

# Section Overview

## Mean, Median, Mode, and Range

Lesson 7-1

**Why?** Mean, median, mode, and range are one-number summaries of a set of data.

Find the mean, median, mode, and range for 23, 25, 24, and 25.

### Mean

The sum of data values divided by the number of data items

$$\begin{aligned} (23 + 25 + 24 + 25) \div 4 \\ = 97 \div 4 \\ = 24.25 \end{aligned}$$

The mean is 24.25.

### Median

- The middle value of an odd number of items arranged in order
- For an even number of items, the mean of the two middle values

$$\begin{aligned} 23, \mathbf{24}, \mathbf{25}, 25 \\ (24 + 25) \div 2 = 24.5 \end{aligned}$$

The median is 24.5.

### Mode

The value that occurs most often  
The mode is 25.

### Range

The difference between the least and greatest values

$$25 - 23 = 2$$

The range is 2.

## Additional Data and Outliers

Lessons 7-2, 7-3

**Why?** Data values that are not close to most other values in the data set can greatly change the mean.

Find the mean, median, and mode of the data set 9, 2, 2, 4, 8, 2, and 8 with and without the outlier 47.

### Mean

**Without outlier:** 5  
**With outlier:** 10.25  
The outlier increases the mean by 5.25.

### Median

**Without outlier:** 4  
**With outlier:** 6  
The outlier increases the median by 2.

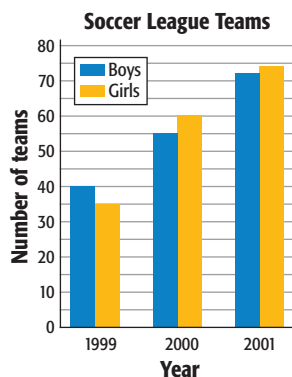
### Mode

**Without outlier:** 2  
**With outlier:** 2  
The outlier does not change the mode.

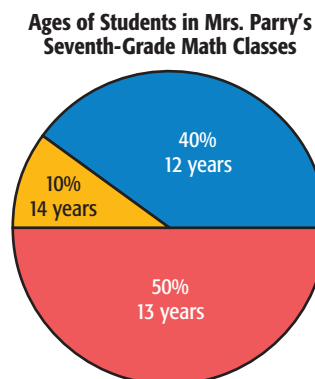
## Data Displays

Lessons 7-4, 7-5

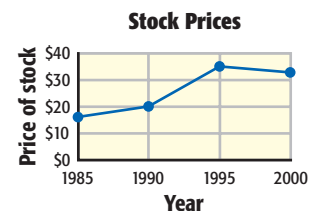
**Why?** Data displays allow people to view a summary of collected data.



A **double-bar graph** compares two sets of data.



A **circle graph** displays all the parts of a whole data set.



A **line graph** displays a set of data using line segments. Data that show change over time are best displayed in a line graph.