11.1 Find Measures of Central Tendency and Dispersion

TEKS a.1, 2A.1.B

Before You displayed data using graphs.

Now You will describe data using statistical measures.

Why? So you can calculate softball statistics, as in Ex. 27.

Key Vocabulary
- **statistics**
- **measure of central tendency**
- **measure of dispersion**
- **standard deviation**
- **outlier**

Statistics are numerical values used to summarize and compare sets of data. Two important types of statistics are *measures of central tendency* and *measures of dispersion*.

A **measure of central tendency** is a number used to represent the center or middle of a set of data values. The *mean*, *median*, and *mode* are three commonly used measures of central tendency.

KEY CONCEPT *For Your Notebook*

Measures of Central Tendency

- The **mean**, or *average*, of n numbers is the sum of the numbers divided by n. The mean is denoted by $\overline{x}$, which is read as "x-bar." For the data set $x_1, x_2, \ldots, x_n$, the mean is $\overline{x} = \dfrac{x_1 + x_2 + \cdots + x_n}{n}$.
- The **median** of n numbers is the middle number when the numbers are written in order. (If n is even, the median is the mean of the two middle numbers.)
- The **mode** of n numbers is the number or numbers that occur most frequently. There may be one mode, no mode, or more than one mode.

EXAMPLE 1 Find measures of central tendency

WAITING TIMES The data sets at the right give the waiting times (in minutes) of several people at two veterinary offices. Find the mean, median, and mode of each data set.

Office A	Office B
14, 17, 18, 19, 20, 24, 24, 30, 32	8, 11, 12, 16, 18, 18, 18, 20, 23

AVOID ERRORS
Before identifying the median as the middle number in a list, make sure the numbers are ordered from least to greatest or from greatest to least.

Solution

Office A: Mean: $\overline{x} = \dfrac{14 + 17 + \cdots + 32}{9} = \dfrac{198}{9} = 22$ Median: 20 Mode: 24

Office B: Mean: $\overline{x} = \dfrac{8 + 11 + \cdots + 23}{9} = \dfrac{144}{9} = 16$ Median: 18 Mode: 18

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