

Exploring Data with Graphs and Numerical Summaries | 2

2.6 How Can Graphical Summaries Be Misused?

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Learning Objectives

- Identify misleading data displays
- Create displays of data
- Compare displays of data

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Misleading Data Displays

HEADING IN DIFFERENT DIRECTIONS
Enrollment at the University of Georgia since 1996 has risen by more than 4,000 students. At the same time, the total number of African Americans at UGA has dipped just about every year.

Year	Total Students	African Americans
1996	29,404	2,003
1997	29,693	1,906
1998	30,009	1,871
1999	30,912	1,815
2000	31,288	1,856
2001	32,317	1,832
2002	32,941	1,825
2003	33,878	1,897
2004	33,405	1,854

Source: University of Georgia Office of Institutional Research

FIGURE 2.18: An Example of a Poor Graph. Question: What's misleading about the way the data are presented?

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Guidelines for Constructing Effective Graphs

- Label axes and give proper headings
- Vertical axis should start at zero
- Use bars, lines, or points
- Consider using separate graphs or ratios when variable values differ

FIGURE 2.19: A Better Graph for the Data in Figure 2.18. Question: What trends do you see in the enrollments from 1996 to 2004?

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2.85 Market share for food sales: The pie chart shown was displayed in an article in *The Scotsman* newspaper (Jan. 15, 2005) to show the market share of different supermarkets in Scotland.

- Pie charts can be tricky to draw correctly. Identify two problems with this chart.
- From looking at the graph without inspecting the percentages, would it be easier to identify the mode using this graph or using a bar graph? Why?

Market Share of Scottish Supermarket Chain

Supermarket Chain	Market Share (%)
Somerfields	6%
Safeway	15.2%
Tesco	27.2%
ASDA	24%
William Morrison Safeway	15.2%

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2.88 BBC license fee: Explain what is wrong with the time plot shown of the annual license fee paid by British subjects for watching BBC programs. (Source: *Evening Standard*, Nov. 29, 2006)

At 1.8% above inflation fee will be £185 by 2013

Today's licence £131.50

At current inflation fee is £158 by 2013

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Image Sources

<http://www.managementscientist.org/wp-content/uploads/2008/06/dice.jpg>
http://www.thewallstickercompany.com.au/dynamic_images/images-2349.jpg
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