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


Amount of Strontium-90 (in millibecquerels)
2.4 STATISTICAL GRAPHICS

Key Concept...
In this section we discuss types of statistical graphs other than $\qquad$ suitable
$\qquad$ graph for representing a---- data $\qquad$ set.
$\mathcal{F R E Q}$ JENNY PO LYON
$\mathcal{A}$ frequency polygon uses line segments connected to points directly above class
midpoint values.
$\mathcal{A}$ relative frequency polygon uses relative frequencies for the $\qquad$ scale.


OGIVE
An ogive (pronounced "of-jive") involves _- (emulative frequencies. Ogives are
useful for determining the number of values below some particular value. An ogive is a
line $\qquad$ graph that depicts cumulative frequencies. An ogive uses class boundaries along the horizontal scale, and _(WMulative_____-_frequencies along the vertical scale.

For example, if you saved $\$ 300$ in both $\operatorname{ganuary}$ and April and $\$ 100$ in each of $\mathcal{F e}$ bruary, March, May, and I one, an ogive would look like Figure 1.

Total Accumulated Savings


Figure 1 Ogive of accumulated savings for one year.
$\mathcal{D O} \mathcal{T P L O} \mathcal{T S}$

A dotplot consists of a graph in which each data value is plotted as a $\square$ or dot $\qquad$ along a scale of values. Dots representing equal values are stacked

## Barry Bonds Batting Average

Before and After Alleged Drug Use


## A stemplot (aka stem-and-leaf plot) represents _quantitative

 separating each value into two parts: the Stem| stem | leaf |
| :--- | :--- |
| 1 | 6 |
| 2 | 2489 |
| 3 | 0112345678 |
| 4 | 058 |
| 5 | 018 |
| 6 | 1 |


| Boys | Girls |  |
| ---: | :--- | :--- |
| 7 | 0 |  |
| 1 | 1 | 1 |
| 146 | 2 | 268 |
| 458 | 3 | 3446689 |
| 12289 | 4 | 436 |
| 3479 | 5 | 4 |
| 258 | 6 |  |
| 13 | 7 |  |

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

```
155
```


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

| 11 | 46 |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 12 | 8 | 9 |  |  |  |
| 13 | 0 | 3 | 6 | 7 | 8 |
| 14 | 0 | 2 | 2 | 4 | 5 |
| 5 | 5 | 79 |  |  |  |
| 15 | 0 | 0 | 1 | 1 | 1 |
| 16 | 1 | 256688 |  |  |  |
| 16 | 13 | 3 | 5 | 6 | 9 |
| 17 | 02 |  |  |  |  |
| 18 | 8 |  |  |  |  |

i. What does the stemplot suggest about the distribution?

Normal.
$\mathcal{B A R}$ GRAPH
9 Gar graph uses bars of e -equal $\qquad$ width to show frequencies of categories of - qualitative qualitative data, The overitats sate reprosoms - -frequencies or $\qquad$ frequencies. The horizontal scale identifies the different categories of qualitative data. The bars may or may not be se parated by small gaps.

A multiple bar graph has two or more sets of bars, and is used to compare two or more data

$\mathcal{P A R E T O} \mathcal{C H A R I S}$
A Pareto chart is a bar graph for qualitative

$\qquad$ . The
 frequencies. The hor izontat scale identifies the different categories of --qualitative
data.

PIE $\mathcal{H} \mathcal{H} \mathcal{A} \mathcal{I}$
A pie chart is agraph that depicts $\square$ data as slices of $a$ qualitative
circle
--- for each category.

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. sum of freaulncuo: 2

6. Construct a Pareto chart of the data.

c. Which graph is more effective in showing the importance of the mistakes made by job applicants? Pareto, but pie chart wan good too.

SCATTERPLOTS
A scatterplot (aka scatter diagram) is a plot of ordered pair quantitative data with a horizontal $x$-axis and a vertical $y$-axis. The horizontal axis is used for the first ( $\mathcal{X}$ ) variable, and the vertical axis is used for the second variable. The pattern of the plotted points is oftentielpful


Scatter Plot, SAT vs. Beta Test
$\mathrm{N}=102, r=0.77$
95\% Confidence Interval: $r=0.68$ to 0.84


- Series 1 - Linear (Serie si)

TIMES ERIS GRAPH
$\mathcal{A}$ time -series graph is a graph of time-series data, which are quantitative data that have been collected at different points in time


Nonzero axis
Some graphs are misleading because one or both of the_ axe be__-_-_ begin at some value other than Metro

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?


Graph is based on data from this study: Williams, Allan F., Ph.D., and Oliver Carston, Ph.D., "Driver Age and Crash Involvement," Am J Public Health 1989; 79: 326-327.


Graph is based on data from this study: Williams, Allan F., Ph.D., and Oliver Carston, Ph.D., "Driver Age and Crash Involvement," Am J Public Health 1989; 79: 326-327.

Solution: Xo. 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.



