

Chapter 9

Data Analysis & Displays

Scatter Plot

2 ACTIVITY: Constructing a Scatter Plot

Work with a partner. The table shows the number of absences and the final grade for each student in a sample.

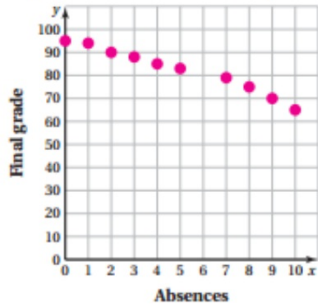
- Write the ordered pairs from the table. Then plot them in a coordinate plane.
- Describe the relationship between absences and final grade. How is this relationship similar to the relationship between weight and circumference in Activity 1? How is it different?
- MODELING** A student has been absent 6 days. Use the data to predict the student's final grade. Explain how you found your answer.

Absences	Final Grade
0	95
3	88
2	90
5	83
7	79
9	70
4	85
1	94
10	65
8	75

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Absences	Final Grade
0	95
3	88
2	90
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7	79
9	70
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8	75

- a. Write the ordered pairs from the table. Then plot them in the coordinate plane.



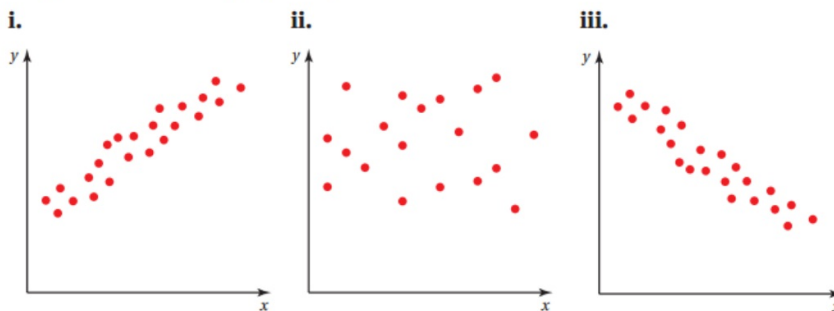
(0, 95)
 (3, 88)
 (2, 90)
 (5, 83)
 (7, 79)
 (9, 70)
 (4, 85)
 (1, 94)
 (10, 65)
 (8, 75)

- b. Describe the relationship between absences and final grade. How is this relationship similar to the relationship between weight and circumference in Activity 1? How is it different?

As the number of absences increases, the final grade decreases; close to a line; falling from left to right

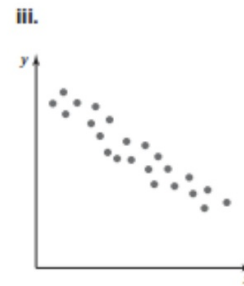
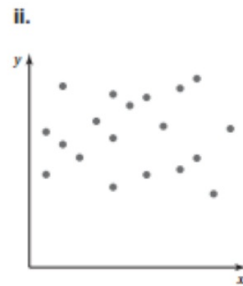
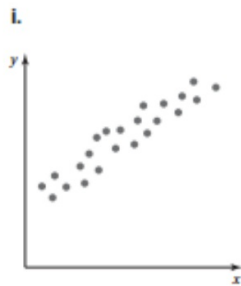
Work with a partner. Match the data sets with the most appropriate scatter plot. Explain your reasoning.

- month of birth and birth weight for infants at a day care
- quiz score and test score of each student in a class
- age and value of laptop computers



Work with a partner. Match the data sets with the most appropriate scatter plot. Explain your reasoning.

- a. month of birth and birth weight for infants at a day care **ii**
- b. quiz score and test score of each student in a class **i**
- c. age and value of laptop computers **iii**



4. How would you define the term *scatter plot*?

5. **IN YOUR OWN WORDS** How can you construct and interpret a scatter plot?

4. How would you define the term *scatter plot*?

***Sample answer:* a graph that shows the relationship between two data sets**

5. **IN YOUR OWN WORDS** How can you construct and interpret a scatter plot?

set up axes, write and plot ordered pairs; positive or negative, linear or nonlinear, clusters, gaps, outliers

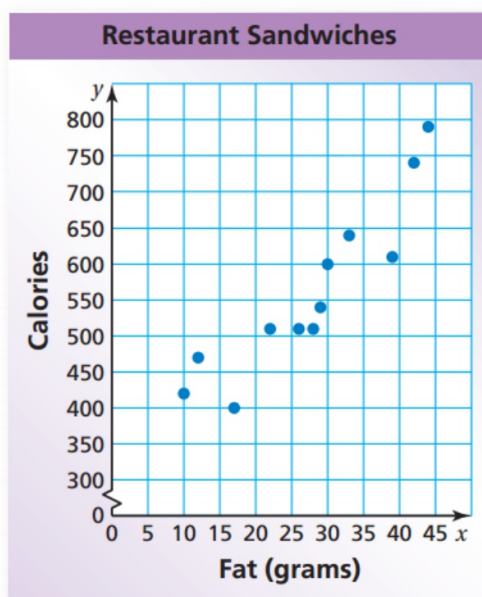
Scatter Plot

A **scatter plot** is a graph that shows the relationship between two data sets. The two sets of data are graphed as ordered pairs in a coordinate plane.

The scatter plot at the left shows the amounts of fat (in grams) and the numbers of calories in 12 restaurant sandwiches.

a. How many calories are in the sandwich that contains 17 grams of fat?

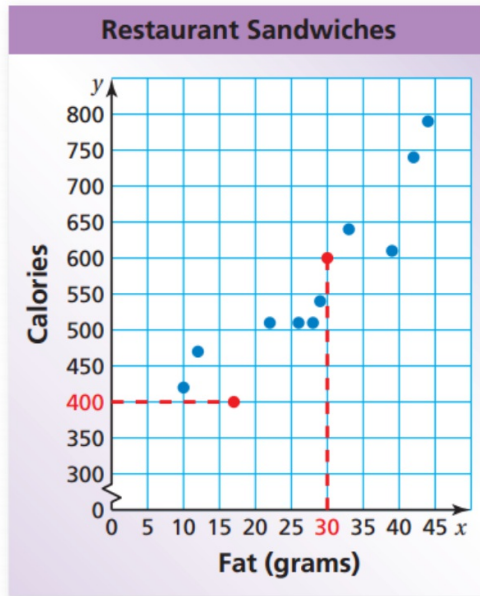
b. How many grams of fat are in the sandwich that contains 600 calories?



c. What tends to happen to the number of calories as the number of grams of fat increases?

Looking at the graph, the plotted points go up from left to right.

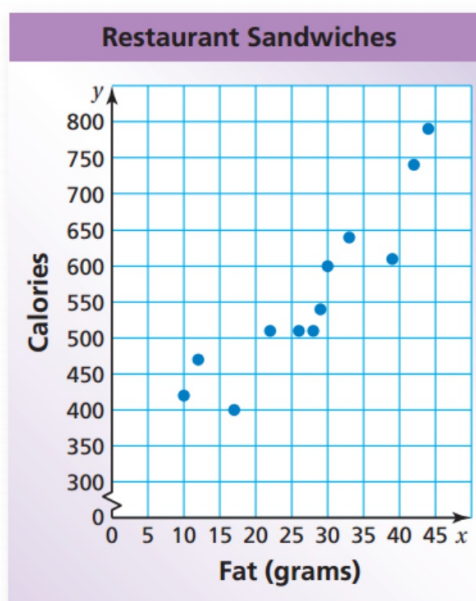
So, the sandwich has 400 calories.



So, the sandwich has 30 grams of fat.

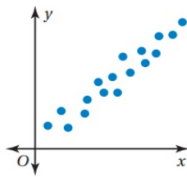
So, as the number of grams of fat increases, the number of calories increases.

- WHAT IF?** A sandwich has 650 calories. Based on the scatter plot in Example 1, how many grams of fat would you expect the sandwich to have? Explain your reasoning.



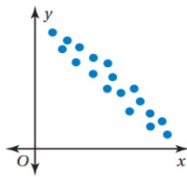
A scatter plot can show that a relationship exists between two data sets.

Positive Linear Relationship



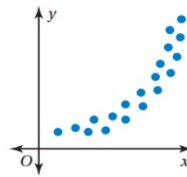
The points lie close to a line. As x increases, y increases.

Negative Linear Relationship



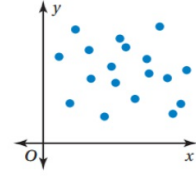
The points lie close to a line. As x increases, y decreases.

Nonlinear Relationship



The points lie in the shape of a curve.

No Relationship

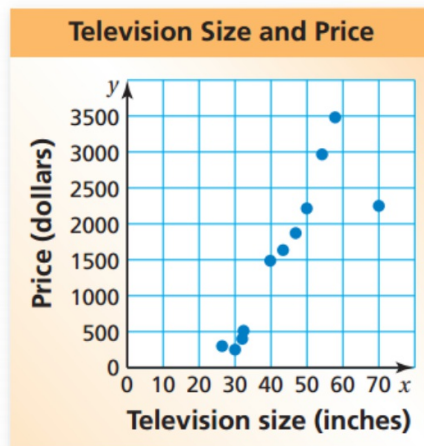


The points show no pattern.

EXAMPLE 2 Identifying Relationships

Describe the relationship between the data. Identify any outliers, gaps, or clusters.

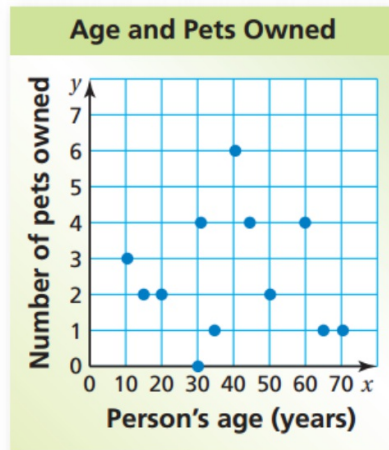
a. television size and price



The points appear to lie close to a line. As x increases, y increases.

❖ So, the scatter plot shows a positive linear relationship. There is an outlier at (70, 2250), a cluster of data under \$500, and a gap in the data from \$500 to \$1500.

b. age and number of pets owned



The points show no pattern.



So, the scatter plot shows no relationship. There are no obvious outliers, gaps, or clusters in the data.

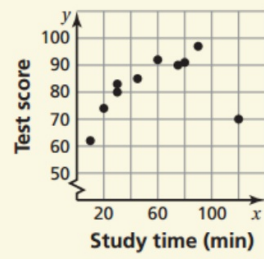
On Your Own

2. Make a scatter plot of the data and describe the relationship between the data. Identify any outliers, gaps, or clusters.

Study Time (min), x	30	20	60	90	45	10	30	75	120	80
Test Score, y	80	74	92	97	85	62	83	90	70	91

On Your Own

2.



positive linear relationship; There is a gap in the data from $x = 90$ to $x = 120$; outlier: $(120, 70)$; no obvious clusters