Math Virtual Learning

Math 7/Pre-Algebra

Comparing Data

April 30, 2020

Grade 7/ Comparing Data
Lesson: April 30, 2020

Objective/Learning Target:

Students will use statistical measures (measures of center and variability) to compare two data sets.

Warm-up

- How do you find the **mean** (average) of a set of numbers?

- How do you find the **median**?

- How do you find the **mode**?

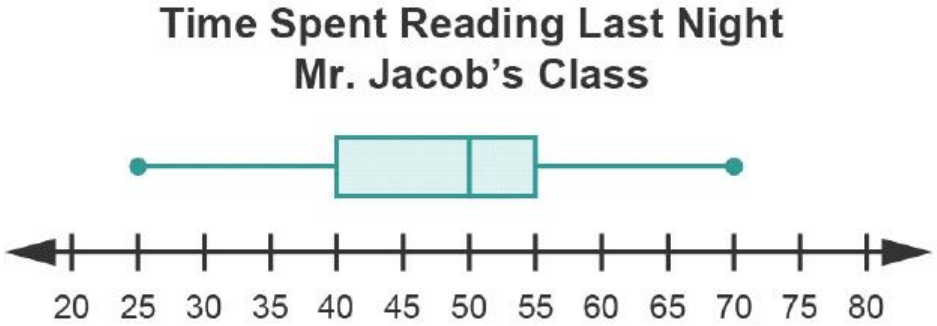
Warm-up answers

- How do you find the **mean** (average) of a set of numbers?
- *Add all of the values together, then divide by the number of values.*

- How do you find the **median**?
- *Order the numbers least to greatest, then find the value in the middle. If there are 2 middle values, find the **mean** of those 2 values.*

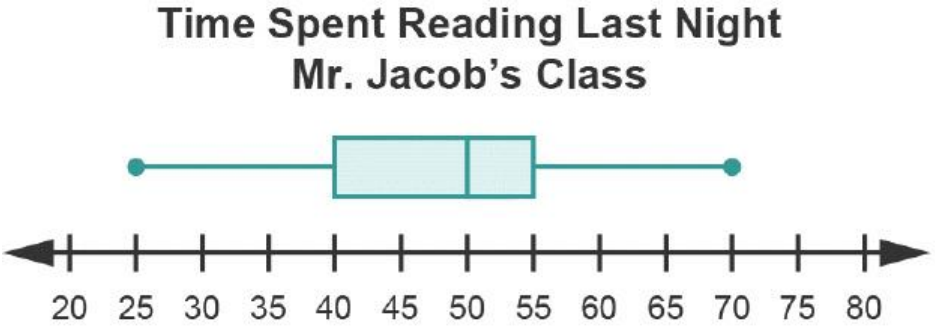
- How do you find the **mode**?
- *Find the value that occurs most often. There may be more than one mode or no mode.*

- Answer the questions about the box and whisker plot.
  - *If you need to watch a reminder video, click here. Answers on the next slide.*



- What is the median time spent reading?
- What is the range? What is the interquartile range?
- True/False: More students read 40-50 min. than 50-55 min.
- True/False: The plot shows only one student read 70 min.

•ANSWERS



- What is the median time spent reading? *50 minutes*
- What is the range? *70-25= **45*** What is the interquartile range? *55-40= **15***
- True/False: More students read 40-50 min. than 50-55 min.

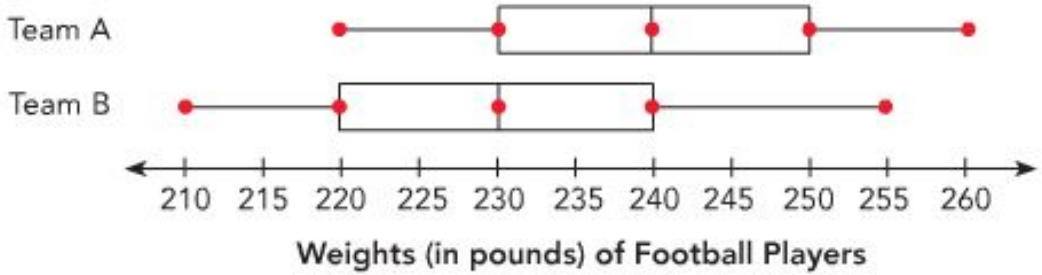
  False, each quartile represents 25% of the students.
- True/False: The plot shows only one student read 70 min.

  False. There may be one or more students that read for 70 minutes.

Comparing Data Sets – Practice

Answers on next slide

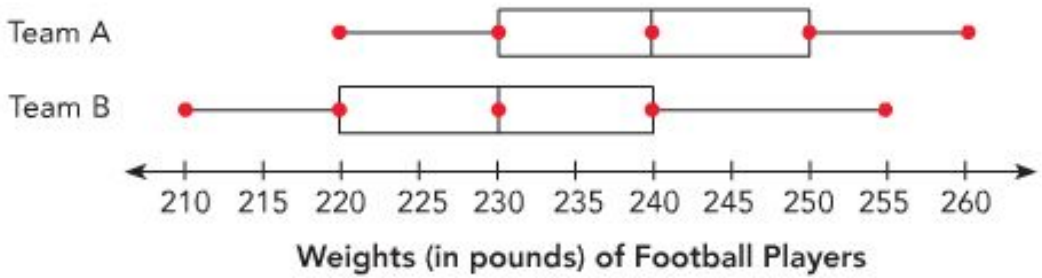
The weights of the players on two football teams are summarized in the box plots.



- Which team has the wider range of player weights?
- Which interquartile range is wider?
- Which team has the higher median player weight?
- What percentage of players on team A are heavier than the upper quartile of players from team B?

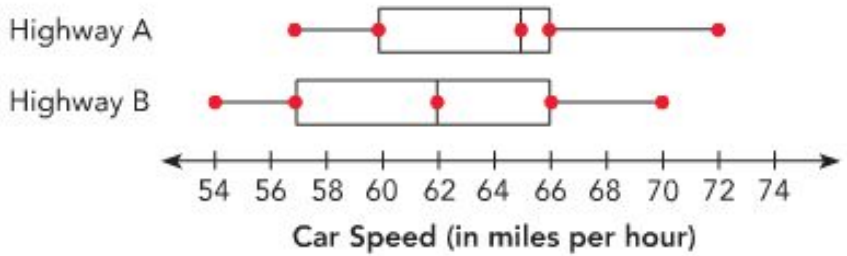
Comparing Data Sets – Answers

The weights of the players on two football teams are summarized in the box plots.



- Which team has the wider range of player weights? *Team B – 45 lbs.*
- Which interquartile range is wider? *They are both 20 lbs.*
- Which team has the higher median player weight? *Team A – 240 lbs.*
- What percentage of players on team A are heavier than the upper quartile of players from team B? *The top 2 quartiles, or 50%, of team A are as heavy or heavier than the top quartile (25%) of team B.*

Two large random samples of car speeds on two highways from 4 P.M. to 6 P.M. were collected. The data were summarized in two box plots.



- If the speed limit on both highways is 65, about what percentage of cars were driving above the speed limit on each highway?

- Comparing the interquartile ranges from both highways, what can you infer about the speeds from the middle 50% of cars?

- Are the ranges similar or different? What about the interquartile ranges?

- What can you infer about the overall speeds on the two highways?

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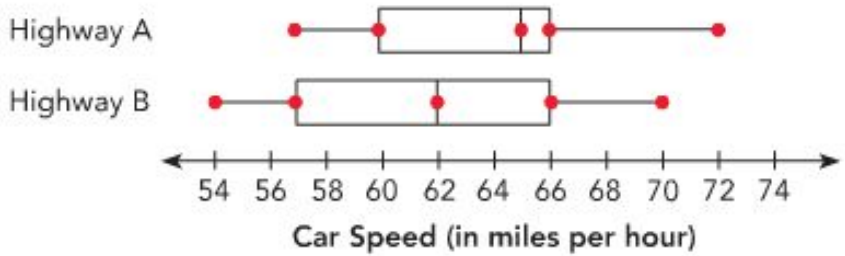

- If the speed limit on both highways is 65, about what percentage of cars were driving above the speed limit on each highway? *About 50% of cars on Highway A and about 25% of cars on Highway B were driving above the speed limit.*
- Comparing the interquartile ranges from both highways, what can you infer about the speeds from the middle 50% of cars? *On Highway A, the speeds had less variation and more drivers drove close to the speed limit. On Highway B, the cars had greater variation in speed.*
- Are the ranges similar or different? What about the interquartile ranges? *The overall ranges are similar (A=15; B=16), but the interquartiles are more varied (A=6; B=9).*
- What can you infer about the overall speeds on the two highways? *In general, the speeds were faster on highway A than on highway B.*

Have pencil, paper, and a calculator ready. Answers will appear on following slides.

The table shows the game scores of Mark and Jason.

Mark's Scores	2	3	8	5	3	4	4	6	5	4
Jason's Scores	9	5	1	1	2	8	9	2	1	6

a) Find the mean scores for Mark and Jason.

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Mark's Scores	2	3	8	5	3	4	4	6	5	4
Jason's Scores	9	5	1	1	2	8	9	2	1	6

a) Find the mean scores for Mark and Jason.

Solution

Mark's mean score

$$= \frac{2+3+8+5+3+4+4+6+5+4}{10}$$

$$= \frac{44}{10}$$

$$= 4.4$$

Jason's mean score

$$= \frac{9+5+1+1+2+8+9+2+1+6}{10}$$

$$= \frac{44}{10}$$

$$= 4.4$$

Link to MAD video

❑ *Both sets of scores have the same mean, **4.4**.*

❑ Next, make a chart and find each *mean absolute deviation*. *Answers on next slide.*

Solution

Mark's Scores	Mark's Mean	Distance of Data from the Mean	Jason's Scores	Jason's Mean	Distance of Data from the Mean
2	4.4	2.4	9	4.4	4.6
3	4.4	1.4	5	4.4	0.6
8	4.4	3.6	1	4.4	3.4
5	4.4	0.6	1	4.4	3.4
3	4.4	1.4	2	4.4	2.4
4	4.4	0.4	8	4.4	3.6
4	4.4	0.4	9	4.4	4.6
6	4.4	1.6	2	4.4	2.4
5	4.4	0.6	1	4.4	3.4
4	4.4	0.4	6	4.4	1.6

Sum of the distances for Mark

$= 2.4 + 1.4 + 3.6 + 0.6 + 1.4 + 0.4 + 0.4 + 1.6 + 0.6 + 0.4$

$= 12.8$

$$\text{MAD for Mark} = \frac{12.8}{10}$$

$$= 1.28$$

Sum of the distances for Jason

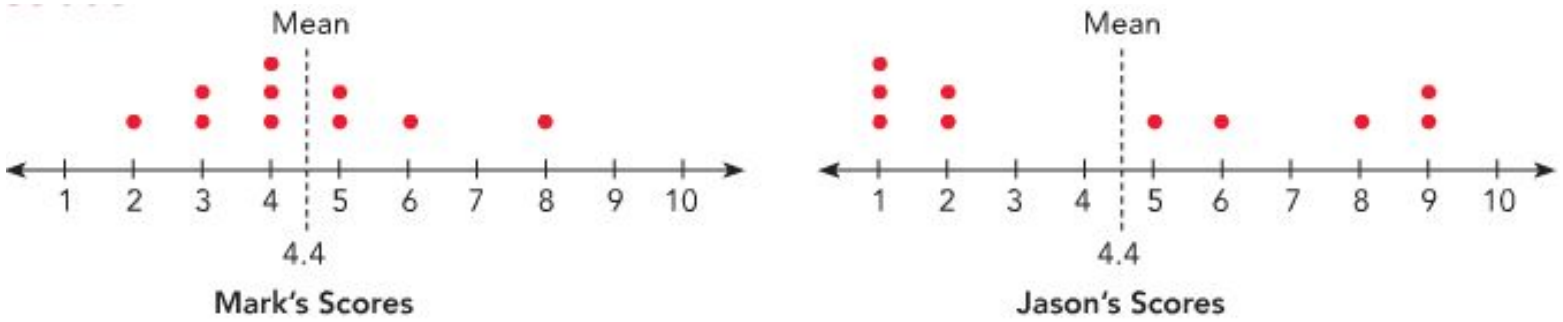
$= 4.6 + 0.6 + 3.4 + 3.4 + 2.4 + 3.6 + 4.6 + 2.4 + 3.4 + 1.6$

$= 30$

$$\text{MAD for Jason} = \frac{30}{10}$$

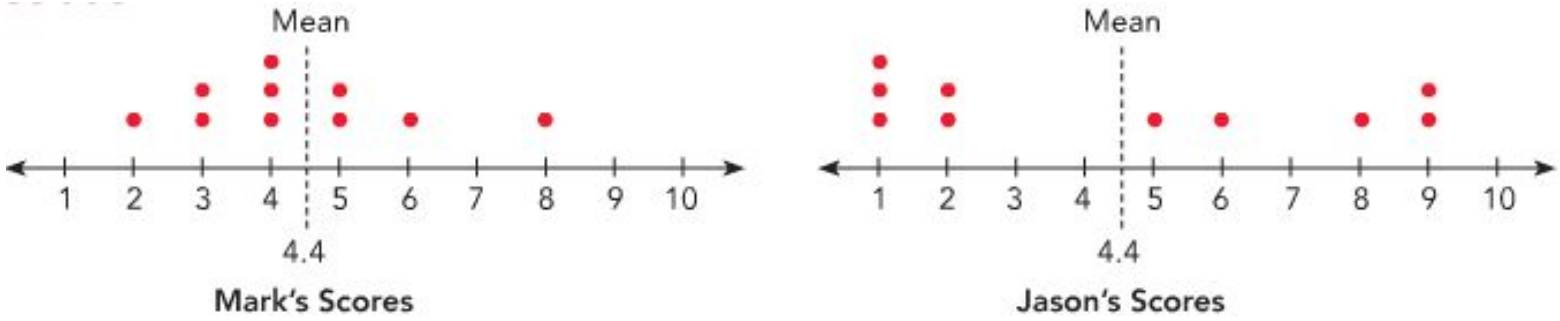
$$= 3$$

Here are Mark's and Jason's scores arranged on dot plots.



- What are some observations you notice with regards to range and consistency?

Here are Mark's and Jason's scores arranged on dot plots.



- What are some observations you notice with regards to range and consistency?
- *Mark's scores are closer to the mean. He has a lower MAD (1.28), so he is the more consistent player.*
- *Jason's scores are more spread out. He has the two highest scores as well as the three lowest scores. His wider range of scores is reflected in his much higher MAD (3), even though both players' mean score is the same.*

Additional Practice

- Khan Academy: Comparing Data Displays
- Khan Academy: Shapes of Distributions
- Quizizz: Comparing Data