Name _____ Date _____

2-1 Frequency Tables (pages 46–49)

QCC 1, 41, 50, 51, 53

Data are pieces of information, usually numbers. When you use **statistics**, you collect, organize, analyze, and present data, often as a **frequency table**.

Making a Frequency Table	Draw a table with three columns and tally the responses. In the third column, write the number of tallies (or frequency).

EXAMPLE

Make a frequency table for the letters in this sentence: Bill sits still.

In the first column, list the letters b, i, l, s, and t. In the second column, mark a tally for b, then a tally for i, then two tallies for l, and so on. In the third column, add the tallies in each row and write the frequency.

Letter	Tally	Frequency
b	|	1
i	|||	3
l	||||	4
s	|||	3
t	||	2

Try This Together

1. Make a frequency table for the digits on a clock face that show the hours.

HINT: In the first column, list the digits 0,1, 2, 3, 4, 5, 6, 7, 8, and 9. Mark tallies in the second column. For 12 o'clock, make one tally mark beside 1 and one tally mark beside 2.

2. Business The colors of roses that were sold at Friedman's Floral in one week are shown at the right. Make a frequency table for the data.

red	white	white	yellow	red	white
red	red	red	white	yellow	pink
red	pink	pink	red	red	red
yellow	white	red	red	white	red

3. Entertainment Mr. Juarez asked everyone in his class how many channels they receive on their televisions. The data is shown below. Make a frequency table for the data.

4	10	8	8	6	10
4	8	10	10	8	6
6	4	4	8	8	10
6	10	10	4	8	6

4. Standardized Test Practice The frequency table shows the kinds of sandwiches sold at school last week. What was the most popular sandwich?

Sandwich	Tally	Frequency
Vegetable	𝍸 𝍸 𝍸 |||	18
Ham	𝍸 𝍸 𝍸	15
Turkey	𝍸 𝍸 𝍸 𝍸 ||	22
Pastrami	𝍸 𝍸 ||||	14

A Turkey **B** Ham **C** Vegetable **D** Pastrami

Answers: 1–3. See Answer Key. 4. A

Name _____ Date _____

2-2 Scales and Intervals (pages 50–53)

QCC 1, 2, 41, 50, 51, 53

When you make a frequency table, sometimes it is easier to group the data into **intervals**. The total size of the groups is the **scale** of the frequency table.

Choosing a Scale for a Frequency Table	Choose a scale that includes the least number and the greatest. • Choose an interval that will give you a manageable number of groups, usually from four to seven. • Make sure all the intervals, or groups, are equal and they do not overlap.

EXAMPLES

A Name the scale and the interval in this first column of a frequency table:

Free Throws
16–20
11–15
6–10
1–5

The scale goes from 1 to 20. Each interval has 5 scores in it (for example, 16, 17, 18, 19, 20). The interval is 5.

B Here are the number of free throws made by the third period gym class: 17, 2, 10, 4, 5, 7, 7, 16, 3, 12, 9, 3, 4. Complete the frequency table started in Example A.

Add two columns to the table. Mark tallies for each interval. Then write the frequencies.

Free Throws	Tally	Frequency
16–20	||	2
11–15	|	1
6–10	||||	4
1–5	𝍸 |	6

Try These Together

1. Choose a scale for data from 3 to 32.
HINT: Your scale must include 3 and 32.

2. How many different whole number scores are possible in an interval from 25 to 30?
HINT: Write each score, 25, 26, … and count how many, or subtract 30 − 25 and add 1.

PRACTICE

Choose the better scale for a frequency table for the set of data.

3. 8, 3, 9, 12, 20, 1 **a.** 0 to 20 **b.** 0 to 30

Choose the best interval for a frequency table for the set of data.

4. 10, 32, 64, 80, 96 **a.** 3 **b.** 10 **c.** 20

5. **Standardized Test Practice** These data show how many miles 10 sixth-graders live from school. What interval would you use in making a frequency table for this set of data?

2 mi, 4 mi, 3 mi, 2 mi, 10 mi, 12 mi, 8 mi, 7 mi, 5 mi, 11 mi

A 20 **B** 10 **C** 5 **D** 2

Answers: 1. Sample answer: 0–40 2. 6 3. a 4. c 5. D

Name _____ Date _____

2-3 Bar Graphs and Line Graphs

(pages 54–57)

QCC 1, 2, 3, 4, 41, 46, 51, 53

A graph represents data visually. A **bar graph** compares frequencies. A **line graph** compares changes over time.

Drawing a Vertical Bar Graph	Draw and label the horizontal and vertical axes. Title your graph. • Choose a scale and interval for the data and mark equal spaces on the vertical axis. • Mark equal spaces on the horizontal axis and label the categories. • Draw a bar for each category. The height shows the frequency.
Drawing a Line Graph	Draw and label the horizontal and vertical axes. Title your graph. • Choose a scale and interval for the data and mark equal spaces on the vertical axis. • Mark equal spaces on the horizontal axis and label the categories • Draw a dot to show the frequency for each category. Draw line segments to connect the dots.

EXAMPLES

A A class collects this data.

Favorite Flavor	Frequency
vanilla	13
strawberry	4
chocolate	10
lemon	2

Determine a scale for this data.

The data go from 2 to 13. You might choose a scale from 0 to 15.

B For the data in Example A, what would be a good interval?

You could use an interval of 2 or 4.

What are the labels for the categories on the horizontal axis?

Vanilla, Strawberry, Chocolate, Lemon

What is the label for the vertical axis? for the horizontal axis? for the graph?

People; Flavors; Favorite Flavors

Try This Together

1. Draw a bar graph for the data in Example A.

HINT: You will have four bars. The tallest bar shows the most popular flavor.

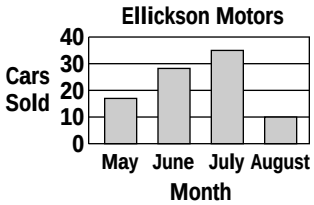
PRACTICE

2. What would be the best scale for the following set of data?

Year	1997	1998	1999	2000
Number of Students in Drama Club	3	9	17	15

3. Make a line graph for the set of data in Practice Exercise 2.

4. **Standardized Test Practice** The bar graph shows how many cars were sold recently at Ellickson Motors. Estimate how many cars were sold in July.



A 15 **B** 35 **C** 25 **D** 10

Answers: 1. See Answer Key. 2. 0–20 3. See Answer Key. 4. B

2-4

Name _____ Date _____

Reading Circle Graphs

(pages 60–63)

1, 2, 29, 41, 50, 51, 53

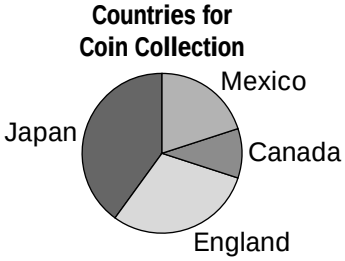
A **circle graph** compares parts of a whole. The circle is the whole and the pie-shaped sections show the parts. All the percents in a circle graph add to 100%.

Reading a Circle Graph	Read the title of the graph and the titles of all the sections. • Recall that half of a circle is 50% and one-fourth is 25%. • See how the percents match the sizes of the sections.

EXAMPLES

A The circle graph shows where the coins in Joel's collection come from. The percents are 10%, 20%, 30%, and 40%. Match each percent with the appropriate section of the graph.

The section for Japan is the largest. It is almost one-half. So 40% of his coins come from Japan. The smallest section is Canada. So 10% of his coins come from Canada. The England section is larger than the Mexico one. So 30% come from England and 20% from Mexico.



B What percent of his coins come from England and Mexico together?

Add the percents: 30% added to 20% is 50%.

Try These Together

1. What fraction of Joel's collection comes from Canada and Japan together?

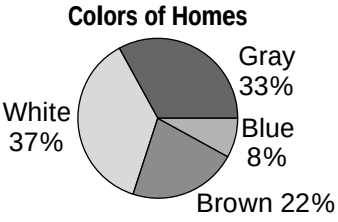
HINT: What part of the circle are these two together?

2. Canada and what other country together equal the same percent as Japan?

HINT: Subtract the percent for Canada from that of Japan.

PRACTICE

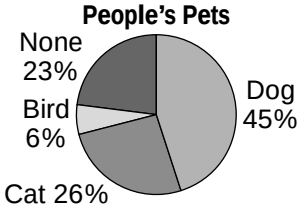
The circle graph shows the colors of homes in Anissa's neighborhood.



3. What percent of homes are blue?

4. What are the two most popular colors for homes in Anissa's neighborhood?

5. **Standardized Test Practice** The circle graph shows the pets students have. What percent of students do not have pets?



A 6% **B** 26%

C 23% **D** 45%

Answers: 1. $\frac{1}{2}$ 2. England 3. 8% 4. white and gray 5. C

2-5

Name _____ Date _____

Making Predictions (pages 64–67)

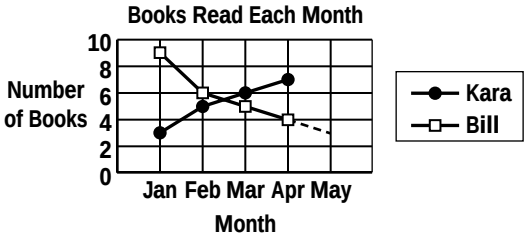
QCC 1, 2, 41, 51, 53

You can use a line graph to help you make predictions.

Predicting with a Line Graph	To make a prediction with a line graph, • Extend the graph with a dashed line. • From the point on the dashed line that shows where you want to make your prediction, draw a horizontal line to the left to meet the vertical axis. • Read the value on the vertical axis.

EXAMPLES

The graph at the right shows how many books Kara and Bill read each month.



A What is the difference in April between the number of books Kara and Bill read?

Kara read 7 and Bill read 4, so the difference is 3.

B Predict how many books Bill will read in May.

The extended line has a value on the vertical axis of 3 books.

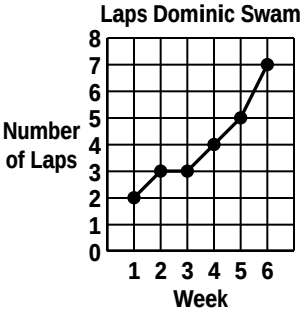
Try These Together

1. Use the graph above to predict how many books Kara will read in May.
HINT: Extend the line for Kara.

2. How many more books would you expect Kara to read than Bill in May?
HINT: Use your predictions for Kara and Bill.

PRACTICE

3. Sports The line graph shows how many laps Dominic swam each week for 6 weeks.

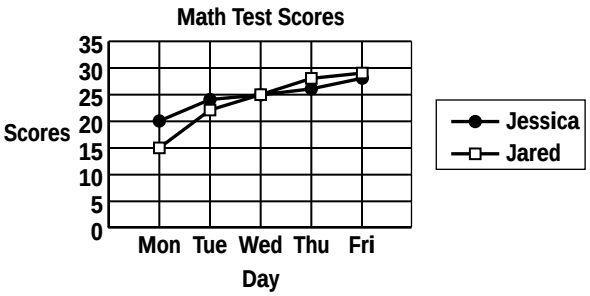


a. Predict how many laps he will be able to swim in Week 7.

b. How many more laps did he swim in Week 4 than in Week 1?

c. Would you predict that Dominic will be able to swim more than 10 laps in Week 8?

4. **Standardized Test Practice** This line graph shows Jessica and Jared's math test scores for one week. Which day did they have the same score?



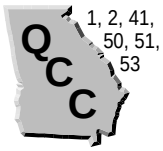
A Monday **B** Tuesday

C Wednesday **D** Friday

Answers: 1. 8 2. 5 3a. 9 3b. 2 3c. yes 4. C

Name _____ Date _____

2-6 Stem-and-Leaf Plots (pages 68–70)



You can make a large data set easier to read with a **stem-and-leaf plot**. The **stems** are the tens digits. The **leaves** are the units digits.

Drawing a Stem-and-Leaf Plot	Find the digits in the tens place for the least and the greatest numbers. • Draw a vertical line and write the tens digits in order for the stems. • Write the units digits, or leaves, to the right of their stems. • Arrange the leaves in order from least to greatest. Include a key.

EXAMPLE

Make a stem-and-leaf plot of this data that shows how many students are in each sixth grade class.

15, 34, 20, 31, 17, 26, 24, 29, 26, 31

The stems are 1, 2, and 3.

Stem	Leaf
1	5 7
2	0 4 6 6 9
3	1 1 4

1|5 = 15 students

Try These Together

1. How many classes are there in the data set in the Example?
HINT: Count the numbers in the data set.

2. What interval contains half of the class sizes?
HINT: Which stem has the most leaves?

PRACTICE

Determine the stems for each set of data.

3. 13, 8, 12, 44, 26, 33, 15

4. 25, 64, 35, 22, 68, 71, 84, 14, 56, 41

Make a stem-and-leaf plot for each set of data.

5. 2, 5, 16, 22, 15, 14

6. 24, 25, 38, 34, 46, 58

7. **Aviation** Adrian's mother is an airline pilot. One week, he counted the number of hours she flew each day. Make a stem and leaf plot of the data.

12, 8, 2, 6, 10, 5

8. **Standardized Test Practice** This stem-and-leaf plot shows how many times Dara's classmates log on to the Internet each week. In which interval do most of the times fall?

Stem	Leaf
0	1 3 3 5 8
1	2 4 4 5 6 6 7 8
2	1 1 4

2|1 = 21

A 12–18 times **B** 21–24 times

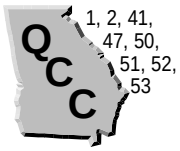
C 1–8 times **D** 0–10 times

Answers: 1. 10 2. 20–29 3. 0, 1, 2, 3, 4 4. 1, 2, 3, 4, 5, 6, 7, 8 5–7. See Answer Key. 8. A

Name _____ Date _____

2-7 Mean, Median, and Mode

(pages 71–75)



One number used to represent an entire set of data is called a **measure of central tendency**. Three common measures of central tendency are the **mean**, the **median**, and the **mode**. The mean is also called the average.

Finding the Mean	Add to find the sum. Divide by the number of pieces of data.
Finding the Median	Arrange the data in order. Find the middle number (or the mean of the two middle numbers).
Finding the Mode	Look for the data item that appears most often. There may be more than one mode, or no mode.

EXAMPLES

A Find the mean of this set of data.

10, 13, 6, 7, 14, 28, 34, 5, 22, 11

The sum of the data is 150. There are 10 pieces of data. Divide 150 by 10 to get a mean of 15.

B For the data in Example A, what is the median?

The data in order are: 5, 6, 7, 10, 11, 13, 14, 22, 28, 34. There are two middle numbers, 11 and 13. The mean of 11 and 13 is 24 ÷ 2 or 12. The median of this data is 12.

Try These Together

1. In Example A, is the mean a number in the data set? is the median?

HINT: Is the mean of 15 one of the numbers listed in the set of data? is the median of 12?

2. For the data in Example A, what is the mode?

HINT: Each number in the data set appears only once. No number is the most common.

PRACTICE

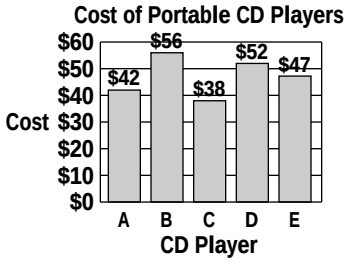
Find the mean, median, and mode for each set of data.

3. 10, 14, 18, 23, 10

4. 36, 24, 21, 58, 21

5. 22, 23, 29, 28, 24, 24

6. Money Matters Alicia is saving money for a portable CD player. The graph shows the costs of different CD players. What is the mean cost of the CD players?



7. **Standardized Test Practice** What is the median of the set of data in the table?

A 54 **B** 62

C 58 **D** 67

School	Number of Students on Sports Teams
Blake	56
Irondale	68
River Trail	101
Jefferson	43

Answers: 1. no, no 2. There is no mode. 3. mean = 15, median = 14, mode = 10 4. mean = 32, median = 24, mode = 21 5. mean = 25, median = 24, mode = 24 6. $47 7. B

Name _____ Date _____

2-8 Misleading Statistics (pages 78–81)

QCC 1, 2, 41, 48, 53

Ways to mislead include choosing an expanded scale, not starting a scale at zero, and omitting labels and titles, as well as choosing the wrong measure of central tendency.

Seeing when a Graph is Misleading	• Is there is a label on both scales and a title on the graph? • Does the scale start at zero? • The mean is best to represent data that are grouped closely together. • The median is best for widely scattered data. • The mode is best for data that have several repeated data values.

EXAMPLES

A What measure of central tendency would best represent the ages of people in your math class? *Many of the ages will be repeated. The mode is best.*

B What measure would best represent the annual salaries in a large company? *The salaries are widely scattered. Choose the median.*

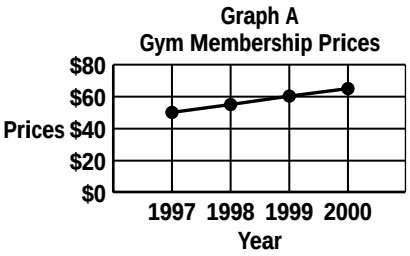
Try These Together

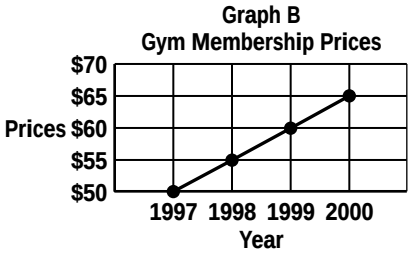
1. What measure best represents the distance each student lives from school?
HINT: Are the data values fairly close together?

2. Is the mode for a set of data always one of the data values?
HINT: Remember the definition of mode.

PRACTICE

Fitness ***The graphs display the same data for prices at the Fitness Center.***





3. If someone were trying to sell memberships by saying that it will cost a lot more in the future, which graph might be used?

4. Why is graph B misleading?

5. **Standardized Test Practice** The results of a class survey on the number of hours each student spends on homework every night are shown in the table. What is the mode for this set of data?

A 1 **B** 2 **C** 4 **D** 8

Number of Hours	Frequency
1	4
2	8
3	2
4	3

Answers: 1. mean 2. yes 3. Graph B 4. It does not show $0 with a break in the vertical axis between $0 and $50. 5. B

Name _____ Date _____

2-9 Graphing Ordered Pairs

(pages 82–85)

QCC 1, 19, 41

The point on a graph where the ***x*-axis** and the ***y*-axis** intersect is the **origin**. You can name any point on a graph by first giving the *x*-coordinate and then the *y*-coordinate of the point. For example, the **ordered pair** (2, 3) names the point that is 2 units to the right of the origin and 3 units up.

Naming a Point on a Graph	Start at the origin. • Move along the *x*-axis until you are as far right as the point. The number of units you moved is the *x*-coordinate. • Move up until you are at the point. The number of units you moved up is the *y*-coordinate.

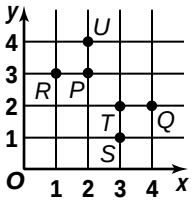
EXAMPLES

A Name the ordered pair for point *P*.

P is 2 to the right and 3 up. P is (2, 3).

B What is the name of the point (3, 1)?

The point that is 3 to the right and 1 up is S.



Try These Together

1. What is the name of the point (1, 3)?

HINT: Move from the origin one unit along the x-axis.

2. Name the ordered pair for point *Q*.

HINT: Start at the origin and move to the right.

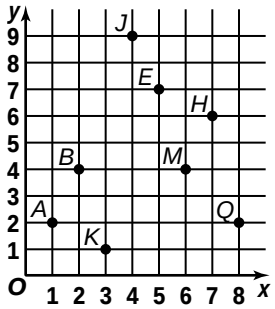
PRACTICE

Use the grid at the right to name the point for each ordered pair.

3. (2, 4) **4.** (5, 7) **5.** (3, 1) **6.** (7, 6)

Use the grid at the right to name the ordered pair for each point.

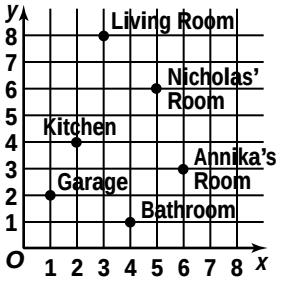
7. *A* **8.** *Q* **9.** *M* **10.** *J*



11. **Standardized Test Practice** The grid is a simple version of Annika's house. Which ordered pair indicates the location of her brother Nicholas' room?

A (6, 3) **B** (6, 5)

C (3, 6) **D** (5, 6)



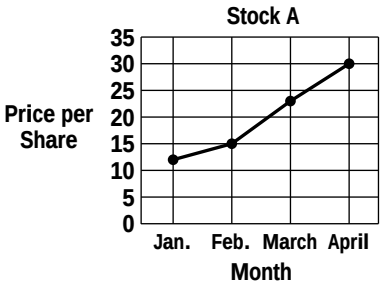
Answers: 1. R 2. (4, 2) 3. B 4. E 5. K 6. H 7. (1, 2) 8. (8, 2) 9. (6, 4) 10. (4, 9) 11. D

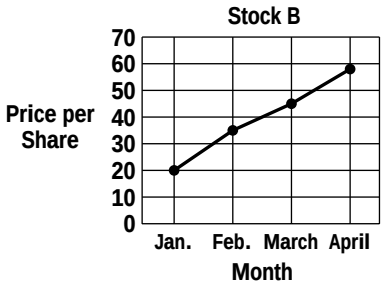
Name _____ Date _____

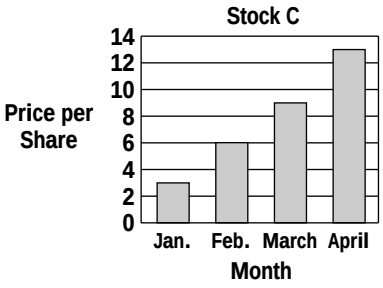
2 Chapter 2 Review

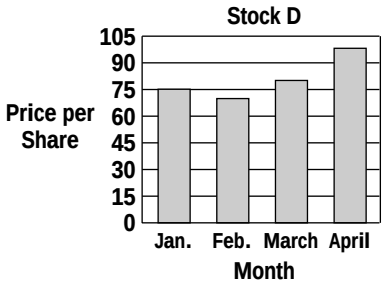
Stock Market Game

In a stock market game, teams of students must pick a stock to "buy." After several months, the team whose stock gains the most value wins. Teams make their decisions about which stocks to buy based on the price of the stock over the past several months. Use the information below to help your team pick the best stock.









1. Read the graphs above. By about how much did the value of each stock increase from January to April?

2. To win the stock market game, you want to buy the stock that will increase in value the most over the next several months. Based on the amount that each stock has increased in value, which stock would you want your team to buy? Explain.

Answers are located on p. 108.