

Mean Absolute Deviation

Lesson 8-3

Name: _____

Date: _____

Class: _____

Key Vocabulary

Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

*Data: 8, 10, 12. Mean = 10. Distances from mean:
2, 0, 2. MAD = (2+0+2) ÷ 3 = 1.33*

Mean Absolute Deviation

The average distance of each number from the mean.

*If mean = 20 and value = 17, deviation = 17 - 20 =
-3 (3 below the mean)*

Deviation

How far a number is from the mean.

$|-3| = 3$ and $|3| = 3$ — both are 3 units from zero

Absolute Value

How far a number is from zero. It is always positive.

*Low spread: 8, 9, 10, 11 (close together). High
spread: 2, 9, 10, 25 (far apart)*

Spread

How far apart the numbers are.

*A set clustered tightly around the mean has low
MAD; a set spread far from the mean has high
MAD*

Data distribution

How the data looks: where it sits and how spread out it is.

*Low variability (MAD = 1): very consistent. High
variability (MAD = 8): very spread out*

Variability

How spread out the numbers are.

Key Ideas & Notes

- Coach wants to know which basketball player is more consistent: Player A scored 18, 22, 20, 24, 16 points in the last 5 games.
- Player B scored 10, 30, 25, 12, 23 points.
- Both players average 20 points per game.
- Which player would you count on to score close to 20 every night?

Think About It

- Both players have the same mean. What is different about their scores?
- Which player's scores stay closer to 20?
- Which player has the biggest single-game difference from 20?

My Notes

Guided Examples

Example 1

The mean of a data set is 15. One value is 11. What is the absolute deviation of that value from the mean?

Solution: Deviation = $11 - 15 = -4$. Absolute deviation = $|-4| = 4$.

Answer: A. 4

Example 2

A data set has absolute deviations of 3, 1, 5, 2, 4. What is the MAD?

Solution: Sum of absolute deviations = $3 + 1 + 5 + 2 + 4 = 15$. MAD = $15 \div 5 = 3$.

Answer: A. 3

Example 3

The mean of a data set is 20. A value is 26. What is the absolute deviation?

Solution: Deviation = $26 - 20 = 6$. Absolute deviation = $|6| = 6$.

Answer: A. 6

Write About the Math

The Writing Revolution

I can explain my work using the words mean absolute deviation, deviation, absolute value, and spread.

1. Kernel Sentence subject + verb

Model: Mean Absolute Deviation is the average distance of each number from the mean.
Desviación media absoluta es la distancia promedio de cada número a la media.

Write a kernel sentence about mean absolute deviation. Use a subject and a verb.

Escribe una oración base sobre desviación media absoluta. Usa un sujeto y un verbo.

2. Sentence Expansion because · but · so

Kernel: Mean Absolute Deviation matters in math
Desviación media absoluta importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because
porque

Mean Absolute Deviation matters in math because ____.
Desviación media absoluta importa en matemáticas porque ____.

but
pero

Mean Absolute Deviation matters in math, but ____.
Desviación media absoluta importa en matemáticas, pero ____.

so
entonces

Mean Absolute Deviation matters in math, so ____.
Desviación media absoluta importa en matemáticas, entonces ____.

3. Sentence Types 4 ways to write a math idea

Statement
Afirmación

Tell one true fact about mean absolute deviation.
Di un hecho verdadero sobre mean absolute deviation.

Mean absolute deviation ____.

Question
Pregunta

Ask a question about mean absolute deviation.
Haz una pregunta sobre mean absolute deviation.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about mean absolute deviation.
Muestra entusiasmo sobre mean absolute deviation.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

Tell a partner what to do with mean absolute deviation.
Dile a un compañero qué hacer con mean absolute deviation.

First, ____ .
Primero, ____ .

4. Explain Your Reasoning use a sentence starter

The MAD shows ____ .
La DMA muestra ____ .

The data is spread out because ____ .
Los datos están dispersos porque ____ .

This matters when ____ .
Esto importa cuando ____ .

Try It

Solve on your own. Check the answer key when you are done.

1. Team A has MAD = 2.1 points. Team B has MAD = 6.8 points. Which team is more consistent?

- A. Team A — lower MAD means scores are closer to the mean
- B. Team B — higher MAD means better performance
- C. Both are equally consistent
- D. Cannot tell from MAD alone

Show your work:

2. Two runners have the same average time of 60 seconds. Runner A's MAD is 1.2 seconds. Runner B's MAD is 5.8 seconds. Which runner is the coach more likely to pick for a relay race that needs a reliable time?

- A. Runner A — lower MAD means more consistent times
- B. Runner B — higher MAD means faster potential
- C. Either — they have the same average
- D. Neither — MAD doesn't matter for relay races

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

Two basketball teams both average 75 points per game. Team A's last 5 scores: 73, 76, 74, 77, 75. Team B's last 5 scores: 60, 90, 65, 85, 75. Calculate the MAD for each team and explain which team a coach would prefer if they need predictable scoring.

Sentence starter: Team A's MAD = ____ . Team B's MAD = ____ . Team A is ____ because ____ . A coach would prefer Team ____ for predictable scoring because ____ .

Show your work:

Reflect — Exit Ticket

Data set: 4, 8, 6, 10, 2. The mean is 6. What is the MAD?

- A. 2.4
- B. 6
- C. 0
- D. 12

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. Team A — lower MAD means scores are closer to the mean — *Lower MAD means less spread — Team A's scores stay closer to their average, making them more consistent.*
2. **Try It 2:** A. Runner A — lower MAD means more consistent times — *Runner A's MAD of 1.2 means times are usually within 1.2 seconds of 60. Runner B's times vary more widely. For reliability, pick Runner A.*
3. **Exit Ticket:** A. 2.4 — *Deviations: -2, 2, 0, 4, -4. Absolute deviations: 2, 2, 0, 4, 4. Sum = 12. MAD = $12 \div 5 = 2.4$.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Mean Absolute Deviation is the average distance of each number from the mean.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).