

? Topic Essential Question

How can data be described by a single number? How can tables and graphs be used to represent data and answer questions?

Vocabulary Review

Write *always*, *sometimes*, or *never* for each statement.

1. Intervals in a *frequency table* go beyond the values in a data set. _____
2. You can calculate the *IQR* from a *box plot*. _____
3. You can calculate the *mean* from a *histogram*. _____
4. The *MAD* is a negative value. _____
5. The *range* is a measure of variability. _____
6. The *mean*, *median*, and *mode* are the same value. _____

Use Vocabulary in Writing

Describe measures of variability and when you would use them to summarize a data set. Use vocabulary words in your explanation.

Concepts and Skills Review

LESSON 8-1 Recognize Statistical Questions

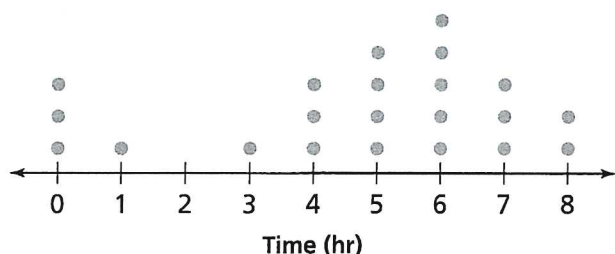
Quick Review

A statistical question anticipates that there will be a variety of answers.

Example

Ramon surveyed his classmates to determine the answer to the statistical question "How many hours do my classmates spend online each week?" The question yielded a variety of numerical answers. Ramon made this dot plot to display the data.

Time Spent Online Each Week



Practice

In 1–4, tell whether each question is statistical.

1. How many stations are there in a subway system?
2. How would passengers of a subway system rate the quality of service on a scale of 1 to 10?
3. How many passengers travel on each of the Green, Blue, Red, and Orange Lines of the subway system each day?
4. How much does it cost for a ticket to ride the subway from Station A to Station B?

LESSON 8-2 Summarize Data Using Mean, Median, Mode, and Range

Quick Review

The mean is the sum of all the values in a data set divided by the total number of values in the set. The median is the middle data value in a set arranged in numerical order. The mode is the value that occurs most often in a set. The range is the difference between the highest and lowest values in a set.

Example

Find the mean, median, mode, and range of the following set of data.

Total Game Points

129 124 128 120 124

Mean: 125 Median: 124

Mode: 124 Range: 9

Practice

In 1–6, find the mean, median, mode, and range of each data set.

1. 2, 5, 5
2. 11, 13, 13, 11, 13
3. 27, 26, 25, 20
4. 100, 200, 500, 300, 500
5. 1.4, 1.3, 1.1, 1.4, 1.9, 1.8, 1.7, 1.4
6. 450, 0, 500, 750, 0

LESSON 8-3 Display Data in Box Plots

Quick Review

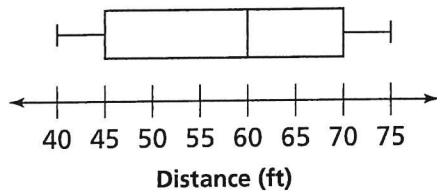
Quartiles divide a data set into four equal groups. A box plot uses the minimum, first quartile, median, third quartile, and maximum values in a data set to show how the data are distributed.

Example

Make a box plot of the distances, in feet, that seven paper airplanes flew: 60, 75, 45, 55, 70, 40, 65.

40 (45) 55 (60) 65 (70) 75
 First Quartile Median Third Quartile

Paper Airplane Distances



Practice

In 1 and 2, use the data to create a box plot.

1. 27, 31, 30, 33, 29, 25, 28

2. 3, 1, 3, 7, 5, 2, 3, 6, 3

LESSON 8-4 Display Data in Frequency Tables and Histograms

Quick Review

A frequency table shows the number of times a data value or a range of data values occurs in a data set. A histogram is a graph that uses bars to show the frequency of equal ranges or groups of data.

Example

Organize the ages of the campers listed below in a frequency table.

12, 14, 12, 14, 10, 11, 15, 13, 13, 11, 12, 12, 7, 14, 12

Divide the data into equal intervals and mark the frequency of the data using tally marks. Then write the frequency.

Ages of Campers	6-8	9-11	12-14	15-17
Tally	I	III	 	I
Frequency	1	3	10	1

Practice

1. Represent the data in the frequency table on the left in a histogram.

LESSON 8-5

Summarize Data Using Measures of Variability

Quick Review

The mean absolute deviation (MAD) describes how spread out data values are from the mean. The interquartile range (IQR) describes the difference between the third quartile and the first quartile.

Example

Find the MAD of the data set.

6, 7, 8, 8, 8, 11

Mean = 8

The absolute deviations from the mean are 2, 1, 0, 0, 0, and 3, and their sum is 6.

So, $MAD = \frac{6}{6} = 1$.

Practice

In 1–3, find the mean and the MAD for each data set.

1. 5, 12, 0, 7

2. 8, 14, 22, 16

3. 1.25, 2.5, 3

In 4 and 5, find the median, first quartile, third quartile, and IQR for each data set.

4. 10, 20, 35, 45, 45, 50

5. 24, 12, 30, 17, 32, 13, 19

LESSONS 8-6 AND 8-7

Choose Appropriate Statistical Measures and Summarize Data Distributions

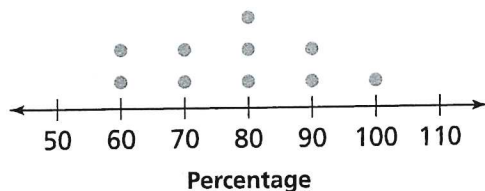
Quick Review

You can summarize data by finding the measure of center and the measure of variability. Use the IQR when the median is an appropriate measure of center, and the MAD when the mean is an appropriate measure of center.

Example

Use statistical measures to summarize the data set shown.

Test Scores



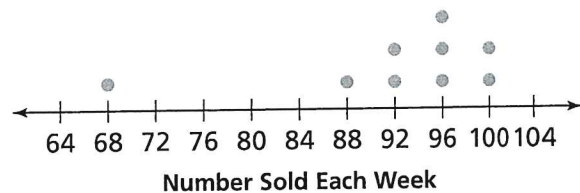
The mean and MAD are good measures to describe this data set.

The mean test score is 78 points. The MAD is 10.4, so most test scores are within 10.4 points of the mean.

Practice

In 1–3, use the data below.

Game Sales



1. Describe the overall shape of the data. Include any outliers.

2. Which measure of center and measure of variability best describe the data set? Explain.

3. Summarize the data set.