MMMR with OUTLIERS

An OUTLIER is a data value that is much greater or much less than the other data values

Ex. What is the outlier?
1, 5, 4, 2, 6, 25, 3, 2

Example: Using the data below, find the outlier and tell how it affects the mean. Round to the nearest tenth.

9 10 12 13 8 9 31 9

Outlier: 31
Mean without outlier: 10
Mean with outlier: 12.625 -> 12.6
How does the outlier affect the mean?

The outlier is higher, so it causes the mean to be higher

Sometimes one measure of central tendency is a better indicator of the data than the others.

For example, consider the eight hourly wage rates show below.

Hourly	Wages
$5.50	$6.20
$5.50	$6.30
$5.50	$8.00
$6.00	$17.00

Mode: $5.50
Mean: $7.50
Median: $6.10

The Mode is the lowest wage listed. It does not describe the data well.

The Mean is above the hourly wage of all but two. It is influenced by the outlier, $17.

The Median is the best measure of central tendency. since it's not influenced by the size of the outlier.

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How to Determine the Best Measure

*When determining the most frequently chosen item, or when the data is not numerical, use the Mode.

*When the data has no outliers, use the Mean.

*When an outlier may significantly influence the mean, use the Median.

1. The favorite movies of students in the eighth grade.

2. **The daily temperatures during a week in July.**

Mean, since the daily temps. in July are likely to not have an outlier.

3. **The distance students in your class travel to school.**

Median, since some students may live much further from school and be considered outliers

4. **Ages of students in a 7th grade classroom.**

Mean, there are likely no outliers

For Math 7+

How to find what numbers are outliers:

IQR x 1.5

Add that to Q3 to get the upper outliers

Subtract that from Q1 to get the lower outliers

Recent test scores:

25, 72, 75, 79, 85, 87, 92, 93, 95, 100

What do you think the outlier is, if any?

STEP 1:

Recent test scores:

~~25~~, ~~72~~, ~~75~~, ~~79~~, ~~85~~, ~~87~~, ~~92~~, ~~93~~, ~~95~~, ~~100~~

Find Q2, Q1, and Q3 first:

Q2= 86

Q1= 75

Q3= 93

STEP 2:

Next find the IQR:

Q3 - Q1 = IQR

93-75=18

STEP 3:

Now determine what the outliers are:

IQR x 1.5 =

18x1.5=27

STEP 4:

To figure out the upper quartile outliers, add the number in step 3 to Q3:

93+27=120

Did anyone score above that on the test? If so, these are your upper outliers.

STEP 5:

To figure out if there are any outliers on the lower end subtract the number in step 3 by Q1:

75-27=48

Were there any scores lower than that for this test? If so, those are your lower outliers.

Warm up:

Write down these numbers in order from least to greatest:

69, 73, 78, 70, 89, 72, 75, 86, 75, 84, 76

~~69~~, ~~70~~, ~~72~~, ~~73~~, ~~75~~, (75), ~~76~~, ~~78~~, ~~84~~, ~~86~~, ~~89~~

Q1=72

*Q2=75

Q3=84

min=69

max=89

Outliers: Odds only

Boxplots + outliers: ALL