Statistics and Data Displays

Lesson 7 Choosing Measures of Center

Standards 6.SP.B.5d

Learning target I can choose a measure of center and explain why.

Materials Grid paper, rulers, colored pencils, data tables.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about choosing measures of center. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Use the shape and context. Mean with mean absolute deviation can describe fairly symmetric data. Median with interquartile range often describes skewed data or data with an unusual value more fairly. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: Reading times in minutes are 4, 5, 5, 6, 7, 16. Choose a center and matching variability measure. Calculate both and justify your choice. Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch sorting before finding medians, quartile conventions, counting every observation once, and mean versus variability.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

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Learn and Discuss

Use the shape and context. Mean with mean absolute deviation can describe fairly symmetric data. Median with interquartile range often describes skewed data or data with an unusual value more fairly.

Example 1 Reading times in minutes are 2, 3, 3, 4, 4, 5. Choose a center and matching variability measure. Calculate both and justify your choice.
Solution Mean 7/2 min and MAD 5/6 min; roughly symmetric data. Mean = 7/2, median = 7/2, IQR = 4 - 3 = 1, MAD = 5/6. Accept another justified choice tied to shape and purpose.
Example 2 Reading times in minutes are 7, 8, 8, 9, 10, 19. Choose a center and matching variability measure. Calculate both and justify your choice.
Solution Median 17/2 min and IQR 2 min; high value makes these resistant measures useful. Mean = 61/6, median = 17/2, IQR = 10 - 8 = 2, MAD = 53/18. Accept another justified choice tied to shape and purpose.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

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Name _____ Show calculations, models, and units.

1. Reading times in minutes are 4, 5, 5, 6, 6, 7. Choose a center and matching variability measure. Calculate both and justify your choice.

2. Reading times in minutes are 3, 4, 4, 5, 5, 6. Choose a center and matching variability measure. Calculate both and justify your choice.

3. Reading times in minutes are 8, 9, 9, 10, 10, 11. Choose a center and matching variability measure. Calculate both and justify your choice.

4. Reading times in minutes are 5, 9, 9, 13, 13, 17. Choose a center and matching variability measure. Calculate both and justify your choice.

5. Reading times in minutes are 4, 9, 9, 14, 14, 19. Choose a center and matching variability measure. Calculate both and justify your choice.

6. Reading times in minutes are 8, 10, 10, 12, 12, 14. Choose a center and matching variability measure. Calculate both and justify your choice.

7. Reading times in minutes are 5, 6, 6, 7, 8, 17. Choose a center and matching variability measure. Calculate both and justify your choice.

8. Reading times in minutes are 6, 7, 7, 8, 9, 18. Choose a center and matching variability measure. Calculate both and justify your choice.

9. Reading times in minutes are 3, 4, 4, 5, 6, 15. Choose a center and matching variability measure. Calculate both and justify your choice.

10. Reading times in minutes are 4, 5, 5, 6, 7, 16. Choose a center and matching variability measure. Calculate both and justify your choice.

Choosing Measures of Center

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1. Mean 11/2 min and MAD 5/6 min; roughly symmetric data
Reasoning Mean = 11/2, median = 11/2, IQR = 6 - 5 = 1, MAD = 5/6. Accept another justified choice tied to shape and purpose.

2. Mean 9/2 min and MAD 5/6 min; roughly symmetric data
Reasoning Mean = 9/2, median = 9/2, IQR = 5 - 4 = 1, MAD = 5/6. Accept another justified choice tied to shape and purpose.

3. Mean 19/2 min and MAD 5/6 min; roughly symmetric data
Reasoning Mean = 19/2, median = 19/2, IQR = 10 - 9 = 1, MAD = 5/6. Accept another justified choice tied to shape and purpose.

4. Mean 11 min and MAD 10/3 min; roughly symmetric data
Reasoning Mean = 11, median = 11, IQR = 13 - 9 = 4, MAD = 10/3. Accept another justified choice tied to shape and purpose.

5. Mean 23/2 min and MAD 25/6 min; roughly symmetric data
Reasoning Mean = 23/2, median = 23/2, IQR = 14 - 9 = 5, MAD = 25/6. Accept another justified choice tied to shape and purpose.

6. Mean 11 min and MAD 5/3 min; roughly symmetric data
Reasoning Mean = 11, median = 11, IQR = 12 - 10 = 2, MAD = 5/3. Accept another justified choice tied to shape and purpose.

7. Median 13/2 min and IQR 2 min; high value makes these resistant measures useful
Reasoning Mean = 49/6, median = 13/2, IQR = 8 - 6 = 2, MAD = 53/18. Accept another justified choice tied to shape and purpose.

8. Median 15/2 min and IQR 2 min; high value makes these resistant measures useful
Reasoning Mean = 55/6, median = 15/2, IQR = 9 - 7 = 2, MAD = 53/18. Accept another justified choice tied to shape and purpose.

9. Median 9/2 min and IQR 2 min; high value makes these resistant measures useful
Reasoning Mean = 37/6, median = 9/2, IQR = 6 - 4 = 2, MAD = 53/18. Accept another justified choice tied to shape and purpose.

10. Median 11/2 min and IQR 2 min; high value makes these resistant measures useful
Reasoning Mean = 43/6, median = 11/2, IQR = 7 - 5 = 2, MAD = 53/18. Accept another justified choice tied to shape and purpose.