

# Parent Newsletter

## Chapter 9: Statistical Measures

### Standards

#### **Common Core:**

**6.SP.1:** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

**6.SP.2:** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

**6.SP.3:** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

**6.SP.4:** Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

**6.SP.5a:** Summarize numerical data sets in relation to their context by reporting the number of observations.

**6.SP.5c:** Summarize numerical data sets in relation to their context by giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

### Students will...

Recognize statistical questions.

Use dot plots to display numerical data.

Understand the concept of the mean of data sets.

Find the mean of data sets.

Compare and interpret the means of data sets.

Understand the concept of measures of center.

Find the median and mode of data sets.

Find the range of data sets.

Find the interquartile range of data sets.

Check for outliers in data sets.

Understand the meaning of *mean absolute deviation*.

Find the mean absolute deviation of data sets.

### Key Terms

**Statistics** is the science of collecting, organizing, analyzing, and interpreting data.

A **statistical question** is one for which you do not expect to get a single answer.

An **outlier** is a data value that is much greater or much less than the other values.

A **measure of center** is a measure that describes the typical value of a data set.

A **measure of variation** is a measure that describes the distribution of a data set.

The **range** of a data set is the difference between the greatest value and the least value.

The **mean absolute deviation** is an average of how much data values differ from the mean.

### Key Ideas

#### Mean

- The **mean** of a data set is the sum of the data divided by the number of data values.

#### Median

- Order the data. For a set with an odd number of values, the **median** is the middle value.
- For a set with an even number of values, the median is the mean of the two middle values.

#### Mode

- The **mode** of a data set is the value or values that occur most often. Data can have one mode, more than one mode, or no mode. When all values occur only once, there is no mode.

### Games

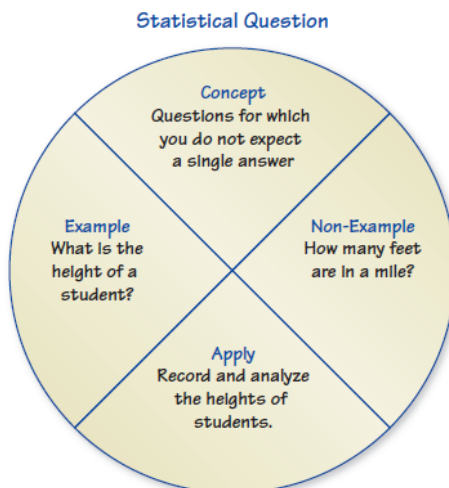
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This is available online in the *Game Closet* at [www.bigideasmath.com](http://www.bigideasmath.com).



## Reference Tools

A **Concept Circle** can be used to organize information about a concept. Write the concept above the circle. Then write associated information in the sectors of the circle. Associated information can include (an explanation of the) Concept, Apply, Solve, Check, Example, Non-Example, Vocabulary, Property, Visual, Words, Algebra, and Justify. Concept circles can have more or fewer than four sectors. Place concept circles on note cards to use as a quick study reference.



## Essential Questions

How can you tell whether a question is a statistical question?

How can you find an average value of a data set?

In what other ways can you describe an average of a data set?

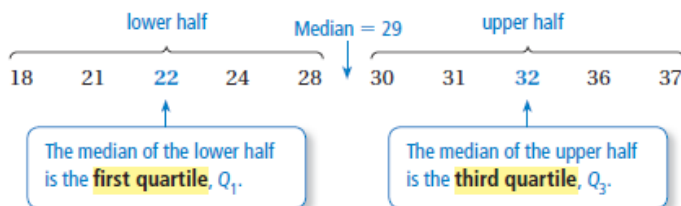
How can you describe the spread of a data set?

How can you use the distances between each data value and the mean of a data set to measure the spread of a data set?

## Key Ideas

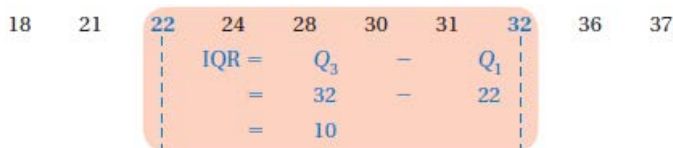
### Quartiles

The **quartiles** of a data set divide the data into four equal parts. Recall that the median (second quartile) divides the data set into two halves.



### Interquartile Range (IQR)

The difference between the third quartile and the first quartile is called the **interquartile range**. The IQR represents the range of the middle half of the data and is another measure of variation.



### Finding the Mean Absolute Deviation (MAD)

- Step 1:** Find the mean of the data.
- Step 2:** Find the distance between each data value and the mean.
- Step 3:** Find the sum of the distances in Step 2.
- Step 4:** Divide the sum in Step 3 by the total number of data values.

## What's the Point?

The ability to use statistical measures is very useful in real life for events like evaluating research data. Have your student survey their family or class about something that interests them. Then have them find the measures of variation. Are there any outliers (extreme values in the data)? If so, what affect does this value have on the mean, median, and mode? What do these values tell you about the data?

The STEM Videos available online show ways to use mathematics in real-life situations. The Chapter 9: Daylight in the Big City STEM Video is available online at [www.bigideasmath.com](http://www.bigideasmath.com).



## Quick Review

- A dot plot uses a number line to show the number of times each value in a data set occurs. Dot plots show the *spread* and the *distribution* of a data set.
- An outlier that is very low or high compared to the rest of the data values will cause the mean to be too low or high. By eliminating the outlier, you can calculate a mean that better demonstrates the average of the data.
- The first quartile can also be called the *lower quartile*. The third quartile can also be called the *upper quartile*.
- The greater the mean absolute deviation, the greater the variation of the data.