7.1 Mean and Mode

Questionnaires, experiments, databases, and the Internet are used to collect data. These collected data can be displayed in tables and graphs, which can be used to make predictions. In this lesson, you will learn ways to describe all the numbers in a data set.

Explore

You will need counters.
Three friends compared the time, in hours, they spent on the computer in one particular week.
Ali spent 5 h,
Bryn spent 9 h,
and Lynne spent 10 h.

Use counters to represent the time each person spent on the computer.
Find one number that best represents this time.

Reflect & Share

Share your findings with another pair of classmates.
How did you use counters to help you decide on the number?
Explain to your classmates why your number best represents the data.

Connect

Allira surveyed 4 friends on the number of first cousins each has.
To find a number that best represents the number of cousins,
Allira used linking cubes.

Kinta		3
Orana		4
Illuka		4
Attunga		9
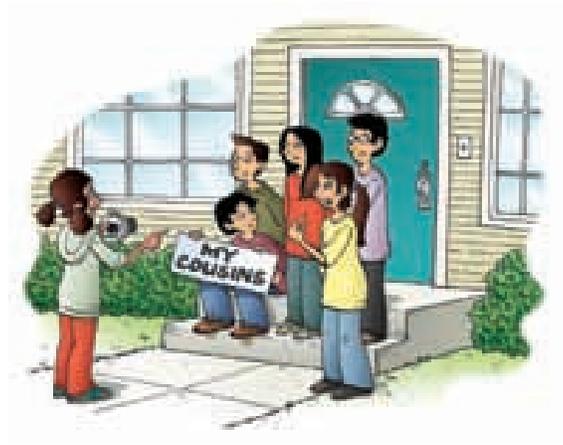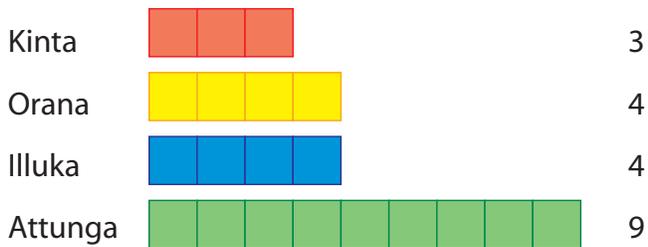
The **mean** is a number that can represent the centre of a set of numbers.

➤ One way to find the mean is to rearrange the cubes to make rows of equal length.
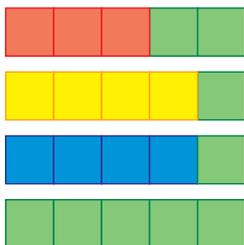
   There are 5 cubes in each row.
   The mean number of first cousins is 5.

   When you make equal rows or columns,
   the total number of cubes does not change.

➤ You can use the total number of cubes to calculate the mean.
   The number of cubes in each row is 3, 4, 4, and 9.
   Add these numbers: $3 + 4 + 4 + 9 = 20$
   Then divide by the number of rows, 4: $20 \div 4 = 5$

   The mean is 5.

The **mode** is the number that occurs most often.

➤ To find the mode, determine which number occurs most often.
   In Allira's data, the number 4 occurs twice.
   The mode is 4 cousins.
   Two people have 4 cousins.

In a set of data, there may be no mode or there may be more than one mode.

Each of the mean and the mode is a **measure of central tendency**.
We say the word **average** to describe a measure of central tendency.
An average is a number that represents all numbers in a set.

Example

Here are Ira's practice times, in seconds, for the 100-m backstroke:

121, 117, 123, 115, 117, 119, 117, 120, 122

Find the mean and mode of these data.

A Solution

To find the mean practice time, add the practice times:

$121 + 117 + 123 + 115 + 117 + 119 + 117 + 120 + 122 = 1071$

Divide by the number of data, 9: $1071 \div 9 = 119$

The mean practice time is 119 s.

The mode is the practice time that occurs most often.

117 occurs three times, so the mode practice time is 117 s.

Practice

1. Use linking cubes to find the mean of each set of data.
   a) 3, 4, 4, 5
   b) 1, 7, 3, 3, 1
   c) 2, 2, 6, 1, 3, 4

2. Calculate the mean of each set of data.
   a) 2, 4, 7, 4, 8, 9, 12, 4, 7, 3
   b) 24, 34, 44, 31, 39, 32

3. Find the mode of each set of data in question 2.

4. Here are the weekly allowances for 10 Grade 7 students:
   $9, $11, $13, $15, $20, $10, $12, $15, $10, $15
   a) What is the mean allowance?
   b) What is the mode allowance?
   c) Suppose two allowances of $19 and $25 are added to the list.
      What is the new mean? What happens to the mode?

5. Here are the ages of video renters at *Movies A Must*
   during one particular hour: 10, 26, 18, 34, 64, 18, 21,
   32, 21, 54, 36, 16, 30, 18, 25, 69, 39, 24, 13, 22
   a) What is the mean age? The mode age?
   b) During another hour, the mode age of twelve video
      renters is 36. What might the ages of the renters be?
      Explain your answer.

6. Jordin Tootoo is the first Inuk athlete to play in the National Hockey League. On October 9, 2003, he played his first game for the Nashville Predators. This table shows Jordin's statistics when he played junior hockey for the Brandon Wheat Kings.

Jordin Tootoo's Scoring Records 1999-2003				
Year	Games Played	Goals	Assists	Points
1999-2000	45	6	10	16
2000-2001	60	20	28	48
2001-2002	64	32	39	71
2002-2003	51	35	39	74

Find the mean and mode for each set of data.
a) Games Played
b) Goals
c) Assists
d) Points

7. **Assessment Focus** The graph shows the most popular sports of 13–15-year-olds in Wesley.
a) Which sports are equally popular?
b) How could you use the bar graph to find the mode? Explain and show your work.
c) Calculate the mean. Use estimated values from the graph.

**Most Popular Sports of 13-15-Year-Olds in Wesley**
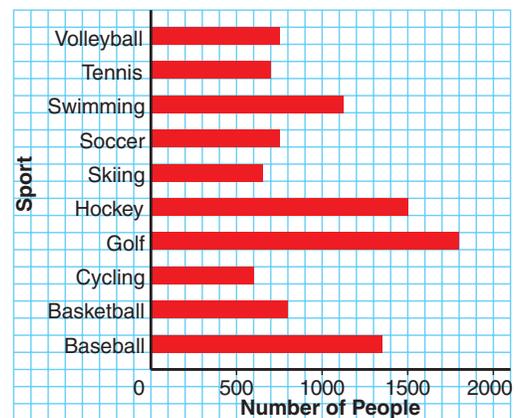
8. **Take It Further** A data set has 6 numbers. Four of the numbers are: 6, 3, 7, 9 Find the other two numbers in each case.
a) The mean is 6.
b) The mode is 3 and the mean is 6. Find as many different answers as you can.

Reflect

What is the difference between mean and mode? Create a set of data to explain.