

10-1

Scatter Plots

Check Skills You'll Need

1. **Vocabulary Review**
What is an **ordered pair**?

Graph each point on a coordinate plane.

2. $A(1, -2)$
3. $B(-3, 5)$

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Lesson 1-7

What You'll Learn

To interpret and make scatter plots of bivariate data

New Vocabulary scatter plot, bivariate data

Why Learn This?

You can use a scatter plot to see the relationship between the number of tickets that were sold to a soccer game and the amount of money collected in ticket sales.



Bivariate data show the relationship between two variables. A **scatter plot** is a graph that displays bivariate data as ordered pairs.

CONTENT STANDARDS

8.SP.1, 8.SP.2

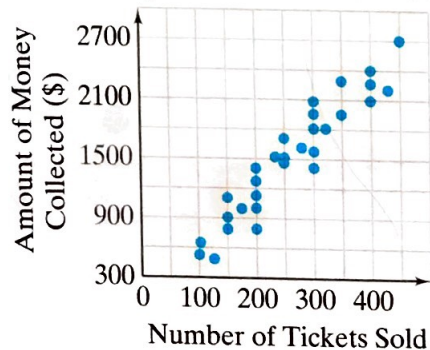
EXAMPLE

Reading Scatter Plots

- 1 On the graph at the right, tell what the ordered pair $(150, 1,100)$ represents.

Each point on the scatter plot represents one ordered pair (number of tickets sold, amount of money collected (\$)). So for $(150, 1,100)$, 150 represents the number of tickets sold to a soccer game, and 1,100 represents the amount of money, in dollars, collected in ticket sales at that game.

Number of Tickets Sold & Money Collected at Soccer Games



Quick Check

1. a. In the scatter plot above, what does $(350, 2,275)$ represent?
b. How many tickets were sold when the amount of money collected was \$2,700?

Given two different sets of numeric data, you can construct a scatter plot. Most scatter plots are in the first quadrant of the coordinate plane because real-world data are usually positive numbers.

EXAMPLE Making Scatter Plots

- 2 **Cars** Make a scatter plot for the data in the table below.



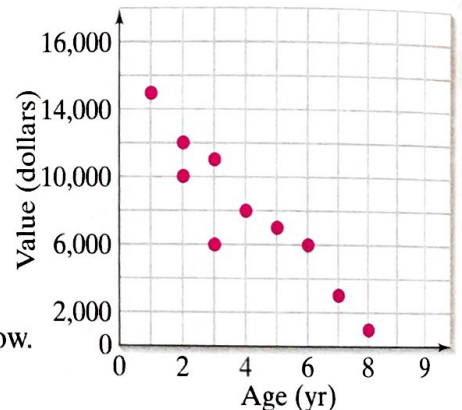
What's a Car Worth?
Average Value of a Midsize Sedan (dollars)

Age (yr)	Value	Age (yr)	Value
3	11,000	1	15,000
2	12,000	4	8,000
7	3,000	5	7,000
8	1,000	3	6,000
2	10,000	6	6,000

Step 1 Use the horizontal axis to represent the age of the car. The greatest age is 8 years. So a reasonable scale on the *Age* axis is 0 to 9.

Step 2 Use the vertical axis to represent the value of the car. The greatest value is \$15,000. So a reasonable scale on the *Value* axis is 0 to 16,000.

Step 3 Plot the data in the table. For example, for the age of 3 years and the value of \$11,000, plot (3, 11,000).



Quick Check

2. Make a scatter plot for the data below.

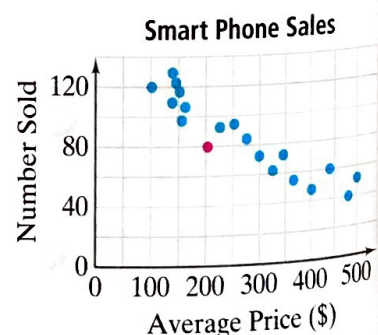
Age (yr)	1	15	6	19	12	3	5	13	20	6
Sleep Time (h)	15	8.5	9.5	7	9.25	12	11	9	7	9.75

Check Your Understanding

1. **Vocabulary** Which type of data compares two variables?

Use the scatter plot to complete Exercises 2–5.

- What information is shown on the horizontal axis of the scatter plot?
- What information is shown on the vertical axis of the scatter plot?
- What does the red data point represent?
- How many smart phones were sold for an average price of \$100?



Homework Exercises

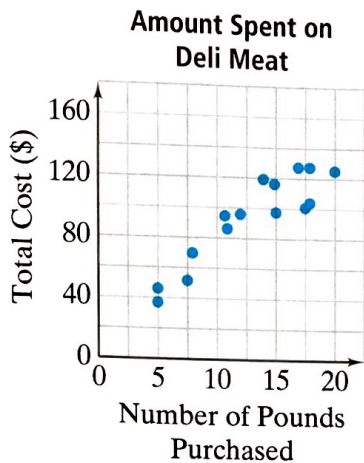
For more exercises, see **Extra Skills and Word Problems**.

Use the given scatter plots to complete Exercises 6 and 7.

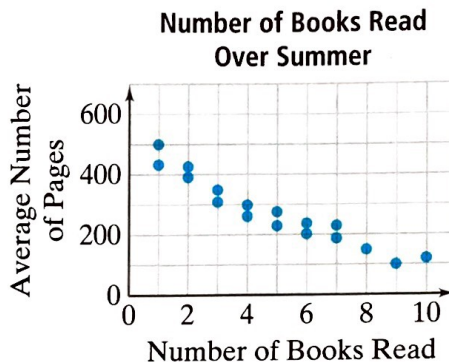
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Exercises	See Examples
6-7	1
8-9	2

6. What does the point (8, 70) represent?



7. What does the point (9, 100) represent?



Make a scatter plot for each set of data.

8. Roommates: 3 2 3 2 4
 Rent (per person): \$400 \$900 \$500 \$700 \$300
9. Hits: 7 8 4 11 8 2 5 9 1 4
 Runs: 3 2 2 7 4 2 1 3 0 1

GPS

10. **Guided Problem Solving** You can use a scatter plot to estimate a value between two known values. Estimate the world production of oil when the United States produced 12% of the world's oil.
- Draw a scatter plot.
 - Find 12% on the vertical axis. Move horizontally to the line of points. Estimate where the new point would fit in the pattern. Then move down to the horizontal axis.

Oil Production 1960–2000
(billion barrels)

World Oil Production	U.S. Percent of World Oil Production
45.9	21
52.8	16
59.9	13
68.3	9
72.5	7

SOURCE: U.S. Energy Information Administration

11. a. Make a scatter plot for the data in the table below.

Height and Weight of Football Players

Height (in.)	77	75	76	70	70	73	74	74	73
Weight (lb)	230	220	212	190	201	245	218	260	196

- b. **Writing in Math** Which display—the table or the scatter plot—do you think is a more appropriate display of the data? Explain your reasoning.

For each topic, decide how a scatter plot of the data would likely look. Explain your reasoning.

12. number of children living in a town and number of schools in the town
13. speed of a runner and amount of time to complete a race
14. the price of an apple at a grocery store and the price of a peach at a farmers' market
15. **Reasoning** Is it possible to make a scatter plot for the data in the table below? If so, make the scatter plot. If not, explain why.

Favorite Colors of Students

Student	Jon	Maya	Arie	Luz	Jose	Alla	Andre	Tori	Joe
Favorite Color	blue	red	black	pink	red	blue	green	red	brown

16. **Challenge** Describe a real-world situation that can be modeled with a scatter plot in the second, third, or fourth quadrant.

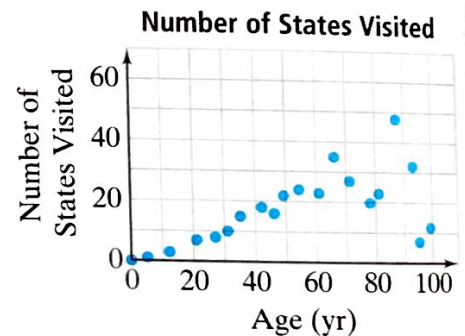
Test Prep and Mixed Review

Practice

Multiple Choice

17. According to the scatter plot, which of the following statements is NOT true?

- (A) The point (66, 35) represents a person who is 66 years old and has visited 35 states.
- (B) The point (35, 15) represents a 15-year old person who has visited 35 states.
- (C) Each point on the scatter plot represents the age of a person and the number of states he or she has visited.
- (D) You could make another scatter plot of the data with *Number of States Visited* on the horizontal axis and *Age (yr)* on the vertical axis.



18. What type of transformation flips a figure over a line?
 - (F) translation
 - (G) reflection
 - (H) rotation
 - (J) dilation
19. A television is 48.4 in. wide and 28.4 in. high. What is the diagonal dimension of the television to the nearest tenth?
 - (A) 20 in.
 - (B) 56.1 in.
 - (C) 76.8 in.
 - (D) 3,149.1 in.
20. A choral group sells a total of 225 tickets to its first show. A student ticket costs \$5. An adult ticket costs \$8. Total ticket sales are \$1,425. How many of each type of ticket were sold?

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Exercise	See Lesson
20	5-2