Statistics and Data Displays

Lesson 9 Histograms and Intervals

Standards 6.SP.B.4

Learning target I can construct and interpret a histogram with equal-width bins.

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 histograms and intervals. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Group numerical values into adjacent, nonoverlapping intervals. Count each observation in exactly one interval, draw touching bars, and label the numerical axis and the frequency axis. 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: Daily reading times in minutes: 17, 15, 18, 8, 8, 9, 14, 1, 4, 11. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes. Which interval has the greatest frequency? Include ties. 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

Group numerical values into adjacent, nonoverlapping intervals. Count each observation in exactly one interval, draw touching bars, and label the numerical axis and the frequency axis.

Example 1 Daily reading times in minutes: 3, 16, 11, 3, 1, 19. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.
Solution Frequencies 3, 0, 1, 2. Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.
Example 2 Daily reading times in minutes: 2, 5, 6, 19, 18, 14, 17, 3, 3, 14. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes. Which interval has the greatest frequency? Include ties.
Solution Frequencies 3, 2, 2, 3; greatest: 0–4, 15–19. Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

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 9 Histograms and Intervals

Name _____ Show calculations, models, and units.

1. Daily reading times in minutes: 11, 7, 14, 11, 7, 8. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.

2. Daily reading times in minutes: 14, 13, 7, 11, 9, 3. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.

3. Daily reading times in minutes: 10, 9, 2, 15, 15, 6. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.

4. Daily reading times in minutes: 13, 4, 3, 10, 1, 15, 15, 16, 18, 5. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.

5. Daily reading times in minutes: 10, 10, 10, 0, 4, 19, 0, 0, 4, 17. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.

6. Daily reading times in minutes: 3, 6, 7, 3, 18, 2, 2, 13, 12, 3. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes.

7. Daily reading times in minutes: 16, 12, 7, 19, 5, 14, 2, 18, 11, 16. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes. Which interval has the greatest frequency? Include ties.

8. Daily reading times in minutes: 8, 7, 8, 17, 7, 6, 17, 8, 7, 2. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes. Which interval has the greatest frequency? Include ties.

9. Daily reading times in minutes: 10, 11, 12, 4, 5, 14, 12, 16, 0, 14. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes. Which interval has the greatest frequency? Include ties.

10. Daily reading times in minutes: 17, 15, 18, 8, 8, 9, 14, 1, 4, 11. Draw a histogram using bins 0–4, 5–9, 10–14, and 15–19. Label axes. Which interval has the greatest frequency? Include ties.

Histograms and Intervals

Statistics and Data Displays

1. Frequencies 0, 3, 3, 0
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

2. Frequencies 1, 2, 3, 0
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

3. Frequencies 1, 2, 1, 2
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

4. Frequencies 3, 1, 2, 4
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

5. Frequencies 5, 0, 3, 2
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

6. Frequencies 5, 2, 2, 1
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

7. Frequencies 1, 2, 3, 4; greatest: 15–19
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

8. Frequencies 1, 7, 0, 2; greatest: 5–9
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

9. Frequencies 2, 1, 6, 1; greatest: 10–14
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.

10. Frequencies 2, 3, 2, 3; greatest: 5–9, 15–19
Reasoning Count every value once. Bars touch and have equal width; horizontal axis is minutes, vertical axis is frequency.