

## What We Are Learning

## Organizing Data

## Vocabulary

These are the math words we are learning:

**mean** the sum of all the items, divided by the number of items in the set (sometimes called an average)

**median** the middle value when the data are in numerical order or the mean of the two middle numbers if there is an even number of items

**mode** the value or values that occur most often in a set of data

**outlier** a value in a set that is very different from the other values and may affect the mean

**range** the difference between the least and the greatest values in the set

*Dear Family,*

Your child is beginning to study statistics and the different ways that data can be represented and organized. In this section, your child will use tables to record and organize data.

By organizing data in a table, your child will be able to easily see patterns and relationships, which will help him or her formulate sensible conclusions.

**Use the temperature data to make a table. Then use your table to find a pattern in the data and draw a conclusion.**

At 6 A.M. the temperature was 15°F; at 10 A.M. it was 22°F; at 2 P.M. it was 35°F; at 6 P.M. it was 21°F; at 10 P.M. it was 10°F.

Time	Temperature
6 A.M.	15°F
10 A.M.	22°F
2 P.M.	35°F
6 P.M.	21°F
10 P.M.	10°F

By organizing the temperature data in the table, it is easy to see that during the time span noted, the temperature rose every four hours until 2 P.M. After 2 P.M. the temperature started to fall every four hours.

One conclusion that can be made from the data in the table is that the low temperature for the day was at least 10° F. See if your child can make another conclusion.

Making a table to organize data is an important problem-solving strategy. A table can help your child decipher confusing data in a clear and concise way. Tables are also helpful when trying to determine if the data has a pattern or when predicting other results.

Once your child has organized data, he or she can use the mean, median, mode, and range to describe it.

Mean	The sum of the values divided by the number of values, otherwise known as the average of the numbers.
Median	Once the values are organized numerically from least to greatest, the median is the middle value.
Mode	The value or values that occur most often in a set of data. If no value occurs more than once, then there is no mode.
Range	The difference between the greatest value and the least value.

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

**45, 44, 48, 42, 12, 44, 45**

*Range* Subtract the least value from the greatest value.

$$48 - 12 = 36$$

The range is 36.

*Mean* Add the values. Divide the sum by the number of items.

$$45 + 44 + 48 + 42 + 12 + 44 + 45 = 280$$

$$280 \div 7 = 40$$

The mean is 40.

*Median* Arrange the values in order. Choose the number in the middle of the data set.

12, 42, 44, 44, 45, 45, 48

The median is 44.

*Mode* The values 44 and 45 each occur 2 times.

The modes are 44 and 45.

Your child will also learn to identify an **outlier**. An outlier is an extreme piece of data. Ask your child how an outlier can affect the mean, median, mode, and range of a data set.

Displaying and analyzing data has an important role in mathematics. Encourage your child to be aware of statistics in everyday situations.

**Sincerely,**

**CHAPTER**  
**6**

**Family Letter**  
**Organizing Data**

1. Ms. Fike has been teaching for five years. Her first year, she had 22 students. Her second year, she had 25 students. Her third year, she had 28 students. Her fourth year, she had 31 students. Her fifth year, she had 34 students. Use this data to make a table.


2. Use your table from Exercise 1 to find a pattern in the data and draw a conclusion.

\_\_\_\_\_

\_\_\_\_\_

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

Price of computer games	\$34	\$28	\$57	\$30	\$38	\$69	\$44	\$30	\$30
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3. Mean

\_\_\_\_\_

4. Median

\_\_\_\_\_

5. Mode

\_\_\_\_\_

6. Range

\_\_\_\_\_

ATTENDANCE AT SCOTT MIDDLE SCHOOL						
Year	1997	1998	1999	2000	2001	2002
Attendance	180	195	210	192	185	208

7. Mean

\_\_\_\_\_

8. Median

\_\_\_\_\_

9. Mode

\_\_\_\_\_

10. Range

\_\_\_\_\_

11. Kate sells kitchen tools at a local kitchen store. Her sales for the past 5 weeks were \$856, \$1,034, \$798, \$2,950, and \$832. What are the mean, median, and mode of the data? Which one best describes the data set?

\_\_\_\_\_

**Answers:** 1. 1; 2. 22; 3. 25; 4. 28; 5. 31; 6. 34; 7. 25; 8. 28; 9. 25; 10. 30; 11. The mean is \$1,294; There is no mode; The median is \$856; The median best describes the data because the value, \$2,950, is an outlier.

**CHAPTER**

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**Family Fun**

***Just a Mean Game***

**Materials**

- Paper in different colors or patterns
- Centimeter ruler
- Bag
- Scissors

**Directions**

- Draw rectangular strips on paper. All the strips should be 1 cm wide. Vary the length—1 cm, 2 cm, 3 cm, and so on, up to 10 cm. Cut several strips of each length. Cut all strips of the same length from the same color. For example, cut all the 1 cm strips from yellow paper. Make at least 30 strips in all.
- Put the strips in a bag and mix them up. Take out a handful of strips.
- Work with a partner to arrange the strips in order from shortest to longest.
- Use the table to record the length of each strip.
- Find the mean, median, mode, and range of the strips you selected.

**Length of Strips (cm)**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>Number of Strips</b>										

Mean \_\_\_\_\_

Median \_\_\_\_\_

Mode \_\_\_\_\_

Range \_\_\_\_\_

### What We Are Learning

#### Displaying and Interpreting Data

#### Vocabulary

These are the math words we are learning:

**bar graph** displays data with vertical or horizontal bars

**coordinate grid** a plane formed by the intersection of the  $x$ -axis and the  $y$ -axis

**double-bar graph** a bar graph that shows two related sets of data

**double-line graph** line graphs that display two sets of data

**frequency table** a table that tells the number of times an event, category, or group occurs

**histogram** a bar graph that shows the number of data items that occurs within each interval

**line graph** displays a set of data using line segments

**line plot** a method of displaying data that uses a number line to show the frequency of values

**ordered pair** two numbers that name a location on a coordinate grid

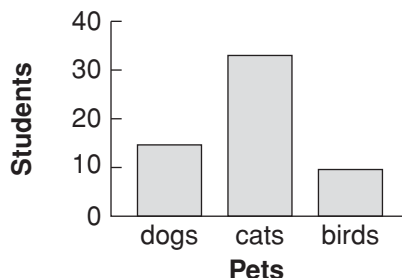
**stem-and-leaf plot** shows data arranged by place value

### Dear Family,

In this section, your child will be interpreting and constructing many different types of graphs used to display data. Some of the graphs your child will be creating will be bar graphs, double bar graphs, line graphs, double line graphs, histograms, and stem-and-leaf plots.

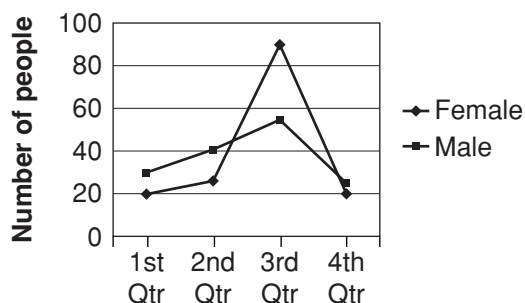
**Bar graphs and double bar graphs** are helpful to display data that can be put into categories.

**Favorite Pets**



**Line graphs and double line graphs** are useful when displaying data over a period of time.

**Attendance at Events**

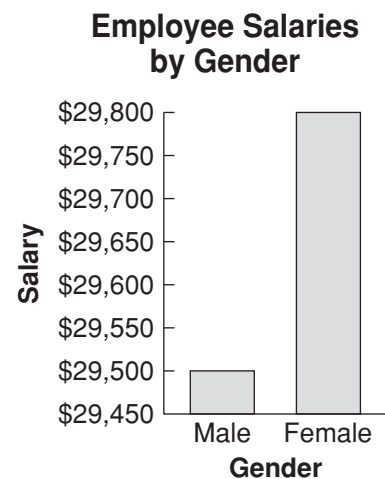


Plotting points on a line graph will prepare your child for graphing ordered pairs on a coordinate grid. The first number in an ordered pair tells you how far to move horizontally from the point  $(0, 0)$ . The second number in an ordered pair tells you how far to move vertically.

Plotting points is an important skill that will help to prepare your child for future mathematical concepts.

There are many different ways to represent data. Sometimes a graph can display data in a misleading way. Misleading graphs rely on someone looking at the shape of the graph, not what the graph is actually representing. Your child will learn to focus on the scale of the graph to be sure that the data is accurately represented.

**Explain why this bar graph is misleading.**



This graph is misleading because it looks as if females earn a lot more than males, while there is actually only a \$300 difference in salaries. Since the scale does not start at zero and the intervals increase by \$50, the difference in salaries appears to be very large.

Search through magazines and newspapers with your child to find graphs that display misleading data and graphs that accurately represent the data presented.

The study of data is a topic that will be covered throughout your child's math education. Be sure to be involved as your child continues to build a foundation for a great math future.

**Sincerely,**

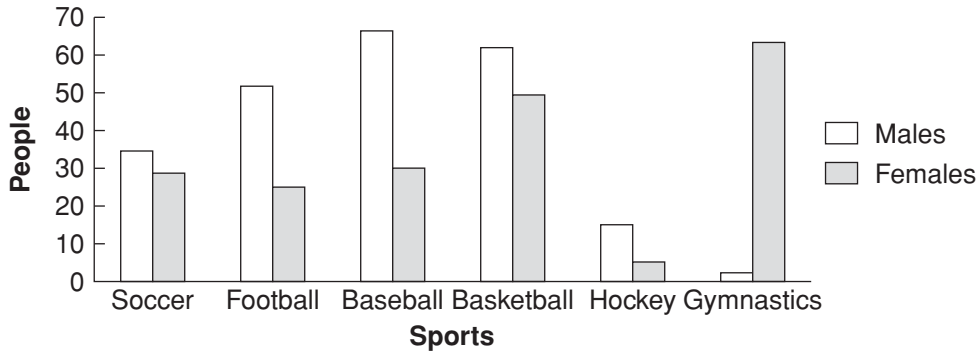
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**Family Letter**

**Displaying and Interpreting Data**

Use the double bar graph to answer each question.

**Favorite Sport to Watch**



1. Which sport is liked best by males?

\_\_\_\_\_

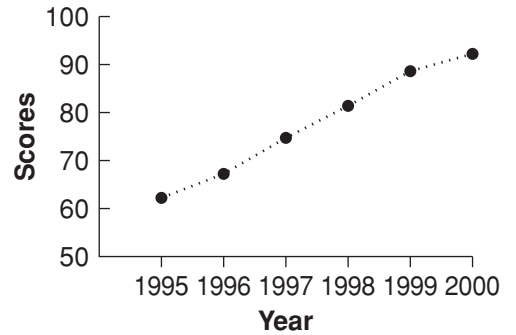
2. Which sport do both males and females prefer to watch?

\_\_\_\_\_

Explain why this line graph is misleading.

3. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Math Scores for Brookpark**



Use the data in the table to complete the stem-and-leaf plot.

4. Stem	Leaves
6	
7	
8	
9	

85	99	65	78	85	82	83
66	74	92	79	92	84	99
80	75	89	92	86	70	65

Key: 6|6 means 66

**Answers:** 1. Baseball 2. Basketball 3. The scale does not start at zero. It looks as if the scores dramatically increased over 6 years. 4. 61 5 5 6; 71 0 4 5 8 9; 81 0 2 3 4 5 6 9; 91 2 2 2 9 9

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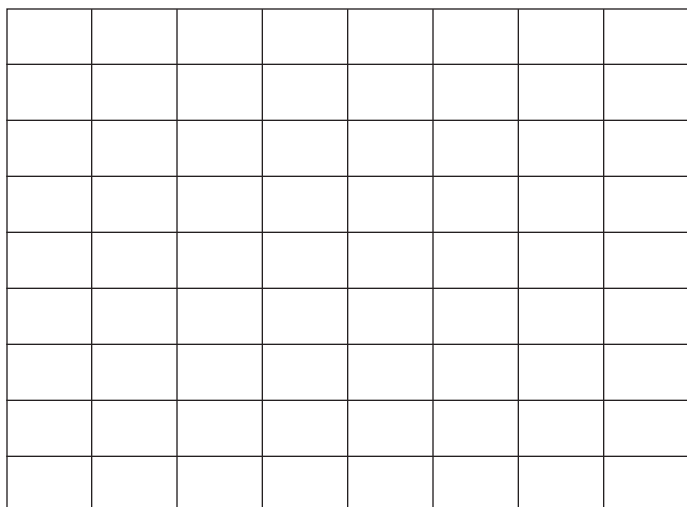
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**Family Fun**

**Graph It**

**Bar Graph**

Make a list of activities that most people do on a daily basis, such as climbing stairs, walking to the car, vacuuming, etc. Interview a person in your household and ask them how many minutes per day they spend doing each activity. Make a bar graph of the data. Remember to label the axes and give the graph a title. Show the results to the person you interviewed.



**Histogram**

Write down the ages of every person in your household or family. Create a histogram with this information. Remember to label the axes and give the graph a title.

