th><th>IQR</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>Part B: Is the data skewed? If so, in which direction, and what does this say about the data?

Part C: What percentage of the data lies above 47 words per minute?

Part D: 25% of data is below which value?

Part E: 50% of the data is between which values?</td></tr>
<tr><td>Learn More About Applying Box Plots</td><td>Angela created the following box plot to represent her test grades in science class. Use the box plot in the course to complete the questions.
Part A: Find the five-number summary and the interquartile range for the data.<table><tr><th>Minimum</th><th>Q1</th><th>Median</th><th>Q3</th><th>Maximum</th><th>IQR</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>Part B: Is the data skewed? If so, in which direction, and what does this say about the data?

Part C: What percentage of the data lies above the score of 72?

Part D: 50% of data is below which value?

Part E: 50% of the data is between which values?</td></tr>
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Creating Box Plots page ____	After collecting a set of data, determine each value of the five-number summary. **Steps for Creating a Box Plot** **Step 1** **Step 2** **Step 3** **Step 4** **Step 5**
Learn How to Create a Box Plot	The following data was collected by a chef and shows the number of recipes created at a restaurant each day for 11 days. 7, 7, 9, 10, 11, 13, 14, 15, 17, 18, 22 Use the steps to create a box plot to represent the data collected by the chef.
Important	It is important to remember that when calculating the values for Q1 and Q3, the _____ of the data is not used to calculate the values of each of the quartiles. This means that after the data is divided by the median, only the data _____ the median is used to find _____ and only the data _____ the median is used to find _____.
Learn More About Creating Box Plots	Victoria practiced the piano for 8 days and recorded the number of minutes she practiced each day. 40, 25, 51, 30, 25, 50, 33, 40 Create a vertical box plot to represent the data. Minimum = Lower quartile (Q1) = Median = Upper quartile (Q3) = Maximum =

Please use a separate sheet of paper to complete your practice problems.	