Lesson 2-4 · Session 1

Building a Box Plot

Name _____ Date _____ Period _____

Maryland Standard 6.DS.5 · Learning target — I can find the five-number summary of a data set and use it to build a box plot.

Show a model, calculation, or explanation. Answer every part and label units when needed.

Exercises 1–12 earn 1 point for a correct response and 1 for supporting work. Spiral Review and Test Practice earn 1 point each.

Learn from a model

REMEMBER

- The five-number summary is: minimum, Q1 (lower quartile), median, Q3 (upper quartile), maximum.
- A box plot uses these five numbers to show the spread of the data.
- Watch out — with an odd count, the median is not part of either half when you find Q1 and Q3.
- Check it — the five numbers must read in order: min ≤ Q1 ≤ median ≤ Q3 ≤ max.

WORKED EXAMPLE

Finding the Five-number Summary Seven daily high temperatures in degrees are 58, 71, 64, 83, 66, 77, 61. Build the box plot.

Step 1 Order the values: 58, 61, 64, 66, 71, 77, 83.

Step 2 Mark the median, 66 — the middle value of the seven.

Step 3 Lower half 58, 61, 64 gives quartile 1 as 61. Upper half gives quartile 3 as 77.

Step 4 Draw a box from 61 to 77 with a line at 66, then whiskers out to 58 and to 83.

Answer Five-number summary: 58, 61, 66, 77, 83. The box covers the middle half of the data.

Practice

1. Data set: 2, 4, 5, 7, 8, 9, 11, 12, 15. Find the five-number summary.

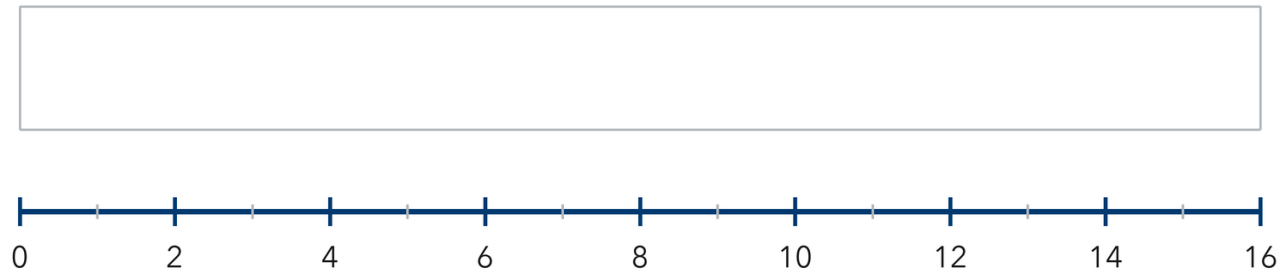
Min _____ Q1 _____ Median _____ Q3 _____ Max _____

Answer _____

SHOW YOUR THINKING

2. Draw and label a number line, then make a box plot for the data in problem 1.

Box plot. Mark all five values on the scale, then draw the box and both whiskers.



Answer _____

SHOW YOUR THINKING

3. What does the length of the box (from Q1 to Q3) tell you about the middle 50% of the data?

Answer _____

SHOW YOUR THINKING

4. Use the ordered data 6, 10, 14, 18, 22, 26, 30.

a. Minimum _____
b. Q1 _____
c. Median _____
d. Q3 _____
e. Maximum _____

Answer _____

SHOW YOUR THINKING

5. Apple Harvest. Seven baskets hold 24, 31, 19, 40, 27, 36, 22 apples. Find the five-number summary.

Answer _____

SHOW YOUR THINKING

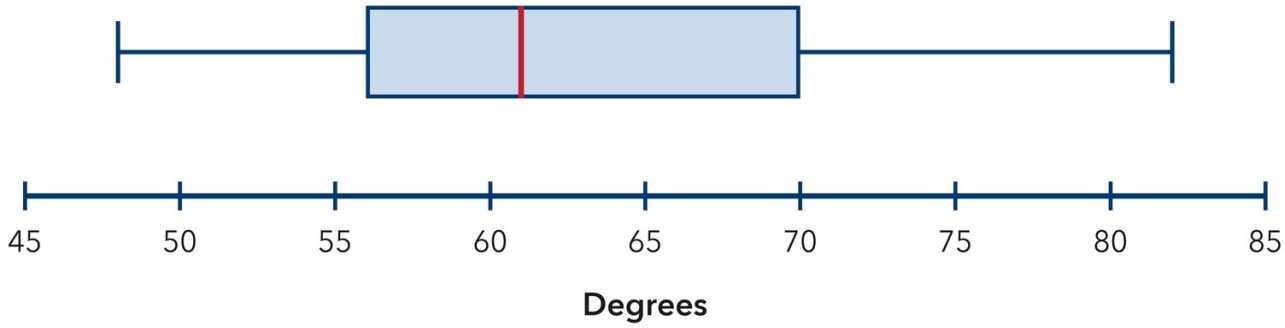
6. Swim Times. Eight swim times in seconds are 41, 47, 39, 53, 45, 49, 43, 55. Find the five-number summary.

Answer _____

SHOW YOUR THINKING

7. Reading the Box. A box plot of daily temperatures shows minimum 48, quartile 1 at 56, median 61, quartile 3 at 70, maximum 82. Find the width of the box and explain what share of the days falls inside it.

Read the box plot. This is the temperature plot the problem describes.



Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

8. Halfway Claim. Percy says the median of a box plot always sits exactly halfway between Q1 and Q3. Use the summary 12, 15, 17, 25, 30 to explain why he is wrong. Sentence Frame: "I know this because..."

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

9. Find the five-number summary of 20, 34, 27, 41, 23, 38, and 30.

Answer min, Q1, median, Q3, max

SHOW YOUR THINKING

10. A box plot has min 5, Q1 11, median 15, Q3 22, max 28. How long is the box?

Answer _____ units

SHOW YOUR THINKING

11. Eight Values. Find the five-number summary of 62, 55, 71, 58, 66, 74, 60, and 68.

Answer min, Q1, median, Q3, max

SHOW YOUR THINKING

12. Find the Mistake. Devon included the median in both halves when finding Q1 and Q3 for a set of 7 values. Explain why that is wrong.
Sentence Frame: "I know this because..."

Answer _____ the explanation

EXPLAIN WITH MATHEMATICAL EVIDENCE

Spiral review

13. From Lesson 2-3 Session 2. Find the median of 11, 17, 23, 29.

Answer _____

SHOW YOUR THINKING

14. From Lesson 2-2 Session 2. Bars of height 2, 4, 9, 4, 2 describe what shape?

Answer _____

RECORD YOUR RESPONSE

15. Grade 5. Find 9.6 ÷ 8.

Answer _____

SHOW YOUR THINKING

Test practice

16. The whiskers of a box plot reach the —

- □ A. minimum and maximum
- □ B. quartiles
- □ C. mean
- □ D. median

17. Q3 is the median of the —

□ A. lower half	□ B. upper half
□ C. whole set	□ D. box

18. For 10, 20, 30, 40, 50, 60, 70, what is Q1?

□ A. 10	□ B. 30
□ C. 20	□ D. 40

Check and revise

CHECK YOUR MATHEMATICS	HOW DID IT GO?
Use consistent units and the same measure when comparing two groups. Every part answered / Work shown / Units labeled when needed	I can do this: Independently / With a hint / With help Question to revisit: _____

One correction or question I want to discuss: _____

Check one response against the data. State which measure or feature supports your answer.