LESSON MAKER PRO

Box Plot Matchup

Build two box plots on one scale to compare groups.

HIGH SCHOOL · S.DA.3.1

S.DA.3.1 "Construct appropriate parallel graphical displays of distributions."

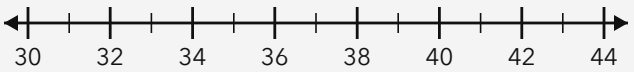
NAME _____ DATE _____

ONE SCALE, TWO GROUPS

To compare groups fairly, draw their box plots on the same number line, one above and one below it. For each group, find the minimum, lower quartile, median, upper quartile, and maximum. If there is an odd number of values, leave out the median when finding the quartiles.

WORKED EXAMPLE

Draw parallel box plots for Cedar: 31, 33, 35, 37, 39, 41, 43 and Birch: 32, 34, 36, 38, 40, 42, 44. Put Cedar above the shared axis and Birch below it.



1. Find each median: Cedar has 37, and Birch has 38.
2. Leave out each median. The five-number summaries are Cedar: 31, 33, 37, 41, 43 and Birch: 32, 34, 38, 42, 44.
3. For each group, draw a box from the lower to the upper quartile with a line at the median. Extend whiskers to the minimum and maximum.

Answer: Cedar: whiskers at 31 and 43, box from 33 to 41, median line at 37. Birch: whiskers at 32 and 44, box from 34 to 42, median line at 38.

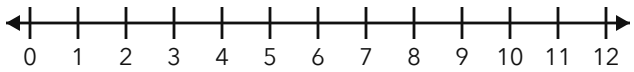
PRACTICE 6 problems

1 Draw parallel box plots for A: 1, 2, 3, 4, 5, 6, 8 and B: 2, 3, 4, 5, 6, 7, 9. Put A above the axis and B below it.



ANSWER _____

2 Draw parallel box plots for A: 0, 1, 3, 4, 5, 7, 9 and B: 1, 2, 3, 4, 6, 8, 10. Put A above the axis and B below it. Which group has the higher median?



ANSWER _____

3 Draw parallel box plots for A: 2, 3, 4, 5, 6, 7, 8 and B: 1, 4, 5, 6, 7, 8, 11. Put A above the axis and B below it. Which group has the greater range?



ANSWER _____

4 Draw parallel box plots for A: 1, 2, 3, 5, 6, 10 and B: 0, 2, 4, 6, 8, 12. Put A above the axis and B below it.



ANSWER _____

5 Draw parallel box plots for A: 0, 1, 2, 2, 3, 4, 10 and B: 0, 3, 4, 4, 5, 6, 10. Put A above the axis and B below it. Which group has the higher median?



ANSWER _____

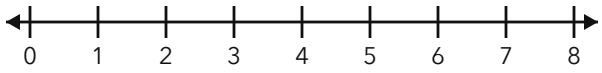
6 Draw parallel box plots for A: 1, 1, 2, 4, 7, 9, 12 and B: 1, 3, 4, 4, 5, 7, 12. Put A above the axis and B below it. Which group has the larger interquartile range?



ANSWER _____

APPLY IT Show your work

1 Two student clubs tracked how many hours seven members spent playing games last weekend. Club A: 1, 2, 2, 3, 4, 5, 8. Club B: 1, 1, 2, 3, 4, 4, 6. Draw parallel box plots, with A above the axis and B below it. Which club has the greater range?



ANSWER _____

2 Students timed two lunch lines on seven days. Line A wait times, in minutes: 2, 3, 4, 5, 6, 7, 10. Line B: 1, 4, 4, 5, 6, 6, 9. Draw parallel box plots, with A above the axis and B below it. Which line has the smaller interquartile range?



ANSWER _____

CHALLENGE One step up

Group A has values 1, 2, 3, 4, 5, 6, 7, 8, 9. Group B has the same values except that 9 is replaced by 12. Draw parallel box plots, with A above the axis and B below it. Explain which parts of the plots change and which stay the same.



WORK SPACE AND ANSWER

ANSWER KEY

Box Plot Matchup

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Draw parallel box plots for A: 1, 2, 3, 4, 5, 6, 8 and B: 2, 3, 4, 5, 6, 7, 9. Put A above the axis and B below it.	**A: 1, 2, 4, 6, 8. B: 2, 3, 5, 7, 9. Each box plot uses its five-number summary on the shared axis.**
2	Draw parallel box plots for A: 0, 1, 3, 4, 5, 7, 9 and B: 1, 2, 3, 4, 6, 8, 10. Put A above the axis and B below it. Which group has the higher median?	**A: 0, 1, 4, 7, 9. B: 1, 2, 4, 8, 10. Neither has a higher median; both medians are 4.**
3	Draw parallel box plots for A: 2, 3, 4, 5, 6, 7, 8 and B: 1, 4, 5, 6, 7, 8, 11. Put A above the axis and B below it. Which group has the greater range?	**A: 2, 3, 5, 7, 8. B: 1, 4, 6, 8, 11. B has the greater range: 10, compared with 6 for A.**
4	Draw parallel box plots for A: 1, 2, 3, 5, 6, 10 and B: 0, 2, 4, 6, 8, 12. Put A above the axis and B below it.	**A: 1, 2, 4, 6, 10. B: 0, 2, 5, 8, 12. Each box plot uses its five-number summary on the shared axis.**
5	Draw parallel box plots for A: 0, 1, 2, 2, 3, 4, 10 and B: 0, 3, 4, 4, 5, 6, 10. Put A above the axis and B below it. Which group has the higher median?	**A: 0, 1, 2, 4, 10. B: 0, 3, 4, 6, 10. B has the higher median: 4, compared with 2 for A.**
6	Draw parallel box plots for A: 1, 1, 2, 4, 7, 9, 12 and B: 1, 3, 4, 4, 5, 7, 12. Put A above the axis and B below it. Which group has the larger interquartile range?	**A: 1, 1, 4, 9, 12. B: 1, 3, 4, 7, 12. A has the larger interquartile range: 8, compared with 4 for B.**

PART 2 · APPLY IT

1. **A: 1, 2, 3, 5, 8. B: 1, 1, 3, 4, 6. Club A has the greater range: 7 hours, compared with 5 hours for Club B.** Find each five-number summary and use it to draw a box plot on the shared axis. Subtract the minimum from the maximum for each club.
2. **A: 2, 3, 5, 7, 10. B: 1, 4, 5, 6, 9. Line B has the smaller interquartile range: 2 minutes, compared with 4 minutes for Line A.** Find each five-number summary and draw both plots on the shared axis. Subtract the lower quartile from the upper quartile for each line.

CHALLENGE

A: 1, 2.5, 5, 7.5, 9. B: 1, 2.5, 5, 7.5, 12. Only the maximum and the whisker reaching it change. The minimum, both quartiles, median, and box stay the same.

Each five-number summary is listed in the order minimum, lower quartile, median, upper quartile, maximum. Accept correctly positioned box plots even if students do not write the summaries.