Name .

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LESSON

Date _

Study Guide

For use with the lesson "Interpret Box-and-Whisker Plots"

GOAL Make and interpret box-and-whisker plots.

Vocabulary

A box-and-whisker plot organizes data values into four groups.

Ordered data are divided into lower and upper halves by the median. The median of the lower half is the **lower quartile.** The median of the upper half is the **upper quartile.**

The **interquartile range** of a data set is the difference of the upper quartile and the lower quartile.

A value that is widely separated from the rest of the data in a data set is called an **outlier**.

EXAMPLE 1 Make a box-and-whisker plot

Calories Several brands of ready-to-eat cereals were compared. The number of calories in a serving of dry cereal for each brand is listed below. Make a box-and-whisker plot of the data.

153, 172, 213, 141, 155, 220, 165, 180, 132, 200, 191

Solution

STEP 1 Order the data. Find the median and the quartiles.



STEP 2 Plot the median, the quartiles, the maximum value, and the minimum value below a number line.



STEP 3 Draw a box from the lower quartile to the upper quartile. Draw a vertical line through the median. Draw a line segment (a "whisker") from the box to the maximum and another from the box to the minimum.

Exercise for Example 1

1. Make a box-and-whisker plot of the heights (in centimeters) of 9 seedling oak trees.

18, 28, 35, 41, 21, 17, 32, 24, 29

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EXAMPLE2 Interpret a box-and-whisker plot

Bird count The box-and-whisker plots show the number of American Goldfinches sighted each month for a year at two different wildlife reserves.



- **a.** For how many months is reserve 2's count at least 17 birds?
- **b.** *Compare* the count in reserve 1 to the count in reserve 2.

Solution

- **a.** For reserve 2, the upper half is at least 17 Goldfinches. The median is 17, so for 6 months, reserve 2 has 17 or more Goldfinch sightings each day.
- **b.** The median count for reserve 1 is 25. The median count for reserve 2 is 17. In general, reserve 1 has more Goldfinch sightings than reserve 2.

For reserve 1, the interquartile range is 27 - 19, or 8 sightings. For reserve 2, the interquartile range is 23 - 11, or 12 sightings. So, reserve 1 has less variation in the middle 50% of the data. The range for reserve 2 is greater than the range for reserve 1. When all the data are considered, reserve 2 has more variation in Goldfinch sightings.

Exercises for Example 2

- **2. Bird Count** In Example 2, for how many months was the count lower than 11 at reserve 2?
- **3. Bird Count** In Example 2, for how many months was the count at least 19 at reserve 1?