Interactive Classroom

Glencoe McGraw-Hill

Pre-Algebra

Chapter 12

More Statistics and Probability

Click the mouse button or press the space bar to continue.

Copyright © by The McGraw-Hill Companies, Inc.

Chapter Menu

Lesson 12-1 Stem-and-Leaf Plots
Lesson 12-2 Measures of Variation
Lesson 12-3 Box-and-Whisker Plots
Lesson 12-4 Histograms
Lesson 12-5 Selecting an Appropriate Display
Lesson 12-6 Misleading Graphs
Lesson 12-7 Simple Probability
Lesson 12-8 Counting Outcomes
Lesson 12-9 Permutations and Combinations
Lesson 12-10 Probability of Composite Events

Lesson Menu

Five-Minute Check (over Chapter 11)

Main Ideas and Vocabulary

Example 1: Draw a Stem-and-Leaf Plot

Example 2: Interpret Data

Example 3: Real-World Example

Main Ideas

- Display data in stem-and-leaf plots.
- Interpret data in stem-and-leaf plots.

New Vocabulary

- stem-and-leaf plot
- stems
- leaves
- back-to-back stem-and-leaf plot

Real-World EXAMPLE Draw a Stem-and-Leaf Plot

1 **FOOD** Display the data in a stem-and-leaf plot.

Peanuts Harvested, 2001	
State	Amount (lb)
Alabama	2400
Florida	2800
Georgia	2800
New Mexico	2400
North Carolina	2900
Oklahoma	2200
South Carolina	2900
Texas	2600
Virginia	3000

Real-World EXAMPLE Draw a Stem-and-Leaf Plot

Step 1 Find the least and the greatest number. Then identify the greatest place value digit in each number. In this case, thousands.

2200

The least number has 2 in the thousands place

3000

The greatest number has 3 in the thousands place

Real-World EXAMPLE Draw a Stem-and-Leaf Plot

Step 2 Draw a vertical line and write the stems 2 and 3 to the left of the line.

Step 3 Write the leaves to the right of the line, with the corresponding stem. For example, for 2400, write 4 to the right of 2.

Stem	Leaf
2	4 8 8 4 9 2 9 6
3	0

Real-World EXAMPLE Draw a Stem-and-Leaf Plot

Step 4 Rearrange the leaves so they are ordered from least to greatest. Then include a key or an explanation.

Stem	Leaf
2	2 4 4 6 8 8 9 9
3	0

2|4 = 2400 lb

The key tells what the stems and leaves represent.

Real-World EXAMPLE Draw a Stem-and-Leaf Plot

1 **Answer:**

Stem	Leaf
2	2 4 4 6 8 8 9 9
3	0

2|4 = 2400 lb

CHECK Your Progress

1 **SPEED** Display the following speeds given in miles per hour in a stem-and-leaf plot.

65 72 59 68 75 70 68 64 67 69 72 55

CHECK Your Progress

1 **A.**

Stem	Leaf
6	5 8 8 4 7 9
7	2 5 0 2
5	9 5

6|4 = 64 mph

B.

Stem	Leaf
5	5 9
6	4 5 7 8 8 9
7	0 2 2 5

6|4 = 64 mph

C.

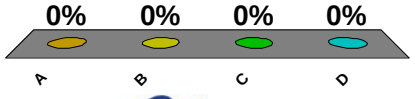
Stem	Leaf
5	5 9
6	4 5 7 8 9
7	0 2 5

6|4 = 64 mph

D.

Stem	Leaf
6	4 5 7 8 9
7	0 5 0 2
5	9 5

6|4 = 64 mph



CheckPoint

Real-World EXAMPLE Interpret Data

2 **MEXICO** The stem-and-leaf plot lists the percent of people in each state in 2004 that were born in Mexico, rounded to the nearest whole number.

A. What interval contains the most percentages?

Answer: Most of the data occurs in the 0-9 interval.

Stem	Leaf
0	0 0 0 1 1 2 2 3 4 4 5 5 5
0	6 6 8 8 8
1	0 1 4 4 7
2	1 2 3 8 9
3	1 2 3 5 5 9 9
4	0 1 2 3 3 3 4 6 8
5	2 6 6
6	4 6
7	4

3|1 = 31%

Real-World EXAMPLE Interpret Data

2 **MEXICO** The stem-and-leaf plot lists the percent of people in each state in 2004 that were born in Mexico, rounded to the nearest whole number.

B. What is the greatest percent of people living in one U.S. state that were born in Mexico?

Answer: 74%

Stem	Leaf
0	0 0 0 1 1 2 2 3 4 4 5 5 5
0	6 6 8 8 8
1	0 1 4 4 7
2	1 2 3 8
3	1 2 3 5 5 9 9
4	0 1 2 3 3 3 4 6 8
5	2 6 6
6	4 6
7	4

3|1 = 31%

Real-World EXAMPLE Interpret Data

2 **MEXICO** The stem-and-leaf plot lists the percent of people in each state in 2004 that were born in Mexico, rounded to the nearest whole number.

C. What is the median percent of people living in one U.S. state that were born in Mexico?

Answer: 22.5%

Stem	Leaf
0	0 0 0 1 1 2 2 3 4 4 5 5 5
0	6 6 8 8 8
1	0 1 4 4 7
2	1 2 3 8
3	1 2 3 5 5 9 9
4	0 1 2 3 3 3 4 6 8
5	2 6 6
6	4 6
7	4

3|1 = 31%

CHECK Your Progress

Stem	Leaf
0	0 5
1	0 2 2 5 8 8 8
2	0 0 0 4 4 5 5 5 5
3	0 0 2 2 2 4 4 5 5 6 6
4	0 2 4 4 5 5 5 5 8 8 9 9
5	0 0

3|1 = 31%

2 **ALLOWANCE** The stem-and-leaf plot lists the amount of allowance students are given each month.

A. In which interval do most of the monthly allowances occur?

A. 0-9 interval

B. 20-29 interval

C. 40-49 interval

D. 50-59 interval

0%

A B C D

CheckPoint

CHECK Your Progress

2 **ALLOWANCE** The stem-and-leaf plot lists the amount of allowance students are given each month.

B. What is the difference between the least and greatest monthly allowance given?

Stem	Leaf
0	0 5
1	0 2 2 5 8 8 8
2	0 0 0 4 4 5 5 5 5
3	0 0 2 2 2 4 4 5 5 6 6
4	0 2 4 4 5 5 5 5 8 8 9 9
5	0 0

3|1 = 31%

0%

A. $0

B. $5

C. $50

D. $495

A B C D

CheckPoint

CHECK Your Progress

Stem	Leaf
0	0 5
1	0 2 2 5 8 8 8
2	0 0 0 4 4 5 5 5 5
3	0 0 2 2 2 4 4 5 5 6 6
4	0 2 4 4 5 5 5 5 8 8 9 9
5	0 0

3|1 = 31%

2 **ALLOWANCE** The stem-and-leaf plot lists the amount of allowance students are given each month.

C. What is the median monthly allowance given?

A. $25 and $45

B. $30

C. $30.8

D. $32

0%

A B C D

CheckPoint

Real-World EXAMPLE

3 **AGRICULTURE** **The yearly production of honey in California and Florida is shown for the years 2000 to 2004, in millions of pounds.** **(Source: USDA)**

A. Which state produces the most honey?

California		Florida
7	1	4
8 4	2	0 0 2 4
2 1	3	

2|3 = 32 million lb *2|0 = 20 million lb*

Answer: California

Real-World EXAMPLE

3 **AGRICULTURE** **The yearly production of honey in California and Florida is shown for the years 2000 to 2004, in millions of pounds.** **(Source: USDA)**

B. Which state has the most varied production? Explain.

California		Florida
7	1	4
8 4	2	0 0 2 4
2 1	3	

2|3 = 32 million lb *2|0 = 20 million lb*

Answer: California; the data are more spread out.

CHECK Your Progress

3 **EXAM SCORES** The exam score earned on the first test in a particular class is shown for male and female students.

A. Which group of students had the higher test scores?

Male		Female
8 2	6	
9 6 4	7	4 8 8 9
7 4 2 2 0	8	1 3 4 8 9
6 5 3	9	2 5 9
2|8 = 82		*7|4 = 74*

0%

A. males

B. females

C. Both groups had an equally high score.

D. cannot be determined

A B C D

CheckPoint

CHECK Your Progress

3 **EXAM SCORES** The exam score earned on the first test in a particular class is shown for male and female students.

B. Which group of students had more varied test scores?

Male		Female
8 2	6	
9 6 4	7	4 8 8 9
7 4 2 2 0	8	1 3 4 8 9
6 5 3	9	2 5 9

2|8 = 82 *7|4 = 74*

0%

A B C D

A. males **B.** females

C. Both groups had equally varied scores.

D. cannot be determined

CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-1)

Main Ideas and Vocabulary

Example 1: Range

Key Concept: Interquartile Range

Example 2: Interquartile Range and Outliers

Example 3: Real-World Example

Main Ideas

- Find measures of variation.
- Use measures of variation to interpret and compare data.

New Vocabulary

- measures of variation
- range
- quartiles
- lower quartile
- upper quartile
- interquartile range
- outlier

EXAMPLE Range

1 A. Find the range of the set of data.

{$79, $42, $38, $51, $63, $91}

The greatest value is $91, and the least value is $38.

Answer: The range is $91 – $38 or $53.

EXAMPLE 1 Range

B. Find the range of the set of data.

Stem	Leaf
3	3 3 5 7 7 8
4	0 3 3 4 9
5	4 9

3|*5* = *35*

The greatest value is 59, and the least value is 33.

Answer: The range is 59 – 33 or 26.

CHECK Your Progress

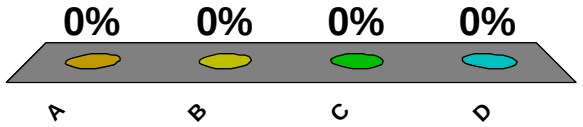
1 **A. Find the range of the set of data.**
{14, 37, 82, 45, 24, 10, 75}

A. 61

B. 65

C. 68

D. 72



CheckPoint

CHECK Your Progress

1 **B. Find the range of the set of data.**

Stem	Leaf
5	2 3 5 5 9
6	4 8 9
7	0 1 8 9

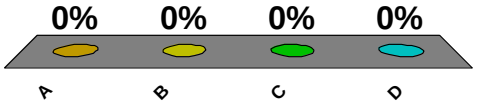
6|8 = 68

A. 27

B. 20

C. 18

D. 12



CheckPoint

KEY CONCEPT — Interquartile Range

Words The interquartile range is the range of the middle half of a set of data. It is the difference between the upper quartile and the lower quartile.

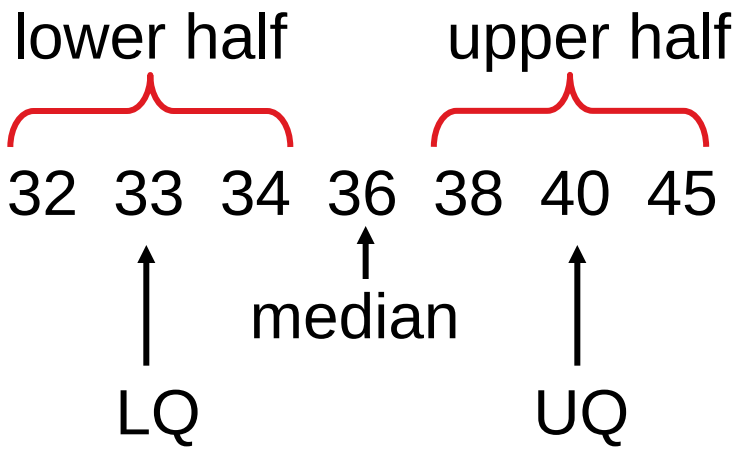
Symbols Interquartile range $= UQ - LQ$

EXAMPLE 2 Interquartile Range and Outliers

A. Find the interquartile range and any outliers for {38, 40, 32, 34, 36, 45, 33}

Step 1 List the data from least to greatest. Then find the median.

Step 2 Find the upper and lower quartiles.



EXAMPLE Interquartile Range and Outliers

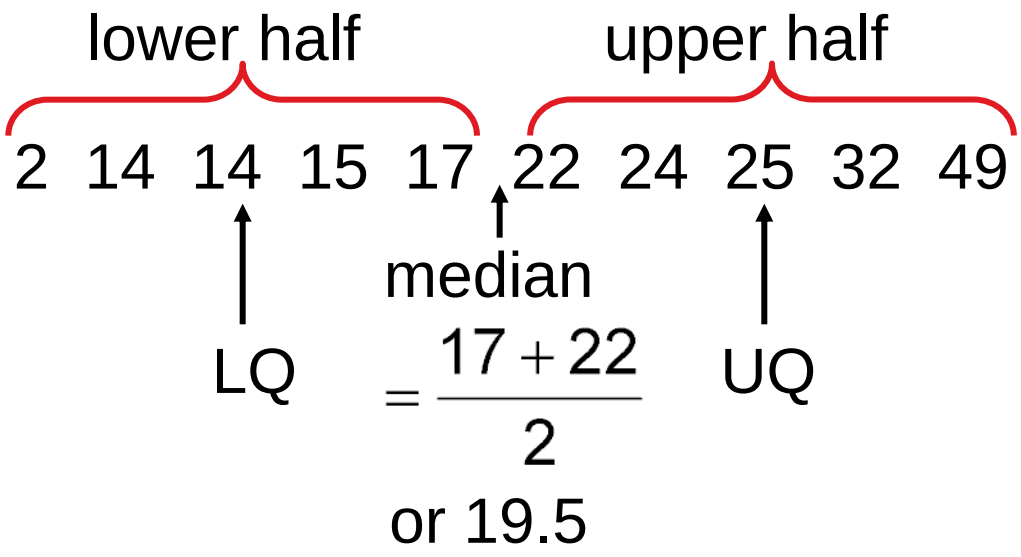
2 **Answer:** The interquartile range is 40 – 33 or 7.

EXAMPLE 2 Interquartile Range and Outliers

B. Find the interquartile range and any outliers for {2, 49, 17, 14, 14, 22, 15, 32, 24, 25}

Step 1 List the data from least to greatest. Then find the median.

Step 2 Find the upper and lower quartiles.



EXAMPLE 2 Interquartile Range and Outliers

Step 3 Find the limits for the outliers.

Multiply the interquartile range, 11, by 1.5

$11 \times 1.5 = 16.5$

Subtract 16.5 from the lower quartile $14 - 16.5 = -2.5$

Add 16.5 to the upper quartile $25 + 16.5 = 41.5$

The limits for the outliers are –2.5 and 41.5. There are no values less than –2.5. One value, 49, is greater than 41.5.

Answer: So, 49 is the one outlier.

CHECK Your Progress

2 Find the interquartile range and any outliers.
{12, 18, 25, 31, 23, 19, 16, 22, 28, 32}

A. interquartile range: 10, outliers: none

B. interquartile range: 15, outliers: 3.43

C. interquartile range: 20, outliers: none

D. interquartile range: 24, outliers: 12

0%

A B C D

CheckPoint

Real-World EXAMPLE

3 **LAND USE** **The urban land in certain western and eastern states is listed below as the percent of each state's total land, rounded to the nearest percent.**

A. What is the median percent of urban land use for each region?

Western States		Eastern States
1 1 1 1 1 0 0	0	
3 2 2 2 1 1 1	0	3 3 4 5 6 6 8
5 4 4	0	8 9 9 9 9 9 9
	1	1 3 3 4 4 5
	2	3 6 7
2|0 = 2%	3	5 *2|7 = 27%*

Answer: The median percent of urban land use for the western states is 1%. The median percent of urban land use for the eastern states is 9%.

Real-World EXAMPLE

3 **LAND USE** **The urban land in certain western and eastern states is listed below as the percent of each state's total land, rounded to the nearest percent.**

B. Compare the range for each set of data.

Western States		Eastern States
1 1 1 1 1 0 0	0	
3 2 2 2 1 1 1	0	3 3 4 5 6 6 8
5 4 4	0	8 9 9 9 9 9 9
	1	1 3 3 4 4 5
	2	3 6 7
2|0 = 2%	3	5 *2|7 = 27%*

Answer: The range for the west is 5% – 0% or 5%, and the range for the east is 35% – 3% or 32%. The percents of urban land use in the east vary more.

CHECK Your Progress

3 **A. EXERCISE** **The hours per week spent exercising for teenagers and people in their twenties are listed in the stem-and-leaf plot. What is the median time spent exercising for each group?**

Teens		Twenties
5 4 2 0	0	0 4 6 7 9
7 3	1	0 2 2 5
1	2	0 3 4 5 8

3|1 = 13 hr 1|5 = 15 hr

A. teenagers: 5 hr; twenties: 12 hr

0%

B. teenagers: 8.9 hr; twenties: 13.9 hr

C. teenagers: 15 hr; twenties: 16 hr

D. teenagers: 21 hr; twenties: 28 hr

A B C D

CheckPoint

CHECK Your Progress

3 **B. EXERCISE** The hours per week spent exercising for teenagers and people in their twenties are listed in the stem-and-leaf plot. Compare the range for each set of data.

Teens		Twenties
5 4 2 0	0	0 4 6 7 9
7 3	1	0 2 2 5
1	2	0 3 4 5 8

3|1 = 13 hr *1|5 = 15 hr*

A. teenagers: 12 hr; twenties: 28 hr
The hours of the twenties group vary more.

B. teenagers: 15 hr; twenties: 16 hr
The hours of the twenties group vary only slightly more.

C. teenagers: 22.5 hr; twenties: 24 hr
The hours of the twenties group vary only slightly more.

D. teenagers: 5 hr; twenties: 12 hr
The hours of the twenties group vary more.

0%

A B C D

CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-2)

Main Ideas and Vocabulary

Example 1: Draw a Box-and-Whisker Plot

Example 2: Interpret Data

Example 3: Real-World Example

Main Ideas

- Display data in a box-and-whisker plot.
- Interpret data in a box-and-whisker plot.

New Vocabulary

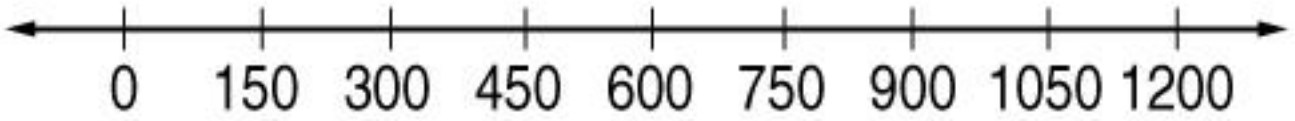
- box-and-whisker plot

Real-World EXAMPLE Draw a Box-and-Whisker Plot

1 **JOBS** The projected number of employees in 2008 in the fastest-growing occupations is shown. Display the data in a box-and-whisker plot.

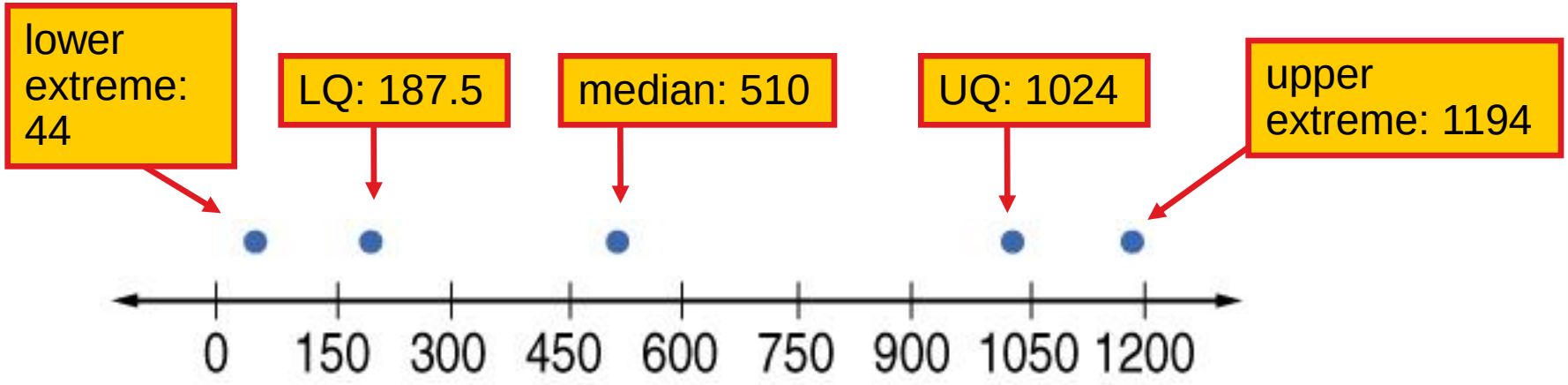
Fastest Growing Jobs	
Occupation	Jobs (1000s)
Computer Engineer	622
Computer Support	869
Systems Analyst	1194
Database Administator	155
Desktop Publishing	44
Paralegal/Legal Assistant	220
Home Health Aide	1179
Medical Assistant	398

Step 1 Find the least and greatest number. Then draw a number line that covers the range of the data.



Real-World EXAMPLE Draw a Box-and-Whisker Plot

Step 2 Find the median, the extremes, and the upper and lower quartiles. Mark these points above the number line.

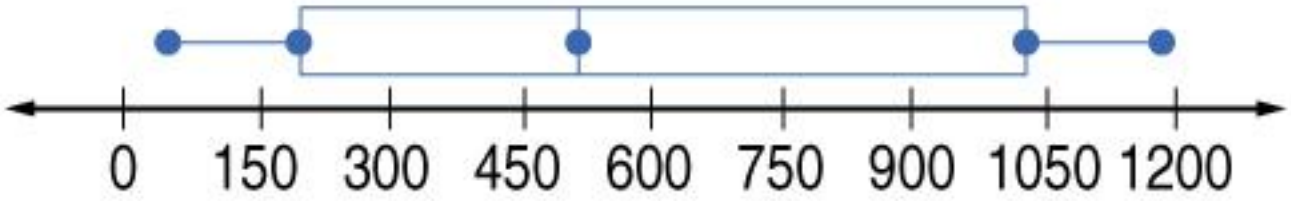


Real-World EXAMPLE Draw a Box-and-Whisker Plot

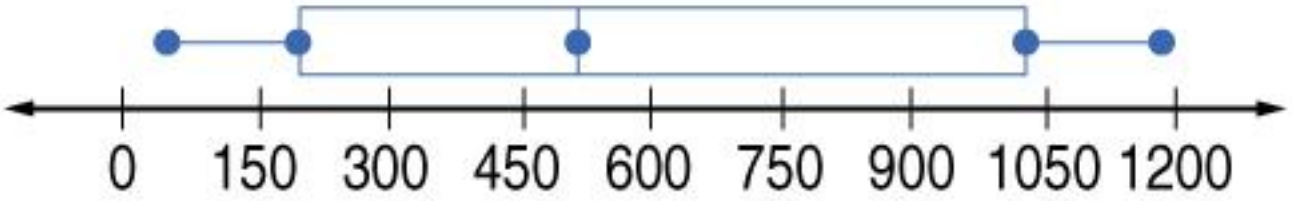
Step 3 Draw a box and the whiskers.

The box contains the UQ and the LQ

The whiskers extend from each quartile to the extreme data points.



Answer:

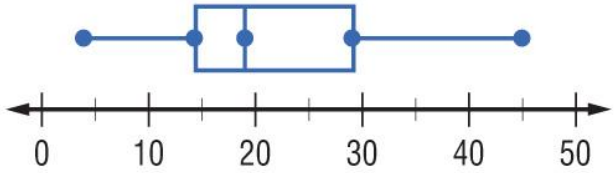


CHECK Your Progress

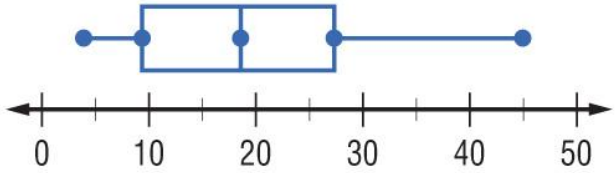
1 **TRANSPORTATION** The data listed below represents the time, in minutes, required for students to travel from home to school each day. Display the data in a box-and-whisker plot.

14 32 7 45 18 22 26 9 4 18 15

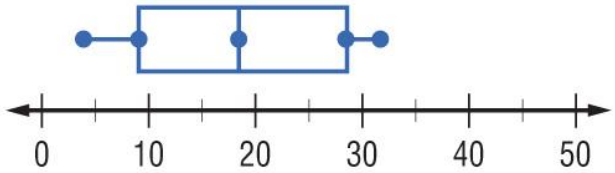
A.



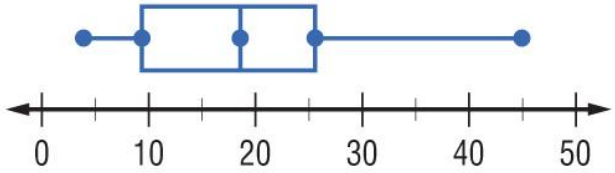
B.

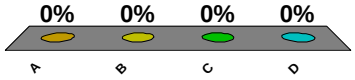


C.



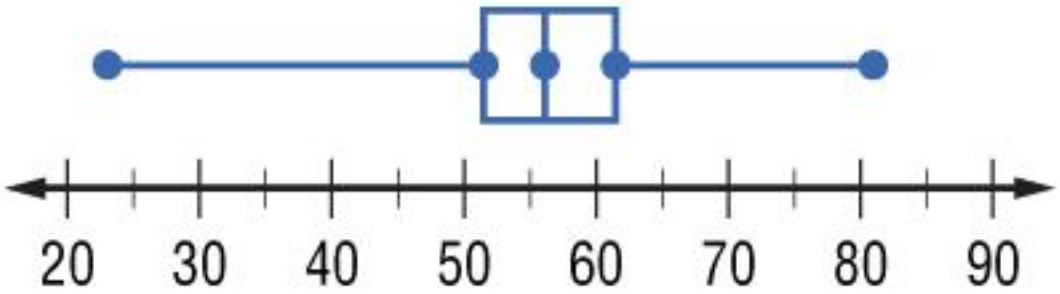
D.





Real-World EXAMPLE Interpret Data

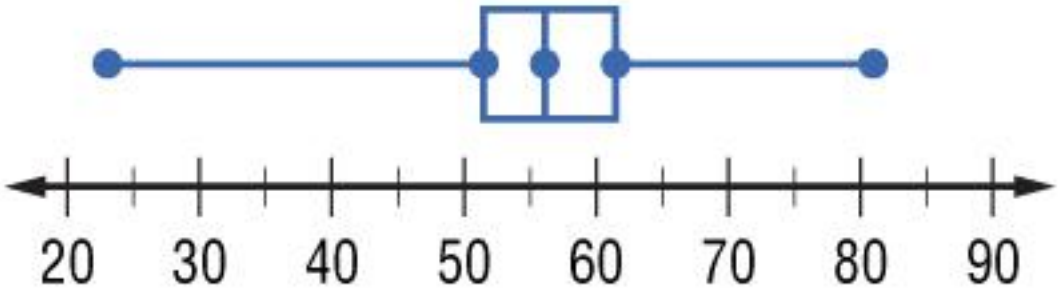
2 **A. WEATHER** **The box-and-whisker plot below shows the average percent of sunny days per year for selected cities in each state. Half of the selected cities have an average of sunny days under what percent?**



Answer: Half of the selected cities have an average percent of sunny days under 56%.

Real-World EXAMPLE Interpret Data

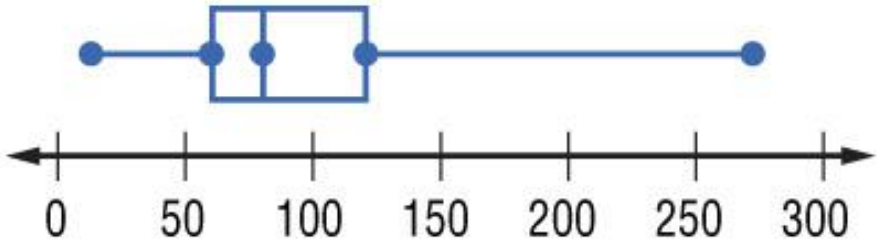
2 **B. WEATHER** **The box-and-whisker plot below shows the average percent of sunny days per year for selected cities in each state. What does the length of the box in the box-and-whisker plot tell about the data?**



Answer: The length of the box is short. This tells us that the data values are clustered together.

CHECK Your Progress

2 **A. RETAIL** The box-and-whisker plot below shows the average amount spent per month on clothing. Half of the monthly expenditures on clothing are under what amount?



0%

A. $275

B. $120

C. $80

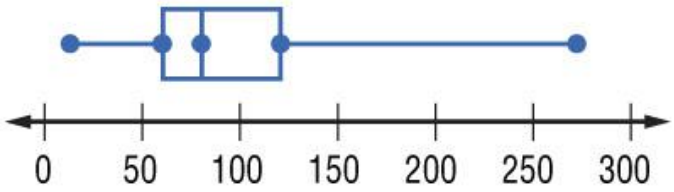
D. $55

A B C D

CheckPoint

CHECK Your Progress

2 **B. RETAIL** The box-and-whisker plot to the right shows the average amount spent per month on clothing. What does the length of the box in the box-and-whisker plot tell about the data?



A. The values of the data in the lower half are very spread out.

B. The values of the data in the upper half are very concentrated.

C. The values of the data in the middle 50% are very spread out.

D. The values of the data in the middle 50% are concentrated.

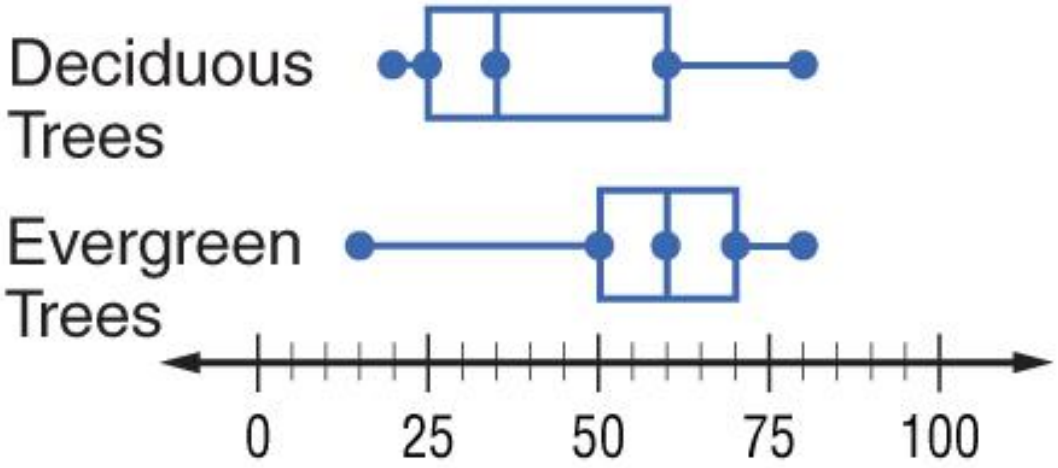
0%

A B C D

CheckPoint

Real-World EXAMPLE

3 **TREES** The average maximum height, in feet, for selected evergreen trees and deciduous trees is displayed. How do the heights of evergreen trees compare with the heights of deciduous trees?



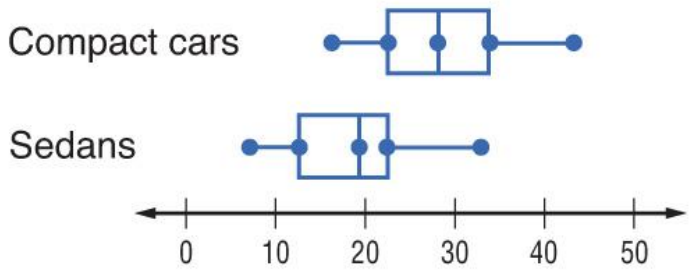
Real-World EXAMPLE

3 Most deciduous trees range in height between 25 and 60 feet. However, some are as tall as 80 feet. Most evergreen trees range in height between 50 and 70 feet. However, some are as tall as 80 feet.

Answer: Most evergreen trees are taller than most deciduous trees.

CHECK Your Progress

3 **CARS** The average gas mileage, in miles per gallon, for selected compact cars and sedans is displayed. How do the gas mileages of compact cars compare with the gas mileages for sedans?



A. The gas mileage of compact cars and sedans is about the same.

B. Most compact cars have a lower gas mileage than most sedans.

C. Most compact cars have a higher gas mileage than most sedans.

D. The median gas mileage for compact cars is lower than the median gas mileage for sedans.

0%

A B C D

CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-3)

Main Ideas and Vocabulary

Example 1: Draw a Histogram

Example 2: Interpret Data

Example 3: Real-World Example

Main Ideas

- Display data in a histogram.
- Interpret data in a histogram.

New Vocabulary

- histogram

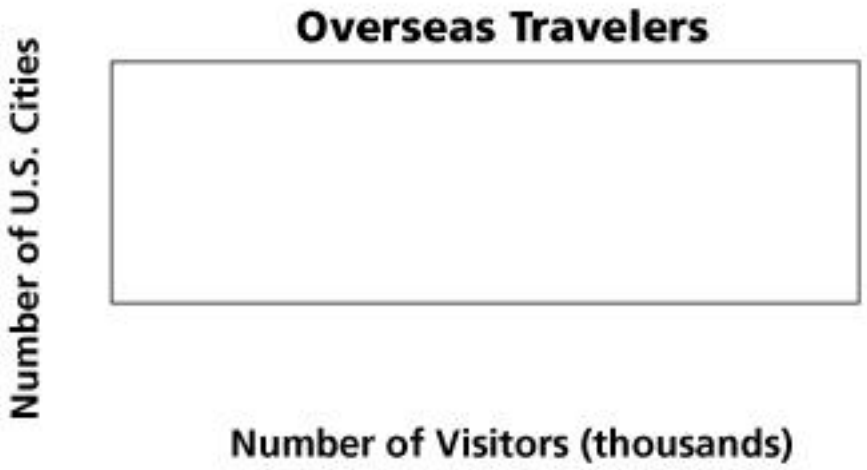
Real-World EXAMPLE Draw a Histogram

1 **TOURISM** The frequency table shows the number of overseas visitors to the top 15 U.S. cities in 2004. Display the data in a histogram.

Overseas Travelers		
Number of Visitors (1000s)	Tally	Frequency
0–1000	𝍸 ||||	9
1001–2000	||	2
2001–3000	|	1
3001–4000		
4001–5000	||	2
5001–6000	|	1

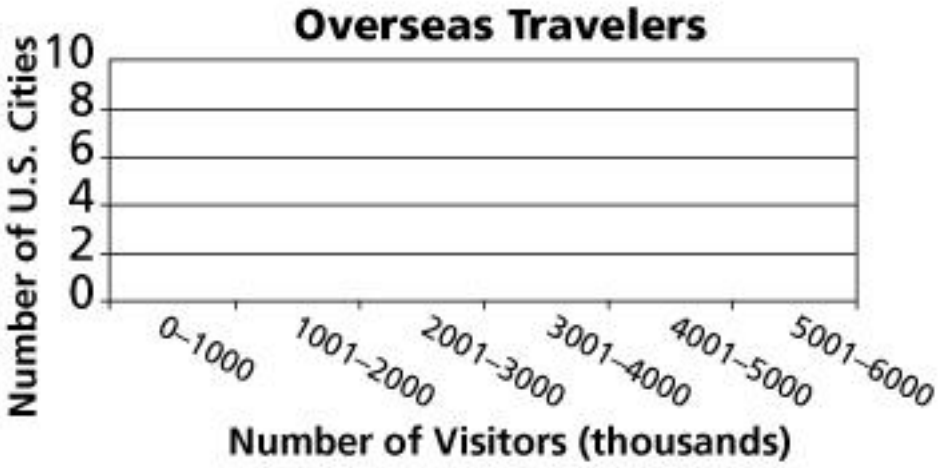
Real-World EXAMPLE Draw a Histogram

Step 1 Draw and label a horizontal and vertical axis. Include a title.



Real-World EXAMPLE Draw a Histogram

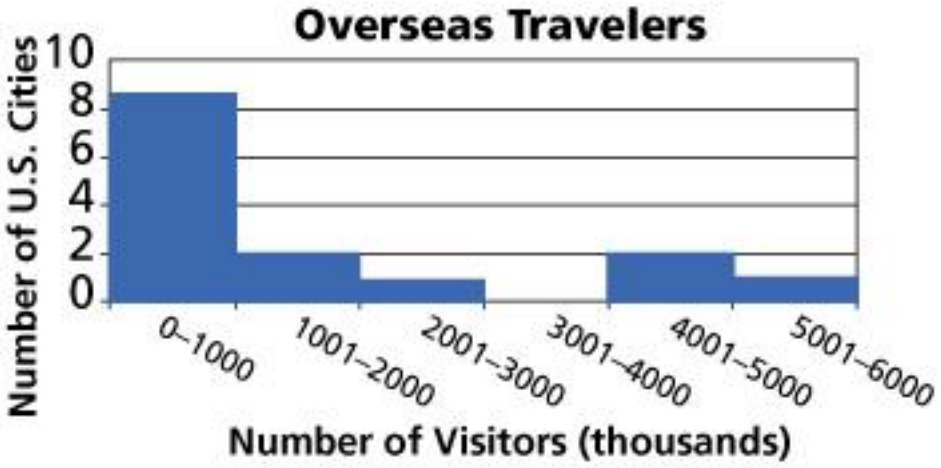
Step 2 Show the intervals from the frequency table on the horizontal axis and an interval of 2 on the vertical axis.



Real-World EXAMPLE Draw a Histogram

Step 3 For each interval, draw a bar whose height is given by the frequency.

Answer:



CHECK Your Progress

1 **CUSTOMERS** The frequency table shows the number of daily customers a new grocery store has during its first 30 days in business. Display the data in a histogram.

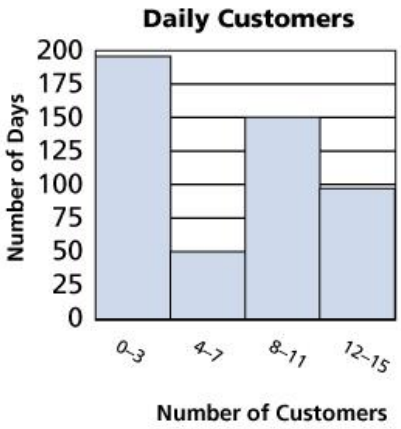
Daily Customers		
Number of Customers	Tally	Frequency
0–49	𝍸 I	6
50–99	𝍸 𝍸 II	12
100–149	𝍸 IIII	9
150–199	III	3

CHECK Your Progress

1

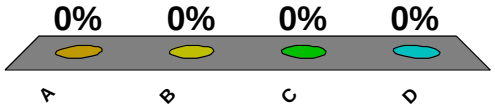
A.

B.



C.

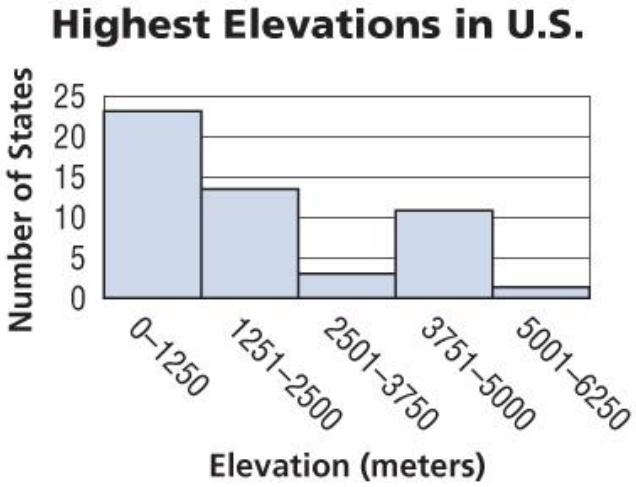
D.



CheckPoint

Real-World EXAMPLE Interpret Data

2 **A. ELEVATIONS** Use the histogram. How many states have highest points with elevations at least 3751 meters?

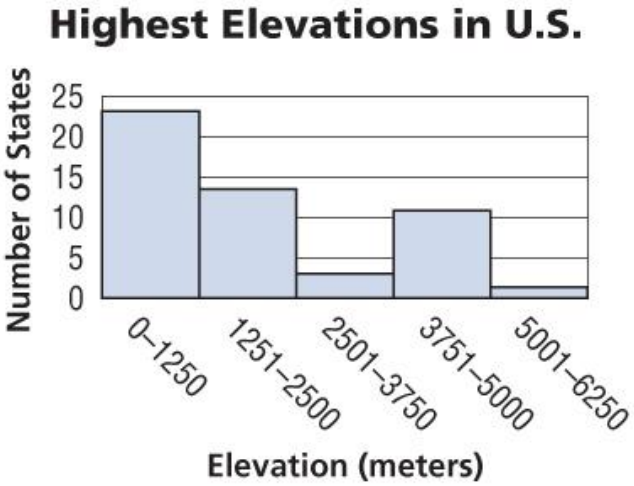


Since 11 states have elevations in the 3751-5000 range and 1 state has elevations in the 5001-6250 range, 11 + 1 or 12 states have highest points with elevations at least 3751 meters.

Answer: 12

Real-World EXAMPLE Interpret Data

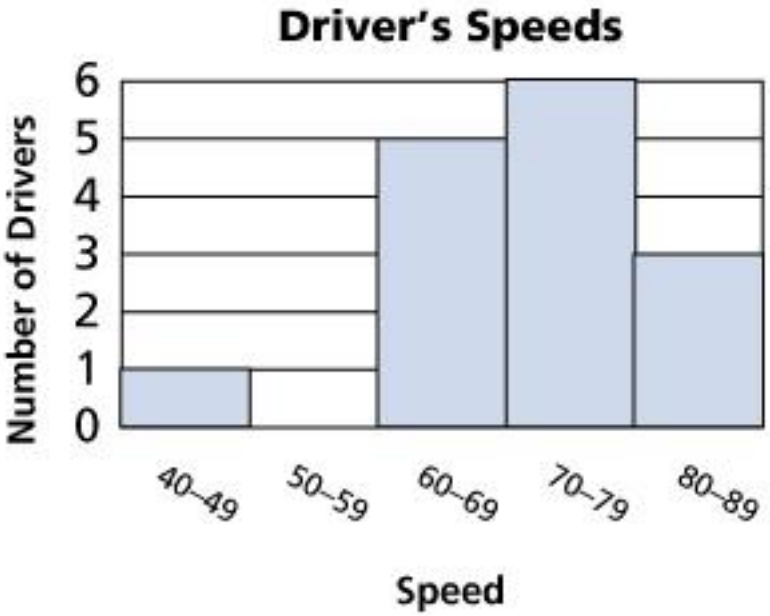
2 **B. ELEVATIONS** Use the histogram. Is it possible to tell the height of the tallest point?



Answer: No, you can only tell that the highest point is between 5001 and 6250 meters.

CHECK Your Progress

2 **A. SPEED** Use the histogram. How many drivers had a speed of at least 70 miles per hour?



A. 3

B. 5

C. 6

D. 9

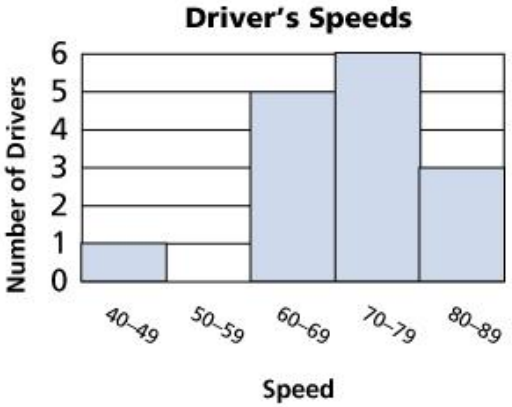
0%

A B C D

CheckPoint

CHECK Your Progress

2 **B. SPEED** Use the histogram. Is it possible to tell the lowest speed driven?



A. Yes, the lowest speed was 40 miles per hour.

B. Yes, the lowest speed was 45 miles per hour.

C. Yes, the lowest speed was 49 miles per hour.

D. No, you can only determine that the lowest speed was between 40 and 49 miles per hour.

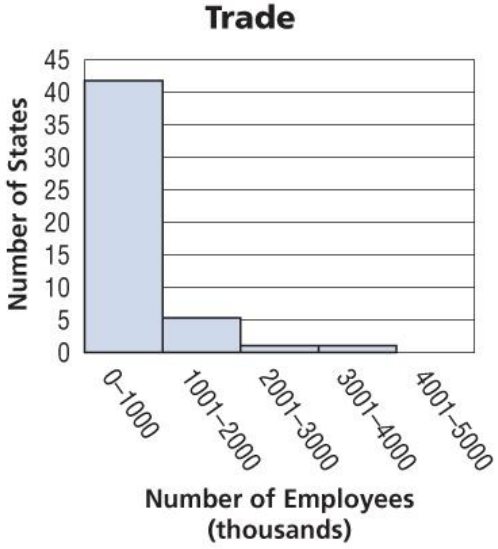
0%

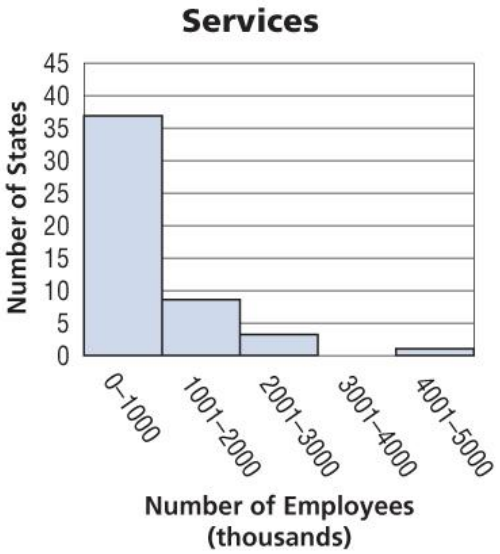
A B C D

CheckPoint

Real-World EXAMPLE

3 **EMPLOYMENT** Use the histograms. Which business sector has more states with between 1,001,000 and 3,000,000 employees?

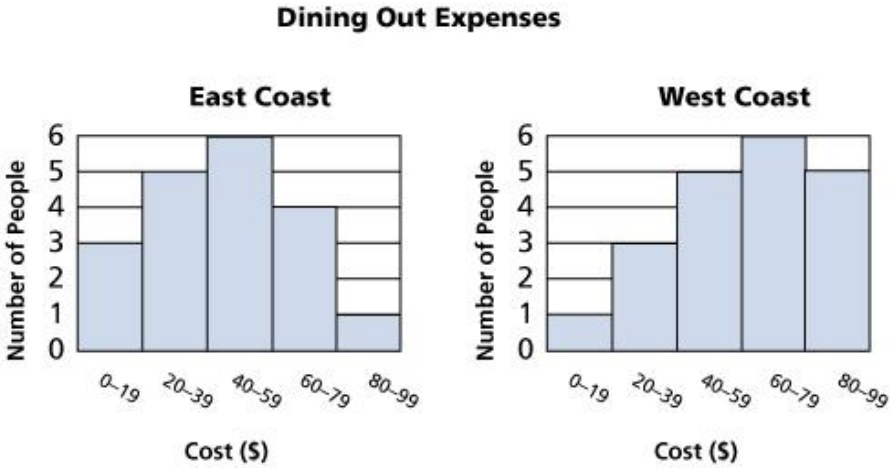




Answer: Services

CHECK Your Progress

3 **EATING OUT** Use the histograms. Which coast has more people spending at least $60 weekly?



0%

A. East Coast

B. West Coast

A B C D

C. Both have an equal number of people spending at least $60 weekly.

D. cannot be determined

CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-4)

Main Idea

Concept Summary: Statistical Graphs

Example 1: Select an Appropriate Display

Example 2: Standardized Test Example

Main Idea

- Select an appropriate display for a set of data.

CONCEPT SUMMARY — Statistical Graphs

Display	Best Time to Use
Bar Graph	to display the frequency of data in categories
Box-and-Whisker Plot	to divide a set of data into four parts using the median and quartiles
Circle Graph	to compare parts of the data to the whole
Frequency Table	to compare the number of values in intervals
Histogram	to display numerical data that has been organized into equal intervals
Line Graph	to show change over a period of time
Line Plot	to display how many times each number occurs in data
Stem-and-Leaf Plot	to list all the data in a condensed form
Table	to list data individually or by groups
Venn Diagram	to display relationships among sets of data

Concepts in Motion

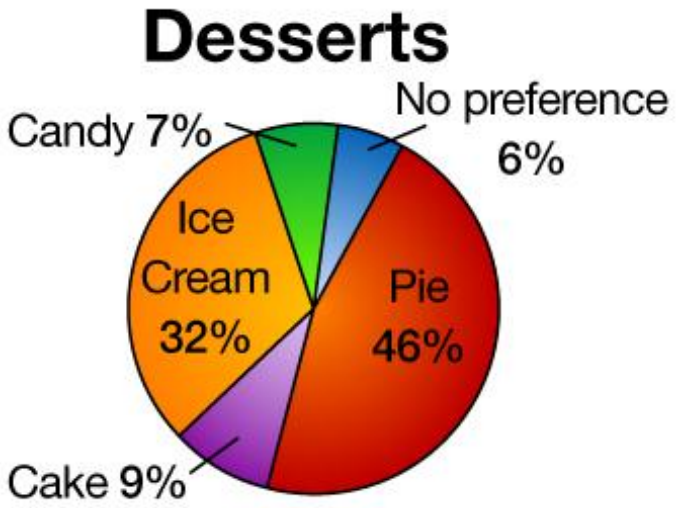
Interactive Lab:
Bar Graphs and Line Graphs

Click here to view!

Real-World EXAMPLE Select an Appropriate Display

1 **A. DESSERT** **Danielle took a survey of her classmates' preferences for desserts. Danielle's survey revealed that 46% of her classmates like pies, 32% like ice cream, 9% like cake, 7% like candy, and 6% don't have a preference. Select an appropriate type of display for this situation. Then make the display with or without the use of technology.**

Answer: A circle graph would compare the parts of the data to the whole.



Real-World EXAMPLE Select an Appropriate Display

1 **B. LACROSSE** **Juan compares the heights of the players on the two lacrosse teams. Juan's team has the following players with heights, in inches: 61, 60, 58, 59, 57, 67, 58, 60, 60, 65, 61, and 61. The rival team has the following players, with heights, in inches: 62, 70, 65, 60, 60, 58, 66, 63, 61, 57, 67, and 64. Select an appropriate type of display for this situation. Then make the display with or without the use of technology.**

A back-to-back stem-and-leaf plot would condense and compare the data.

Answer:

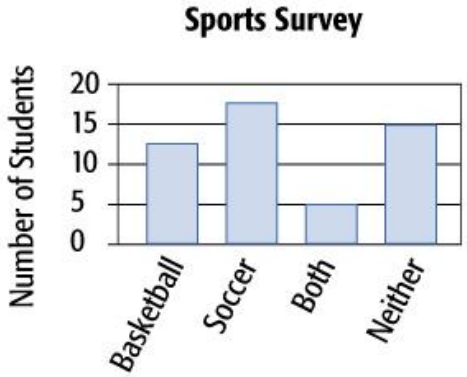
Juan's Team		Rival
9 8 8 7	5	7 8
7 5 1 1 1 0 0 0	6	0 0 1 2 3 4 5 6 7
	7	0

5|7 = 57 inches

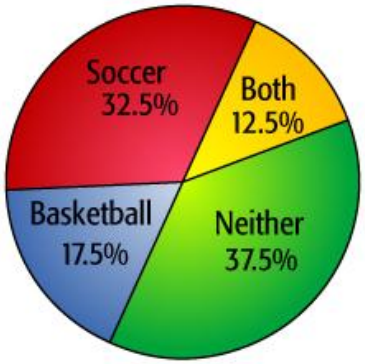
CHECK Your Progress

1 **A. SPORTS** Out of 40 athletes surveyed, 12 play basketball and 18 play soccer. Of those athletes who play either sport, 5 play both sports. Select an appropriate type of display for this situation. Then make the display with or without the use of technology.

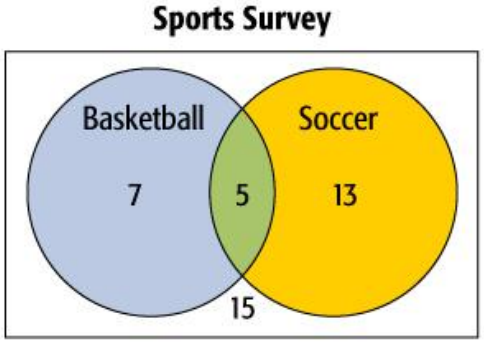
A.



B.

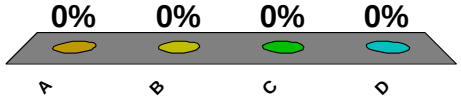


C.



D.

Sports Survey	
Sport	Number of Participants
Basketball	12
Soccer	18
Both	5
Neither	15



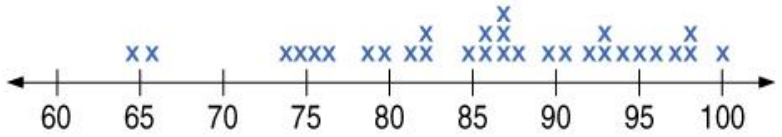
CheckPoint

CHECK Your Progress

1 **B. TEST SCORES** Ms. Slater compares the scores of the students in her two math classes. The morning math class earned the following scores on the last test: 98, 82, 76, 94, 65, 82, 78, 98, 86, 93, 74, 96, 73, 87, and 81. The afternoon math class earned the following scores: 86, 93, 75, 89, 100, 84, 86, 97, 64, 95, 92, 85, 79, 90, and 85. Select an appropriate type of display for this situation. Then make the display with or without the using technology.

CHECK Your Progress

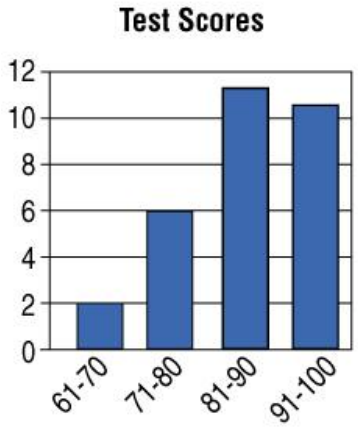
1 **A.**



B.

Grade	Number of Students
91 - 100	𝍸 𝍸
81 - 90	𝍸 𝍸 I
71 -80	𝍸 I
61-70	II

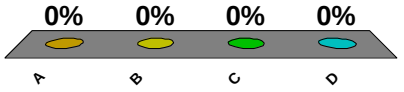
C.



D.

Morning class		Afternoon class
	10	0
8 8 6 4 3	9	0 2 3 5 7
7 6 2 2 1	8	4 5 5 6 6 9
8 6 4 3	7	5 9
5	6	4

5|6 = 56



CheckPoint

Standardized Test EXAMPLE

2 **Which graph would best represent the data if you want to show relationships among sets of data?**

A line graph

B Venn diagram

C bar graph

D circle graph

Answer: B

CHECK Your Progress

2 **Which graph would best represent the data if you want to show how many times each number occurs in the data?**

A. box-and-whisker plot

B. line plot

C. line graph

D. bar graph

0%

A B C D

CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-5)

Main Ideas

Example 1: Real-World Example

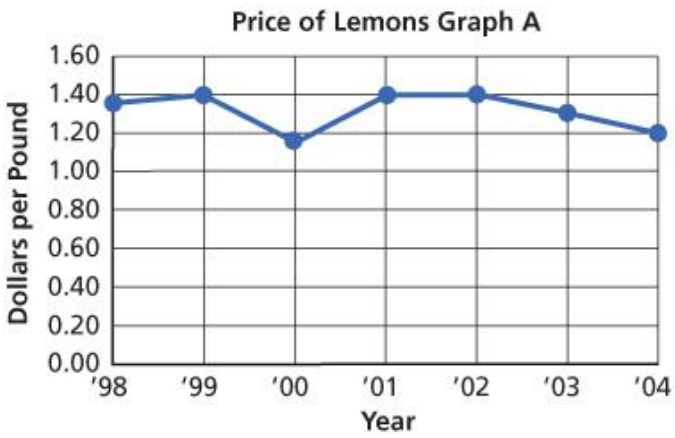
Example 2: Accuracy of Predictions and Conclusions

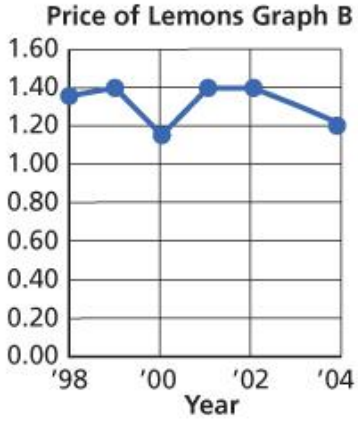
Main Ideas

- Recognize when graphs are misleading.
- Evaluate predictions and conclusions based on data analysis.

Real-World EXAMPLE

1 **A. FOOD** **The graphs show the decrease in the price of lemons. Why do the graphs look different?**

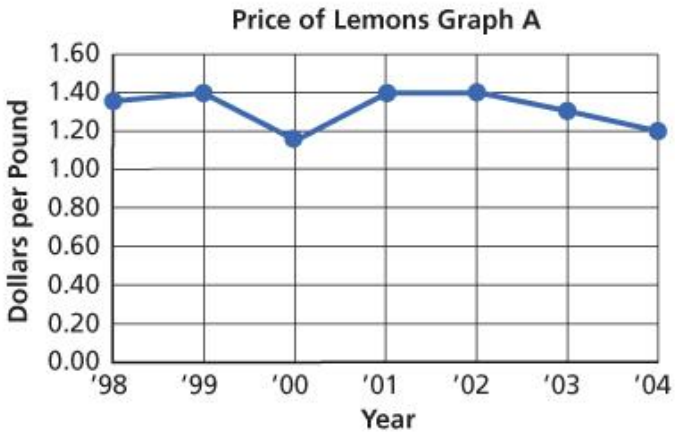


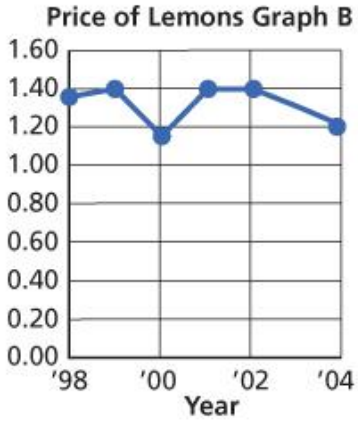


Answer: The horizontal scales differ.

Real-World EXAMPLE

1 **B. FOOD** The graphs show the decrease in the price of lemons. Which graph appears to show a more rapid decrease in the price of lemons after 2002? Explain.

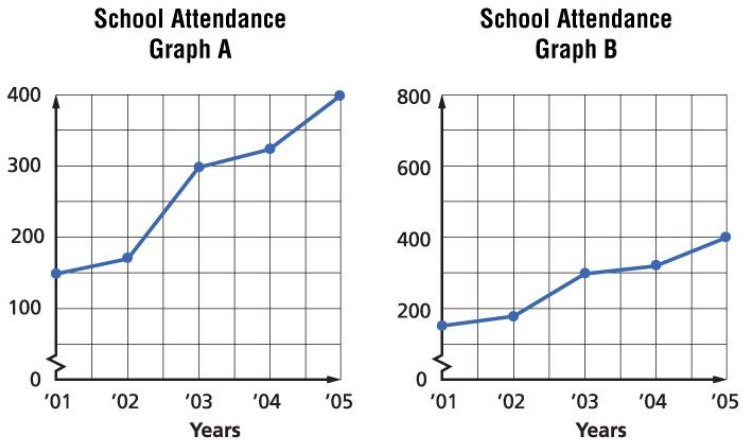




Answer: Graph B; the slope of the line from 2002 to 2004 is steeper in Graph B.

CHECK Your Progress

1 **A. ATTENDANCE** The graphs show the increase in attendance at a public elementary school. Why do the graphs look different?

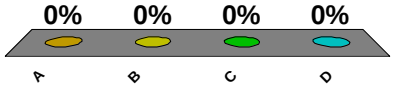


A. The vertical scales differ.

B. The vertical axis does not include zero.

C. There are no labels on either side.

D. The horizontal scales differ.



CheckPoint

CHECK Your Progress

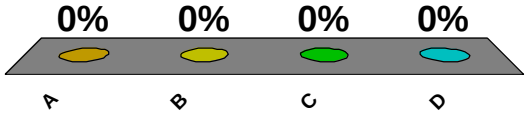
1 **B. ATTENDANCE** The graphs show the increase in attendance at a public elementary school. Which graph appears to show a more rapid increase in attendance between 2002 and 2003? Explain.

A. Graph A; The slope of the line from 2002 to 2003 is steeper in graph A.

B. Graph B; The slope of the line from 2002 to 2003 is steeper in graph B.

C. Both graphs show the same increase from 2002 to 2003.

D. cannot be determined

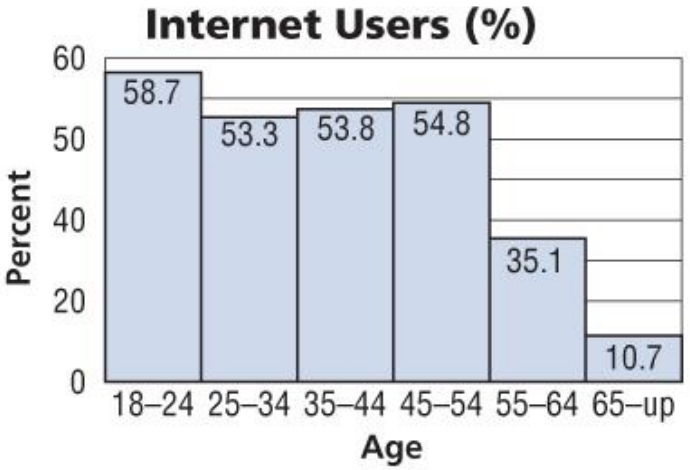


CheckPoint

Real-World EXAMPLE

Accuracy of Predictions and Conclusions

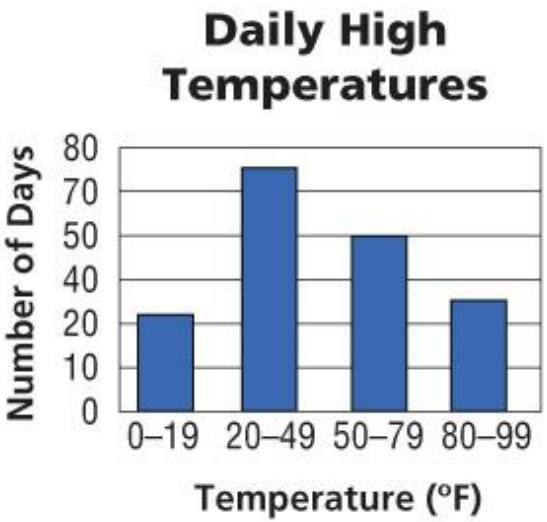
2 **INTERNET** The graph shows the percent of Internet use in different age groups. According to the graph, more 18- to 24-year-olds are using the internet than the other age groups. Determine whether this statement is accurate. Justify your reasoning.



Answer: No, the statement is not accurate. Even though the 18-24 age group has the greatest percent of users, the other age groups span a greater age range and thus have more people.

CHECK Your Progress

2 **WEATHER** According to the graph, the difference between the number of days with temperatures 20°F–49°F and 50°F–79°F is the same as the difference between 50°F–79°F and 80°F–99°F. Determine whether this statement is accurate. Justify your reasoning.



CheckPoint

CHECK Your Progress

2 **A.** Yes, the bars for the 20°F–49°F interval and the 50°F–79°F interval are $1\frac{1}{2}$ lines apart and so are the bars for the 50°F–79°F interval and the 80°F–99°F interval.

B. No, the difference between the number of days in the 20°F–49°F interval and the 50°F–79°F interval is 25 while the difference between the 50°F–79°F interval and the 80°F–99°F interval is 20.

C. Yes, the intervals on the horizontal axis are all evenly spaced

D. Yes, the numbers on the vertical axis are all evenly spaced.

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-6)

Main Ideas and Vocabulary

Key Concept: Probability

Example 1: Find Probability

Example 2: Find Probability

Example 3: Find Experimental Probability

Example 4: Make a Prediction

Main Ideas

- Find the probability of simple events.
- Use a sample to predict the actions of a larger group.

New Vocabulary

- outcomes
- simple event
- probability
- sample space
- theoretical probability
- experimental probability

KEY CONCEPT — Probability

Words The probability of an event is a ratio that compares the number of favorable outcomes to the number of possible outcomes.

Symbols $P(\text{event}) = \dfrac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$

Concepts in MOtion

BrainPOP:
Probability of Events

Click here to view!

EXAMPLE Find Probability

1 **Suppose a number cube is rolled. What is the probability of rolling a 4 or a 5?**

There are 2 numbers on the number cube that are a 4 or a 5: 4 and 5.

There are 6 possible outcomes: 1, 2, 3, 4, 5, and 6.

$$P(4 \text{ or } 5) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{2}{6} \text{ or } \frac{1}{3}$$

Answer: The probability of rolling a 4 or a 5 is $\frac{1}{3}$ or $33\frac{1}{3}\%$.

CHECK Your Progress

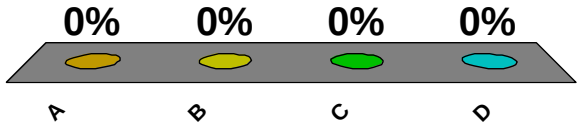
1 **Suppose a number cube is rolled. What is the probability of rolling a number that is divisible by 3?**

A. $\frac{1}{6}$ or $16\frac{2}{3}\%$

B. $\frac{1}{3}$ or $33\frac{1}{3}\%$

C. $\frac{1}{2}$ or 50%

D. $\frac{2}{3}$ or $66\frac{2}{3}\%$



CheckPoint

EXAMPLE Find Probability

2 **Suppose that two number cubes are rolled. Find the probability of rolling two identical numbers.**

Make a table showing the sample space when rolling two number cubes.

	1	2	3	4	5	6
1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
3	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
4	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
5	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
6	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

EXAMPLE Find Probability

2 There are 6 outcomes in which the two numbers are identical.

Answer: $P(\text{two identical numbers}) = \frac{6}{36}$ or $\frac{1}{6}$.

This means there is a $\frac{1}{6}$ or $16\frac{2}{3}\%$ chance of rolling two identical numbers.

CHECK Your Progress

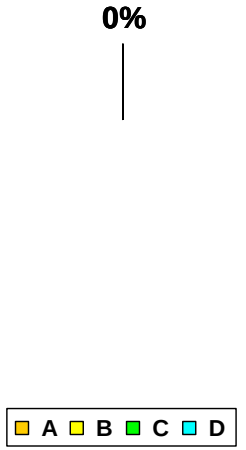
2 Suppose that two number cubes are rolled. Find the probability of rolling two numbers whose sum is 8.

A. $\frac{1}{15}$ or about 5.6%

B. $\frac{1}{12}$ or about $8\frac{1}{3}\%$

C. $\frac{1}{9}$ or about $11\frac{1}{9}\%$

D. $\frac{5}{36}$ or about 13.9%



EXAMPLE Find Experimental Probability

3 **A coin was tossed 40 times and heads came up 18 times. Find the experimental probability of getting tails for this experiment.**

$$\frac{\text{number of times tails occur}}{\text{number of possible outcomes}} = \frac{40-18}{40} = \frac{22}{40} \text{ or } \frac{11}{20}.$$

Answer: The experimental probability of getting tails in this case is $\frac{11}{20}$ or 55%.

CHECK Your Progress

3 **BASKETBALL** Brian is shooting baskets with a basketball. He makes 13 shots and misses 9 shots. Determine the experimental probability of Brian making a shot.

A. $\frac{4}{13}$ or about 31%

B. $\frac{9}{22}$ or about 41%

C. $\frac{13}{22}$ or about 59%

D. $\frac{9}{13}$ or about 69%

0%

A B C D

CheckPoint

Real-World EXAMPLE Make a Prediction

4 **SPORTS** **Miss Newman surveyed her class to see which sports they preferred watching. 44% preferred football, 28% basketball, 20% soccer, and 8% tennis. Out of 560 students in the entire school, how many would you expect to say they prefer watching basketball?**

The total number of students is 560. So, 560 is the base. The percent is 28%.

What number is 28% of 560? Write the percent proportion. Let *a* represent the part.

Real-World EXAMPLE Make a Prediction

4 part → $\frac{a}{560} = \frac{28}{100}$ ← percent
base →

$100 \cdot a = 560 \cdot 28$ Find the cross products.

$100a = 15{,}680$ Simplify.

$a = 156.80$ Mentally divide each side by 100.

Answer: You can expect about 157 students to say they prefer watching basketball.

CHECK Your Progress

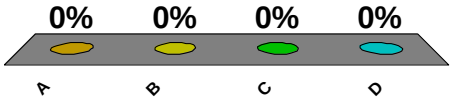
4 **COLORS** The students in an art class were surveyed about their favorite color. 32% preferred blue, 29% preferred red, 23% preferred yellow, and 16% preferred green. Out of 450 students in the entire school, how many would you expect to say they prefer red?

A. about 6

B. 29

C. about 131

D. 144



CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-7)

Main Ideas and Vocabulary

Example 1: Use a Tree Diagram to Count Outcomes

Key Concept: Fundamental Counting Principle

Example 2: Use the Fundamental Counting Principle

Example 3: Find Probabilities

Main Ideas

- Use tree diagrams or the Fundamental Counting Principle to count outcomes.
- Use the Fundamental Counting Principle to find the probability of an event.

New Vocabulary

- tree diagram
- Fundamental Counting Principle

EXAMPLE Use a Tree Diagram to Count Outcomes

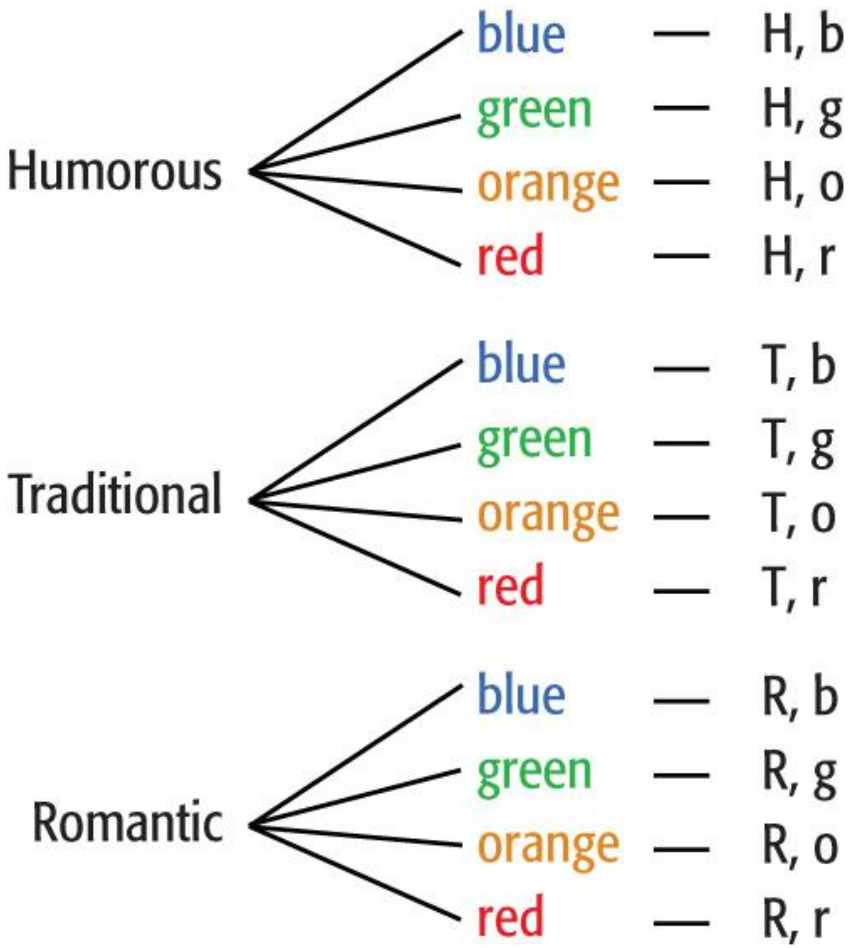
1 **GREETING CARDS** A greeting card maker offers three birthday greetings in four possible colors, as shown below. Draw a tree diagram to find the number of cards that can be made from three greeting choices and four color choices?

Greeting	Color
Humorous	Blue
Traditional	Green
Romantic	Orange
	Red

EXAMPLE Use a Tree Diagram to Count Outcomes

1 You can draw a diagram to find the number of possible cards.

Answer: There are 12 possible cards.



CHECK Your Progress

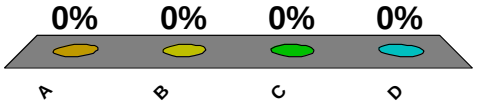
1 **ICE CREAM** An ice cream parlor offers a special on one-scoop sundaes with one topping. The ice cream parlor has 5 different flavors of ice cream and three different choices for toppings. How many different sundaes can be made?

A. 3

B. 5

C. 8

D. 15



CheckPoint

KEY CONCEPT — Fundamental Counting Principle

Words If event M can occur in m outcomes and is followed by event N that can occur in n outcomes, then the event M followed by N can occur in $m \cdot n$ outcomes.

Example If there are 5 possible decks and 3 possible sets of wheels, then there are $5 \cdot 3$ or 15 possible skateboards.

EXAMPLE Use the Fundamental Counting Principle

2 **CELL PHONES** **A cell phone company offers 3 payment plans, 4 styles of phones, and 6 decorative phone wraps. How many phone options are available?**

Use the Fundamental Counting Principle.

The number of types of payment plans	times	the number of styles of phones	times	the number of decorative wraps	equals	the number of possible outcomes.
3	×	4	×	6	=	72

Answer: There are 72 possible phone options.

CHECK Your Progress

2 **SANDWICHES** A sandwich shop offers 4 choices for bread, 5 choices for meat, and 3 choices for cheese. If a customer can make one choice from each category, how many different sandwiches can be made?

A. 60

B. 12

C. 5

D. 3

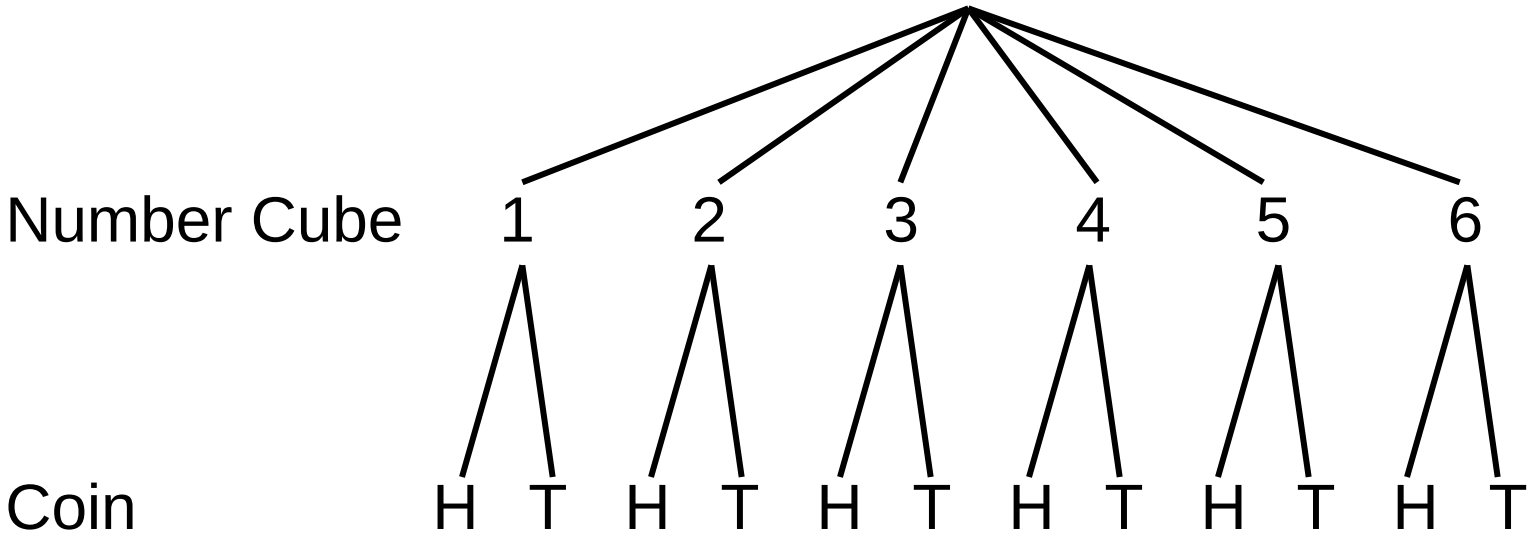
0%

A B C D

EXAMPLE 3 Find Probabilities

A. Henry rolls a number cube and tosses a coin. What is the probability that he will roll a 3 and toss heads?

First find the number of outcomes.



EXAMPLE Find Probabilities

3 There are 12 possible outcomes.

Look at the tree diagram. There is one outcome that has a 3 and a head.

$$P(\text{3 and head}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{1}{12}$$

Answer : The probability that Henry will roll a 3 and toss heads is $\frac{1}{12}$.

EXAMPLE 3 Find Probabilities

B. What is the probability of winning a raffle where the winning number is made up of 6 numbers from 1 to 50 chosen at random? Assume all numbers are eligible each draw.

First, find the number of possible outcomes. Use the Fundamental Counting Principle.

There are 50 choices for the first number, 50 choices for the second number, 50 choices for the third number, and so on.

$50 \times 50 \times 50 \times 50 \times 50 \times 50 = 15{,}625{,}000{,}000$

EXAMPLE Find Probabilities

3 There are 15,625,000,000 possible outcomes.
There is 1 winning number.

Answer : The probability of winning with one ticket is $\frac{1}{15,625,000,000}$.

CHECK Your Progress

3 **A. Bob rolls a number cube and tosses a coin. What is the probability that he will roll an odd number and toss tails?**

A. $\frac{1}{4}$

B. $\frac{1}{3}$

C. $\frac{3}{8}$

D. 1

0%

A B C D

CheckPoint

CHECK Your Progress

3 **B. What is the probability of winning a lottery where the winning number is made up of 5 numbers from 1 to 20 chosen at random? Assume all numbers are eligible each draw.**

A. $\frac{1}{4}$

B. $\frac{1}{20}$

C. $\frac{1}{100}$

D. $\frac{1}{3,200,000}$

0%

A B C D

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-8)

Main Ideas and Vocabulary

Example 1: Use a Permutation

Example 2: Use a Combination

Example 3: Real-World Example

Main Ideas

- Use permutations.
- Use combinations.

New Vocabulary

- permutation
- combination

Real-World EXAMPLE Use a Permutation

1 **A. TRAVEL** **The Reyes family will visit a complex of theme parks during their summer vacation. They have a four-day pass good at one park per day; they can choose from seven parks. How many different ways can they arrange their vacation schedule?**

The order in which they visit the parks is important. This arrangement is a permutation.

7 parks **Choose 4**

$$p(7,4) = 7 \bullet 6 \bullet 5 \bullet 4$$
$$= 840$$

7 choices for the 1st day
6 choices for the 2nd day
5 choices for the 3rd day
4 choices for the 4th day

Answer: There are 840 possible arrangements.

Real-World EXAMPLE Use a Permutation

1 **B. NUMBERS** How many five-digit numbers can be made from the digits 2, 3, 4, 5, 8, and 9 if each digit is used only once?

$$p(5,5) = 5 \bullet 4 \bullet 3 \bullet 2 \bullet 1$$
$$= 120$$

5 choices for the 1st digit
4 choices for the 2nd digit
3 choices for the 3rd digit
2 choices for the 4th digit
1 choice remains for the 5th digit

Answer: 720

CHECK Your Progress

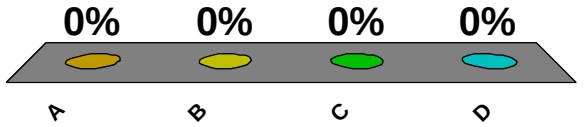
1 **A. TRACK AND FIELD** How many ways can five runners be arranged on a three-person relay team?

A. 10

B. 30

C. 60

D. 120



CheckPoint

Check Your Progress

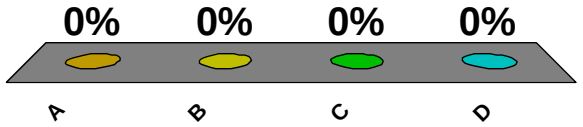
1 **B.** How many six-digit numbers can be made from the digits 1, 2, 3, 4, 5, and 6 if each digit is used only once?

A. 6

B. 720

C. 7776

D. 46,656



CheckPoint

Real-World EXAMPLE Use a Combination

2 HATS How many ways can a window dresser choose two hats out of a fedora, a bowler, and a sombrero?

Since order is not important, this arrangement is a combination.

First, list all of the permutations of the types of hats taken two at a time.

Then cross off arrangements that are the same as another one.

FB and BF are not different in this case, so cross off one of them.

Real-World EXAMPLE Use a Combination

2 There are only three *different* arrangements.

Answer: There are three ways to choose two hats from three possible hats.

Real-World EXAMPLE Use a Combination

2 **B. PENS** **How many ways can a customer choose two pens from a purple, orange, green, red, or black pen?**

The arrangement is a combination because order is not important.

First, list all of the permutations.

Then cross off the arrangements that are the same.

PO	*PG*	*PR*	*PB*	~~*OP*~~	*OG*	*OR*
OB	~~*GP*~~	~~*GO*~~	*GR*	*GB*	~~*RP*~~	~~*RO*~~
~~*RG*~~	*RB*	~~*BP*~~	~~*BO*~~	~~*BG*~~	~~*BR*~~	

Answer: There are 10 ways to choose two pens from five possible colored pens.

CHECK Your Progress

2 **A. SHIRTS** How many ways can two shirts be selected from a display having a red shirt, a blue shirt, a green shirt, and a white shirt?

A. 4

B. 6

C. 12

D. 24

0%

A B C D

CheckPoint

CHECK Your Progress

2 **B. BOOKS** How many ways can a student select 2 books from a bookshelf containing a mystery, a biography, a non-fiction book, a fantasy book, and a novel?

A. 10

B. 20

C. 60

D. 120

0%

A B C D

CheckPoint

Real-World EXAMPLE

3 **TENNIS** **The players listed are playing singles in a tennis tournament. If each player plays every other player once, what is the probability that Kyle plays in the first match?**

Thomas	Carl
Ager	Jack
Brian	Seth
Kyle	Pedro

Explore The order in which the players are selected is not important, so this is a combination.

Plan Find the combination of 8 people taken 2 at a time. This will give you the number of matches that take place during the tournament. Then find how many of the matches involve Kyle.

Real-World EXAMPLE

3 Solve

$C(8, 2) = \frac{8 \bullet 7}{2 \bullet 1} = 28$ There are 28 way to choose 2 people. Kyle plays each person once during the tournament. If there are 7 other players, Kyle is involved in 7 matches. So the probability that Kyle plays in the first match is $\frac{7}{28}$ or $\frac{1}{4}$.

Check List all the 2-player matches in the tournament. Check to see that there are 28 matches.

Real-World EXAMPLE

3 **Answer:** $\frac{7}{28}$ or $\frac{1}{4}$

CHECK Your Progress

3 **VOLLEYBALL** The teams listed are playing in a volleyball tournament. If each team plays every other team once, what is the probability that the Lions play in the first game?

A. $\frac{1}{90}$

B. $\frac{1}{45}$

C. $\frac{1}{10}$

D. $\frac{1}{5}$

Huskers	Broncos
Gators	Waves
Cougars	Red Storm
Wild Cats	Lions
Badgers	Bearcats

0%

A B C D

CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 12-9)

Main Ideas and Vocabulary

Concept Summary: Probability of Two Independent Events

Example 1: Probability of Independent Events

Key Concept: Probability of Two Dependent Events

Example 2: Probability of Dependent Events

Key Concept: Probability of Mutually Exclusive Events

Example 3: Probability of Mutually Exclusive Events

Main Ideas

- Find the probability of independent and dependent events.
- Find the probability of mutually exclusive events.

New Vocabulary

- composite events
- independent events
- dependent events
- mutually exclusive events

CONCEPT SUMMARY — *Probability of Two Independent Events*

Words The probability of two independent events is found by multiplying the probability of the first event by the probability of the second event.

Symbols $P(A \text{ and } B) = P(A) \cdot P(B)$

Example $P(\text{red and white}) = \frac{1}{2} \cdot \frac{1}{2}$ or $\frac{1}{4}$

EXAMPLE Probability of Independent Events

1 **GAMES** **In a popular number cube game, the highest possible score in a single turn is a roll of five of a kind. After rolling one five of a kind, every other five of a kind you roll earns 100 points. What is the probability of rolling two five of a kinds in a row?**

The events are independent since each roll does not affect the outcome of the next roll.

There are six ways to roll five of a kind, (1, 1, 1, 1, 1), (2, 2, 2, 2, 2), and so on, and there are 6^5 or 7776 ways to roll five dice. So, the probability of rolling five of a kind on a toss of the number of cubes is $\frac{6}{7776}$ or $\frac{1}{1296}$.

EXAMPLE Probability of Independent Events

1 $P(\text{two five of a kind}) = P(\text{five of a kind on first roll}) \bullet P(\text{five of a kind on second roll})$

$$= \frac{1}{1296} \bullet \frac{1}{1296}$$

$$= \frac{1}{1{,}679{,}616}$$

Answer : The probability of rolling two five of a kind in a row is $\frac{1}{1{,}679{,}616}$.

CHECK Your Progress

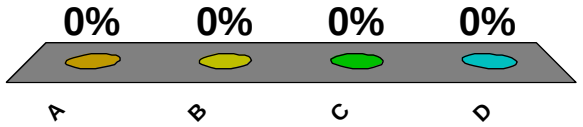
1 **GAMES** Find the probability of rolling doubles four times in a row when rolling a pair of number cubes.

A. $\frac{1}{3808}$

B. $\frac{1}{1296}$

C. $\frac{1}{256}$

D. $\frac{2}{3}$



CheckPoint

KEY CONCEPT — Probability of Two Dependent Events

Words If two events, A and B, are dependent, then the probability of both events occurring is the product of the probability of A and the probability of B after A occurs.

Symbols $P(A \text{ and } B) = P(A) \cdot P(B \text{ following } A)$

Example $P(\text{red and white, without replacement}) = \frac{1}{2} \cdot \frac{2}{3}$ or $\frac{1}{3}$

EXAMPLE Probability of Dependent Events

2 **CLOTHES** **Charlie's clothes closet contains 3 blue shirts, 10 white shirts, and 7 striped shirts. What is the probability that Charlie will reach in and randomly select a white shirt followed by a striped shirt?**

$$P(\text{white shirt and striped shirt}) = \frac{10}{20} \cdot \frac{7}{19}$$

$$= \frac{70}{380} \text{ or } \frac{7}{38}$$

Answer : The probability Charlie will select a white shirt followed by a striped shirt is $\frac{7}{38}$.

CHECK Your Progress

2 **COOKIES** A plate has 6 chocolate chip cookies, 4 peanut butter cookies, and 5 sugar cookies. What is the probability of randomly selecting a chocolate chip cookie followed by a sugar cookie?

A. $\frac{1}{30}$

B. $\frac{1}{7}$

C. $\frac{11}{30}$

D. $\frac{159}{210}$

0%

A B C D

CheckPoint

KEY CONCEPT — Probability of Mutually Exclusive Events

Words The probability of one or the other of two mutually exclusive events can be found by adding the probability of the first event to the probability of the second event.

Symbols $P(A \text{ or } B) = P(A) + P(B)$

Example $P(5 \text{ or even}) = \frac{4}{36} + \frac{18}{36}$ or $\frac{11}{18}$

EXAMPLE Probability of Mutually Exclusive Events

3 **You draw a card from a standard deck of playing cards. What is the probability that the card will be a black nine or any heart?**

The events are mutually exclusive because the card cannot be both a black nine and a heart at the same time.

$$P(\text{black nine or heart}) = P(\text{black nine}) + P(\text{heart})$$

$$= \frac{2}{52} + \frac{13}{52}$$

$$= \frac{15}{52}$$

EXAMPLE Probability of Mutually Exclusive Events

3 **Answer :** The probability that the card will be a black nine or any heart is $\frac{15}{52}$.

CHECK Your Progress

3 **CARDS** You draw a card from a standard deck of playing cards. What is the probability that the card will be a club or a red face card?

A. $\frac{3}{104}$

B. $\frac{3}{102}$

C. $\frac{19}{52}$

D. $\frac{39}{52}$

0%

A B C D

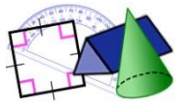
CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Chapter Resources Menu

CheckPoint Five-Minute Checks

 Image Bank

Math Tools

Concepts in Motion

Interactive Lab Bar Graphs and Line Graphs

BrainPOP Probability of Events

Five-Minute CHECK

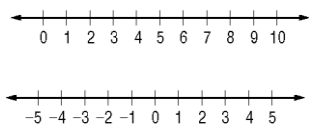
Lesson 12-1	(over Chapter 11)
Lesson 12-2	(over Lesson 12-1)
Lesson 12-3	(over Lesson 12-2)
Lesson 12-4	(over Lesson 12-3)
Lesson 12-5	(over Lesson 12-4)
Lesson 12-6	(over Lesson 12-5)
Lesson 12-7	(over Lesson 12-6)
Lesson 12-8	(over Lesson 12-7)
Lesson 12-9	(over Lesson 12-8)
Lesson 12-10	(over Lesson 12-9)

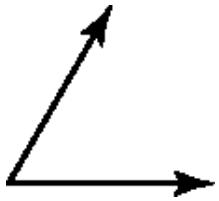
Image Bank

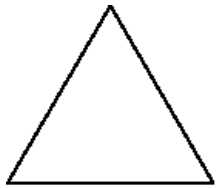
To use the images that are on the following three slides in your own presentation:

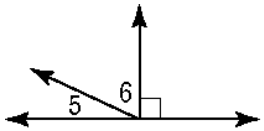
1. Exit this presentation.
2. Open a chapter presentation using a full installation of Microsoft® PowerPoint® in editing mode and scroll to the Image Bank slides.
3. Select an image, copy it, and paste it into your presentation.

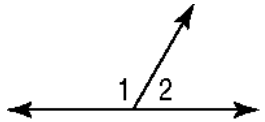
Image Bank

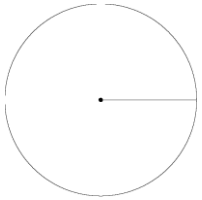

0 1 2 3 4 5 6 7 8 9 10
−5 −4 −3 −2 −1 0 1 2 3 4 5

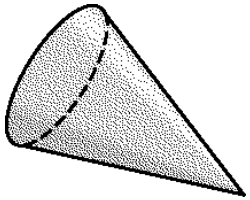


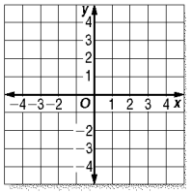


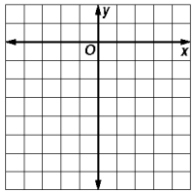

5
6

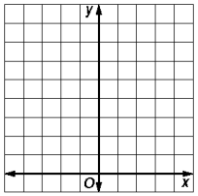

1
2

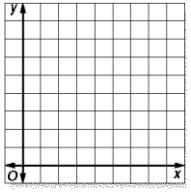


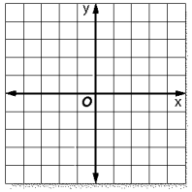


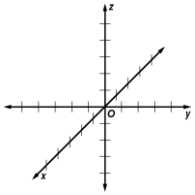

y
4
3
2
1
−4 −3 −2
O
1 2 3 4 x
−2
−3
−4

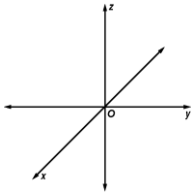

y
O
x

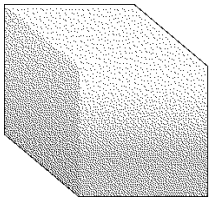

y
O
x

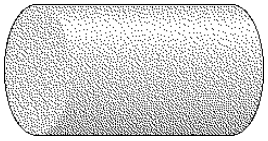

y
O
x

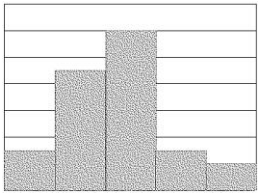

y
O
x

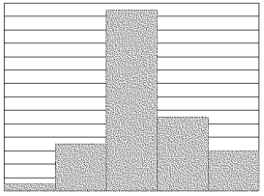

z
O
y
x

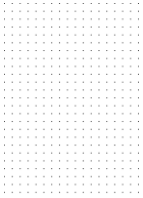

z
O
y
x











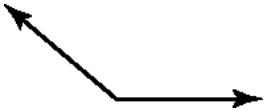
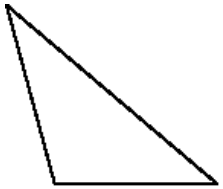
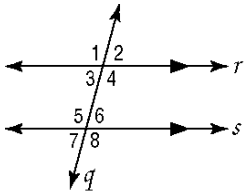
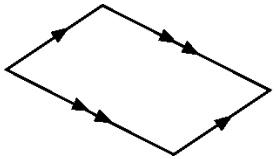
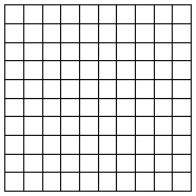


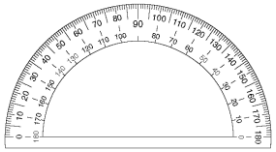
Image Bank

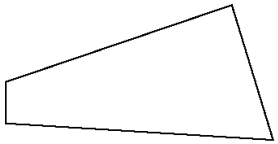


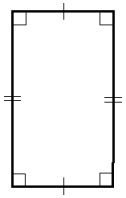


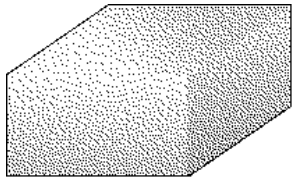


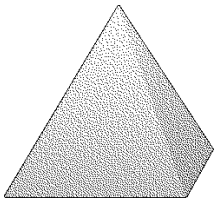


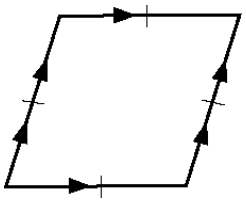


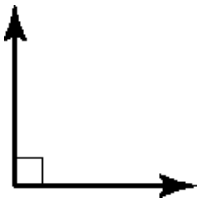


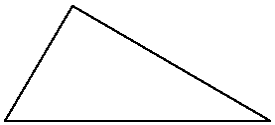


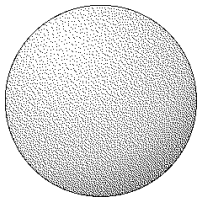


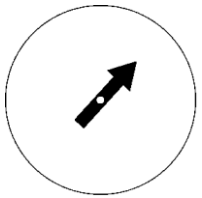


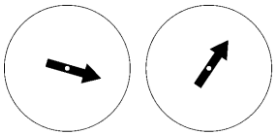


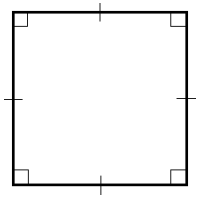












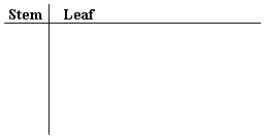
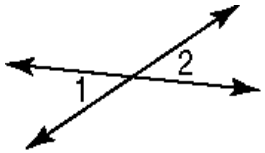
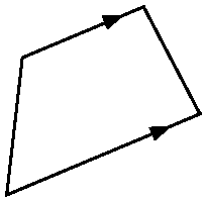
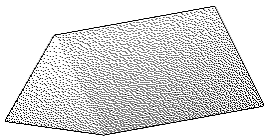
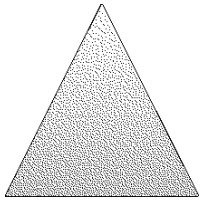


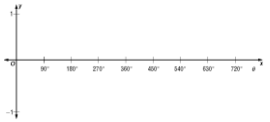
Image Bank

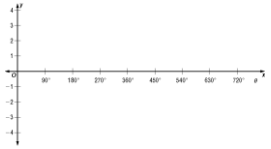


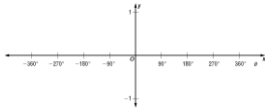


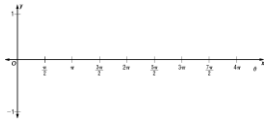


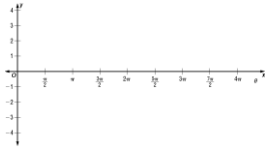












Five-Minute CHECK (over Chapter 11)

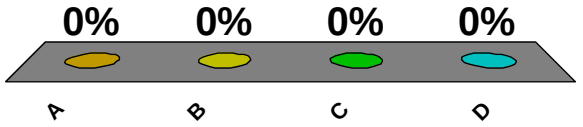
1 Find the volume of a cylinder having radius 2.3 cm and height 9 cm. If necessary, round to the nearest tenth.

A. 64.9 cm^3

B. 130.1 cm^3

C. 149.6 cm^3

D. 428.5 cm^3



CheckPoint

Five-Minute CHECK (over Chapter 11)

2 Find the volume of a rectangular pyramid having length 12 in., width 8 in., and height 11 in.

A. 62 in^3

B. 352 in^3

C. 325 in^3

D. 1056 in^3

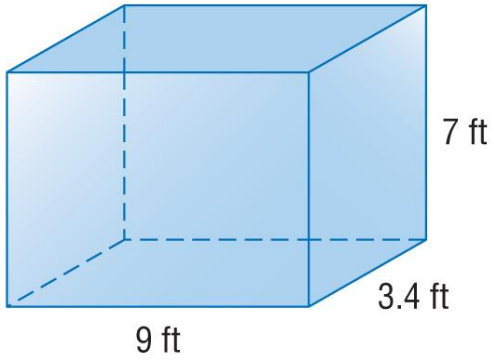
0%

A B C D

CheckPoint

Five-Minute CHECK (over Chapter 11)

3 Find the surface area of the solid shown in the figure. If necessary, round to the nearest tenth.



A. 116.4 ft^2

0%

B. 214.2 ft^2

C. 234.8 ft^2

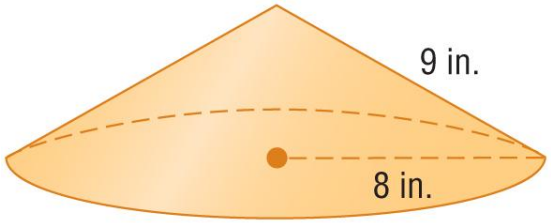
D. 334.8 ft^2

A B C D

CheckPoint

Five-Minute CHECK (over Chapter 11)

4 Find the surface area of the solid shown in the figure. If necessary, round to the nearest tenth.

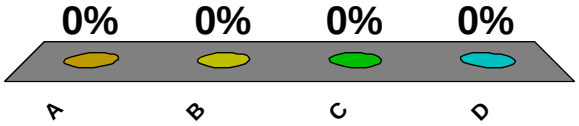


A. 427.3 in^2

B. 226.1 in^2

C. 194.7 in^2

D. 42.7 in^2



CheckPoint

Five-Minute CHECK (over Chapter 11)

5 A model for a new movie theatre is 55 centimeters tall. On the model, 1 centimeter represents 5 meters. How tall is the actual theatre?

A. 11 m

B. 55 m

C. 175 m

D. 275 m

CheckPoint

Five-Minute CHECK (over Chapter 11)

Standardized Test Practice

6 A cone and a cylinder have the same radius and the same height. The volume of the cone is 48 cm^3. What is the volume of the cylinder?

A. 48 cm^3 0%

B. 96 cm^3

C. 144 cm^3

D. 192 cm^3

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-1)

1 The table displays information about the tallest buildings. Identify the stem-and-leaf plot that represents the data.

Name	Stories	Name	Stories
A	32	G	34
B	43	H	52
C	36	I	40
D	42	J	56
E	32	K	32
F	42	L	54

A.

Stem	Leaf
5	2 2 2 4 6
4	2 4 6
3	0 2 2 3

3|2 = 32 stories

B.

Stem	Leaf
5	6 2 4
4	4 6
3	1 2 3

3|1 = 31 stories

C.

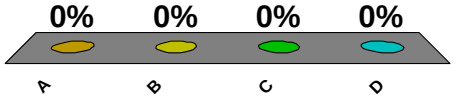
Stem	Leaf
5	2 4 6
4	0 2 2 3
3	2 2 2 4 6

3|2 = 32 stories

D.

Stem	Leaf
5	0 2 6
4	3 6
3	2 4

4|3 = 43 stories



CheckPoint

Five-Minute CHECK (over Lesson 12-1)

2 The table displays information about the tallest buildings. How many buildings have 32 stories?

Name	Stories	Name	Stories
A	32	G	34
B	43	H	52
C	36	I	40
D	42	J	56
E	32	K	32
F	42	L	54

A. 2 buildings

B. 3 buildings

C. 5 buildings

D. 7 buildings

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-1)

3 The table displays information about the tallest buildings. How many buildings have more than 40 stories?

Name	Stories	Name	Stories
A	32	G	34
B	43	H	52
C	36	I	40
D	42	J	56
E	32	K	32
F	42	L	54

A. 3 buildings

0%

B. 4 buildings

C. 5 buildings

D. 6 buildings

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-1)

4 The table displays information about the tallest buildings. What is the median number of stories for the data set?

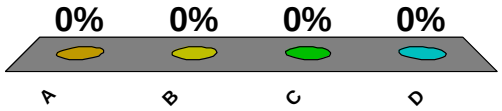
Name	Stories	Name	Stories
A	32	G	34
B	43	H	52
C	36	I	40
D	42	J	56
E	32	K	32
F	42	L	54

A. 40 stories

B. 41 stories

C. 42 stories

D. 43 stories



CheckPoint

Five-Minute CHECK (over Lesson 12-1)

Standardized Test Practice

5 **Which stem-and-leaf plot key represents the number 108?**

A. 1 | 8

B. 1 | 08

C. 10 | 8

D. 8 | 10

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-2)

HAAP (in.)	El. (ft.)
524	520
467	4597
460	5148
405	30
354	120
340	5102
256	12
183	3337

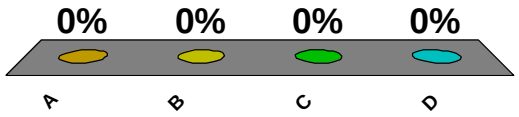
1 Refer to the table. Find the interquartile range for the highest average annual precipitation (HAAP) and for the elevation (El).

A. 142.75; 4625.75

B. 205; 5050.5

C. 165.5; 4774.5

D. 211; 5072



CheckPoint

Five-Minute CHECK (over Lesson 12-2)

HAAP (in.)	El. (ft.)
524	520
467	4597
460	5148
405	30
354	120
340	5102
256	12
183	3337

2 **Refer to the table. For which set of data is the middle data more clustered about the median? Which choice provides a correct explanation?**

A. The data for the average annual precipitation is more clustered around the median because the interquartile range is smaller

B. The data for the elevation is more clustered around the median because the interquartile range is high.

C. The data for the elevation is more clustered around the median because the interquartile range is high.

D. The data for the avarage annual precipitation is more clustered around the median because the interquartile range is high.

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-2)

Standardized Test Practice

3 Which is the least measure for the data set {73, 81, 60, 94, 48, 57, 68}?

A. range

0%

B. median

C. lower quartile

D. interquartile range

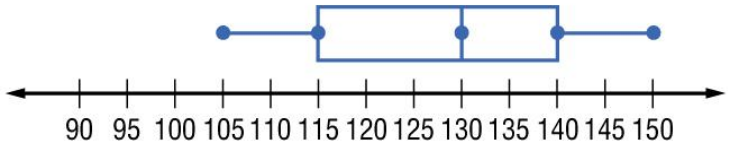
A B C D

CheckPoint

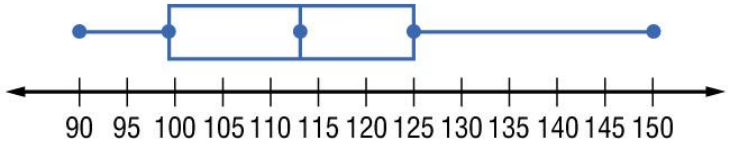
Five-Minute CHECK (over Lesson 12-3)

1 Identify the box-and-whisker plot for {$125, $93, $111, $101, $125, $115, $90, $150, $99, $120}.

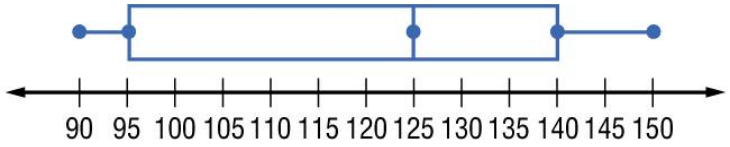
A.



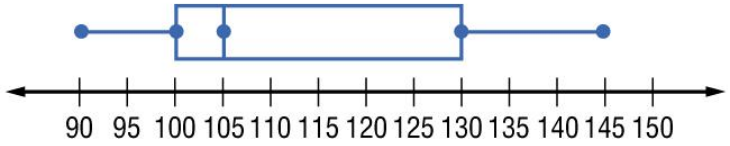
B.

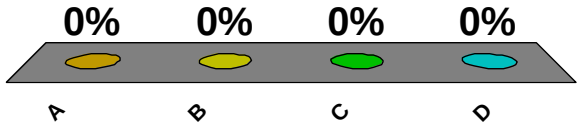


C.



D.

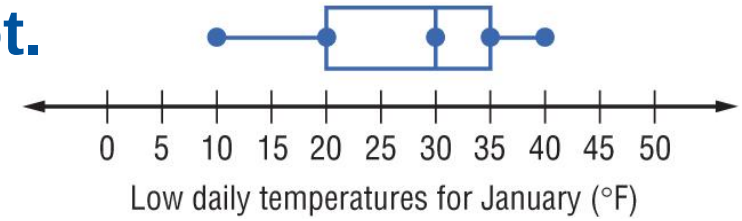




CheckPoint

Five-Minute CHECK (over Lesson 12-3)

2 Use the box-and-whisker plot. What percent of the data is between 20°F and 35°F?



A. 15 percent

B. 20 percent

C. 35 percent

D. 50 percent

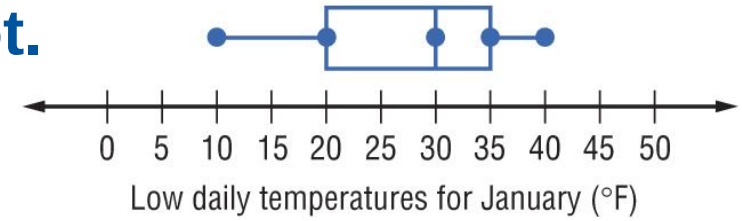
0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-3)

3 **Use the box-and-whisker plot. Which option describes the data for January?**



A. The low daily temperatures for January ranged from 0°F to 50°F with most between 20°F and 35°F.

B. The low daily temperatures for January ranged from 20°F to 45°F with most between 20°F and 40°F.

C. The low daily temperatures for January ranged from 10°F to 40°F with most between 20°F and 35°F.

D. The low daily temperatures for January ranged from 10°F to 40°F with most between 20°F and 30°F.

0%

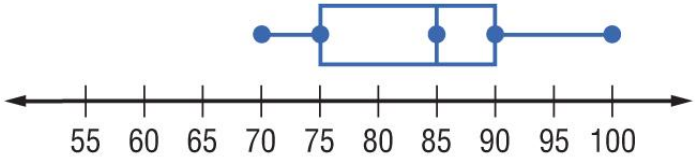
A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-3)

Standardized Test Practice

4 Which does the number 100 represent on the plot shown in the figure?

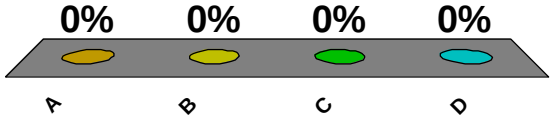


A. extreme

B. median

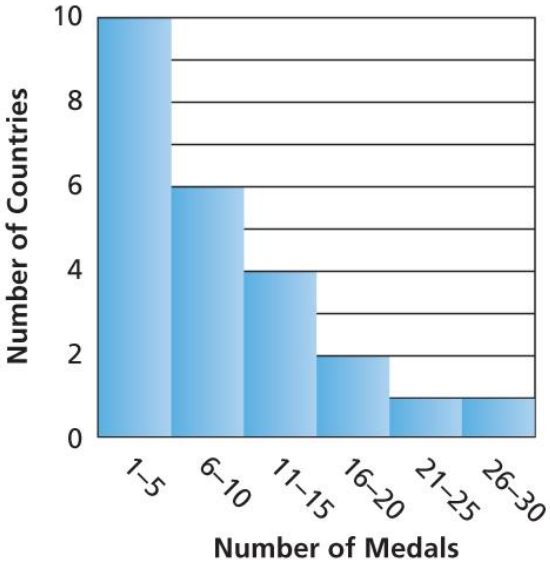
C. lower quartile

D. interquartile range



CheckPoint

Five-Minute CHECK (over Lesson 12-4)



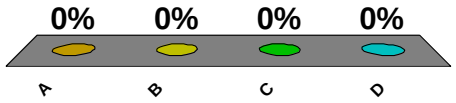
1 Use the data in the histogram shown in the figure. What are the intervals on the histogram?

A. 2

B. 3

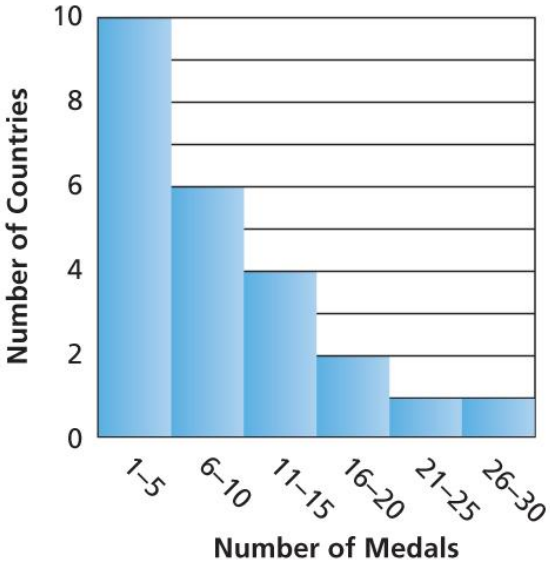
C. 4

D. 5



CheckPoint

Five-Minute CHECK (over Lesson 12-4)



2 Use the data in the histogram shown in the figure. How many countries won between 1 and 10 medals?

A. 6 countries

B. 10 countries

C. 16 countries

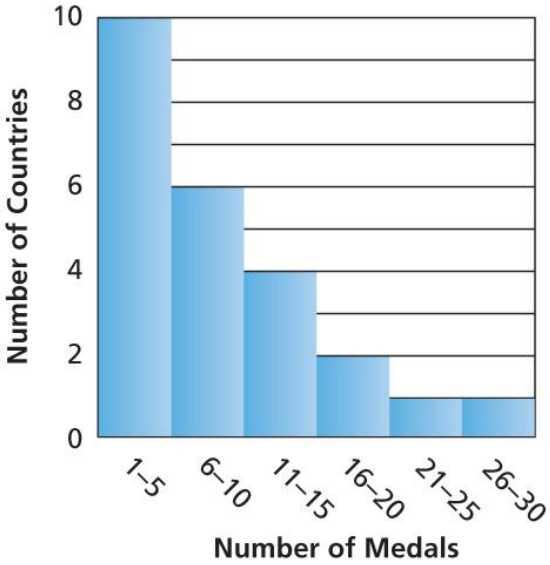
D. 20 countries

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-4)



3 Use the data in the histogram shown in the figure. How many countries won medals at the 1998 Winter Olympics?

A. 10 countries

B. 24 countries

C. 26 countries

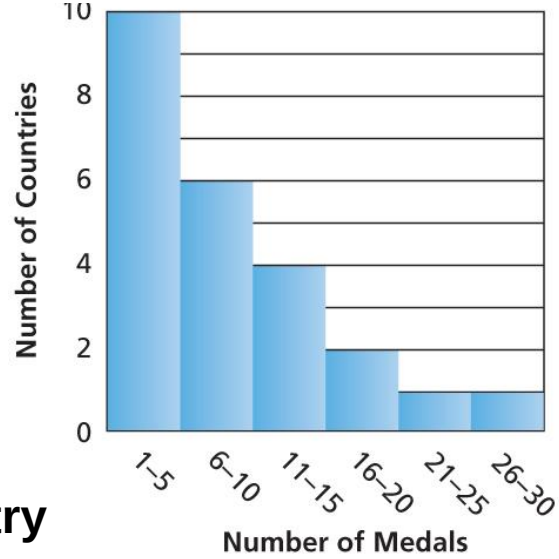
D. 30 countries

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-4)



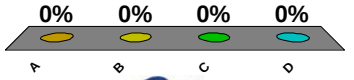
4 Use the data in the histogram shown in the figure. Is it possible to tell the largest number of medals won by a country? Which choice proved a correct explanation?

A. It is only possible to tell that one country won between 26 and 30 medals.

B. It is only possible to tell that two countries won 30 medals.

C. It is only possible to tell that 30 countries won between 2 and 10 medals.

D. It is only possible to tell that 24 countries won the largest number of medals.

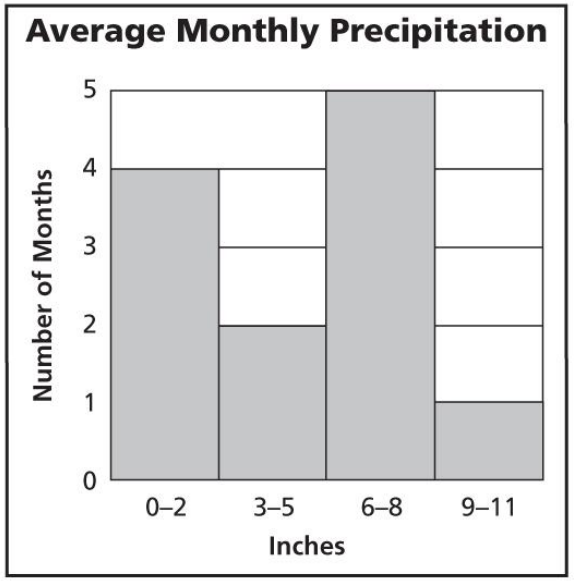


CheckPoint

Five-Minute CHECK (over Lesson 12-4)

Standardized Test Practice

5 The histogram in the figure shows the average amount of monthly precipitation in a city. How many months average at least 3 inches of rain?



A. 2

B. 6

C. 8

D. 11

0%

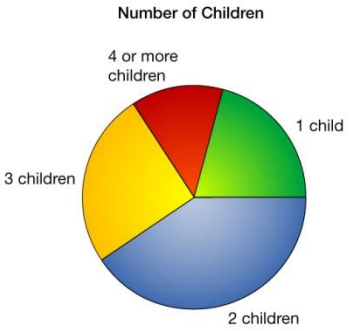
A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-5)

1 Select an appropriate type of display for the data set. Out of 195 mothers surveyed, 42 have only 1 child, 67 have 2 children, 34 have 3 children, and 22 have 4 or more children.

A.

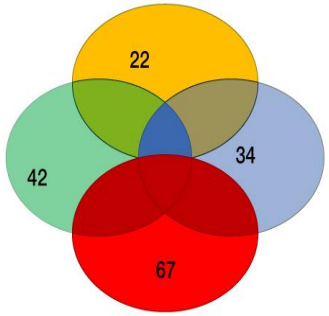


B.

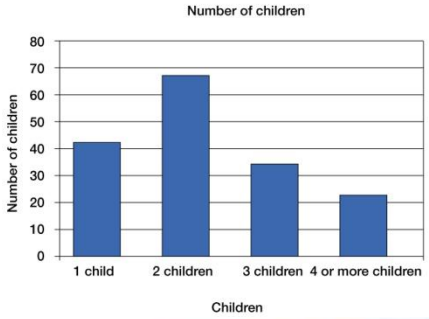
Stem	Leaf
2	2
3	4
4	2
5	
6	7

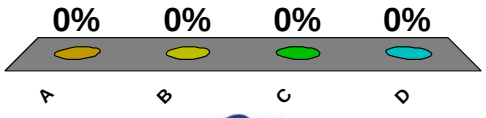
2|2 = 22 children

C.



D.





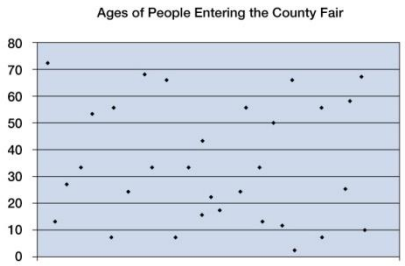
CheckPoint

Five-Minute CHECK (over Lesson 12-5)

2 **Select an appropriate type of display for the data set represented in the graph.**

Ages of People Entering the County Fair									
72	13	27	34	53	9	55	25	67	34
65	8	35	43	15	22	18	54	25	34
50	13	65	7	13	77	15	7	42	2
3	54	11	2	55	8	26	58	67	10

A.

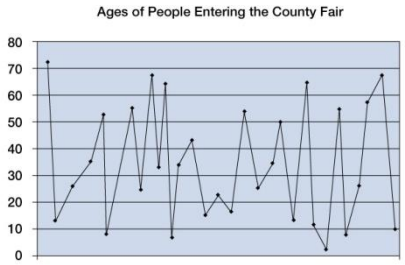


B.

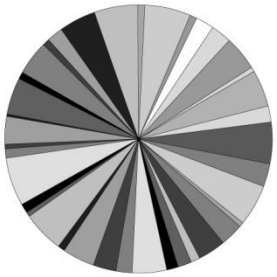
Stem	Leaf
0	2 2 3 7 7 8 8 9
1	0 1 3 3 3 5 5 8
2	2 5 5 6 7
3	4 4 4 5
4	2 3
5	0 3 4 4 5 5 8
6	5 5 7 7
7	2 7

5|4 = 54

C.



D.



0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-5)

Standardized Test Practice

3 Select an appropriate type of display for the relationship among people who have one pet, two or more pets, or have no pets.

A. circle graph 0%

B. histogram

C. bar graph

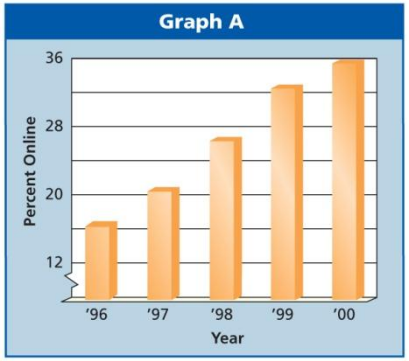
D. Venn diagram

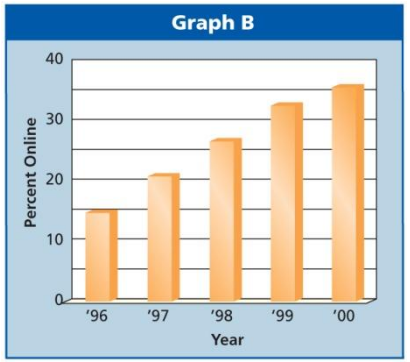
A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-6)

1 **Refer to the graphs. What causes the graphs to appear different?**



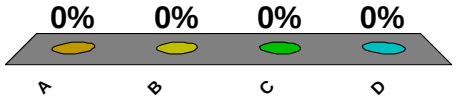


A. The graphs do not differ.

B. The vertical scales are different.

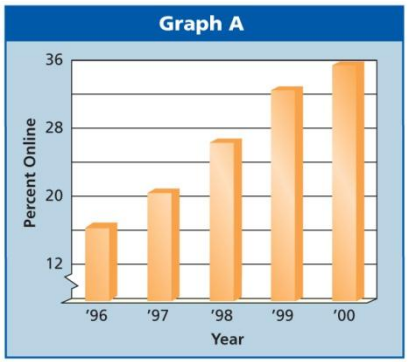
C. The horizontal scales are different.

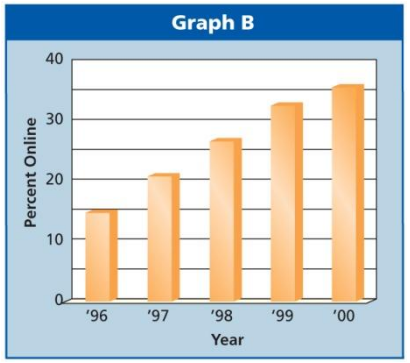
D. The vertical and horizontal scales are different.



CheckPoint

Five-Minute CHECK (over Lesson 12-6)





2 **Refer to the graphs. Which of the following explains which graph is misleading?**

A. Graph B is misleading because the increase in online households appears gradual.

B. Graph A is misleading becuase the increase in online households appears gradual.

C. Graph B is misleading because the increase in online households appears more drastic.

D. Graph A is misleading because the increase in online households appears more drastic.

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-6)

Standardized Test Practice

3 Refer to the graph. Which statement best describes the change in cell phone subscribers from 1997 to 2000?

A. It doubled.

B. It tripled.

C. It quadrupled.

D. It cannot be determined.

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-7)

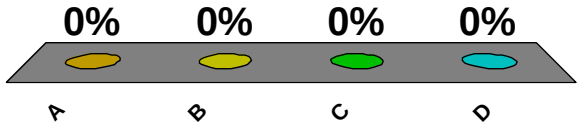
1 Suppose a number cube is rolled. What is the probability of rolling an even number?

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{6}$

D. $\frac{1}{2}$



CheckPoint

Five-Minute CHECK (over Lesson 12-7)

2 Suppose a number cube is rolled. What is the probability of rolling a number that is a factor of 6?

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{6}$

D. $\frac{1}{2}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-7)

3 Suppose two number cubes are rolled. What is the probability of rolling a difference of less than 4?

A. $\frac{1}{9}$

B. $\frac{5}{6}$

C. $\frac{5}{12}$

D. $\frac{4}{9}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-7)

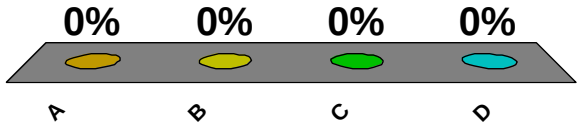
4 Suppose two number cubes are rolled. What is the probability of rolling a sum greater than 5?

A. $\frac{1}{9}$

B. $\frac{1}{2}$

C. $\frac{13}{18}$

D. $\frac{4}{9}$

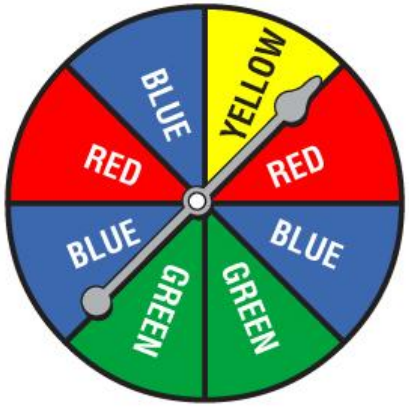


CheckPoint

Five-Minute CHECK (over Lesson 12-7)

Standardized Test Practice

5 What is the probability of spinning blue or green on the spinner shown?



A. $\frac{5}{8}$

B. $\frac{3}{8}$

C. $\frac{1}{4}$

D. $\frac{1}{8}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-8)

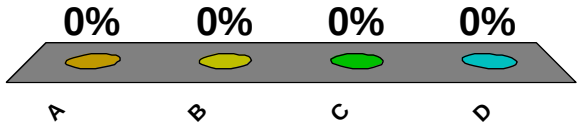
1 Find the number of possible outcomes for the situation. Lou has a choice of 4 sandwiches, 3 beverages, and 2 desserts.

A. 4 outcomes

B. 9 outcomes

C. 12 outcomes

D. 24 outcomes



CheckPoint

Five-Minute CHECK (over Lesson 12-8)

2 Two number cubes labeled 1 to 6 are rolled. What is the probability of getting an even number on both number cubes?

A. $\frac{1}{3}$

B. $\frac{1}{4}$

C. $\frac{1}{9}$

D. $\frac{1}{6}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-8)

3 Three coins are tossed. What is the probability of getting all heads or all tails?

A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. $\frac{3}{4}$

D. $\frac{1}{3}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-8)

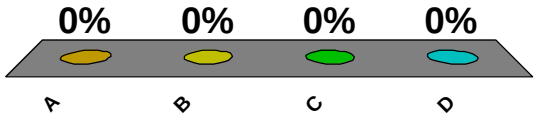
4 A wheel of chance has the numbers 1 to 42 once each, evenly spaced. What is the probability that a multiple of 7 will come up when the wheel is spun?

A. $\frac{1}{14}$

B. $\frac{1}{42}$

C. $\frac{1}{6}$

D. $\frac{1}{7}$



CheckPoint

Five-Minute CHECK (over Lesson 12-8)

Standardized Test Practice

5 A password is made using three components. The first component is any of the 26 letters of the alphabet, and the last two are each one-digit numbers from 0 through 9. How many possible passwords can be made?

A. 260

B. 2106

C. 2340

D. 2600

0%

A B C D

Five-Minute CHECK (over Lesson 12-9)

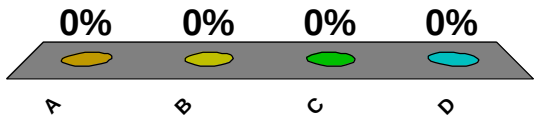
1 Tell whether the situation is a permutation or combination. Then solve. How many ways can a president and vice president be chosen from the 8 people running for office.

A. combination; 28

B. combination; 56

C. permutation; 56

D. permutation; 28



CheckPoint

Five-Minute CHECK (over Lesson 12-9)

2 Tell whether the situation is a permutation or combination. Then solve. An ice cream sundae shop has 9 toppings to choose from. How many different 3-topping sundaes can be ordered?

A. combination; 432

B. combination; 84

C. permutation; 432

D. permutation; 84

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-9)

3 How many ways can 7 runners place first and second in a race?

A. 24

0%

B. 42

C. 124

D. 256

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 12-9)

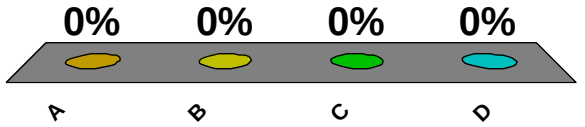
4 Find the number of line segments that can be drawn between any two vertices of a hexagon.

A. 6

B. 12

C. 15

D. 25



CheckPoint

Five-Minute CHECK (over Lesson 12-9)

Standardized Test Practice

5 How many different 4-letter codes can be formed from the letters shown in the figure if a letter is used only once in the code?

A. 5040

B. 1260

C. 840

D. 210

0%

A B C D

CheckPoint