

## Chapter 12 Vocabulary: Algebra 1

### 12.2 Frequency and Histograms

**Frequency:** the number of data values in the interval

**Frequency table:** groups a set of data values into intervals and shows the frequency for each interval; intervals do not overlap, do not have any gaps, and are usually of equal size

**Histogram:** a graph that can display data from a frequency table; has one bar for each interval; the height of the bar shows the frequency of the data in the interval it represents; no gaps between bars; bars are usually of equal width

**Uniform:** bars are roughly the same height

**Symmetric:** a vertical line can divide the histogram into two parts that are close to mirror images

**Skewed:** has one peak that is NOT in the center

**Cumulative frequency table:** shows the number of data values that lie in or below a given interval

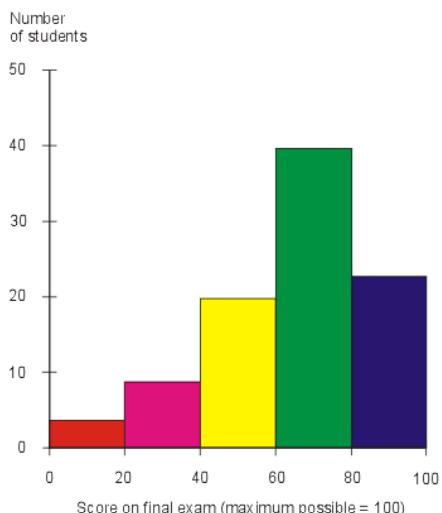
### Examples

1. The marks awarded for an assignment set for a Year 8 class of 20 students were as follows:

6    7    5    7    7    8    7    6    9    7  
4    10   6    8    8    9    5    6    4    8

Mark	Tally	Frequency
4		2
5		2
6		4
7		5
8		4
9		2
10		1

2. Histogram (skewed)



## 12.3 Measures of Central Tendency and Dispersion

**Measure of Central Tendency:** a way to describe the center of a data set

**Mean:** the average;  $\frac{\text{sum of the data values}}{\text{number of data values}}$

**Median:** the middle value in a data set when the **values are arranged in ORDER**; when there are two middle values, the median is the average of these two middle data values

**Mode:** most occurring; the data item that occurs the **MOST** times; a data set can have one mode, no mode, or more than one mode

**Outlier:** a data value that is much greater or less than the other values in the set

**Measure of dispersion:** describes how dispersed, or spread out, the values in a data set are

**Range of a set of date:** a measure of dispersion; the difference between the greatest and the least data values

### Example

Data: 2, 7, 12, 5, 4, 6, 10, 5, 9, 2, 7, 3

$$\text{Mean: } \frac{2+7+12+5+4+6+10+5+9+2+7+3}{12} = \frac{72}{12} = 6$$

$$\text{Median: } 2, 2, 3, 4, 5, \underline{5, 6}, 7, 7, 9, 10, 12 \rightarrow \frac{5+6}{2} = 5.5$$

Mode: 2, 5, 7

Range:  $12 - 2 = 10$

## 12.4 Box-and-Whisker Plots

**Quartile:** value that divides a set into four equal parts

**Second quartile,  $Q_2$ :** the median, which separates the data into upper and lower halves

**First quartile,  $Q_1$ :** the median of the lower half of the data

**Third quartile,  $Q_3$ :** the median of the upper half of the data

**Interquartile range:** the difference between the third and first quartiles

**Box-and-whisker plot:** a graph that summarizes a set of data by displaying it along a number line; consists of three parts: a box and two whiskers

**Percentiles:** separate data sets into 100 equal parts

**Percentile rank:** the percentage of data values that are less than or equal to that value

Examples:

Data: 2, 7, 12, 5, 4, 6, 10, 5, 9, 2, 7, 3

2, 2, 3, | 4, 5, 5, | 6, 7, 7, | 9, 10, 12  
↓      ↓      ↓  
 $Q_1$      $Q_2$      $Q_3$

Minimum: 2

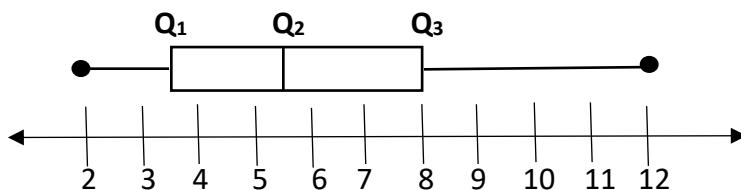
First Quartile: 3.5

Second Quartile: 5.5

Third Quartile: 8

Maximum: 12

Interquartile range:  $8 - 3.5 = 4.5$



Percentile rank: 7 has a percentile rank of 75<sup>th</sup>  $\rightarrow \frac{9 \text{ numbers are equal to or less than } 7 \text{ in the data}}{12 \text{ numbers are in the data}} = \frac{9}{12} = 0.75$