

Name: _____

Measures of Variability

One way to describe a data set is with its spread, or variability. This helps identify how similar the values are to one another. The three most common measures of variability are **range**, **interquartile range**, and **mean absolute deviation**.

Minutes Allie studied each day this week: 30, 0, 30, 40, 40, 20, 120

	What Is It?	Limitations
Range	<p>Range tells the total spread of all data values.</p> <p>Step 1: Order the data values.</p> <p>Step 2: Subtract the smallest value from the largest.</p> <p>0, 20, 30, 30, 40, 40, 120</p> <p>$120 - 0 = 120$</p> <p>The range is 120.</p>	The range is greatly affected by outliers and skewed distributions. It also gives no indication of gaps or clusters.
	Interquartile range (IQR) tells the spread of the middle 50% of	The IQR usually



Preview

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Mean Absolute Deviation

Mean absolute deviation (MAD) tells the **average distance from the mean** for all data values.

Step 1: Find the mean. (Add all values then divide by the total number of values.)

Step 2: Find the absolute deviations, or distance of each value from the mean.

Step 3: Find the mean of the absolute deviations.

Mean = $(30 + 0 + 30 + 40 + 40 + 20 + 120) \div 7 = 40$

value	30	0	30	40	40	20	120
AD	$ 30 - 40 $ = 10	$ 0 - 40 $ = 40	$ 30 - 40 $ = 10	$ 40 - 40 $ = 0	$ 40 - 40 $ = 0	$ 20 - 40 $ = 20	$ 120 - 40 $ = 80

MAD = $(10 + 40 + 10 + 0 + 0 + 20 + 80) \div 7 = 22.86$

The MAD is 22.86.

Like any mean, the MAD can be affected by outliers. The information it provides is also limited since absolute values do not show the direction of skews.