1.9: Statistics: Analyzing Data by Using Tables & Graphs

HCPS III

- **Standard 12:** Data Analysis, Statistics, and Probability: STATISTICS: Interpret data using methods of exploratory data analysis
- **Standard 13:** Data Analysis, Statistics, and Probability: DATA ANALYSIS: Develop and evaluate inferences, predictions, and arguments that are based on data
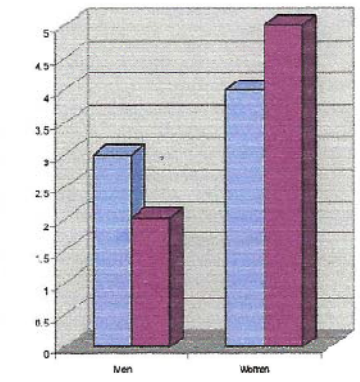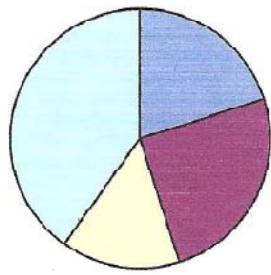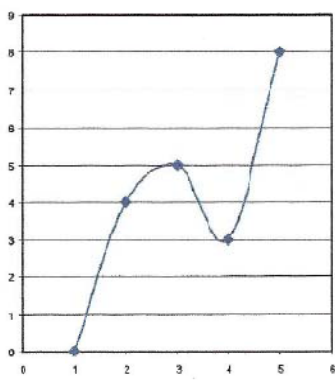
Objectives

- To analyze data given in tables and graphs (bar, line, & circle)
- To determine whether graphs are misleading.

Types of Graphs

Why are graphs and tables used?

They help you visualize data so that you can see the whole picture.

key concept

| Type of Graph	Bar Graph	Circle Graph	Line Graph
When to Use	To compare different categories of data (multiple sets)	To show data as parts of a whole set of data.	To show the change in data over time.
Visual			

Example 1: Analyze a Bar Graph

The table shows the number of men and women participating in NCAA championship sports programs from 2995 to 1999. The same data are displayed in a bar graph.

| NCAA Championship Sports Participation 1997–2001				
Year	'97–'98	'98–'99	'99–'00	'00–'01
Men	200,031	207,592	208,481	206,573
Women	133,376	145,832	146,617	149,115

Source: NCAA
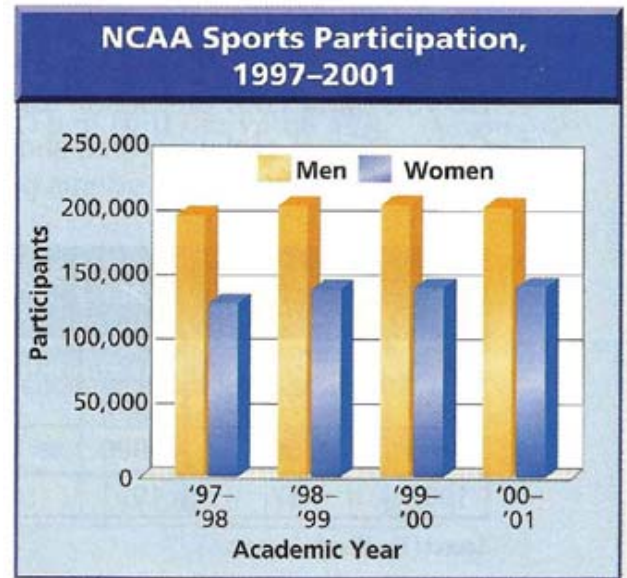
a.) Describe the general trend shown in the graph.

b.) Approximately how many more men than women participated in sports during the 1997-1998 school year?

c.) What was the total participation among men and women in the 2000-2001 academic year?

Example 2: Analyze a Circle Graph

A recent poll in New York asked residents whether cell phone use while driving should be banned. The results are shown in the circle graph.

a.) If 250 people in New York were surveyed, about how many would think that cell phone use while driving should be banned?

Should cell phone use while driving be banned?
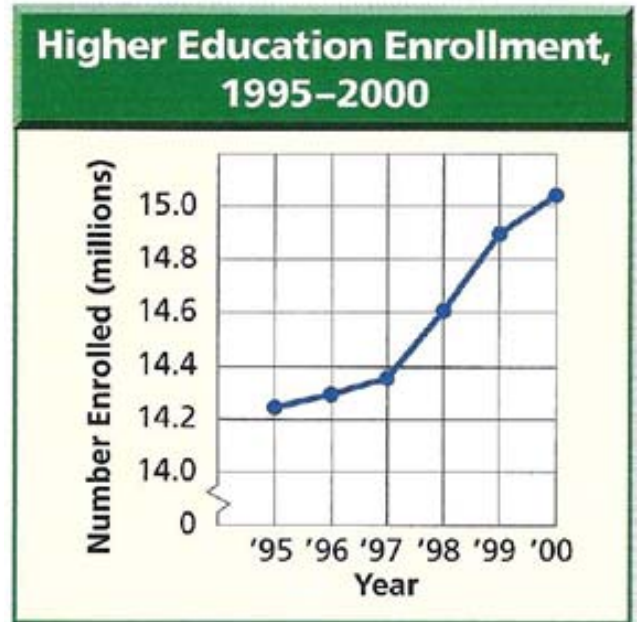
Don't know 3%

Yes 87%

No 10%
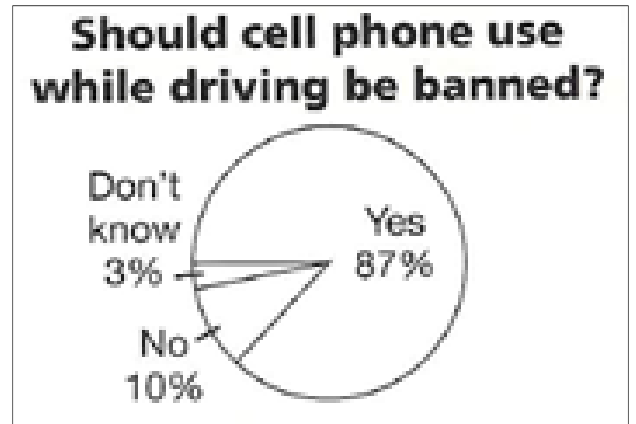
b.) If a city of 516,000 is representative of those surveyed, how many people could be expected not to know whether cell phone use while driving should be banned?

Example 3: Analyze a Line Graph

Refer to the line graph.

a.) Estimate the change in enrollment between 1995 and 1999.

Higher Education Enrollment, 1995–2000

Source: U.S. National Center for Educational Statistics

b.) If the rate of growth between 1998 and 1999 continues, predict the number of people who will be enrolled in higher education in year 2005.

c.) How would the change in enrollment between 1995 and 1997 compare to the change in enrollment between 1997 and 1999.
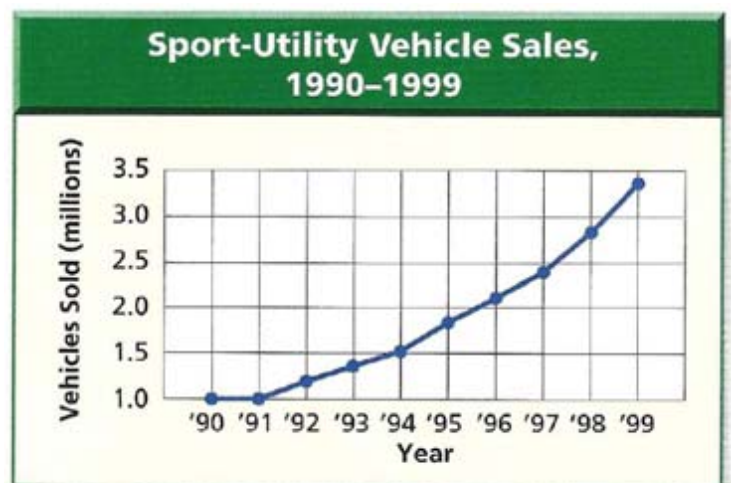
Misleading Graphs

Graphs are very useful for displaying data. However, graphs that have been constructed incorrectly can be confusing and can lead to false assumptions. Here are some common ways that a graph may be misleading:

- Graph is mislabeled.
- Numbers are omitted on an axis, but no break is shown.
- The tick marks on an axis are not the same distance apart or do not have the same-sized intervals.
- The percents on a circle graph do not have a sum of 100.

Example 4: Misleading Graphs

AUTOMOBILES. The graph shows the number of sport utility vehicle (SUV) sales in the United States from 1990 to 1999. Explain how the graph misrepresents the data.

Sport-Utility Vehicle Sales, 1990–1999

Vehicles Sold (millions): 3.5, 3.0, 2.5, 2.0, 1.5, 1.0

Year: '90 '91 '92 '93 '94 '95 '96 '97 '98 '99

Source: *The World Almanac*