

6.1 Activity

A visual display, such as a graph, helps a reader to see and understand an entire data set at a glance. It can make it easier to identify important subsets and trends in the data. In this lesson, you will examine several types of graphs and evaluate their usefulness.

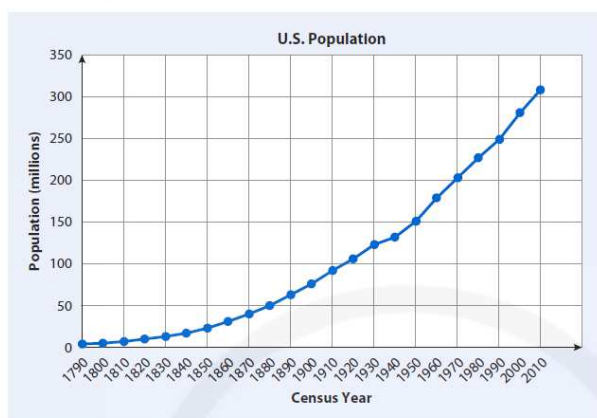
You are probably familiar with the following types of graphs:

- bar graphs
- circle graphs
- pictographs
- line graphs

Each type of graph is useful for certain kinds of data. Sometimes more than one type of graph can be appropriate for a single data set.

TYPES OF GRAPHS

A **line graph** is often used to show trends over time. The line graph below shows the changes in the U.S. population from 1790 to 2010. Line segments connect the points on the graph even though data are not available for non-census years. This is often done for line graphs in order to help show trends more clearly.



1. Describe the overall trend in the U.S. population between 1790 and 2010.
2. What would the slope of one of the line segments tell you?
3. During what 10-year period did the population grow the least?
4. When was the population about half of its value in 2010?

① The population has increased steadily, with a greater rate of change in later years compared to earlier years.

② The slope would equal the average rate of change of the population between any two census years.

③ 1790-1800

④ $2010 \approx 310$ mil
 $\text{so } \frac{1}{2}(310) = 155 \text{ mil}$
 $\text{so approx } 1950$

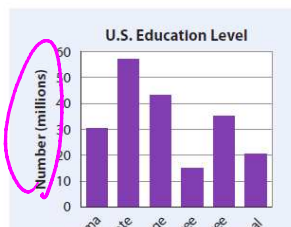
A **bar graph** can be used to compare amounts in different categories.

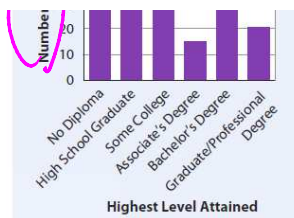
The table shows the highest education level reached by people in the United States who were at least 25 years old in 2008.

Education Level	Number of People	Percent of Total Population
No high school diploma	30,068,765	15
High school graduate	57,032,214	29
Some college	42,565,378	21
Associate's degree	15,006,479	8
Bachelor's degree	35,003,071	17
Graduate/professional degree	20,354,111	10

SOURCE: AMERICAN COMMUNITY SURVEY 2008

This vertical bar graph (sometimes called a *column graph*) allows you to quickly see the relative numbers of people in each educational category.





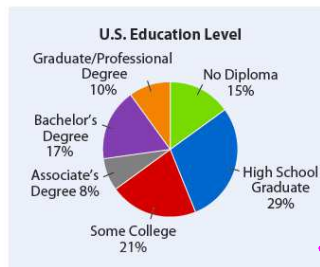
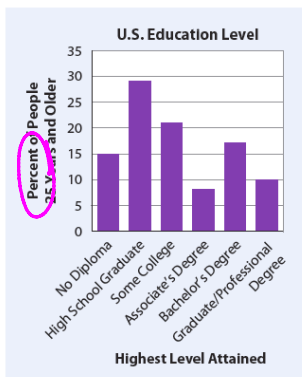
5. What was the most common education level for people in the United States who were over 25 in 2008?

6. Describe another way to display the data in a bar graph.

*High School Graduates
Create a horizontal bar graph by switching the axes.*

The bar graph above shows the number of people who have reached each education level. But the categories taken together make up the whole population of people in the United States who were at least 25 years old.

When the categories in a bar graph are parts of a whole, it is more common to show the amount in each category as a percent of the whole as shown in the graph below.



A circle graph or pie chart is also frequently used to show parts of a whole.

7. What percent of people had some kind of college degree? $10 + 17 + 8 = 35\%$

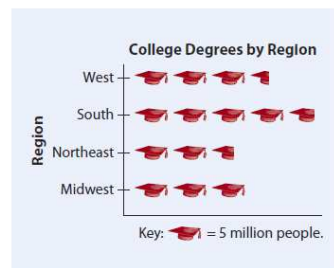
8. What percent of people had completed high school but did not have a college degree? $29 + 21 = 50\%$

9. Must the percents in a circle graph always add to exactly 100%? Explain.

Yes, since the graph is used to show parts of a whole; however due to rounding, it may be off.

Pictographs are often used in newspapers and magazines to emphasize the kind of data that are being displayed.

This graph shows the actual numbers of college graduates in the various regions of the United States.



10. Which region has the most residents with college degrees? How do you know?

South; represented w/ the greatest # of caps

11. Which region has the fewest residents with college degrees?

Northeast

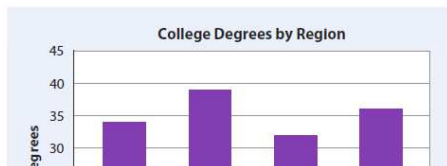
12. Can you tell from the graph what percent of people in the Midwest have college degrees? Explain.

13. About how many people in the West have college degrees?

No - you would need to know the total # of people who live in the Midwest to find the % of people in the Midwest that have college degrees.

EXAMPLE

The bar graph shows the percent of people 25 years of age or older in various regions of the United States who have earned at least one type of college degree.



A) The bar graph shows the percent of people with degrees. The South may have more people with college degrees, but that # is a smaller percent of the



- The pictograph in the Investigation showed that the South had more people with college degrees. However, the bar in this graph is tallest for the Northeast. Explain.
- Explain why the percents for all the bars do not add up to 100%.
- Would a circle graph be appropriate for these data? Explain.

people with degrees. The Northeast has more people with college degrees, but that # is a smaller percent of the overall population.

B) The bars show the percents of each region. The bars as a group do not represent one population.

c) A circle graph is not appropriate for this situation, since the bars do not represent parts of a whole.