

# Scatter Plots

When data in the form of ordered pairs is graphed as points in a coordinate plane, the result is called a **scatter plot**. A scatter plot sometimes reveals a pattern in the relationship between two variables.

**EXAMPLE 1** **Weight versus age for female babies**

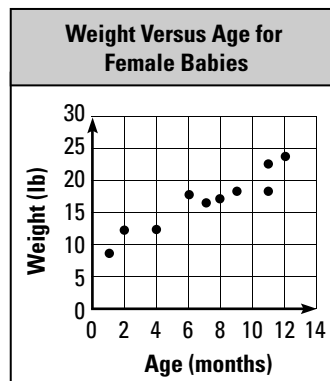
The table gives the age and weight for ten female babies, of various ages, born in the U.S. in 2005.

Age (months)	1	2	4	6	7	8	9	11	11	12
Weight (pounds)	8.6	12.5	13.1	17.9	16.5	17.2	18.4	18.3	22.8	23.9

- Create a scatter plot of the data, with age on the horizontal axis and weight on the vertical axis.
- Would you expect the relation between age and weight to be a function? *Discuss.* Review Lesson 1.7 as necessary.
- What general trend is evident in the relation between age and weight?
- What is a good estimate for the likely weight of a baby girl at the age of 10 months?

**Solution:**

- The scatterplot is as shown.



- Any one baby will have only a single recorded weight at each monthly checkup, so for an individual baby the age-weight relation can be considered a function. But in a population of babies, it is possible for the same age to correspond to several different weights, and then the relation is not a function. In the data given, for instance, the age of 11 months is associated with two different weights.
- The trend is for babies to increase in weight as they get older.
- A weight of about 20 pounds at 10 months would be well in line with the pattern of the data. ■

**Scatter Plots** *continued***Practice**

- Reasoning** Identify pairs of real-world variables whose scatterplot would match each of the following descriptions. *Explain* your answers.
  - One variable decreases as the other increases.
  - There is no pattern to the relation between the variables.
- Writing** *Explain* why it would make no sense to try to construct a scatter plot relating different flavors of ice cream to the number of calories per scoop.
- World Geography** In the list of the world's most populous countries, China and India rank first and second. The table shows the next ten countries, as of mid-2004.

<b>Country</b>	<b>Land area (millions of sq km)</b>	<b>Population (millions)</b>
Russia	17.1	144
United States	9.6	293
Brazil	8.5	184
Mexico	2.0	105
Indonesia	1.9	238
Nigeria	0.9	137
Pakistan	0.8	159
Japan	0.4	127
Philippines	0.3	86
Bangladesh	0.1	141

- Construct a scatter plot with land area as the independent variable and population as the dependent variable.
  - Describe* the pattern of the data and comment on the relationship, for the countries shown, between land area and population size.
  - How does a country's population *density* show up on the graph? (Hint: Of the countries on the list, Bangladesh has the highest density and Russia has the lowest.)
  - Challenge** Give two reasons why this scatter plot would not be a good tool for predicting the population of a country with a land area of 5 million square kilometers.
- Challenge** The plot from Example 1 is used to make two predictions: the weight of a baby girl aged 3 months, and the weight of a baby girl aged 14 months. Which prediction is likely to be more accurate? *Explain*. Give two separate reasons for your answer.
  - Activity** Use an Internet search engine to locate real-world data in the form of a table relating two quantitative variables. Copy the table and paste it into a spreadsheet application. Use the application's chart utility to create a scatter plot. Describe the pattern of points and discuss the usefulness of the graph for making predictions.