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Demographers often characterize population growth by a doubling time—the time it takes the population to double. During the late 20th century, the doubling time for human population was about 40 years. If population continued to double at this rate, world population would reach 34 billion by 2100 and 192 billion by 2200. By about 2650, human population would be so large that it would not fit on the Earth even if everyone stood elbow-to-elbow everywhere.

## Pictographs

For our final example urging caution with graphics, we consider *pictographs*, or graphs that are embellished with additional art work. The art work may make the graph more appealing, but it can also distract or mislead.

Figure 3.45 is a pictograph showing the rise in world population from 1804 to 2054 (numbers for future years are based on United Nations projections). The lengths of the bars correspond correctly to world population for the different years listed. However, the artistic embellishments of this graph can be deceptive in several ways. For example, your eye may be drawn to the figures of people lining the globe. Because this line of people rises from the left side of the pictograph to the center and then falls, it might give the impression that future world population will be declining. In fact, the line of people is purely decorative and carries no information.

Perhaps the most serious problem with this pictograph is that it makes it appear that world population has been rising linearly. However, notice that the time intervals on the horizontal axis are not the same in each case. For example, the interval between the bars for 1 billion and 2 billion people is 123 years (from 1804 to 1927), but the interval between the bars for 5 billion and 6 billion people is only 12 years (from 1987 to 1999).

Pictographs are very common, but as this example shows, you have to study them carefully to extract the essential information and not be distracted by the cosmetic effects.

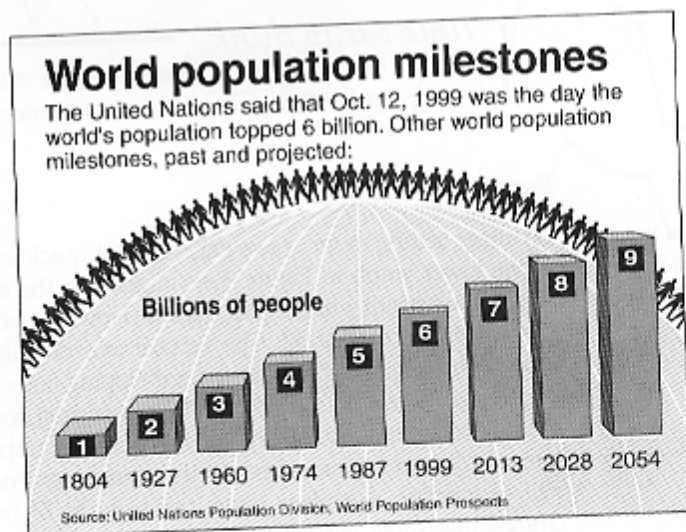


FIGURE 3.45. SOURCE: James Abundis and Bob Laird, USA TODAY, October 18, 1999.