Statistics and Data Displays

Unit 9 Test

Standards 6.G.A.1, 6.G.A.2, 6.G.A.4, 6.SP.A.1, 6.SP.A.2, 6.SP.A.3, 6.SP.B.5a, 6.SP.B.5b, 6.SP.B.5c, 6.SP.B.5d, 6.SP.B.4

Learning target I can apply the skills taught so far, show my reasoning, and check my answers.

Assessment 20 open-response questions. Questions 1–4 review Unit 8; the remaining 16 assess this unit. Review accounts for exactly 20% of questions and points.

Administration

0–5 minutes Distribute only the attached student assessment pages. Read directions and confirm students have pencils, rulers, and extra plotting paper when needed. Ask for calculations, models, labels, and explanations where requested.

5–45 minutes Students complete the unit test independently. Allow an extended block for model-heavy responses as needed. Follow the course policy of doing arithmetic by hand unless an established classroom accommodation applies.

Final minutes Collect responses and ask students to note one item they want to revisit. Use the next teaching session for corrections and focused reteaching.

Scoring and Feedback

5 points each, 100 total: 2 for setup or model, 2 for calculation or reasoning, 1 for units, interpretation, or the requested check.

Score prior-unit review separately from current-unit work. Accept equivalent exact answers and valid alternate methods. For drawings, use the coordinate, face, frequency, or summary information in the attached key to check the representation.

Suggested follow-up based on current-unit items: 80% or above, continue with brief corrections; 60–79%, provide targeted small-group support; below 60%, reteach with models. These are instructional suggestions, not state proficiency cut scores.

Likely misconceptions Watch sorting before finding medians, quartile conventions, counting every observation once, and mean versus variability.

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Questions 1–4 review Unit 8 (20%). The remaining questions assess this unit. Show work, simplify exact answers, label units, and justify models or explanations. 5 points per question; 100 points total.

1. [Review] A parallelogram has base 5 m and perpendicular height 7 m. Sketch how it can be rearranged into a rectangle and find its area.

2. [Review] A rectangular prism has edges 2, 3 1/2, and 4 cm. Sketch it and find its volume.

3. [Review] Draw a net for a closed 2 × 3 × 6 cm rectangular prism. Label the six faces and calculate total area.

4. [Review] An L-shaped garden is a 10 m by 8 m rectangle with an 6 m by 4 m corner rectangle removed. Sketch and find the garden area.

5. [Current unit] Is “What are the heights of the plants in our garden?” statistical? Explain.

6. [Current unit] Reading times in minutes are 2, 3, 3, 4, 4, 5. Describe a typical value, range, shape, and any striking value.

7. [Current unit] Reading times in minutes are 8, 9, 9, 10, 10, 11. Report n, units, and mean.

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8. [Current unit] Reading times in minutes are 8, 12, 12, 16, 16, 20. Find the median. Show the middle positions.

9. [Current unit] Reading times in minutes are 8, 11, 11, 14, 14, 17. Find Q1, Q3, IQR, and range.

10. [Current unit] Reading times in minutes are 6, 10, 10, 14, 14, 18. Calculate the mean and MAD. Show all absolute deviations.

11. [Current unit] Reading times in minutes are 4, 10, 10, 16, 16, 22. Choose a center and matching variability measure. Calculate both and justify your choice.

12. [Current unit] Reading times in minutes are 7, 13, 13, 19, 19, 25. Draw a labeled dot plot. Check the number of dots.

13. [Current unit] Daily reading times in minutes: 9, 12, 17, 10, 17, 3, 7, 1, 13, 2. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.

14. [Current unit] Reading times in minutes are 6, 7, 7, 8, 9, 18. Find the five-number summary and draw a labeled box plot. State the IQR.

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15. [Current unit] Reading times (min): Group A [8, 9, 9, 10, 11, 20], Group B [10, 11, 11, 12, 13, 22]. Compare median and IQR. Which group reads longer typically? Which is more consistent?

16. [Current unit] Reading times in minutes are 3, 4, 4, 5, 6, 15. Write a summary with count, attribute, units, center, variability, shape, and a justified choice of measures.

17. [Current unit] A survey asks “Is our school nice?” Improve it to collect numerical data with expected variation.

18. [Current unit] Reading times in minutes are 3, 4, 4, 5, 6, 15. Describe a typical value, range, shape, and any striking value.

19. [Current unit] Reading times in minutes are 2, 3, 3, 4, 5, 14. Report n, units, and mean. If one more student reads 6 minutes, find the new mean.

20. [Current unit] Reading times in minutes are 2, 3, 3, 4, 5, 14. Find the median and mean. Explain the difference in this set.

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1. 35 m²
Reasoning Cut and shift a corner; A = bh = 5 × 7 = 35.

2. 28 cm³
Reasoning B = 2 × 7/2 = 7 cm²; V = B × 4 = 28 cm³.

3. 2 faces each of 2×3, 2×6, 3×6; 72 cm²
Reasoning Add 2(6) + 2(12) + 2(18) = 72.

4. 56 m²
Reasoning Outer area 80 minus cutout 24 = 56.

5. Yes; plant heights vary.
Reasoning Look for a collection of data and anticipated variation; identify the population and variable.

6. Center near 7/2 min; range 3 min; roughly symmetric; no isolated extreme
Reasoning The values balance around the middle. Range = 5 - 2.

7. n = 6; minutes; mean 19/2 min
Reasoning Sum = 57; mean = 57 ÷ 6 = 19/2.

8. Median 14 min
Reasoning 6 ordered values: average positions 3 and 4: (12 + 16) ÷ 2 = 14.

9. Q1 11, Q3 14; IQR 3 min; range 9 min
Reasoning Lower half [8, 11, 11] has median 11; upper half [14, 14, 17] has median 14. Subtract Q1 from Q3.

10. Mean 12 min; MAD 10/3 min
Reasoning Distances: 6, 2, 2, 2, 2, 6; sum 20; divide by 6 = 10/3.

11. Mean 13 min and MAD 5 min; roughly symmetric data
Reasoning Mean = 13, median = 13, IQR = 16 - 10 = 6, MAD = 5. Accept another justified choice tied to shape and purpose.

12. 7: 1 dot; 13: 2 dots; 19: 2 dots; 25: 1 dot; n = 6
Reasoning Each observation contributes one dot; stack repeated values at their number-line position.

13. Frequencies 3, 2, 3, 2
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

14. (6, 7, 15/2, 9, 18); IQR 2 min
Reasoning Box runs from 7 to 9, median line at 15/2, whiskers to 6 and 18.

15. A median 19/2, B median 23/2 min; both IQR 2 min. B is typically 2 min higher; equal middle-half variability.
Reasoning Adding 2 shifts all values and the median by 2, but does not change Q3 - Q1.

16. 6 observations of reading time in minutes. Median 9/2 min, IQR 2 min; right-skewed with a high value 15 min, so median/IQR resist that value.
Reasoning Calculate the center and spread before interpreting them in context. Other accurate, justified summaries are acceptable.

17. Example: On a 1 to 5 scale, how do students in our class rate the school library? Ratings vary among students; the numerical scale must be defined.
Reasoning Look for a collection of data and anticipated variation; identify the population and variable.

18. Center near 9/2 min; range 12 min; right-skewed with high value 15 min
Reasoning The values cluster low with a long high tail. Range = 15 - 3.

19. n = 6; minutes; mean 31/6 min; new mean 37/7 min
Reasoning Sum = 31; mean = 31 ÷ 6 = 31/6. New sum = 37; divide by 7.

20. Median 7/2 min; mean 31/6 min; the high value pulls the mean upward
Reasoning 6 ordered values: average positions 3 and 4: (3 + 4) ÷ 2 = 7/2.