

Introduction: Brian Burson

Chart Paper: Draw a line separating top to bottom
Write all the ways we tell our students how they use math
in everyday life.

Video: <http://www.weusemath.org>

Chart Paper: Do you have other options of ways math is used?
Add examples and share with the group.

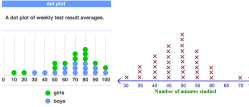
Types of Data Display

Numerical facts (data) which has evolved into statistics.
 The Science of collecting, classifying, and using data to interpret the significance of numerical information.
 Data Displays those stories visually.

Frequency Table

score	tally	frequency (f)	Number of Cups of Coffee	Tally	Frequency
1		4	0-3		2
2		5	4-7		3
3		5	8-11		5
4		5	12-15		3
5		2	16-19		2
6		2			

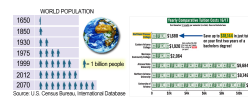
Dot Plot or Line Plot



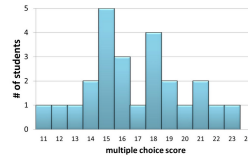
Stem-and-Leaf Plot



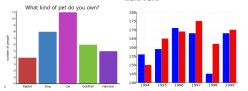
Pictograph



Histogram



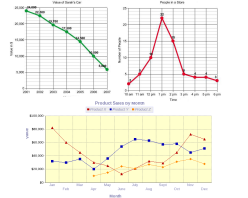
Bar Graph



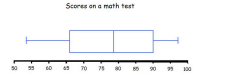
Circle Graph



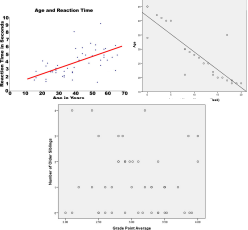
Line Graph



Box-and-Whisker Plots



Scatter plots



Creating Data Displays

www.nces.ed.gov

[https://www.nces.ed.gov/
nceskids/createagraph/](https://www.nces.ed.gov/nceskids/createagraph/)

Activity 1 & 2: Graphing M&M's and What's in the bag?

extension: Compare cell phone usage, social media, computer or electronic games through the week. Weekend. How does this compare to grades or doing homework?

Come up with a web site, video link, or activity you might have used or are considering using in your classroom on data, data displays, or statistics. Share with the class.

Additional examples:

Math Antics <http://www.mathantics.com/>

Khan Academy <https://www.khanacademy.org/>

Activity 3: Gaps and Clusters

Video: Don't be fooled by bad statistics.

"The misuse of center or "central tendency".

<https://www.youtube.com/watch?v=jguYUbcIv8c>

Mean: "Average" The summing of the data values and the division by the number of data points in the set.

Median: "Average" The middle number or midmost value of an ordered set.

Mode: "Average" The value of the data set that occurs most often (greatest frequency).

Range: The spread or distribution of data. The difference between the largest and smallest values in the data set.

Calculate the Mean, Median, and Mode

Which central tendency would you use and why?

Age: 2 , 3 , 3 , 4 , 5

Age: 2 , 3 , 3 , 80

Age: 2 , 15 , 17 , 18 , 80

Age: 2 , 10 , 10 , 45 , 47 , 49 , 50 , 60 , 78 , 80

Activity 4: Grouped Data

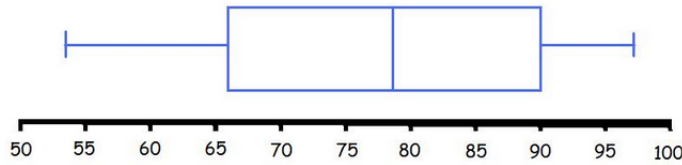
Note: Display using a histogram for the grouped frequency table

Activity 5: What's the Average?

extension: How many states have you visited? Which ones?

Box-and-Whisker Plot

Scores on a math test



Minimum value: 54	Range: $98 - 54 = 44$
Maximum value: 98	Interquartile Range: $90 - 66 = 24$
Quartile 1: 66	Approximately 25% of the grades fall in Q1 and Q3
Quartile 2: 78	and 50% of the grades fall inside the box.
Quartile 3: 90	

Create a Box-and-Whisker Plot:

Grades: 72, 75, 75, 76, 78, 83, 83, 86, 88, 88, 89, 91



How to calculate an outlier?
 If a data point is more than 1.5 IQR greater than the upper quartile or less than the lower quartile.
 $LQ - 1.5 * IQR$ or $UQ + 1.5 * IQR$

Activity 6: Finger-Snapping Time



Activity 7: The Weather Report

Activity 8: Are Women Catching Up?

Activity 9: To Change or Not Change

Decision Making with Data

What are some questions that should be asked about data collection?

What are some signals that conclusions based on data may not be valid?

What are some ways that graphs may cause misleading conclusions?

What are some questions that should be asked about data-based conclusion?

What do data analysis and problem solving have in common?



<https://www.youtube.com/watch?v=CpmDIP3Fn2Y>