

Data Display Lab

Build and read box plots and histograms.

GRADE 6 • MA.6.DP.1.5

MA.6.DP.1.5 "Create box plots and histograms to represent sets of numerical data within real-world contexts."

NAME _____

DATE _____

TWO WAYS TO SHOW DATA

A histogram groups numerical data into equal-size intervals. Its bar height shows how many data values are in each interval. A box plot uses the minimum, Q1, median, Q3, and maximum to show the spread of ordered data. For this worksheet, exclude the overall median before finding the median of each half.

WORKED EXAMPLE

Use the data points on the number line to find the five numbers needed to create a box plot.



1. Read the ordered values: 2, 4, 5, 7, 9.
2. The minimum is 2, the median is 5, and the maximum is 9.
3. Exclude the median. The lower half is 2, 4, so $Q1 = (2 + 4) / 2 = 3$.
4. The upper half is 7, 9, so $Q3 = (7 + 9) / 2 = 8$.

Answer: Minimum 2, Q1 3, median 5, Q3 8, maximum 9.

PRACTICE 6 problems

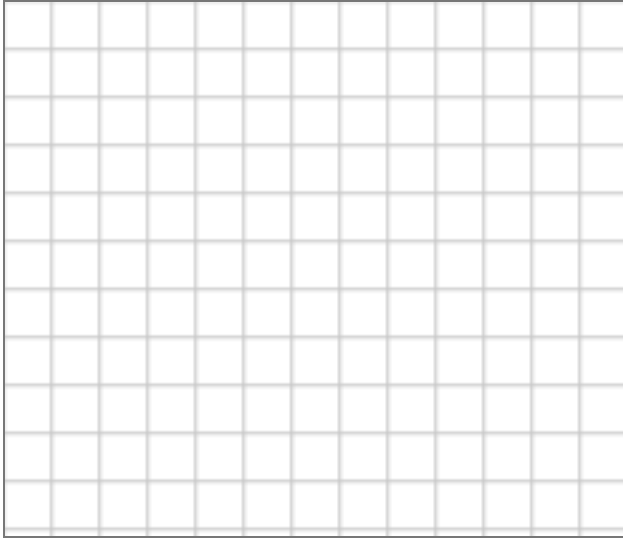
- 1** Find the five-number summary for this ordered data set: 11, 13, 16, 18, 21.

ANSWER _____

- 2** Find the five-number summary for this ordered data set: 24, 27, 31, 34, 38, 42.

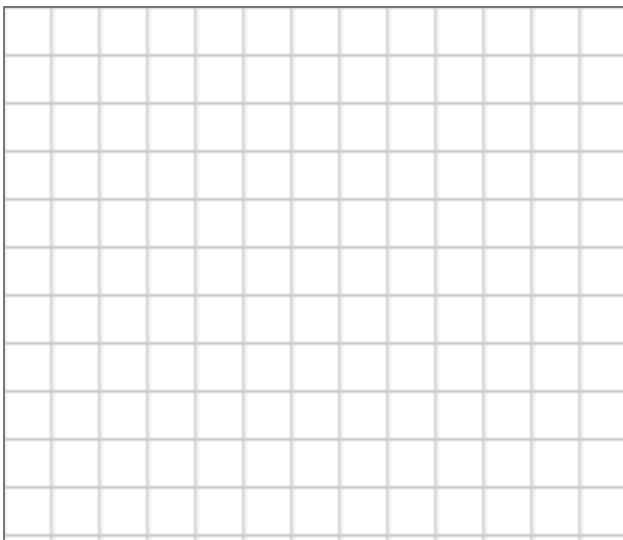
ANSWER _____

- 3 Make a histogram using intervals 40-44, 45-49, 50-54, and 55-59. Write the four bar heights in order for this data set: 43, 46, 48, 51, 53, 57, 58, 59.



ANSWER _____

- 5 Draw a box plot with minimum 76, Q1 79, median 83, Q3 88, and maximum 92. Label the number line and all five values.



ANSWER _____

- 4 A histogram has intervals 60-64, 65-69, and 70-74. Write the bar heights in order for this data set: 62, 63, 66, 67, 69, 70, 72, 73, 74.

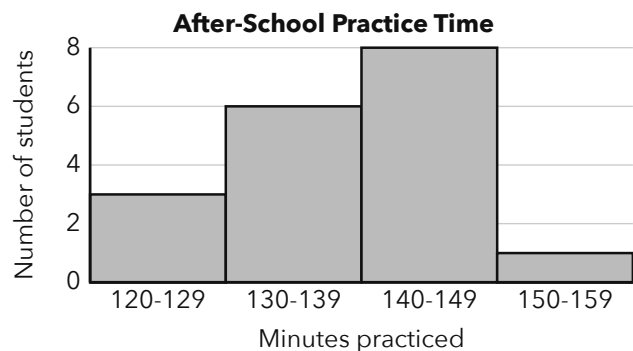
ANSWER _____

- 6 A data set is 94, 95, 96, 102, 103, 104, 110. Which display, a histogram or a box plot, is better for seeing groups and gaps in the data? Explain briefly.

ANSWER _____

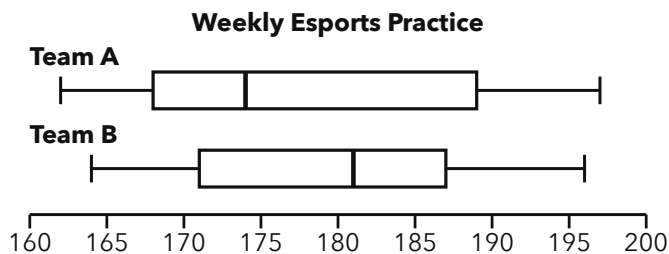
APPLY IT Show your work

- 1** A music club tracked the number of minutes students practiced an instrument after school. Use the histogram to identify the interval with the most students.



ANSWER _____

- 2** Two esports teams recorded how many minutes each player spent practicing during one week. Use the box plots to decide which team has the higher median practice time and find the difference between the medians.



ANSWER _____

CHALLENGE One step up

Create an ordered data set of 7 whole numbers with minimum 205, Q1 211, median 216, Q3 225, and maximum 231. Then explain which positions give Q1, the median, and Q3.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the five-number summary for this ordered data set: 11, 13, 16, 18, 21.	Minimum 11, Q1 12, median 16, Q3 19.5, maximum 21.
2	Find the five-number summary for this ordered data set: 24, 27, 31, 34, 38, 42.	Minimum 24, Q1 27, median 32.5, Q3 38, maximum 42.
3	Make a histogram using intervals 40-44, 45-49, 50-54, and 55-59. Write the four bar heights in order for this data set: 43, 46, 48, 51, 53, 57, 58, 59.	1, 2, 2, 3
4	A histogram has intervals 60-64, 65-69, and 70-74. Write the bar heights in order for this data set: 62, 63, 66, 67, 69, 70, 72, 73, 74.	2, 3, 4
5	Draw a box plot with minimum 76, Q1 79, median 83, Q3 88, and maximum 92. Label the number line and all five values.	A labeled number line has whiskers at 76 and 92, a box from 79 to 88, and a median line at 83.
6	A data set is 94, 95, 96, 102, 103, 104, 110. Which display, a histogram or a box plot, is better for seeing groups and gaps in the data? Explain briefly.	Histogram. A histogram shows the frequencies in intervals, so groups and gaps are easier to see.

PART 2 • APPLY IT

- 1. 140-149 minutes** Compare the bar heights. The tallest bar has height 8 and is labeled 140-149.
- 2. Team B, by 7 minutes.** Team A has a median of 174 minutes and Team B has a median of 181 minutes. Subtract 174 from 181.

CHALLENGE

Answers vary. One data set is 205, 211, 214, 216, 220, 225, 231. The 2nd value is Q1, the 4th value is the median, and the 6th value is Q3.

For five-number summaries, accept equivalent formatting such as (minimum, Q1, median, Q3, maximum). For the challenge, accept any ordered set of 7 whole numbers that has the stated five-number summary. Use the stated convention of excluding the overall median when splitting an odd-sized data set. In the worked example, Q1 is 3 and Q3 is 8.

PRACTICE 5 · SAMPLE FIGURE

