

Grade Level/Course: **Math 6 and Math 7**

Lesson/Unit Plan Name: **Mean Absolute Deviation (MAD)**

Rationale/Lesson Abstract: **The objective of this lesson is to give ~~students~~ an understanding of Mean Absolute Deviation (MAD) as a single value of variability. Students will be able to calculate the MAD from data and know when and why** (Ab)-5(sol)8(u)-4(t)5(e )4(D)-4(e)19(f,

Activity/Lesson:

Ask: What do you know or what can you tell me about any of these three words?

Mean-

Absolute

Deviation

Sample Responses:

Mean- An average, adding up all of the numbers and dividing by how many numbers you have.

Absolute A reference may be made to absolute value, the distance a number is from zero.

Deviation A distance.

Deviation may be a word that is unfamiliar to most students. An example is when you deviate from a path. If you deviate from a path, you are straying.

Activity/Lesson continued: Pass out the Student Note-Taking Guide

Students at this point have looked at measures of central tendency (mean, median and mode) and some measures of variation or spread (range and interquartile range). Another measure of variation is mean absolute deviation.

Definition: The mean absolute deviation (aka MAD) of a set of data is the average distance between each data value and the mean.

Example 1:

The boys basketball team recorded their scores from 10 games this season. The scores are shown in the table below. Find the mean absolute deviation of the set of data. Describe what the mean absolute deviation represents in this situation.

Basketball Scores			
41	37	50	38
54	42	56	49

Step 1: Find the mean.

$$\frac{41 + 37 + 50 + 38 + 46 + 54 + 42 + 56 + 49 + 47}{10}$$
$$= \frac{460}{10}$$
$$= 46$$

∴ The mean of the data is 46 points.

Step 2: Find the absolute value of the difference between each value in the data set and the mean.

$$\begin{array}{l} |41 - 46| \\ = |-5| \\ = 5 \end{array} \quad \begin{array}{l} |37 - 46| \\ = |-9| \\ = 9 \end{array} \quad \begin{array}{l} |50 - 46| \\ = |4| \\ = 4 \end{array} \quad \begin{array}{l} |38 - 46| \\ = |-8| \\ = 8 \end{array}$$

$$\begin{array}{l} |54 - 46| \\ = |8| \\ = 8 \end{array} \quad \begin{array}{l} |42 - 46| \\ = |-4| \\ = 4 \end{array} \quad \begin{array}{l} |56 - 46| \\ = |10| \\ = 10 \end{array} \quad \begin{array}{l} |49 - 46| \\ = |3| \\ = 3 \end{array}$$

Step 3: Find the average of the absolute values of the differences between each value in the data set and the mean.

$$\frac{5+8+4+1+9+0+10+4+8+3}{10}$$

$$= \frac{52}{10}$$

$$= 5.2$$

∴ The mean absolute deviation is 5.2. This means that the average distance each data value is from the mean is 5.2 points.

Example 2 (You try!):

The number of runs allowed by a pitcher on the baseball team was recorded for his last 9 in a game. The results are shown in the table below. Find the mean absolute deviation of the set of data. Describe what the mean absolute deviation represents in this situation.

Number of Runs Allowed		
0	8	6
4	5	5
2	6	0

Step 1: Find the mean.

$$\frac{0+8+6+4+5+5+2+6+0}{9}$$

$$= \frac{36}{9}$$

$$= 4$$

∴ The mean of the data is 4 runs allowed per game.

Step 2: Find the absolute value of the difference between each value in the data set and the mean.

$$\begin{array}{ccccc} |0-4| & |8-4| & |6-4| & |4-4| & |5-4| \\ = |-4| & = |4| & = |2| & = |0| & = |1| \\ = 4 & = 4 & = 2 & = 0 & = 1 \end{array}$$

$$\begin{array}{cc} |5-4| & |2-4| \\ = |1| & = |-2| \\ = 1 & = 2 \end{array}$$

Step 3: Find the average of the absolute values of the differences between each value in the



Exit Ticket/Assessment:

- 1) In your own words describe the steps for finding the mean absolute deviation of a data set.

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- 2) What is the mean absolute deviation of the data: 10, 17, 20, 12 and 16 ?

- 3) Challenge Problem

From the list of numbers below, write one number in each box. You may use each number exactly once.

3 4 7 8 9 14	Three unique numbers with mean = 8 and MAD = 4		
	Three unique numbers with mean = 7 and MAD = 2		

1) In ~~\_\_\_\_\_~~ of ~~\_\_\_\_\_~~ describe in ~~\_\_\_\_\_~~ ps fETQq66.6 53.04 478.9 688.56 reW\*nBT8.9 688.56



# Warm-Up

# Warm-Up: Answer Key

CCSS: 6.RP.3c

60% of what number is 105?

- A) 63
- B) 175
- C) 630
- D) 1750

CCSS: 5.NBT.7

Find the sum:

$$6.2 + 31.59 + 11.11 + 19.85 =$$

CCSS: 6.SP.3

Find the mean, median and mode(s) of the following data:

8, 14, 22, 7, 2, 11, 25, 7, 5, 9

CCSS: 6.SP.3

Find the range and interquartile range of the following data:

8, 14, 22, 7, 2, 11, 25, 7, 5, 9

- What are mean, median and mode also known as?

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## Mean Absolute Deviation: Note-Taking Guide

Definition: **The** mean absolute deviation (aka MAD) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Example 1:

\_\_\_\_\_ scores from 10 games this season. The scores are shown in the table below. Find the mean absolute deviation of the set of data. Describe \ the mean absolute deviation represents in this situation.

Basketball Scores				
41	37	50	38	
54	42	56	49	4

Step 1: Find the mean.

Example 2 (You try!):

Example 3 (You try!):

The table below shows the high temperatures in the Bay Area for one week during the Month of March. Find the mean absolute deviation of the set of data. Describe what the mean absolute deviation represents in this situation.

High Tempe

