

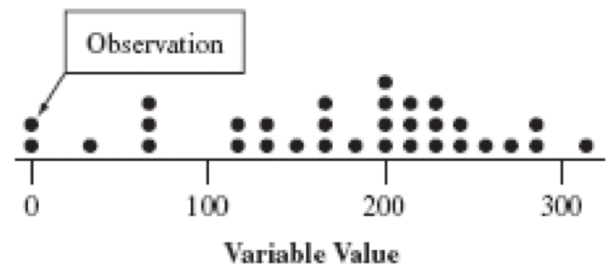
2.2: Graphing Quantitative Data

Which Graph?

1. Dot-plot and stem-and-leaf plot
 - a. More useful for small data sets
 - b. Data values are retained
2. Histogram
 - a. More useful for large data sets
 - b. Most compact display
 - c. More flexibility in defining intervals

Dot Plots

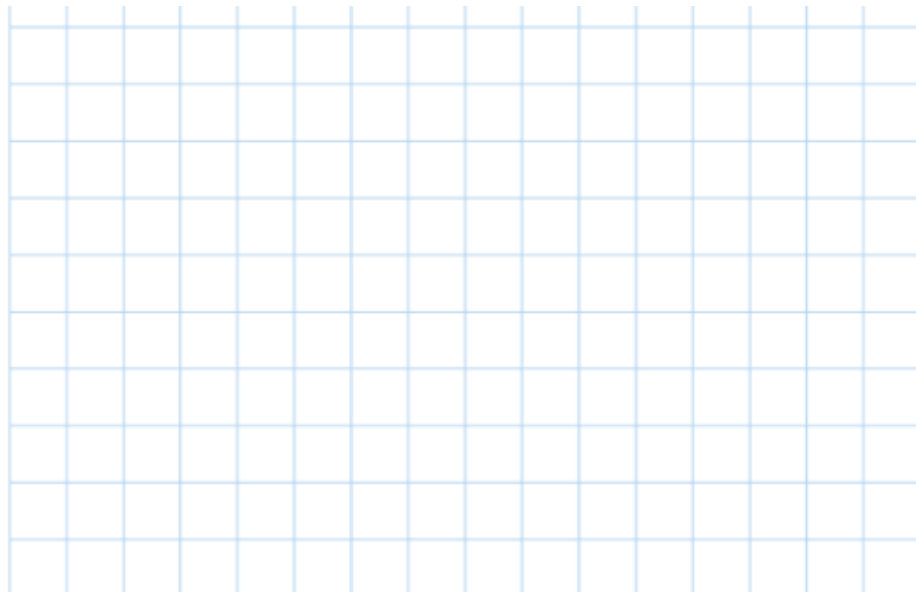
- Dot Plots are used for summarizing a quantitative variable
- To construct a dot plot
 1. Draw a horizontal line
 2. Label it with the name of the variable
 3. Mark regular values of the variable on it
 4. For each observation, place a dot above its value on the number line



Dot plot Example

Below is data collected on sodium levels in cereals. Make a dot plot for this

11	11
12	15
22	23
23	23
25	31
35	38
42	44
45	47
47	47
48	52
53	53

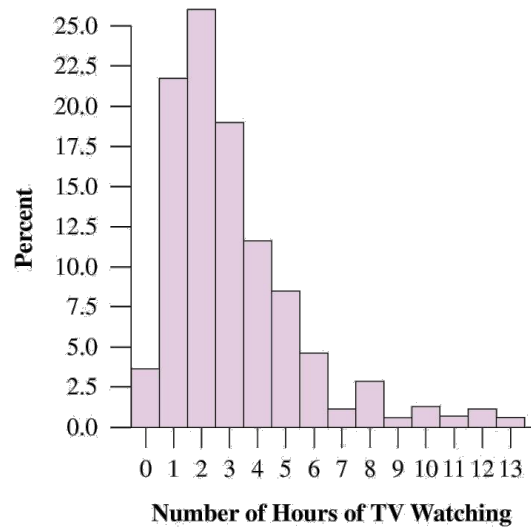


Histograms

- A Histogram is a graph that uses bars to portray the frequencies or the relative frequencies of the possible outcomes for a quantitative variable

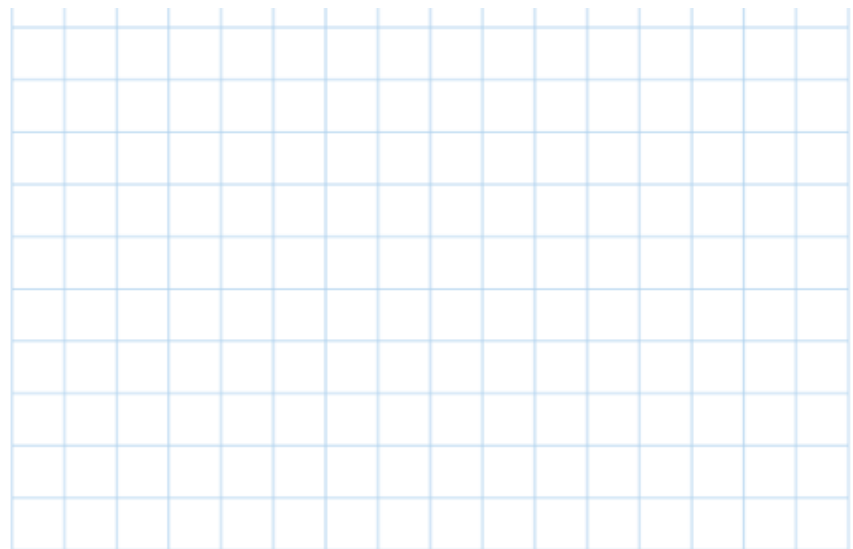
Steps for Constructing a Histogram

1. Divide the range of the data into intervals of equal width
2. Count the number of observations in each interval, creating a frequency table
3. On the horizontal axis, label the values or the endpoints of the intervals.
4. Draw a bar over each value or interval with height equal to its frequency (or percentage), values of which are marked on the vertical axis.
5. Label and title appropriately

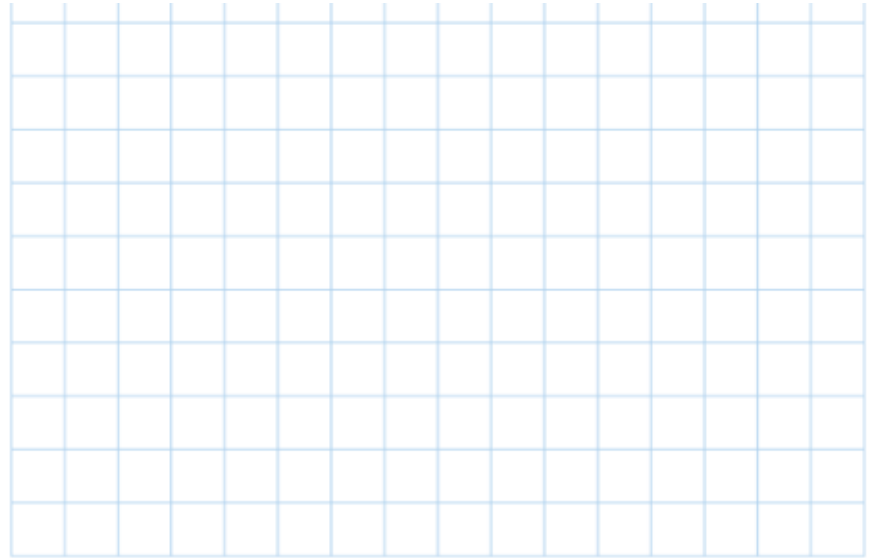


Histogram for Sodium in Cereals

11	11
12	15
22	23
23	23
25	31
35	38
42	44
45	47
47	47
48	52
53	53



Try your Quantitative data:



Interpreting Histograms

- Overall pattern consists of center, spread, and shape

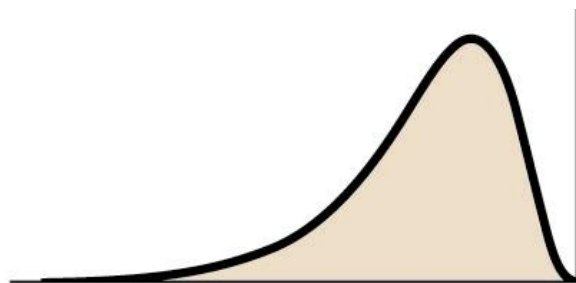
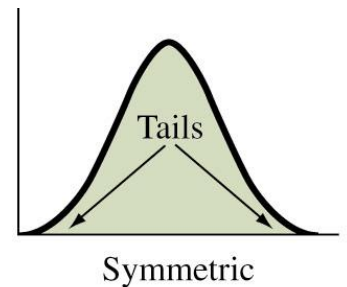
Assess where a distribution is **centered**.

Assess the **spread** of a distribution.

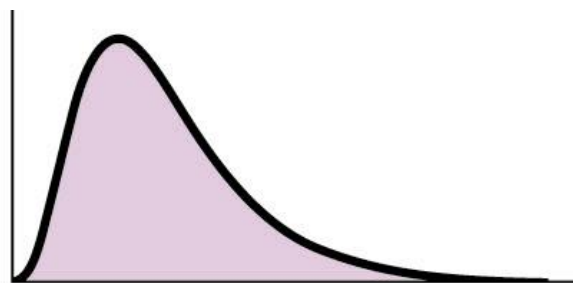
Shape of a distribution: roughly symmetric, skewed to the right, or skewed to the left

Shape

- Symmetric Distributions: if both left and right sides of the histogram are mirror images of each other
- A distribution is skewed to the left if the left tail is longer than the right tail
- A distribution is skewed to the right if the right tail is longer than the left tail

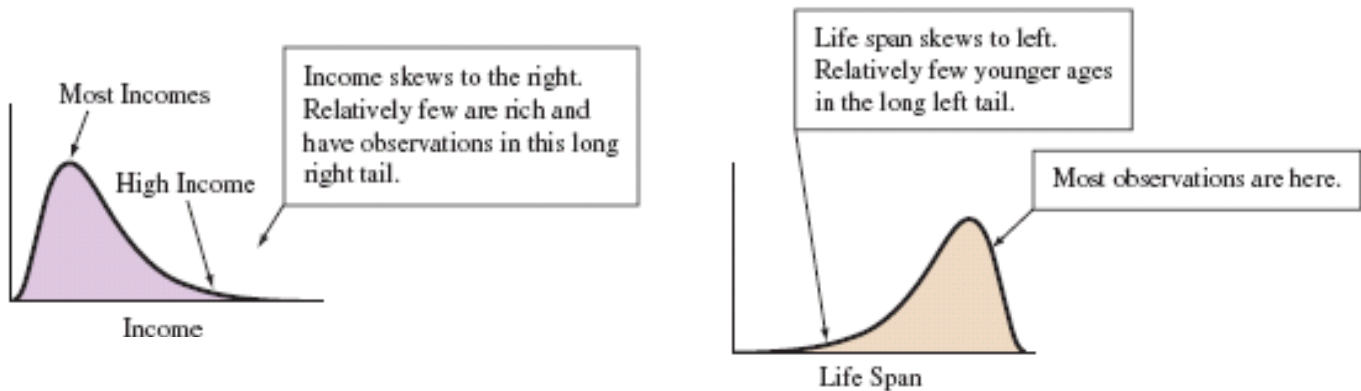


Skewed to the left



Skewed to the right

Examples of Skewness



Shape and Skewness

Example: Consider a data set containing IQ scores for the general public:

- What shape would you expect a histogram of this data set to have?
 - a. **Symmetric**
 - b. **Skewed to the left**
 - c. **Skewed to the right**
 - d. **Bimodal**

Example: Consider a data set of the scores of students on a very easy exam in which most score very well but a few score very poorly:

- **What shape would you expect a histogram of this data set to have?**
 - a. **Symmetric**
 - b. **Skewed to the left**
 - c. **Skewed to the right**
 - d. **Bimodal**