

## ► Solve the problems.

- 1 Emma has a coupon for \$5.25 off a frame that normally costs \$15.00. What percent discount does she receive on the frame? Show your work.

$$\frac{5.25}{15} = \frac{x}{100} \quad 525 \div 15 = 35$$

**SOLUTION** Emma receives a 35% discount

- 2 Lincoln estimates the height of a tree. Lincoln's estimate has a 6% error. The actual height of the tree is 17 feet. What could be Lincoln's estimate? Select all the correct answers.

A 11

B 15.98

C 18.02

D 16.94

E 23

$$\frac{x}{17} = \frac{6}{100}$$

$$102 \div 100 = 1.02$$

$$17 + 1.02 = 18.02$$

$$17 - 1.02 = 15.98$$

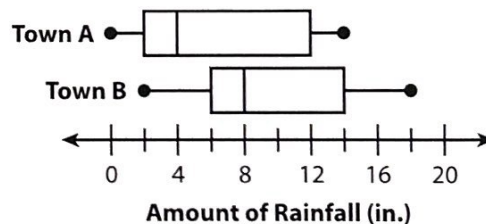


- 3 The developer for a movie-streaming service wants to survey its customers to help determine features for a new app. Which sampling method would produce a representative sample of the population of the movie-streaming service's customers?

Choose Yes or No for each method.

	Yes	No
a. Spin an alphabet spinner four times and record the letters. Survey everyone at the <u>local movie theater</u> whose name begins with any of the letters.	<input type="radio"/>	<input checked="" type="radio"/>
b. Use a random number generator to generate two numbers. Survey every current customer whose address includes those two numbers.	<input checked="" type="radio"/>	<input type="radio"/>
c. Use a random letter generator to select six letters. Survey everyone on the e-mail list whose e-mail address begins with one of those letters.	<input checked="" type="radio"/>	<input type="radio"/>
d. Stand by the movie section at a store and survey everyone that buys a movie.	<input type="radio"/>	<input checked="" type="radio"/>

- 4 The box plots show the amount of rainfall, in inches, in two different towns during storms. Express the difference in the median amounts of rainfall as a multiple of the IQR for each data set. Show your work.



$$\begin{array}{lcl}
 & B & A \\
 \text{Median} & 8 - 4 = 4 & \\
 \text{IQR} : A : 12 - 2 = 10 & & A \\
 & B : 14 - 6 = 8 & 4 \div 10 = 0.4 \\
 & & B \\
 & & 4 \div 8 = 0.5
 \end{array}$$

**SOLUTION** The difference in the medians is 0.4 times the IQR for Town A's data and 0.5 times the IQR for Town B's data.



- 5 Samuel buys 3 bottles of juice that each have an original price of \$2.80. He uses a coupon for 35% off. How much does Samuel pay for 3 bottles of juice?

A \$5.46

B \$2.94

C \$1.82

D \$0.98

$$(0.65 \cdot 2.80) \cdot 3$$

$$(1.82) \cdot 3$$

$$5.46$$

- 6 Grayson and Theo collect items to recycle. The table shows the number of metal and plastic items each person collects. If Grayson collects 400 items and Theo collects 300 items, who would be expected to have more metal items? Show your work.

	Metal	Plastic
Grayson	33	27
Theo	13	7

Grayson

$$\frac{33}{60} = \frac{x}{400}$$

$$13200 \div 60$$

$$220$$

Theo

$$\frac{13}{20} = \frac{x}{300}$$

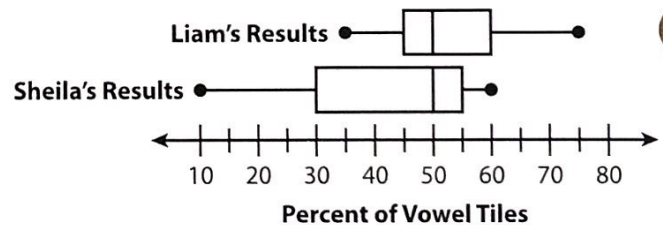
$$3900 \div 20 = 195$$

**SOLUTION** Grayson would be expected to collect more metal items.





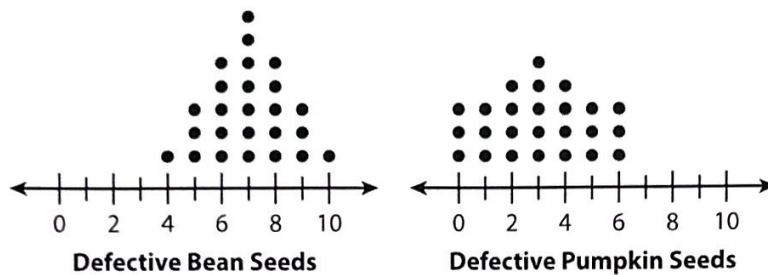
Liam and Sheila have a container with 400 letter tiles. Each letter tile shows either a consonant or a vowel. They each select a sample of letter tiles from the container, count the number that show vowels, and return the letter tiles to the container. They both collect 30 samples, as shown in the box plots. Would it be better to use one of Liam's or Sheila's samples to make an estimate of the number of vowel tiles in the container? Explain your reasoning.



**SOLUTION** Liam's. The data from Liam's samples are more tightly clustered around the center than the data from Sheila's samples. By using one of Liam's samples, there is a smaller chance of using a misleading sample.



- 9 A seed company tests 25 random samples of 250 bean seeds and 25 random samples of 250 pumpkin seeds. The dot plots show the number of defective seeds in each sample. The owner wants to order 1,750 bean seeds and 1,750 pumpkin seeds. How many more defective bean seeds would be expected than defective pumpkin seeds? Show your work.



Mean: 7

$$\frac{4 + 5(3) + 6(5) + 7(7) + 8(5) + 9(3) + 10}{25}$$

$$\frac{1}{250} = \frac{x}{1750}$$

$$12250 \div 250$$

49 defective

Mean: 3

$$\frac{0 + 1(3) + 2(4) + 3(5) + 4(4) + 5(3) + 6(3)}{25}$$

$$\frac{3}{250} = \frac{x}{1750}$$

$$5250 \div 250$$

21 defective

$$\begin{array}{r} 49 \\ - 21 \\ \hline 28 \end{array}$$

**SOLUTION** 28 more defective bean seeds would be expected

- 10 Last year, 470 people attended Fairfield Community Day. This year, 585 people attended the event. To the nearest percent, what is the percent change in the number of people who attended Fairfield Community Day?

A 19%

B 20%

**C 24%**

D 25%

$$\begin{array}{r} 585 \\ - 470 \\ \hline 115 \end{array}$$

$$\frac{115}{470} = \frac{x}{100}$$

$$11500 \div 470$$

24.46...

- 11 Arielle wants to survey soccer players to determine whether they would prefer to wear short-sleeved or long-sleeved jerseys. Arielle decides to go to a soccer game and survey every fourth person watching the game. Is this sample likely to be representative of soccer players? Explain your reasoning.

**SOLUTION** No. This sample includes people who are not on the team so it is not representative



- 12 The principal of Carver Middle School wants to build a student lounge. The principal wants to know how many students would want table tennis.

**PART A** What is one way the principal could select a random sample that would be representative of the middle school students? Explain your reasoning.

**SOLUTION** The principal could spin an alphabet spinner four times and survey every student whose last name starts with one of the four letters. This would make a random sample where every student would have a chance of being selected.

**PART B** The principal surveys a random sample of 120 students about table tennis. The results are shown in the table. If the middle school has 450 Grade 7 students and 350 Grade 8 students, about how many total students would be expected to want table tennis? Show your work.

	Want Table Tennis	Do Not Want Table Tennis
Grade 7	13	27
Grade 8	31	49

$$\frac{13}{40} = \frac{x}{450}$$

$$5850 \div 40$$

$$146.25$$

$$\frac{31}{80} = \frac{x}{350}$$

$$10850 \div 80$$

$$135.625$$

$$\begin{array}{r} 146.25 \\ + 135.625 \\ \hline 281.875 \end{array}$$

**SOLUTION** About 282 students would want table tennis