

8.2 Tables, Pictographs, and Bar Graphs

8.2 OBJECTIVES

1. Read a table
2. Interpret a table
3. Create a pictograph
4. Use a table to create a pictograph
5. Read a bar graph

A **table** is a display of information in parallel rows or columns. Tables can be used anywhere that information is to be summarized.

Below is a table describing land area and world population. Each entry in the table is sometimes called a **cell**. This table will be used for Examples 1 and 2.

Continent or Region	Land Area (1000 sq mi)	% of Earth	Population 1900	Population 1950	Population 2000
North America	9400	16.2	106,000,000	221,000,000	305,000,000
South America	6900	11.9	38,000,000	111,000,000	515,000,000
Europe	3800	6.6	400,000,000	392,000,000	510,000,000
Asia (including Russia)	17,400	30.1	932,000,000	1,591,000,000	4,178,000,000
Africa	11,700	20.2	118,000,000	229,000,000	889,000,000
Oceania (including Australia)	3300	5.7	6,000,000	12,000,000	32,000,000
Antarctica	5400	9.3	Uninhabited	—	—
World Total	57,900		1,600,000,000	2,556,000,000	6,429,000,000

(Source: Bureau of the Census, U.S. Dept. of Commerce.)

Example 1

Reading a Table

From the table above, find each of the following.

- (a) What was the population of Africa in 1950?

Looking at the cell that is in the row labeled Africa and the column labeled 1950, we find a population of 229,000,000.

- (b) What is the land area of Asia in square miles?



The cell in the row Asia and column land area says 17,400. But note that the column is labeled “1000 sq mi.” The land area is 17,400 thousand square miles, or 17,400,000 sq mi.

**CHECK YOURSELF 1**

Use the table above to answer each question.

- (a) What was the population of South America in 1900?
- (b) What is the land area of Africa as a percent of Earth's land area?

We can frequently use a table to find answers to questions that are not directly answered as part of the table. The next example will illustrate.

Example 2**Interpreting a Table**

Use the world population and land area table to answer each of the following questions.

- (a) To the nearest tenth of a percent, what percent of the world's population was in North America in the year 2000?

Note that 305,000,000 of the world's 6,429,000,000 people lived in North America.

$$\frac{305,000,000}{6,429,000,000} \approx 0.0474 \approx 4.7\%$$

Note that, although North America has more than 16% of the Earth's land area, it has less than 5% of the world's population.

- (b) What percent of the Earth's habitable land is in Asia?

First, we must decide what is meant by "habitable land." We will assume anything outside of Antarctica is habitable. To find the amount of habitable land, we take the total of 57,900,000 and subtract Antarctica's 5,400,000. This leaves total habitable land of 52,500,000 sq mi.

$$\frac{17,400,000}{52,500,000} \approx 0.3314 \approx 33.1\%$$

- (c) What was the mean population for the six populated regions in 1900?

Although we could add the six numbers, note that they have already been totaled. Using that total, we find the average.

$$\frac{1,600,000,000}{6} \approx 267,000,000$$

**CHECK YOURSELF 2**

Use the world population and land area table to answer each of the following questions.

- (a) To the nearest percent, what was the increase in the population of Africa between 1950 and 2000?
- (b) Did world population increase by a greater percent between 1900 and 1950 or between 1950 and 2000?

If a table has only one or two columns of numeric information, it is often easier to interpret in picture form. A **graph** is a diagram that represents the connection between two or more things. A graph that uses pictures to represent quantities is called a **pictograph**.

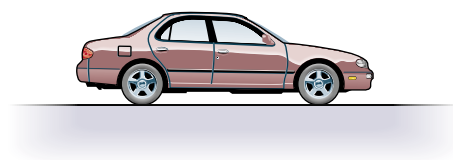
Example 3

Creating a Pictograph

Create a pictograph that displays the information in the following table.

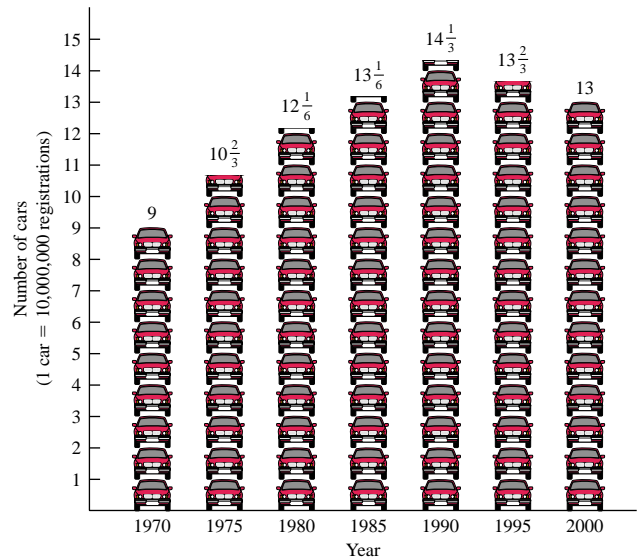
Cars Registered in the USA (Federal Highway Admin., U.S. Dept. of Transportation)	
Year	Cars Registered
1970	89,243,557
1975	106,705,934
1980	121,600,843
1985	131,664,029
1990	143,549,627
1995	136,066,045
2000	130,000,000* (est)

First, we must decide what to use as our picture unit. A car is the obvious choice in this case.



Second, we must decide the “value” of each car. Given the units in the table, we will let each car represent 10,000,000 registrations.

(Federal Highway Admin., U.S. Dept. of Transportation)	
Year	Cars Pictured
1970	9 cars
1975	$10 \frac{2}{3}$ cars
1980	$12 \frac{1}{6}$ cars
1985	$13 \frac{1}{6}$ cars
1990	$14 \frac{1}{3}$ cars
1995	$13 \frac{2}{3}$ cars
2000	13 cars





CHECK YOURSELF 3

Create a pictograph to represent the following table, which gives the percent of U.S. workers employed as farm workers.

(Economic Research Service, U.S. Dept. of Agriculture)	
Year	Percent of Workers in Farm Occupations
1800	73.2
1840	68.6
1880	57.1
1920	27.0
1960	6.1
2000	2.3

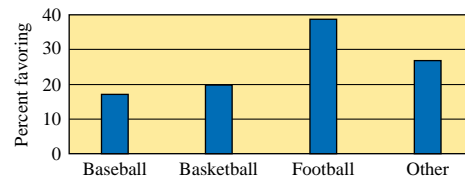
Other kinds of graphs also show the relationship of two sets of data. Perhaps the most common is the bar graph.

A bar graph is read in much the same manner as a pictograph.

Example 4

Reading a Bar Graph

The following bar graph represents the response to a 1995 Gallup poll that asked people what their favorite spectator sport was. In the graph, the information at the bottom describes the sport, and the information along the side describes the percentage of people surveyed. The height of the bar indicates the percentage of people who favor that particular sport.



- (a) Find the percentage of people for whom football is their favorite spectator sport.

As is the case with pictographs, we frequently have to estimate our answer when reading a bar graph. In this case, 38% would be a good estimate.

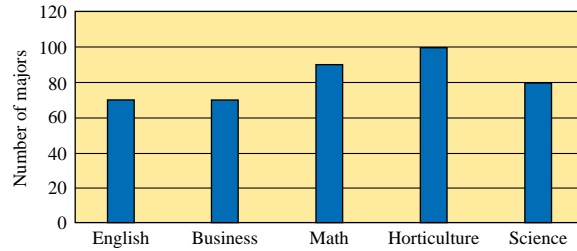
- (b) Find the percentage of people for whom baseball is their favorite spectator sport.

Again, we can only estimate our answer. It appears to be approximately 17% of the people responding who favored baseball.



CHECK YOURSELF 4

This bar graph represents the number of students who majored in each of five areas at Experimental Community College.



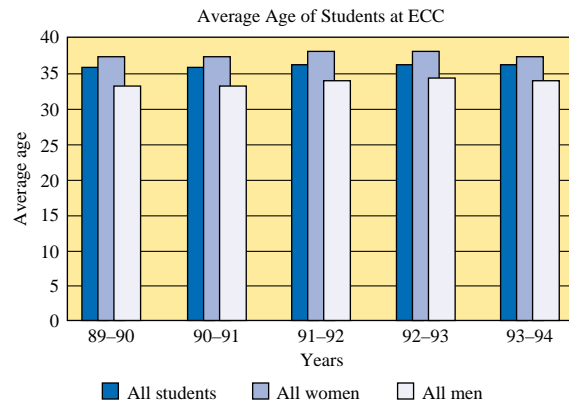
- (a) How many mathematics majors were there?
- (b) How many English majors were there?

Some bar graphs display additional information by using different colors or shading for different bars. With such graphs it is important to read the legend. The **legend** is the key that describes what each color or shade of the bar represents.

Example 5

Reading the Legend of a Graph

The following bar graph represents the average student age at ECC.



- (a) What was the average age of female students in 93-94?

The legend tells us that the ages of all women are represented as the medium blue color. Looking at the height of the medium blue column for the year 93-94, we see the average age was about 38.

- (b) Who tends to be older, male students or female students?

The medium blue bar is higher than the light blue bar in every year. Female students tend to be older than male students at ECC.



CHECK YOURSELF 5

Use the graph in Example 5 to answer the following questions:

- (a) Did the average age of female students increase or decrease between 92–93 and 93–94?
- (b) What was the average age of male students in 91–92?

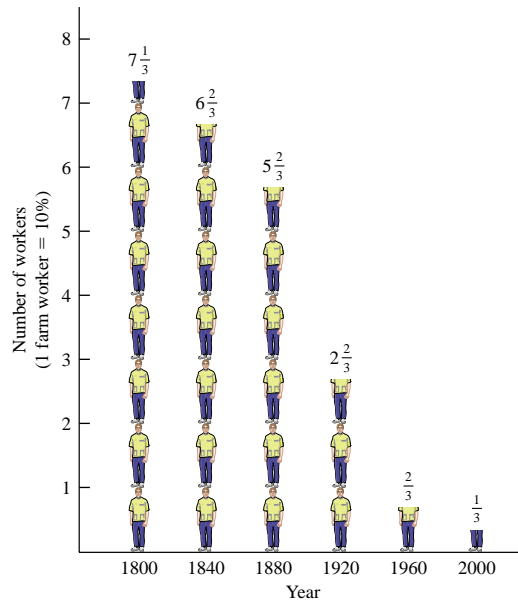
CHECK YOURSELF ANSWERS

1. (a) 38,000,000; (b) 20.2% 2. (a) 288.2%; (b) 1950–2000 (152% vs. 60%)

3.

**1 Worker = 10%
(Economic Research Service U.S. Dept. of Agriculture)**

Year	Workers Pictured
1800	7 $\frac{1}{3}$ workers
1840	6 $\frac{2}{3}$ workers
1880	5 $\frac{2}{3}$ workers
1920	2 $\frac{2}{3}$ workers
1960	$\frac{2}{3}$ worker
2000	$\frac{1}{4}$ worker



4. (a) 90; (b) 70 5. (a) It decreased; (b) 34



8.2 Exercises

Use the world population and land area table in the text for exercises 1 to 10. Round answers to the nearest tenth of a percent, unless the directions specify otherwise.

1. (a) What was the population in North America in 1950?
(b) What is the total land area in North America as a percent of Earth?

2. (a) What is the population of Europe in 2000?
(b) What is the total area of Europe?

3. (a) What was the percent increase in population in Asia from 1900 to 1950?
(b) What was the percent increase in population in Asia from 1950 to 2000?
(c) What was the population per square mile in Asia in 1950?
(d) What was the population per square mile in Asia in 2000?

4. Compare the population per square mile in Asia to the population per square mile in North America for the year 2000.

5. What was the mean population of all inhabited areas except Asia in 1950?

6. What is the rate of the increase in the population for all six inhabited continents, excluding Asia, from 1950 to 2000?

7. (a) What percent of the Earth's inhabitable land is in North America?
(b) What percent of the 2000 world's population is in North America?

8. What was the rate of increase in the population in South America from 1900 to 2000?

9. (a) What was the number of people per square mile for the entire world in 1950?
(b) What is the number of people per square mile for the entire world in 2000?
(c) What is the rate of increase in the number of people per square mile for the entire world from 1950 to 2000?

10. (a) What is the mean population of the six continents or land masses that are habitable in 2000?
(b) What was the mean population in 1950?
(c) What was the percent increase in the mean population from 1950 to 2000?

Name _____

Section _____ Date _____

ANSWERS

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

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11.

12.

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14.

In exercises 11 to 15, use the following table:

Gasoline Retail Prices, U.S. City Average, 1974–98				
(cents per gallon, including taxes)				
Average	Leaded Regular	Unleaded Regular	Unleaded Premium	All Types¹
1974	53.2	NA	NA	NA
1975	56.7	NA	NA	NA
1976	59.0	61.4	NA	NA
1977	62.2	65.6	NA	NA
1978	62.6	67.0	NA	65.2
1979	85.7	90.3	NA	88.2
1980	119.1	124.5	NA	122.1
1981 ²	131.1	137.8	147.0 ³	135.3
1982	122.2	129.6	141.5	128.1
1983	115.7	124.1	138.3	122.5
1984	112.9	121.2	136.6	119.8
1985	111.5	120.2	134.0	119.6
1986	85.7	92.7	108.5	93.1
1987	89.7	94.8	109.3	95.7
1988	89.9	94.6	110.7	96.3
1989	99.8	102.1	119.7	106.0
1990	114.9	116.4	134.9	121.7
1991	NA	114.0	132.1	119.6
1992	NA	112.7	131.6	119.0
1993	NA	110.8	130.2	117.3
1994	NA	111.2	130.5	117.4
1995	NA	114.7	133.6	120.5
1996	NA	123.1	141.3	128.8
1997	NA	123.4	141.6	129.1
1998 (Jan–June)	NA	108.2	126.8	113.7

(1) Also includes types of motor gasoline not shown separately.

(2) In Sept. 1981, the Bureau of Labor Statistics changed the weights used in the calculation of average motor gasoline prices. Starting in Sept. 1981, gasohol is included in the average for all types, and unleaded premium is weighted more heavily.

(3) Based on Sept. through Dec. data only. **Note:** Geographic coverage for 1974–77 is 56 urban areas; for 1978 and later, 85 urban areas. NA = not available.

Source: Energy Information Administration, U.S. Dept. of Energy, *Monthly Energy Review*, June 1998.

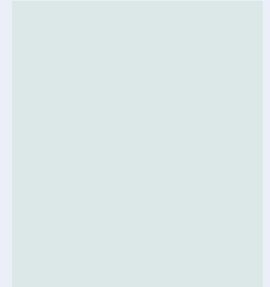
11. What was the mean cost of unleaded regular gas in 1990?
12. What was the mean cost of unleaded premium gas in 1997?
13. (a) What was the decrease in the price of unleaded regular gas from 1990 to 1998?
 (b) What was the percent decrease in price of all types of gas from 1981 to 1998?
14. What was the difference in price between unleaded regular and unleaded premium in 1997?

15. (a) What was the decrease in price of unleaded regular gas from 1982 to 1986?
 (b) What was the decrease in price of unleaded premium gas from 1982 to 1986?
16. Create a pictograph for the total world population in 1950 using the information given in the world population and land area table in the text.

1 Individual \approx 200 Million	
Continent/Region	Population Individuals
North America	1.1
South America	0.5
Europe	1.96
Asia	7.9
Africa	1.14
Oceania	0.06

15. _____

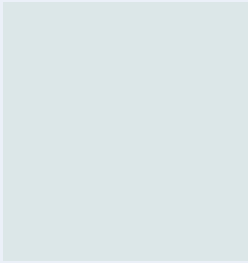
16. _____



17. _____

17. Use the information in the table to create a pictograph.

U.S. Car Sales	
Year	Car Sales
1970	8,403,000
1975	8,538,000
1980	8,979,000
1985	11,039,000
1990	9,484,000
1995	8,686,000

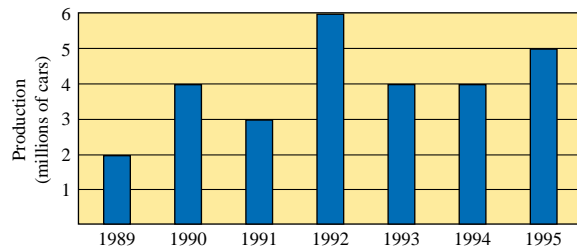


- 18. _____
- 19. _____
- 20. _____
- 21. _____
- 22. _____
- 23. _____
- 24. _____
- 25. _____
- 26. _____

18. Use the following table to create a pictograph.

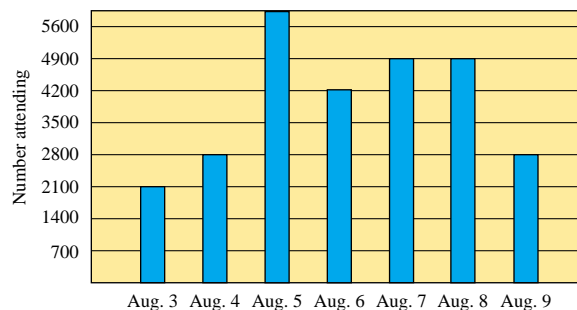
World Motor Vehicle Production	
Year	Vehicles
1970	29,419,000
1980	38,565,000
1985	44,909,000
1990	48,554,000
1995	49,983,000

Use the graph below, showing automobile production in millions of cars from 1989 to 1995, to solve exercises 19 to 22.



- 19. What was the production in 1991?
- 20. In what year did the greatest production occur?
- 21. Find the median number of cars produced in the 7 years.
- 22. In what year was the production decline the greatest compared to the previous year?

Use the bar graph below, showing the attendance at a circus for 7 days in August, to solve exercises 23 to 26.

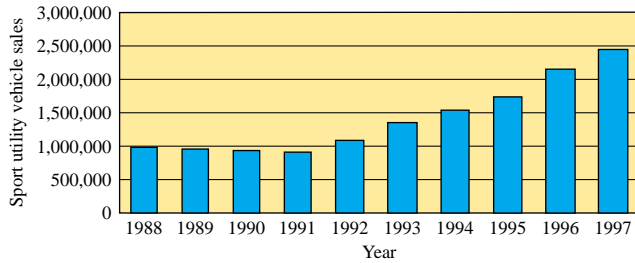


- 23. Find the attendance on August 4.
- 24. Which day had the greatest attendance?
- 25. Which day had the lowest attendance?
- 26. Find the median attendance over the 7 days.

For exercises 27 to 30, use the bar graph below.

Sport Utility Vehicle Sales in the U.S., 1988–97

In 1988, 960,852 sport utility vehicles (SUVs) were sold in the United States, accounting for 6.3% of all sales of light vehicles (SUVs, minivans, vans, pickup trucks, and trucks under 14,000 lbs.). By 1997, sales of SUVs in the U.S. increased to 2,435,301, accounting for 16.1% of total light vehicle sales.



Source: American Automobile Manufacturers Assn.

27. What were the sales of SUVs in 1997?



28. In what year did the greatest sales occur?

29. What was the percent increase in sales from 1988 to 1997?

30. In what year did the greatest increase in sales occur?

In exercises 31 to 34, use the nutritional facts given for Campbell’s cream of mushroom soup. Assume you consume 1 cup of soup.

Nutrition Facts		Amount / serving	%DV*	Amount / serving	%DV*
Serv. Size 1/2 cup (120mL) condensed soup		Total Fat 7g	11%	Total Carb. 9g	3%
Servings about 2.5		Sat. Fat 2.5g	13%	Fiber 1g	4%
Calories 110		Cholest. Less than 5mg	1%	Sugars 1g	
Fat Cal. 60		Sodium 870mg	36%	Protein 2g	
*Percent Daily Values (DV) are based on a 2,000 calorie diet.					
Vitamin A 0% • Vitamin C 0% • Calcium 2% • Iron 2%					

Satisfaction guaranteed. For questions or comments, please call 1-800-257-8443. Please have code and date information on can end available. For recipes, information & more, visit Campbell’s Community at www.campbellsoup.com 1261-56

- 27. _____
- 28. _____
- 29. _____
- 30. _____

ANSWERS

31. _____
 32. _____
 33. _____
 34. _____
 35. _____
 36. _____
 37. _____
 38. _____
 39. _____
 40. _____

31. How many calories have you consumed?
 32. What percent of the daily value of saturated fat have you consumed?
 33. What percent of fiber did you get?
 34. How many grams of sodium did you get?

In exercises 35 to 40, use the table provided.

Soup	Calories	Fat	Total Protein	Sodium
Cream of mushroom	110	7 g	2 g	870 mg
Cream of chicken	130	8 g	11 g	890 mg
Split pea	180	3.5 g	10 g	860 mg
Tomato	100	0 g	2 g	760 mg

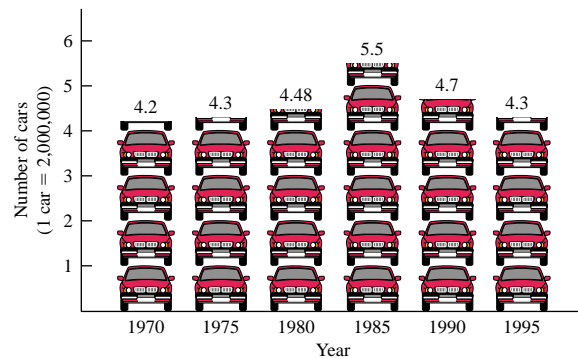
35. Which soup has the least fat?
 36. Which soup has the most sodium?
 37. Which soup has the least sodium?
 38. Which soup has the fewest calories?
 39. Find the mean number of calories in the soups.
 40. Find the mean number of milligrams of sodium in the soups.

Answers

1. 221,000,000; 16.2% 3. (a) 71%; (b) 163%; (c) 91.4; (d) 240.1; (e) 162.6%
 5. 193,000,000 7. (a) 17.9%; (b) 4.7% 9. (a) 44.1; (b) 111.0; (c) 151.7%
 11. 116.4 cents per gallon 13. (a) 8.2 ¢/gal; (b) 16%
 15. (a) 36.9 ¢/gal; (b) 33 ¢/gal

17.

Year	# of Cars
1970	4.2
1975	4.3
1980	4.45
1985	5.5
1990	4.7
1995	4.3



19. 3,000,000 21. 4,000,000 23. 2800 25. August 3
 27. 2,400,000 29. 140% 31. 220 33. 8% 35. Tomato
 37. Tomato 39. 130 cal