Lesson 2-6 · Session 1

Median and Outliers

Name _____ Date _____ Period _____

Maryland Standard 6.NOS.2 · Learning target — I can explain why the median is a better measure of center than the mean when a data set has an outlier.
Sentence Frame: "I know this because..."
Show a model, calculation, or explanation. Answer every part and label units when needed.

Exercises 1–12 earn 1 point for a correct response and 1 for supporting work. Spiral Review and Test Practice earn 1 point each.

Learn from a model

REMEMBER

- An outlier is a value far away from the rest of the data.
- The median is not strongly affected by outliers, but the mean IS.
- Watch out — an outlier is still real data. Report it; do not throw it away.
- Check it — if the mean sits outside the cluster of most values, use the median instead.

WORKED EXAMPLE

Finding the Median When a Set Has an Outlier Seven weekly tips in dollars are 22, 18, 25, 20, 27, 24, 96. What is a typical tip?

Step 1 Order the values: 18, 20, 22, 24, 25, 27, 96.

Step 2 Spot the outlier: 96 sits far above every other tip in the list.

Step 3 Find the value in the middle position of the seven ordered tips.

Step 4 Test it: dropping that 96 down to 30 would leave the same middle value.

Answer The median tip is 24 dollars, and the outlier 96 does not pull it away from the group.

Practice

1. Data: 20, 22, 21, 23, 90. Find the median. _____ Is 90 an outlier? _____

Answer _____

SHOW YOUR THINKING

2. Remove the outlier from problem 1 and find the median of the remaining 4 values. Did the median change much?

Answer _____

SHOW YOUR THINKING

3. Explain why the median is described as 'resistant to outliers.'
Sentence Frame: "I know this because..."

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

4. Find the median of each set, then name the outlier.

a. 5, 6, 7, 8, 60 — median _____ outlier _____
b. 41, 44, 47, 50, 300 — median _____ outlier _____
c. 2, 88, 90, 92, 94 — median _____ outlier _____
d. 15, 17, 19, 21, 23, 25, 400 — median _____ outlier _____

Answer _____

RECORD YOUR RESPONSE

5. Parking Meters. Seven meters collected 12, 15, 13, 17, 14, 16, 115 dollars. Find the median.

Answer _____

SHOW YOUR THINKING

6. Snow Plow Hours. Seven shifts lasted 5, 6, 7, 8, 9, 10, 46 hours. Find the median and explain why it describes a typical shift better than the mean would.
Sentence Frame: "I know this because..."

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

7. Removing the Outlier. Nine test scores are 62, 65, 68, 70, 72, 75, 78, 80, 12. Find the median, then find the median again with the 12 removed.

Answer _____

SHOW YOUR THINKING

8. Resistant Center. Bode says an outlier always makes the median wrong. Explain why the median is called resistant, and use an example of your own.
Sentence Frame: "I know this because..."

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

9. Find the median of 14, 17, 15, 19, 16, and 88, then name the outlier.

Answer _____ median and outlier

RECORD YOUR RESPONSE

10. A set has a mean of 52 and a median of 31. What does this suggest about the data?

Answer _____ your explanation

SHOW YOUR THINKING

11. Choose a Measure. House prices on a street are $180,000, $195,000, $205,000, $190,000, and $2,400,000. Which measure of center should a report use? Explain.

Answer _____ measure and why

EXPLAIN WITH MATHEMATICAL EVIDENCE

12. Find the Mistake. Marcus deletes an outlier so his mean looks better. Explain why that is not acceptable.
Sentence Frame: "I know this because..."

Answer _____ the explanation

EXPLAIN WITH MATHEMATICAL EVIDENCE

Spiral review

13. From Lesson 2-5 Session 1. Q1 = 18 and Q3 = 29. Find the IQR.

Answer _____

SHOW YOUR THINKING

14. From Lesson 2-4 Session 2. What does the line inside a box plot's box show?

Answer _____

SHOW YOUR THINKING

15. Grade 5. Find 90 ÷ 15.

Answer _____

SHOW YOUR THINKING

Test practice

16. An outlier pulls the mean —

- □ A. to zero
- □ B. away from itself
- □ C. toward itself
- □ D. to the median

17. What is the median of 2, 3, 4, 5, 200?

□ A. 200	□ B. 5
□ C. 42.8	□ D. 4

18. The best measure of center for data with an outlier is the —

□ A. median	□ B. mean
□ C. range	□ D. maximum

Check and revise

CHECK YOUR MATHEMATICS	HOW DID IT GO?
Order the data first. Count all values, including repeated values. Every part answered / Work shown / Units labeled when needed	I can do this: Independently / With a hint / With help Question to revisit: _____

One correction or question I want to discuss: _____

Check one response against the data. State which measure or feature supports your answer.