



## Common Core Math Newsletter

### 6th Grade Unit 5: Statistics & Probability

*In this unit, students will distinguish, collect, describe and report statistical data in mathematical terms such as mean, median, mean absolute deviation, box plot or histogram.*

#### Standards

##### 6.SP.A.1

- Recognize a statistical question as one that anticipates variability in the data related to ...
  - the question
  - accounts for it in the answers
- *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*

##### 6.SP.A.2

- Understand that a set of data collected to answer a statistical question has a distribution
- which can be described by its...
  - center,
  - spread
  - overall shape

##### 6.SP.B.4

- Display numerical data in plots on a number line
  - dot plots
  - histograms
  - box plots

##### 6.SP.B.5

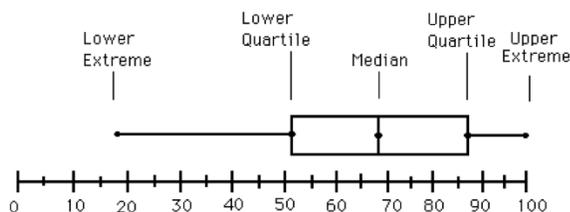
- Summarize numerical data sets in relation to their context
- Report the number of observations
- Describe the nature of the attribute under investigation, including how it was measured and its units of measurement
- Give quantitative measures of center (median and/or mean)
- Give variability (interquartile range and/or mean absolute deviation)
- Describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered
- Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered

# 6th Grade Advanced Common Core Math

## Unit 5: Statistics and Probability

### Vocabulary

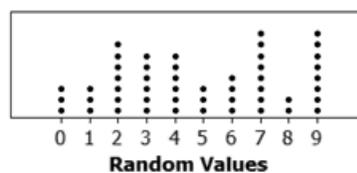
**box and whisker plot/ box plot** a diagram that summarizes data using the median, upper and lower quartiles, and the extreme values (minimum & maximum); it is constructed from the five-number summary of the data (minimum, lower quartile, median, upper quartile, maximum)



**distribution** arrangement of values that show the spread of the data

**dot plot** statistical chart consisting of data points on a number line typically using circles

**Dotplot of Random Values**



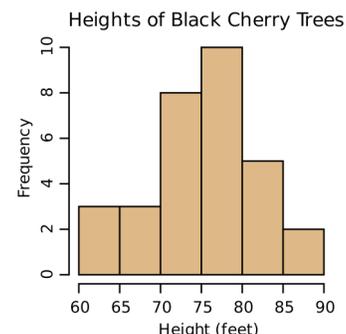
**frequency** the number of times an item, number, or events occurs in a set of data (e.g. If four students have a score of 80, then the score of 80 is said to have a frequency of 4.)

**grouped frequency table** organization of raw data in table form with classes and frequencies

Number of Cups of Coffee	Tally	Frequency
0 - 3	//	2
4 - 7	///	3
8 - 11	//// //	8
12 - 15	///	3
16 - 19	//	2

**histogram** graphical display of numerical data where the data is grouped into ranges and then plotted as rectangles either horizontally or vertically; similar to a bar graph but in a histogram each bar is a range of data. (histogram shows distribution of a variable/har graph compares variables)

[A Histogram is not a Bar Graph](#)



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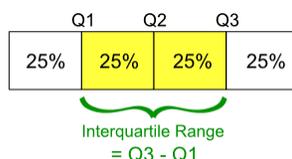
#### Vocabulary cont'd

**first quartile/  
lower quartile** middle value between the lowest value and the median of the data set (i.e. 25% of the data is less than this number)

**second  
quartile** median of the data set

**third quartile/  
upper quartile** middle value between the highest value and the median of the data set (i.e. 75% of the data is less than this number)

**Interquartile range (IQR)** also known as the midspread or middle fifty is a measure of statistical dispersion or spread that is the difference between the first and third quartiles (i.e.  $IQR = Q_3 - Q_1$ )



**maximum  
value** largest value in a set of data

**mean** average or fair share value for the data; balancing point of the data distribution; measure of center

**median** middle number in a value sorted list; value for which half the numbers are larger and half are smaller

**measures of  
center** mean & median

**mode** number which appears most often in a set of numbers

**numerical  
data** consists of numbers only; can be any rational number

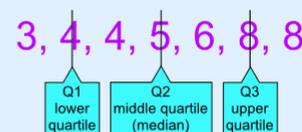
**outlier** an observation that is numerically distant from the rest of the data; value that lies outside (is much smaller or larger than) most of the other values

**range** difference between lowest and highest values in a data set

Example: 5, 8, 4, 4, 6, 3, 8

Put them in order: 3, 4, 4, 5, 6, 8, 8

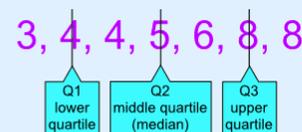
Cut the list into quarters:



And the result is:

- Quartile 1 (Q1) = 4
- Quartile 2 (Q2), which is also the Median, = 5
- Quartile 3 (Q3) = 8

Example:



The **Interquartile Range** is:

$$Q_3 - Q_1 = 8 - 4 = 4$$



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#### Vocabulary cont'd

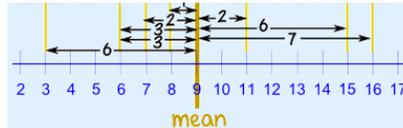
**(MAD) mean absolute deviation** another way to describe data variability; it is the average distance of each data value from the mean; it is how far “on average” all values are from the middle or mean value (i.e. find the mean ... use it to calculate distances ... then find the mean of those; **mean deviation of 3,6,6,7,8,11,15,16 is 3.75**)

#### Step 1: find the mean

$$\text{Mean} = \frac{3 + 6 + 6 + 7 + 8 + 11 + 15 + 16}{8} = \frac{72}{8} = 9$$

#### Step 2: find the distance of each value from the mean

Value	Distance from 9
3	6
6	3
6	3
7	2
8	1
11	2
15	6
16	7



#### Step 3: find the mean of those distances

$$\text{Mean Deviation} = \frac{6 + 3 + 3 + 2 + 1 + 2 + 6 + 7}{8} = \frac{30}{8} = 3.75$$

**measures of spread**

range & mean absolute deviation

**skewed data**

when a set of data is not symmetrical; data distribution tends to have a long tail on one side or the other

**statistical question**

can be answered by collecting data and where there will be variability in that data; no single answer; there is interest in the data distribution (e.g. How tall are the students in your school?)

**variability**

describes how spread out or closely clustered a set of data is; extent to which data points differ from each other

#### Additional Resources

**IXL.com 6th & 7th grade Topics:**

- Data and Graphs
- Statistics

**LearnZillion.com Videos:**

- <https://learnzillion.com/lessonsets/213-summarize-numerical-data-sets-in-relation-to-their-context>
- <https://learnzillion.com/lessonsets/739-summarize-numerical-data-sets-in-relation-to-their-context>
- <https://learnzillion.com/lessonsets/340-draw-inferences-about-a-population-and-understand-variability>
- <https://learnzillion.com/lessonsets/706-draw-comparative-inferences-about-populations-using-measures-of-center-and-variability>
- <https://learnzillion.com/lessonsets/262-approximate-the-probability-of-a-chance-event-by-collecting-and-interpreting-data>