

12-2

Frequency and Histograms



Vocabulary

Review

A researcher conducted a survey to determine the favorite colors of 130 people. Tally marks are used at the right to show the *data*.

| Color | Number of Votes |
|--------|-----------------|
| Blue | |
| Pink | |
| Yellow | |
| Green | |
| Purple | |
| Red | |

- The color ? received the most votes.
- The color pink received votes.
- more people voted for green than for pink.
- Which two colors are closest in the number of votes they received?

 and

Vocabulary Builder

frequency (noun) FREE kwun see

Related Words: frequent (adjective), frequents (verb), frequently (adverb)

Definition: The **frequency** of an event is the number of times the event occurs.

Example: If 39 people vote for pizza and 28 people vote for hamburgers, the **frequency** of pizza is 39. The **frequency** of hamburgers is 28.

Use Your Vocabulary

Complete each statement with the appropriate word from the list.

frequently frequents frequency

- The tally chart shows how ? each color occurs.
- During cold and flu season, the ? of student absences rises.
- Use the data set below to complete each sentence.

A A A A B B B C C C D D

The letter occurs with the greatest frequency. Its frequency is .

A **frequency table** groups a set of data values into intervals and shows the frequency for each interval. Intervals in frequency tables do not overlap, do not have any gaps, and are usually of equal size.



Problem 1 Making a Frequency Table

Got It? The numbers of home runs by the batters in a local home run derby are listed below. What is a frequency table that represents the data? Use intervals of 5.

7 17 14 2 7 9 5 12 3 10 4 12 7 15

8. Complete the boxes to show the end of each interval of 5. Then count the number of home-run data values in the interval and complete the blanks on the right.

1-5 There is/are data value(s) in this interval.

6- There is/are data value(s) in this interval.

11- There is/are data value(s) in this interval.

16- There is/are data value(s) in this interval.

9. Use your findings to make a frequency table.

| Interval | Frequency |
|--------------------------|----------------------|
| 1-5 | <input type="text"/> |
| 6- <input type="text"/> | <input type="text"/> |
| 11- <input type="text"/> | <input type="text"/> |
| 16- <input type="text"/> | <input type="text"/> |

A **histogram** is a graph that can display data from a frequency table. A histogram has one bar for each interval. The height of each bar shows the frequency of the interval it represents. There are no gaps between bars. The bars are often of equal width.



Problem 2 Making a Histogram

Got It? The finishing times, in seconds, for a race are shown below. What is a histogram that represents the data?

95 105 83 80 93 98 102 99 82 89 90 82 89

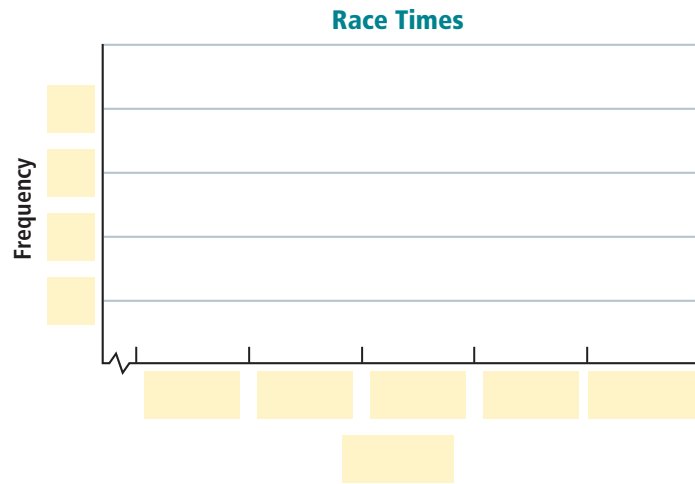
10. **Multiple Choice** Which of the following sets of intervals could be used for a frequency table to represent the data?

- | | | | |
|-----------|-----------|-----------|-----------|
| (A) 85-90 | (B) 80-85 | (C) 80-85 | (D) 80-85 |
| 91-96 | 86-91 | 90-95 | 85-90 |
| 97-102 | 92-97 | 96-101 | 90-95 |
| 103-108 | 98-103 | 102-107 | 95-100 |
| | 104-109 | | 100-105 |

11. Use your answer from Exercise 10 to make a frequency table.

| Time (s) | Frequency |
|----------|-----------|
| | |
| | |
| | |
| | |
| | |

12. Draw a histogram on the axes provided.



You can describe a histogram by its shape.

- If the bars are roughly the same height, the histogram has a *uniform* shape.
- If you can draw a vertical line that divides a histogram into two parts that are close to mirror images, then the histogram has a *symmetric* shape.
- If the histogram has one peak that is not in the center, the histogram has a *skewed* shape.

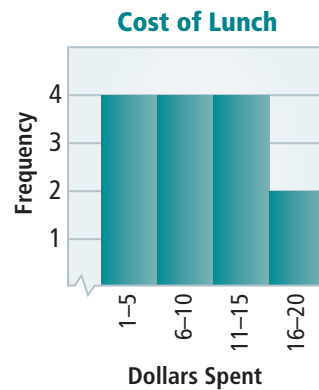
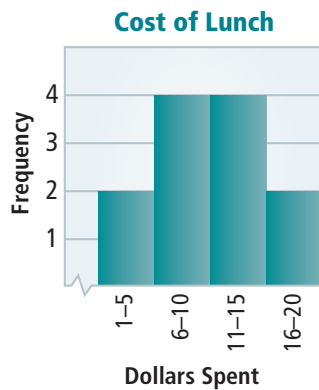
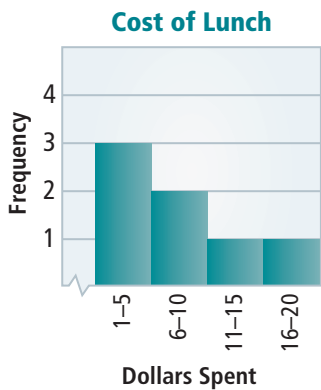


Problem 3 Interpreting Histograms

Got It? The following set of data shows the numbers of dollars Jay spent on lunch over the last two weeks. Make a histogram of the data. Is the histogram *uniform*, *symmetric*, or *skewed*?

17 1 4 11 14 14 5 16 6 5 9 10 13 9

13. Cross out the histograms that do NOT represent the data.



14. Circle the word that best describes the histogram you did not cross out in Exercise 13.

uniform

symmetric

skewed



Problem 4 Making a Cumulative Frequency Table

Got It? What is a cumulative frequency table that represents the data below?

12 13 15 1 5 7 10 9 2 2 7 11 2 1 0 15

15. Complete the cumulative frequency table.

| Interval | Frequency | Cumulative Frequency |
|----------|----------------------|--------------------------------|
| 0–5 | <input type="text"/> | 7 |
| 6–11 | 5 | 7 + 5, or <input type="text"/> |
| 12–17 | <input type="text"/> | <input type="text"/> |



Lesson Check • Do you UNDERSTAND?

Compare and Contrast What is the difference between a symmetric histogram and a skewed histogram?

16. Underline the correct word to complete each sentence.

If you can draw a vertical line to make two parts of the histogram that are mirror images, then the histogram is symmetric / skewed.

If the bars of the histogram are *not* roughly the same height AND they are not symmetric, then the histogram is uniform / skewed.

17. How are skewed histograms and symmetric histograms different?



Math Success

Check off the vocabulary words that you understand.

frequency frequency table histogram cumulative frequency table

Rate how well you can *make and interpret frequency tables and histograms*.

