MEAN / AVERAGE

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THE ***MEAN*** IS A NUMBER THAT BEST DESCRIBES ALL OF THE DATA IN A SET. THE *MEAN* IS ALSO CALLED THE ***AVERAGE***.

HELPFUL EXAMPLE #1

TAKE 1 FROM THE 4 AND GIVE IT TO THE 2.

2, 4, 3 ⇨ 2 4 3 ⇨ 3 3 3

ONE WAY OF FINDING THE MEAN IS TO MOVE THE NUMBERS AROUND UNTIL EACH ONE IS THE SAME.

THE NUMBERS ARE ALL 3, WHICH TELLS US THE MEAN IS 3.

EVEN THOUGH EXAMPLE #1 WORKS, IT'S NOT THE MOST EFFECTIVE WAY TO FIND THE MEAN. CHECK OUT EXAMPLE #2 FOR A BETTER WAY.

HELPFUL EXAMPLE #2

2, 4, 3 ⇨ 2 + 4 + 3 = 9 ⇨ 9 ÷ 3 = 3 (MEAN)

ADD ALL THE NUMBERS TOGETHER.

DIVIDE THE ANSWER BY HOW MANY NUMBERS THERE ARE.

FIND THE MEAN FOR EACH SET.

1. 4, 2, 0, 6 ⇨ 4 + 2 + 0 + 6 = 12 ; 12 ÷ 4 = 3. MEAN = 3

2. 5, 9, 1 ⇨ 5 + 9 + 1 = 15 ; 15 ÷ 3 = 5 MEAN

REMINDER: ADD ALL THE AMOUNTS TOGETHER AND THEN DIVIDE THE ANSWER BY THE NUMBER OF PIECES IN THE SET.

3. 5, 0, 7, 3, 1, 2 — *3*

4. 2, 4, 1, 2, 1, 3, 1 — *2*

5. 18, 11, 19, 12 — *15*

6. 3, 6, 0, 2, 1, 9, 0, 3 — *3*

7. 15, 8, 13, 14, 20 — *14*

8. 11, 13, 16, 9, 8, 9 — *11*

MEDIAN

THE ***MEDIAN*** IS THE NUMBER IN THE MIDDLE. BEFORE YOU START, ALWAYS PUT THE NUMBERS IN ORDER FROM LEAST TO GREATEST.

HELPFUL EXAMPLE

7, 1, 6, 7, 3, 2, 4 ⇨ 1, 2, 3, 4, 6, 7, 7 (MEDIAN)

SMALLEST TO BIGGEST

FIND THE MEDIAN FOR EACH SET.

9. 3, 9, 11, 1, 5, 7, 4 — *5*

10. 6, 0, 2, 4, 6, 2, 4 — *4*

11. 16, 27, 20, 14, 23 — *20*

12. 8, 1, 13, 9, 4, 1, 7 — *7*

13. 19, 28, 15, 30, 11 — *19*

14. 4, 7, 3, 4, 7, 3, 8 — *4*

MODE

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THE ***MODE*** IS THE NUMBER YOU SEE THE MOST. IT HELPS TO PUT THE NUMBERS IN ORDER FROM LEAST TO GREATEST.

HELPFUL EXAMPLE

1, 4, 0, 1, 4, 2, 1 ⇨ 0, 1, 1, 1, 2, 4, 4 (MODE)

PUT IN ORDER FROM LEAST TO GREATEST

FIND THE MODE FOR EACH SET.

1. 5, 7, 6, 2, 7, 4, 1 — *7*

2. 8, 11, 5, 4, 2, 5, 6 — *5*

3. 4, 3, 4, 1, 3, 5, 3 — *3*

4. 13, 0, 8, 11, 0, 12 — *0*

5. 9, 2, 1, 9, 1, 2, 1, 3 — *1*

6. 14, 8, 19, 13, 8, 9 — *8*

RANGE

THE ***RANGE*** IS THE DIFFERENCE BETWEEN THE LARGEST AND SMALLEST NUMBER IN THE SET. IT HELPS TO PUT THE NUMBERS IN ORDER FROM LEAST TO GREATEST.

HELPFUL EXAMPLE

6, 12, 7, 4, 10, 6 ⇨ 4, 6, 6, 7, 10, 12

PUT IN ORDER FROM LEAST TO GREATEST

RANGE = 8 ; RANGE: 12 - 4 = 8

RANGE = HOW FAR APART?

FIND THE RANGE FOR EACH SET.

7. 5, 3, 9, 2, 4, 3 — *7*

8. 4, 0, 5, 7, 4, 7, 2 — *7*

9. 15, 20, 13, 19, 21 — *8*

10. 8, 11, 4, 5, 1, 5, 1 — *10*

11. 32, 22, 24, 18, 27 — *14*

12. 11, 4, 9, 11, 28, 6 — *24*

OUTLIER

A SET OF NUMBERS MAY CONTAIN A VALUE THAT IS MUCH HIGHER OR LOWER THAN THE OTHER NUMBERS. THIS IS CALLED AN ***OUTLIER***.

HELPFUL EXAMPLE

4, 3, 7, 34, 2

THE OUTLIER IS **34**. IT'S MUCH BIGGER THAN THE OTHER NUMBERS.

MEAN WITH OUTLIER: (4 + 3 + 7 + 34 + 2) ÷ 5 = 10

MEAN WITHOUT OUTLIER: (4 + 3 + 7 + 2) ÷ 4 = 4

DO YOU SEE HOW THE OUTLIER MAKES OUR MEAN HIGHER? IT MAKES OUR MEAN ***LIE***.

FIND THE OUTLIER. THEN FIND THE MEAN WITH AND WITHOUT THE OUTLIER.

13. 28, 34, 6, 27, 31, 30
- OUTLIER: *6*
- MEAN WITH OUTLIER: *26*
- MEAN WITHOUT OUTLIER: *30*

14. 4, 2, 0, 56, 1, 2, 4, 1, 2
- OUTLIER: *56*
- MEAN WITH OUTLIER: *8*
- MEAN WITHOUT OUTLIER: *2*

SPECIAL CIRCUMSTANCES

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MEDIAN (MIDDLE)

SOMETIMES THERE ARE TWO NUMBERS IN THE MIDDLE. WHEN THIS HAPPENS YOU NEED TO:
1. ADD THEM TOGETHER.
2. DIVIDE BY TWO.

HELPFUL EXAMPLE

8, 1, 6, 7, 2, 4 ⇨ 1, 2, 4, 6, 7, 8 (SMALLEST TO BIGGEST)

1. 4 + 6 = 10
2. 10 ÷ 2 = 5 MEDIAN = 5

FIND THE MEDIAN FOR EACH SET.

1. 10, 6, 14, 12, 15, 9 — *11*

2. 2, 6, 4, 7, 8, 5, 1, 7 — *5.5*

3. 8, 5, 9, 3, 2, 5, 6 — *5*

MODE (MOST)

SOMETIMES THERE ARE TWO OR MORE NUMBERS THAT OCCUR MOST OFTEN. WHEN THIS HAPPENS YOU WILL HAVE MORE THAN ONE MODE.

HELPFUL EXAMPLE

3, 5, 3, 2, 5, 2, 5, 2 ⇨ 2, 2, 2, 3, 3, 5, 5, 5 (SMALLEST TO BIGGEST)

THE MODES ARE 2 AND 5.

FIND THE MODES FOR EACH SET.

4. 3, 6, 4, 1, 4, 1, 3, 1, 4 — *1 AND 4*

5. 14, 5, 17, 20, 5, 17, 7 — *5 AND 17*

6. 7, 3, 2, 7, 1, 2, 6, 3 — *2, 3, AND 7*

PUTTING IT ALL TOGETHER

FIND THE MEAN, MEDIAN, MODE, AND RANGE FOR EACH SET. THEN WRITE A SHORT EXPLANATION DESCRIBING WHAT YOUR ANSWERS TELL US ABOUT THE NUMBERS.

HELPFUL EXAMPLE 5, 36, 3, 6, 7, 3, 1, 3 ⇨ 1, 3, 3, 3, 5, 6, 7, 36 (SMALLEST TO BIGGEST)

MEAN: (1 + 3 + 3 + 3 + 5 + 6 + 7 + 36) ÷ 8 = 8 MEAN

MEDIAN: ~~1~~ ~~3~~ ~~3~~ 3 5 ~~6~~ ~~7~~ ~~36~~ (3 + 5) ÷ 2 = 4 MEDIAN

MODE: 1 3 3 3 5 6 7 36 — 3 MODE

RANGE: 1 3 3 3 5 6 7 36 — 36 - 1 = 35 RANGE

*The numbers are all small except 36, which is an OUTLIER. It makes our mean and range high. I would take out the 36 from the set, or use the median and mode as the numbers to best describe this set of data. *

7. 10, 4, 6, 9, 4, 2, 6, 4, 9, 6
- MEAN: *6*
- MEDIAN: *6*
- MODE: *4 AND 6*
- RANGE: *8*

The mean, median, and mode are all 6, which is the best number to describe this set.

8. 27, 26, 32, 29, 25, 0, 32, 29
- MEAN: *25*
- MEDIAN: *28*
- MODE: *29 AND 32*
- RANGE: *32*

0 is an OUTLIER, which makes our mean too low. If you take it out our mean would be about 28.5.

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