12- 10- 10- 10- 10- 10- 10- 10- 10
2.4 STATISTICAL GRAPHICS
Key Concept In this section we discuss types of statistical graphs other than <u>http://www.com/action.</u> .
Our objective is to identify a $\frac{8\omega fable}{2}$ graph for representing
a data set.
FREQUENCY POLYGON
A <u>frequency polygon</u> uses line segments connected to points directly above class
midpoint values.
A relative frequency polygon uses relative frequencies for the Vertical
scale.
100x 90x 80x 70x 60x 50x 40x 20x 10x 00

22.50 27.50 32.50 37.50 42.50 47.50 52.50

Example 4: Use the frequency distribution from example 3 to construct a histogram.

OGIVE	
An ogive (pronounced "oh-jive") involves	_ frequencies. Ogives are
useful for determining the number of values below some particular value. An og 	ive is a s class boundaries along ne vertical scale.

For example, if you saved \$300 in both January and April and \$100 in each of February, March, May, and June, an ogive would look like Figure $\underline{1}$.



Figure 1 Ogive of accumulated savings for one year.

DOTPLOTS



STEMPLOTS			
A stemplot (aka stem-and-leaf plot) repr	esents <u>quantita</u>	ative	data by
separating each value into two parts: the _	Stem	and theleaf	
		Boys Girls	

		7	0	
stem	leaf	1	1	1
1	6	146	2	268
2	2489	458	3	3446689
3	0112345678	122289	4	436
Ā	0112040070	3479	5	4
4	0.78	258	6	
5	018	13	7	
6	1			<u>1</u>

Example 1: Listed below are amounts of strontium-90 (in millibecquerels) in a simple random sample of baby teeth obtained from Pennsylvania residents born after 1979.

155 142 149 130 151 163 151 142 156 133 138 161 128 144 172 137 151 166 147 163 145 116 136 158 114 165 169 145 150 150 158 151 145 152 140 170 129 188 156

a. Construct a stemplot of the amounts of Strontium-90

i. What does the stemplot suggest about the distribution?

Normal.

BAR GRAPH
A <u>bar graph</u> uses bars of <u>QQUA</u> width to show frequencies of categories of <u>QUALITATIVE</u> data. The vertical scale represents <u>Frequencies</u> or <u>CLATIVE</u> frequencies. The horizontal scale identifies the different
<u>Categories</u> of qualitative data. The bars may or may not be separated by small gaps.
A multiple bar graph has two or more sets of bars, and is used to compare two or more



PARETO CHARTS

A Pareto chart is a bar graph for	data, with added stipulation that
the bars are arranged in descending order according to	frequencies
vertical scale represents	or
frequencies. The horizontal scale identifies the different data.	categories of <u>qualitative</u>

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PI E CHARTS	
A pie chart is a graph that depicts	qualitative data as slices of a
for each category.	U the size of each slice is proportional to the frequency count

Example 2: Chief financial officers of U.S. companies were surveyed about areas in which job applicants make mistakes. Here are the areas and the frequency of responses: interview (452); résumé (297); cover letter (141); reference checks (143); interview follow-up (113); screening call (85).

a. Construct a pie chart representing the given data.



Interview	452 ·100% ≈ 36.7%
résume:	$\frac{297}{1231} \cdot 1002 \approx 24.12$
Cover Detter	$\frac{141}{1231} \cdot 1002 \approx 11.5\%$
reference Checks	$\frac{143}{1231} \cdot 100\% \approx 11.6\%$
interview fallow-up:	$\frac{113}{1231}$.100 $2 \approx 9.2 $
Screening:	$\frac{85}{1231}$ $100\% \approx 6.9\%$

Sum of frequencies: 123

b. Construct a Pareto chart of the data.



c. Which graph is more effective in showing the importance of the mistakes made by job applicants?



SCATTERPLOTS

A scatterplot (aka scatter diagram) is a plot of ordered pair		
data with a horizontal x-axis and a vertical y-axis. The horizontal axis is used for the first (x) variable,		
and the vertical axis is used for the second variable. The pattern of the plotted points is often helpful		
in determining whether there is a		



TIME-SERIES GRAPH

A <u>time-series graph</u> is a graph of <i>time-series data</i> , w	hich are <u>quantitative</u>
data that have been collected at different points in _	time.



2.5 CRITICAL THINKING: BAD GRAPHS

Nonzero axis

Some graphs are misleading because o	ne or both of the	begin at some value
other than	, so the differences are	exaggerated.

The following statistics suggest that 16-year-olds are safer drivers than people in their twenties, and that octogenarians are very safe. Is this true?





Solution: No. As the following graph shows, the reason 16-year-old and octogenarians appear to be safe drivers is that they don't drive nearly as much as people in other age groups.

Pictographs

Drawings of objects, often called pictographs, are often misleading.



