

2-1

Frequency Tables (pages 54–57)

You can organize large amounts of data in a **frequency table**, which shows the number of times each item appears. A frequency table has a **scale** that includes all of the numbers in the data. A frequency table also has an **interval**, which separates the scale into equal parts.

EXAMPLE

Luis surveyed T-shirt shops in Port Aransas to find the average prices (in dollars) of souvenir T-shirts. The average prices he found at each shop were: 9, 10, 12, 9, 18, 12, 13, 10, 5, 8, 16, and 11. Create a frequency table with these data.

Cost (\$)	Tally	Frequency
1–5		1
6–10		5
11–15		4
16–20		2

- The frequency table includes all of the data, so the scale will be from 1–20.
- The interval, which divides the data into four equal parts, is 5.

Try This Together

1. Every student in the Pet Lovers Club has at least one pet. The number of pets each member has is 1, 2, 1, 1, 3, 2, 4, and 6. Make a frequency table with this data. Identify the scale and interval.

Hint: The scale must include all of the data, and the interval must divide the data into equal-sized parts.

PRACTICE

Choose an appropriate scale and interval to make a frequency table for each set of data.

- 5, 3, 2, 1, 4, 6, 9
- 111, 125, 101, 94, 136
- 15, 10, 24, 20, 37, 40
- 5, 6, 11, 0, 14, 12, 8, 16, 18
- 220, 340, 130, 180, 230, 340, 100
- 20, 10, 50, 60, 40, 30, 90, 70
- Draw a number line that shows a scale of 0 to 10 and an interval of 2.

9. **Food** Alex’s class is having a pizza party. The set of data shows what kinds of pizza people ordered. Make a frequency table of the data.

Kind of Pizza				
P	V	M	V	M
S	P	S	M	P
P	S	P	V	V

S = sausage
P = pepperoni
M = mushroom
V = vegetable



10. **Standardized Test Practice** What is an appropriate scale for this set of data?
15, 10, 12, 16, 18, 5, 3, 46, 35, 21, 26

- A** 5–50 **B** 0–45 **C** 3–45 **D** 1–50

Answers: 1. See Answer Key. 2–7. Sample scales and intervals are given. 8–9. 20, 0–19, 2. 0–99, 20. 3. 10–44, 5. 4. 90–139, 10. 5. 100–349, 50. 6. 0–19, 2. 7. 0–99, 20. 8–9. See Answer Key. 10. D

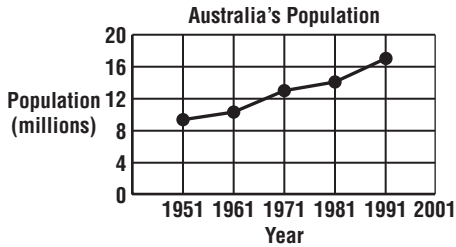
2-2

Making Predictions (pages 60–63)

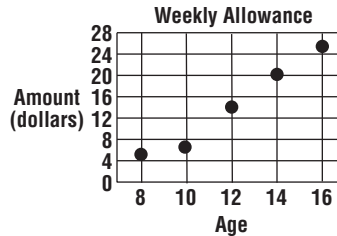
The following examples show a **line graph** and a **scatter plot**.

EXAMPLES

A Line Graph



B Scatter Plot

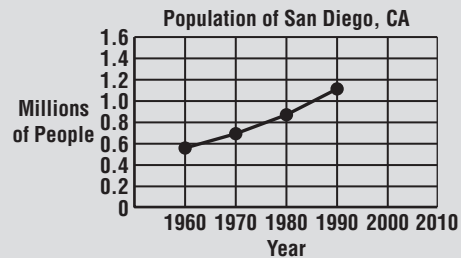


You can make predictions from a line graph because it shows a trend over time. You can also make predictions from a scatter plot based on the relationship it shows.

Try This Together

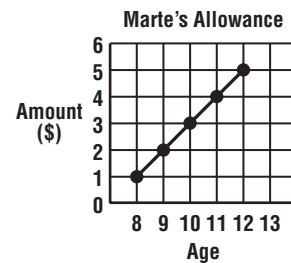
- The line graph shows how the population of San Diego has grown since 1960. Predict the population of San Diego in the year 2010.

Hint: Where do you expect to see the line in the year 2010?

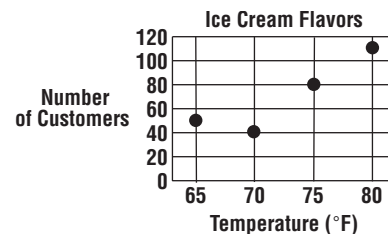


PRACTICE

- Money Matters** The line graph shows how much allowance Marte receives every week. Predict how much allowance she will receive every week when she is 13 years old.



- Standardized Test Practice** The scatter plot shows the number of customers at an ice cream shop and the high temperature for that day. Predict the number of customers when the temperature reaches 85° F.



A 100

B 150

C 110

D 220

Answers: 1. Sample answer: 1.5 million 2. \$6 per week 3. B

2-5

Stem-and-Leaf Plots (pages 76–79)

You can use a **stem-and-leaf** plot to display data. In a stem-and-leaf plot, the last digit in each data item is the **leaf**. The digits in front of the leaf become the **stem**.

EXAMPLES

Create stem-and-leaf plots with the following data.

- A** Gladys has four dogs. They weigh 42, 58, 53, and 61 pounds.

Use the tens digits to form the stems, and the ones digits to form the leaves. So $4|2 = 42$.

There are two values, 53 and 58, that have a five in the tens place. This causes the 5 stem to have leaves of 3 and 8, to represent 53 and 58.

Stem	Leaf
4	2
5	3 8
6	1 $4 2 = 42$

- B** Gladys also has three cats. They weigh 10, 13, and 9 pounds.

Use the tens digits to form the stems, and the ones digits to form the leaves. So $0|9 = 9$.

Stem	Leaf
0	9
1	0 3 $0 9 = 9$

Try These Together

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

1. 11, 5, 6, 12, 23, 24, 28, 21, 18, 17 2. 36, 41, 25, 28, 30, 45, 45, 40, 26, 29

PRACTICE

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

3. 15, 13, 26, 12, 14, 23, 26, 21, 15 4. 92, 86, 85, 66, 73, 72, 64, 75, 84, 81
 5. 2, 6, 3, 5, 11, 15, 16, 18, 7, 9, 19 6. 56, 54, 28, 41, 33, 26, 58, 64, 24, 45

7. **Music** The data table lists prices of compact discs (CDs) in two different music categories at Annie’s Music Shop. Make a stem-and-leaf plot of the prices of classical music compact discs and country music compact discs. Which category of music CDs is priced lower at Annie’s Music Shop?

Type of Music CD	Prices
Classical	8, 7, 15, 13, 13, 12, 10, 14, 16, 11, 13, 15, 9
Country	12, 9, 14, 15, 16, 16, 17, 14, 15, 12, 11, 9, 9



8. **Standardized Test Practice** Look at the stem-and-leaf plot of prices of tickets to a play. In which interval do the greatest number of prices fall?

- A** 1–10 **B** 32–38 **C** 11–19 **D** 20–29

Stem	Leaf
1	1 3 5 7 9
2	0 5 7 9
3	2 4 6 $3 2 = 32$

Answers 1–7. See Answer Key. 8. C

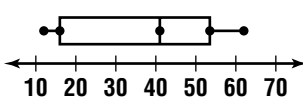
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Box-and-Whisker Plots (pages 80–83)

You can use a **box-and-whisker plot** to summarize data. A box-and-whisker plot divides a data set into four parts.

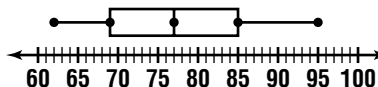
EXAMPLE

Create a box-and-whisker plot for these data:
12, 16, 62, 48, 16, 59, 43, 39.

Step 1	<ul style="list-style-type: none"> Write the data in order from least to greatest. Find the median of the data, which is 41. Find the lower quartile, which is the median of the lower half of the data, or 16. Find the upper quartile, which is the median of the upper half of the data, or 53.5. The lower extreme is the least value. The upper extreme is the greatest value. The lower extreme is 12 and the upper extreme is 62.
Step 2	<ul style="list-style-type: none"> Draw a number line. Graph the values you found in step 1. Draw a box around the lower and upper quartiles and draw a vertical line through the median value. Extend whiskers from each quartile to the extreme points. 
Step 3	<ul style="list-style-type: none"> Calculate the interquartile range by subtracting the lower quartile from the upper quartile. The interquartile range for these data is 37.5. Data that are more than 1.5 times the interquartile range from the quartiles are outliers. The limits on outliers are the points beyond which data are considered to be outliers. There are no outliers for these data.

PRACTICE

Use the box-and-whisker plot of test scores.

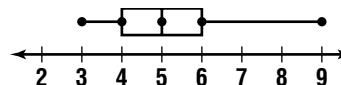


- What is the median?
- What is the lower quartile?
- What is the upper quartile?
- What is the lower extreme?
- What is the upper extreme?
- What is the interquartile range?
- What are the limits on outliers?
- Are there any outliers?
- Sports** The table shows the games won by each girls' sports team at Dennison High School. Make a box-and-whisker plot of the data.

Sport	Wins	Sport	Wins	Sport	Wins
Soccer	5	Volleyball	6	Hockey	4
Basketball	7	Softball	7	Kickball	8

10. **Standardized Test Practice** What is the upper extreme of this box-and-whisker plot?

- A** 5 **B** 4 **C** 3 **D** 9



Answers: 1. 77 2. 69 3. 85 4. 62 5. 95 6. 16 7. 45 and 109 8. No 9. See Answer Key 10. D

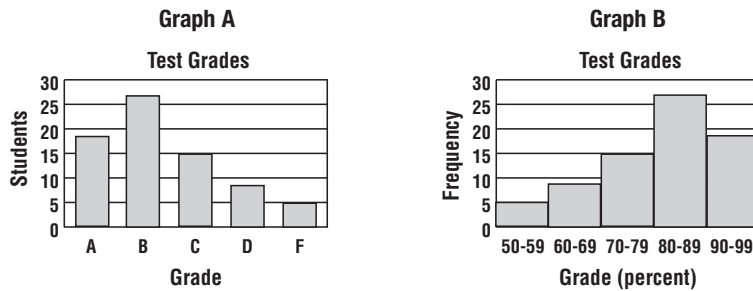
2-7

Bar Graphs and Histograms (pages 85–89)

A **bar graph** is one method of comparing data by using solid bars to represent quantities. A special kind of bar graph, called a **histogram**, uses bars to represent the frequency of numerical data that have been organized in intervals. Use a bar graph to show *the value* of different items or categories. use a histogram to show *how many items* are contained in each interval.

EXAMPLE

Determine which graph is a histogram and which is a bar graph.



Graph A is a bar graph because it shows the values of five different categories, which are letter grades. Graph B is a histogram because it shows the number of students receiving the scores described by each interval.

Try This Together

- Members of the student council cannot agree on which day of the week to have their meeting. Refer to the set of data that shows how many students voted for each day. Determine whether a bar graph or a histogram should be used to show the data then draw the graph.

HINT: Does the data require intervals?

Day	Number of Votes
Monday	4
Tuesday	3
Wednesday	5
Thursday	6
Friday	2

PRACTICE

- Make a histogram of the data below.

Points Scored by the Football Team			
17	21	42	24
31	28	14	35
28	7	27	13

- Make a bar graph of the data below.

Bake Sale Item	Number Sold
cookie	45
brownie	37
cupcake	35
pie	20
cheesecake	30

Standardized Test Practice

- Which is *not* a true statement?
 - A histogram shows data organized by intervals.
 - Bars on a histogram may be different widths.
 - A bar graph shows the value of different categories.
 - The number of wrestlers in each weight group could be displayed on a histogram.

Answers: 1. bar graph; See answer key. 2-3. See answer key. 4. B

2-8

Misleading Statistics (pages 92–95)

Statistics and graphs can be presented in ways that are misleading. For example, the mean is not a good way to describe a data set when there are outliers. Changing the scale of a graph may also make the graph misleading.

EXAMPLE

Darnell was notified that the raffle ticket he bought at the county fair was a winner. He was told that the average prize amount was almost \$4,000. Use the information at the right to explain why Darnell should not expect to win more than \$100.

Raffle Prizes	
Prize	Amount
Grand Prize	\$100,000
First Prize (2 winners)	\$50,000
Second Prize (50 winners)	\$100

There are only three prizes over \$100, and 50 prizes of \$100. Because of the large number of \$100 prizes, Darnell is most likely to win only \$100.

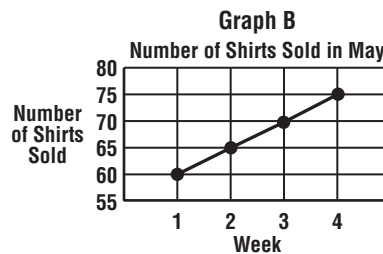
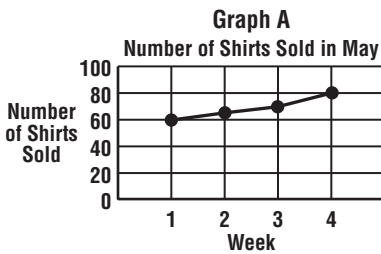
The average winner wins almost \$4,000!

Try This Together

- Abigail’s starting salary was \$47,000, three years ago. She has received a \$2,000 raise each year. Create a graph that makes her salary increases look more substantial than they actually are.

PRACTICE

- The two line graphs show sales of T-shirts at The Tee Shop for May. Which graph could be misleading? Explain.



- Standardized Test Practice** The Italian Restaurant advertises huge meals. The sizes of many of their meals are shown in the table at the right. What misleading statistic might they be using to describe the serving sizes of their meals?

- A** mean **B** median
C mode **D** distorted facts

Meal	Serving Size (oz)
Spaghetti	10
Tortellini	12
Manicotti	14
Ravioli	11
Lasagna	15
Fettucine	32

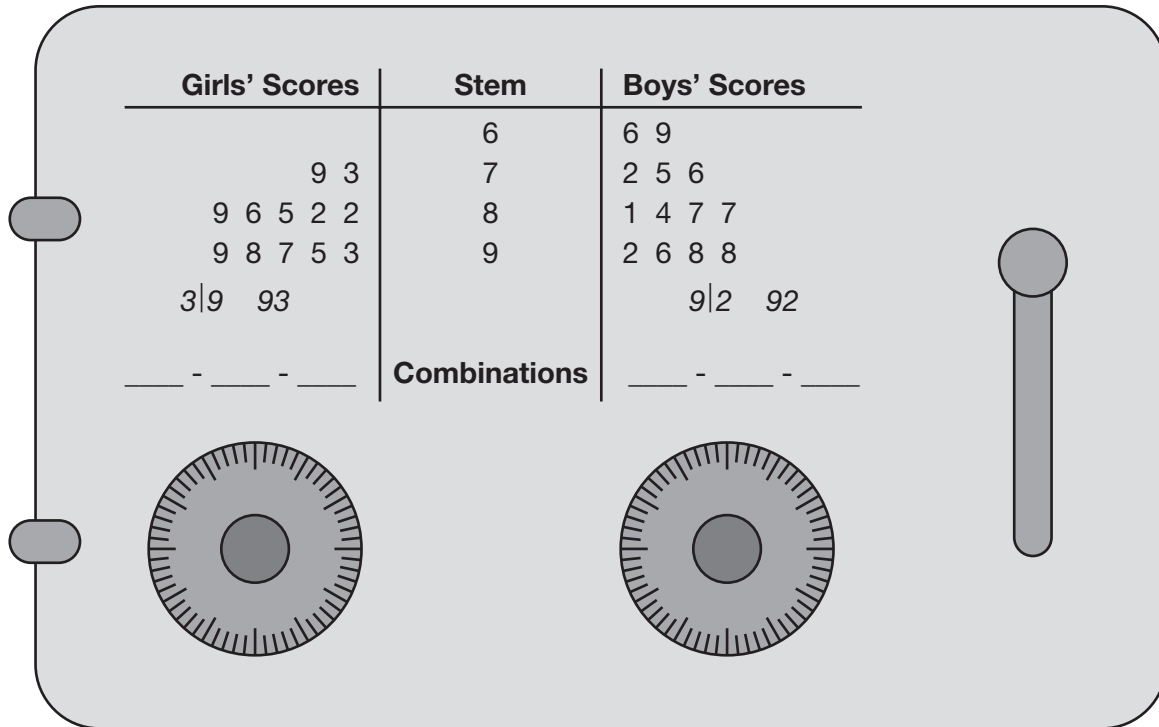
Answers: 1. See Answer Key. 2. Graph B; the vertical scale starts from 55 instead of zero. It makes it look like sales increased more than they actually did. 3. A

2

Chapter 2 Review

Safe Combinations

To find out what is in a secret safe, you must find the combination to the two locks on the safe. Use the stem-and-leaf plot of midterm-exam scores to answer the questions below to find the combinations for the girls' lock and the boys' lock.



1. How many girls are there in the class?
2. What was the lowest girls' score?
3. What was the highest girls' score?

Use the answers for Exercises 1–3 to fill in the combination for the girls' lock above.

4. How many boys are there in the class?
5. What was the highest boys' score?
6. What was the lowest boys' score?

Use the answers for Exercises 4–6 to fill in the combination for the boys' lock above.

Answers are located on page 106.