

A Passion for Compassion

In the 19th century, statistics was not widely seen as an applicable skill. That is, until Florence Nightingale came onto the scene. When she arrived at the front line of the Crimean War, she was appalled by the situation. The mortality rate was too high, and the hospitals were in complete disarray. She immediately set about organizing what little records were kept, and started to gather a lot of new data. Upon analyzing this new data, she discovered that the majority of deaths that were occurring in British military hospitals were due to preventable diseases. Using this new information, Nightingale was able to present a case to Parliament for improving the sanitary practices in British hospitals. She utilized data analysis and visualization to literally save thousands of lives, and in the process, her "rose diagram", also known as a "coxcomb chart", became an iconic data visualization.

In order to determine from the pie chart how much was spent in a particular category, multiply the total amount by the proportion given for that category in the pie chart. For example, to find the dollar amount of government funds spent on Medicare and Medicaid, multiply the total amount of government expenditures (\$4.4 trillion) by the proportion spent on Medicare and Medicaid. This means that $\$4.4(0.25) = \1.1 trillion of all government expenditures goes to Medicare and Medicaid.

Federal Government Spending, Fiscal Year 2019

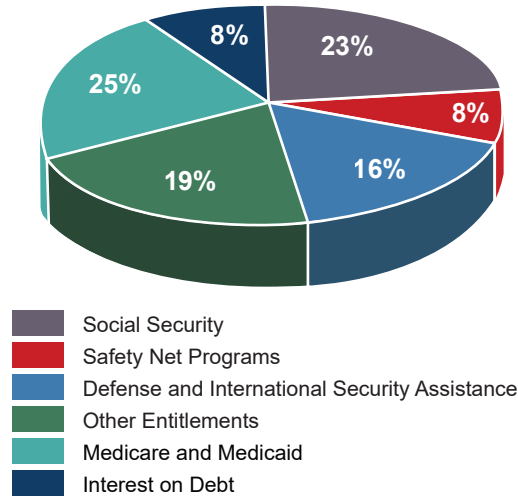


Figure 3.2.12

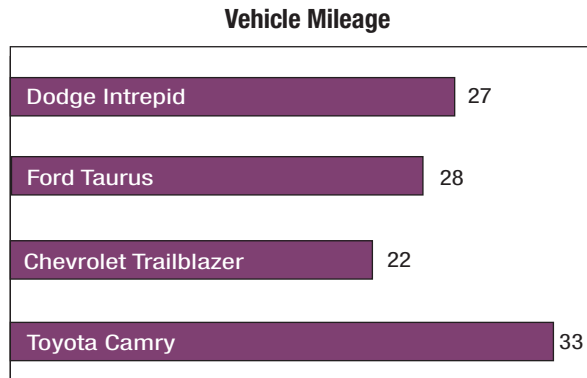
3.2 Exercises

Basic Concepts

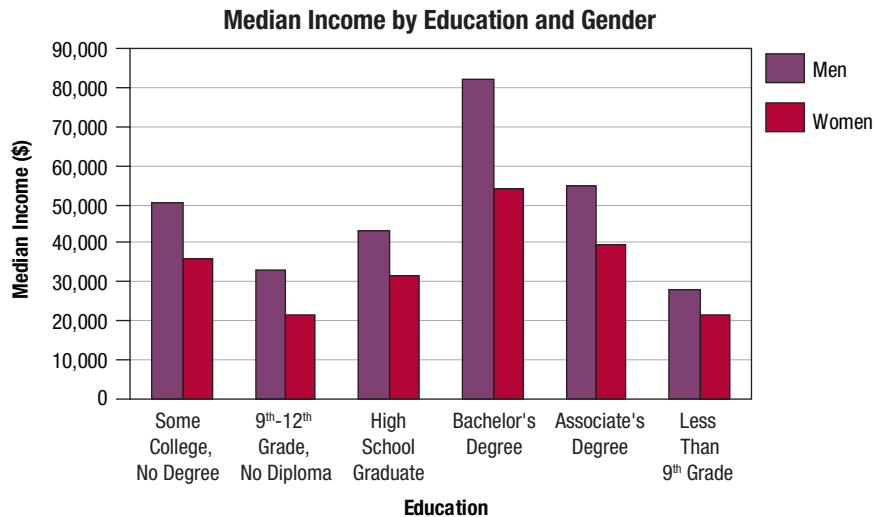
1. What are some benefits of graphing?
2. What is the major disadvantage of graphing?
3. Describe the types of data that a bar chart would be useful in displaying.
4. Where should miscellaneous categories be displayed in a bar chart?
5. Explain how axis scales on bar charts can be misleading.
6. What is a stacked bar chart?
7. Why would a stacked bar chart be preferred over a normal bar chart?
8. What is one disadvantage of using a 3-D chart?
9. What is a pie chart?
10. What is the main advantage of using a pie chart?

Exercises

11. A consumer magazine uses bar charts to compare four popular brands of automobiles. This particular bar chart represents a comparison of the miles per gallon (mpg) for the four brands.



- What is wrong with this picture?
 - Evaluate the bar chart using the guidelines suggested in the section on the aesthetics of bar chart construction.
12. The following bar chart presents the median income of U.S. employees by education level and gender. Evaluate the bar chart using the guidelines suggested in the section on the aesthetics of bar chart construction.



13. Consider the following data regarding the number of wildfires in the U.S. categorized by the size class in acres and the cause of the fire.

Number of Wildfires in the U.S.		
Size Class (Acres)	Lightning-Caused	Person-Caused
0.25 or less	4637	2367
0.26 – 9	1940	1904
10 – 99	219	571
100 – 299	44	103
300 – 999	26	52
1000 – 4999	43	17
5000 +	21	9
Total	6930	5023

- Construct a bar chart for the number of wildfires caused by lightning.
 - Construct a bar chart for the number of wildfires caused by people.
 - Construct a stacked bar chart for the number of wildfires caused by lightning and the number of wildfires caused by people.
 - Construct a pie chart for the number of wildfires caused by lightning.
 - Construct a pie chart for the number of wildfires caused by people.
 - What did you learn from the charts created in parts a. through e.?
14. Consider the following data regarding the average spending on healthcare per person for various countries.

Healthcare Costs Around the World per Capita, 2009	
Country	Average Cost (\$)
Australia	2886
Canada	2998
Denmark	2743
Finland	2104
France	3048
Germany	2983
Iceland	3159
Ireland	2455
Japan	2249
Sweden	2745
Switzerland	3847
United Kingdom	2317
United States	5711

Source: www.creditloan.com

- Construct a bar chart for the average healthcare cost per person for the various countries.
- What did you learn from the chart?

15. Consider the following data regarding professions with high projected growth rates for the years 2008 through 2018.

Occupation Growth Rates	
Occupation	Projected Increase 2008 – 2018
Biomedical engineers	72%
Network systems and data communications analysts	53%
Home health aides	50%
Personal and home care aides	46%
Financial examiners	41%
Medical scientists, except epidemiologists	40%
Physician assistants	39%
Skin care specialists	38%

Source: Bureau of Labor Statistics

- Construct a bar chart for the projected growth rates of the various occupations.
 - What did you learn from the chart?
16. Consider the following data regarding the methods which consumers use to pay for items purchased in a particular store.

Payment Methods	
Method of Payment	Relative Frequency
Cash	81.1%
Checks	7.6%
General-Purpose Credit Cards	5.5%
Proprietary Credit Cards	5.3%
Debit Cards	0.5%

- Construct a bar chart for the relative frequencies of the various methods of payment.
- Construct a pie chart for the relative frequencies of the various methods of payment.
- Comment on any information about the relative frequencies of the various methods which you were able to ascertain by examining the charts.