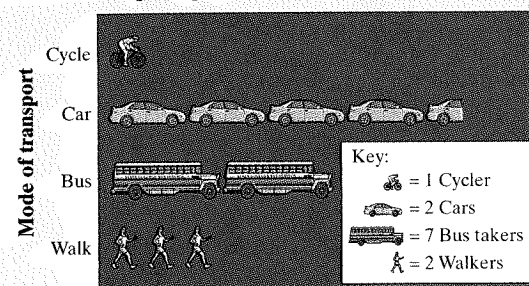
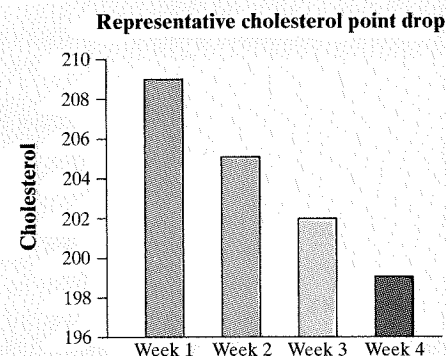


- (b) Would it be correct to make a pie chart of these data? Why or why not?
- (c) A movie studio wants to know what percent of the total audience for movies is 18 to 24 years old. Explain why these data do not answer this question.

17. **Going to school** Students in a high school statistics class were given data about the main method of transportation to school for a group of 30 students. They produced the pictograph shown.



- (a) How is this graph misleading?
- (b) Make a new graph that isn't misleading.
18. **Oatmeal and cholesterol** Does eating oatmeal reduce cholesterol? An advertisement included the following graph as evidence that the answer is "Yes."



- (a) How is this graph misleading?
- (b) Make a new graph that isn't misleading. What do you conclude about the relationship between eating oatmeal and cholesterol reduction?
19. **Attitudes toward recycled products** Recycling is supposed to save resources. Some people think recycled products are lower in quality than other products, a fact that makes recycling less practical. People who use a recycled product may have different opinions from those who don't use it. Here are data on attitudes toward coffee filters made of recycled paper from a sample of people who do and don't buy these filters:

	Buy recycled filters?	
	Yes	No
Think quality is		
Higher	20	29
The same	7	25

- (a) How many people does this table describe? How many of these were buyers of coffee filters made of recycled paper?
- (b) Give the marginal distribution (in percents) of opinion about the quality of recycled filters. What percent of the people in the sample think the quality of the recycled product is the same or higher than the quality of other filters?

20. **Smoking by students and parents** Here are data from a survey conducted at eight high schools on smoking among students and their parents.

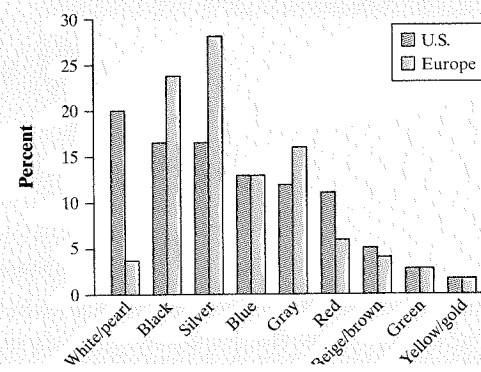
	Neither parent smokes	One parent smokes	Both parents smoke
Student does not smoke	1168	1823	1380
Student smokes	188	416	400

- (a) How many students are described in the two-way table? What percent of these students smoke?
- (b) Give the marginal distribution (in percents) of parents' smoking behavior, both in counts and in percents.

21. **Attitudes toward recycled products** Exercise 19 gives data on the opinions of people who have and have not bought coffee filters made from recycled paper. To see the relationship between opinion and experience with the product, find the conditional distributions of opinion (the response variable) for buyers and nonbuyers. What do you conclude?

22. **Smoking by students and parents** Refer to Exercise 20. Calculate three conditional distributions of students' smoking behavior: one for each of the three parental smoking categories. Describe the relationship between the smoking behaviors of students and their parents in a few sentences.

23. **Popular colors—here and there** Favorite vehicle colors may differ among countries. The side-by-side bar graph shows data on the most popular colors of cars in a recent year for the United States and Europe. Write a few sentences comparing the two distributions.



24. **Comparing car colors** Favorite vehicle colors may differ among types of vehicle. Here are data on the most popular colors in a recent year for luxury cars and for SUVs, trucks, and vans.

Color	Luxury cars (%)	SUVs, trucks, vans (%)
Black	22	13
Silver	16	16
White pearl	14	1
Gray	12	13
White	11	25
Blue	7	10
Red	7	11
Yellow/gold	6	1
Green	3	4
Beige/brown	2	6

- (a) Make a graph to compare colors by vehicle type.
- (b) Write a few sentences describing what you see.

25. **Snowmobiles in the park** Yellowstone National Park surveyed a random sample of 1526 winter visitors to the park. They asked each person whether they owned, rented, or had never used a snowmobile. Respondents were also asked whether they belonged to an environmental organization (like the Sierra Club). The two-way table summarizes the survey responses.

	Environmental Club		Total
	No	Yes	
Never used	445	212	657
Snowmobile renter	497	77	574
Snowmobile owner	279	16	295
Total	1221	305	1526

Do these data suggest that there is an association between environmental club membership and snowmobile use among visitors to Yellowstone National Park? Give appropriate evidence to support your answer.

26. **Angry people and heart disease** People who get angry easily tend to have more heart disease. That's the conclusion of a study that followed a random sample of 12,986 people from three locations for about four years. All subjects were free of heart disease at the beginning of the study. The subjects took the Spielberger Trait Anger Scale test, which measures how prone a person is to sudden anger. Here are data for the 8474 people in the sample who had normal blood pressure. CHD stands for "coronary heart disease." This includes people who had heart attacks and those

	Low anger	Moderate anger	High anger	Total
CHD	53	110	27	190
No CHD	3057	4621	606	8284
Total	3110	4731	633	8474

Do these data support the study's conclusion about the relationship between anger and heart disease? Give appropriate evidence to support your answer.

Multiple choice: Select the best answer for Exercises 27 to 34.

Exercises 27 to 30 refer to the following setting. The National Survey of Adolescent Health interviewed several thousand teens (grades 7 to 12). One question asked was "What do you think are the chances you will be married in the next ten years?" Here is a two-way table of the responses by gender.

	Female	Male
Almost no chance	119	103
Some chance, but probably not	150	171
A 50-50 chance	447	512
A good chance	735	710
Almost certain	1174	756

27. The percent of females among the respondents was
(a) 2625. (c) about 46%. (e) None of these.
(b) 4877. (d) about 54%.

28. Your percent from the previous exercise is part of
(a) the marginal distribution of females.
(b) the marginal distribution of gender.
(c) the marginal distribution of opinion about marriage.
(d) the conditional distribution of gender among adolescents with a given opinion.
(e) the conditional distribution of opinion among adolescents of a given gender.

29. What percent of females thought that they were almost certain to be married in the next ten years?
(a) About 16% (c) About 40% (e) About 61%
(b) About 24% (d) About 45%

30. Your percent from the previous exercise is part of
(a) the marginal distribution of gender.
(b) the marginal distribution of opinion about marriage.
(c) the conditional distribution of gender among adolescents with a given opinion.
(d) the conditional distribution of opinion among adolescents of a given gender.
(e) the conditional distribution of "Almost certain"