# **Data and Statistics Comprehension Check**

For questions 1-8, use the table to describe each type of data representation as well as the scenarios in which it is the most useful.

|  |  |  |
| --- | --- | --- |
| **Type of Data Representation** | **Description** | **When Useful** |
| 1. Frequency Table |  |  |
| 2. Bar Graph & Double Bar Graph |  |  |
| 3. Histogram |  |  |
| 4. Line Graph & Double Line Graph |  |  |
| **Type of Data Representation** | **Description** | **When Useful** |
| 5. Circle Graph |  |  |
| 6. Line Plot |  |  |
| 7. Stem-and-Leaf Plot |  |  |
| 8. Box Plot |  |  |

1. What are measures of central tendency? Describe the three main measures of central tendency and how they help us understand data sets. (Measures of Central Tendency, p. 26-27)
2. What are measures of variability? Describe each and explain how they help us better understand data sets. (Measures of Variability: Range and Shape, p. 28-31)

# **Data and Statistics Comprehension Check Answer Key**

For questions 1-8, use the table to describe each type of data representation as well as the scenarios in which it is the most useful.

|  |  |  |
| --- | --- | --- |
| **Type of Data Representation** | **Description** | **When Useful** |
| 1. Frequency Table | A frequency table is used to show the number of times an event or data value occurs in a data set. Frequency tables often use tally marks to represent the number of occurrences. | Frequency tables are often used to organize data before representing it in another way, like in a bar graph or a box plot. Frequency tables can also be used to analyze general trends in data. |
| 2. Bar Graph & Double Bar Graph | A bar graph uses lengths or heights of bars to show numerical data.  Double bar graphs are an extension of bar graphs and shows two sets of data using lengths or heights of bars. | Bar graphs help us visualize and compare data points easily. Double bar graphs are great tools for visualizing and comparing data. |
| 3. Histogram | Histograms are special types of bar graphs that represent data with lengths and heights of bars but show the number of data values within various intervals, or ranges. | Histograms help us visualize data and describe the distribution of a data set. |
| 4. Line Graph & Double Line Graph | Line graphs show the relationship between two variables and are shown on coordinate grids.  A double line graph shows two sets of data, often using different colors to represent each set of data. | Line graphs are useful for tracking changes over short or long periods of time. Line graphs can help us visualize and see trends in the data that might be more difficult to see on a bar graph. Double line graphs can be useful when comparing two sets of data. |
| **Type of Data Representation** | **Description** | **When Useful** |
| 5. Circle Graph | A circle graph, sometimes called a pie chart, uses a circle to show a whole and sections of the circle to show parts. We can think about a circle graph showing 100% of the data, and each piece showing how much of that 100% is made up of certain data points. | Circle graphs can help us visualize and compare data within a data set. |
| 6. Line Plot | A line plot, sometimes called a dot plot, uses dots to represent different data points, often on a number line. Line plots can look similar to bar graphs, but rather than using the length or height of a bar to represent the number of data points, they use individual dots. | Line plots can be used to help us visualize and compare data points within a data set easily. |
| 7. Stem-and-Leaf Plot | A stem-and-leaf plot is a shorthand way of presenting data. Stem-and-leaf plots can be used to show a lot of data in a compressed and organized way. The stem represents the first digit (or set of digits) of each data value and the leaves represent the last digit of each data value. | Stem-and-leaf plots can be more useful than frequency tables or other representations because it is easier to see the distribution of data. |
| 8. Box Plot | Box plots are used to summarize the statistics of a given data set. Box plots include the minimum, maximum, and median. In addition, they show the range of the entire data set as well as the range of the middle half of the data values. | Box plots are useful because they not only provide a visual summary of the data, but also provide a quick look into a measure of central tendency, the distribution and shape of the data, and the range of the entire set. |

1. What are measures of central tendency? Describe the three main measures of central tendency and how they help us understand data sets.
   1. Measures of central tendency are used to determine the central, or middle value, of a data set. There are three main measures of center: mean, median, and mode.
   2. The mean is the sum of the data divided by the number of data values. The mean is often called the average. When people talk about the average, they are often referring to a single number that can be used to generally represent the entire set of data.
   3. The median is another measure of central tendency. To find the median, line up all the data values and identify the one in the middle. If the median is close to the mean, the data set is likely somewhat evenly distributed.
   4. The mode describes the most common value in a data set. The mode is the only main measure of central tendency that can be used to describe categorical data.
2. What are measures of variability? Describe each and explain how they help us better understand data sets.
   1. Measures of variability refer to how alike or different the values in a data set are. To describe the shape of a data set, think about how spread out the values are. If the data are all bunched together, they have low variability and if they are all spread out, they have high variability. A data value that is unusually large or small compared to the others is considered an outlier.
   2. The range describes the difference between the least and greatest values of a data set. When a data set does not have any outliers, the range can be used as a good indicator of the set’s variability.