Appropriate Measures

Lesson 8-4

Name: _____ Date: _____ Class: _____

Key Vocabulary Level 1 support

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

Mean of 10, 20, 30 = (10+20+30) ÷ 3 = 20

Mean

The average. Add all the numbers, then divide by how many there are.

Data: 5, 8, 12, 15, 20 → median is 12 (the 3rd of 5 values)

Median

The middle number when you put them in order.

Data: 12, 14, 13, 15, 45 → 45 is far from the cluster, so it is an outlier

Outlier

A number that is much bigger or smaller than the rest.

Scores: 5, 6, 7, 8, 8, 35 → most scores are low, but 35 creates a tail to the right (skewed right)

Skewed

When most data sits on one side with a tail on the other.

Symmetric = even on both sides. Skewed = bunched on one side with a tail

Data distribution

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

88, 90, 89, 91 (low variability) vs. 50, 70, 95, 100 (high variability)

Variability

How spread out the numbers are.

Key Ideas & Notes

- The league is creating awards for the season.
- For the scoring title, they need to pick the best measure of a typical game.
- Here are the top scorer's points per game: 22, 24, 20, 25, 23, 21, 58.
- That 58-point game was a record-breaker!

Think About It

- How does the 58-point game compare to the other scores?
- What is the mean? What is the median?
- Which measure is closer to what this player usually scores?

My Notes

Guided Examples

Example 1

A gymnast's scores are: 8.5, 8.8, 8.7, 8.6, 8.9. There are no outliers. Which measure best represents a typical score?

Solution: The data is symmetric with no outliers, so the mean (8.7) best represents the typical score.

Answer: A. Mean

Example 2

A runner's mile times are: 7:10, 7:15, 7:12, 7:20, 12:00. The 12:00 was due to a cramp. Which measure best represents a typical mile?

Solution: The 12:00 is an outlier that pulls the mean up. The median (7:15) better represents the runner's typical time.

Answer: A. Median — the outlier 12:00 pulls the mean too high

Example 3

Data set: 5, 6, 7, 7, 8, 50. The mean is about 13.8 and the median is 7. Which better represents the typical value?

Solution: The mean (13.8) is higher than 5 of the 6 values because the outlier 50 pulls it up. The median (7) better represents a typical value.

Answer: A. Median (7) — the outlier 50 inflates the mean

Write About the Math

The Writing Revolution

I can explain my choice using the words mean, median, outlier, and skewed.

1. Kernel Sentence

subject + verb

Model: Mean is the average. Add all the numbers, then divide by how many there are.
Media es el promedio. Suma todos los números y divide entre cuántos hay.

Write a kernel sentence about mean. Use a subject and a verb.
Escribe una oración base sobre media. Usa un sujeto y un verbo.

2. Sentence Expansion

because · but · so

Kernel: Mean matters in math
Media importa en matemáticas

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

because *porque*	**Mean matters in math because ____.** *Media importa en matemáticas porque ____.*
but *pero*	**Mean matters in math, but ____.** *Media importa en matemáticas, pero ____.*
so *entonces*	**Mean matters in math, so ____.** *Media importa en matemáticas, entonces ____.*

3. Sentence Types

4 ways to write a math idea

Statement
Afirmación

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

Mean ____.

Question
Pregunta

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

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about mean.
Muestra entusiasmo sobre mean.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

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

First, ____ .
Primero, ____ .

---

4. Explain Your Reasoning

use a sentence starter

I chose the ____ because ____.
Elegí la ____ porque ____.

It fits the data because ____.
Encaja con los datos porque ____.

An average can mislead when ____.
Un promedio puede engañar cuando ____.

Try It

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

1. A baseball player's batting averages over 6 seasons are: .280, .295, .290, .285, .300, .110. The .110 was an injury-shortened season. Which measure better represents the player's typical batting average?

A. Median, because the .110 outlier pulls the mean down

B. Mean, because it uses all the data

C. Mean, because .110 is a real season

D. Neither measure works

Show your work:

2. Match the reason with whether to use mean or median.

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A local newspaper reports that the average home price in a neighborhood is $450,000. The actual prices are: $180K, $200K, $190K, $210K, $195K, $1,725K. Is the reporter's claim misleading? Calculate the mean and median and explain which better represents a 'typical' home price.

Sentence starter: Mean = ____. Median = ____. The reporter's claim is ____ because the outlier ($1,725K) pulls the mean ____. The ____ (about $____) better represents a typical home price because ____.

Show your work:

Reflect — Exit Ticket

Data set: 15, 18, 16, 17, 15, 72. Which measure of center best represents the data?

A. Median, because 72 is an outlier

B. Mean, because it uses all values

C. Mean, because it is always best

D. Neither works for this data

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. Median, because the .110 outlier pulls the mean down — *The .110 is an outlier that pulls the mean down to .260. The median (.2875) better represents typical performance because it isn't affected by the extreme value.*
2. **Try It 2:**
3. **Exit Ticket:** A. Median, because 72 is an outlier — *The value 72 is an outlier. The mean (25.5) is pulled high by 72 and doesn't represent the typical values. The median (16.5) is a better measure of center.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Mean is the average. Add all the numbers, then divide by how many there are.
- **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).