Statistics and Data Displays

Lesson 2 Center Spread and Shape

Standards 6.SP.A.2, 6.SP.A.3

Learning target I can describe a distribution by center, spread, and shape.

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 center spread and shape. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. A distribution shows which values occur and how often. Describe a typical value, how spread out the values are, and whether the shape is roughly symmetric, skewed, clustered, or has unusual values. 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 2, 3, 3, 4, 5, 14. Describe a typical value, range, shape, and any striking value. 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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Learning target I can describe a distribution by center, spread, and shape.

Learn and Discuss

A distribution shows which values occur and how often. Describe a typical value, how spread out the values are, and whether the shape is roughly symmetric, skewed, clustered, or has unusual values.

Example 1 Reading times in minutes are 7, 8, 8, 9, 9, 10. Describe a typical value, range, shape, and any striking value.
Solution Center near 17/2 min; range 3 min; roughly symmetric; no isolated extreme. The values balance around the middle. Range = 10 - 7.
Example 2 Reading times in minutes are 2, 3, 3, 4, 5, 14. Describe a typical value, range, shape, and any striking value.
Solution Center near 7/2 min; range 12 min; right-skewed with high value 14 min. The values cluster low with a long high tail. Range = 14 - 2.

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

Lesson 2 Center Spread and Shape

Name _____ Show calculations, models, and units.

1. Reading times in minutes are 5, 6, 6, 7, 7, 8. Describe a typical value, range, shape, and any striking value.

2. Reading times in minutes are 4, 5, 5, 6, 6, 7. Describe a typical value, range, shape, and any striking value.

3. Reading times in minutes are 8, 9, 9, 10, 10, 11. Describe a typical value, range, shape, and any striking value.

4. Reading times in minutes are 4, 9, 9, 14, 14, 19. Describe a typical value, range, shape, and any striking value.

5. Reading times in minutes are 2, 6, 6, 10, 10, 14. Describe a typical value, range, shape, and any striking value.

6. Reading times in minutes are 4, 6, 6, 8, 8, 10. Describe a typical value, range, shape, and any striking value.

7. Reading times in minutes are 7, 8, 8, 9, 10, 19. Describe a typical value, range, shape, and any striking value.

8. Reading times in minutes are 8, 9, 9, 10, 11, 20. Describe a typical value, range, shape, and any striking value.

9. Reading times in minutes are 4, 5, 5, 6, 7, 16. Describe a typical value, range, shape, and any striking value.

10. Reading times in minutes are 2, 3, 3, 4, 5, 14. Describe a typical value, range, shape, and any striking value.

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1. Center near 13/2 min; range 3 min; roughly symmetric; no isolated extreme
Reasoning The values balance around the middle. Range = 8 - 5.

2. Center near 11/2 min; range 3 min; roughly symmetric; no isolated extreme
Reasoning The values balance around the middle. Range = 7 - 4.

3. Center near 19/2 min; range 3 min; roughly symmetric; no isolated extreme
Reasoning The values balance around the middle. Range = 11 - 8.

4. Center near 23/2 min; range 15 min; roughly symmetric; no isolated extreme
Reasoning The values balance around the middle. Range = 19 - 4.

5. Center near 8 min; range 12 min; roughly symmetric; no isolated extreme
Reasoning The values balance around the middle. Range = 14 - 2.

6. Center near 7 min; range 6 min; roughly symmetric; no isolated extreme
Reasoning The values balance around the middle. Range = 10 - 4.

7. Center near 17/2 min; range 12 min; right-skewed with high value 19 min
Reasoning The values cluster low with a long high tail. Range = 19 - 7.

8. Center near 19/2 min; range 12 min; right-skewed with high value 20 min
Reasoning The values cluster low with a long high tail. Range = 20 - 8.

9. Center near 11/2 min; range 12 min; right-skewed with high value 16 min
Reasoning The values cluster low with a long high tail. Range = 16 - 4.

10. Center near 7/2 min; range 12 min; right-skewed with high value 14 min
Reasoning The values cluster low with a long high tail. Range = 14 - 2.