

Lesson 16-6: Problem Solving

Example

- » The student council is determining the winner of a two-classroom running race. The table shows the race times of the students of Classroom A and Classroom B. The student council wants to give the prize to the faster class.

Race Times (seconds)

Classroom A	12.7	13.0	13.3	13.4	14.0	14.1	15.2	15.4	15.4	15.5	15.8	17.2	18.3	20.0
Classroom B	13.2	13.5	13.8	13.9	13.9	14.1	14.2	14.7	15.6	15.9	16.4	17.9	18.1	18.3

Compare the median of both classes to determine the winner.

Compare the mean of both classes to determine the winner.

Got It?

Classroom B was the winner when you compare the medians, and Classroom A was the winner when you compare the means. If you had to decide the winner based on a measure of center, which classroom would you choose? Explain.

Example

- » The student council is determining the winner of a two-classroom running race. The table shows the race times of the students of Classroom A and Classroom B. The student council wants to give the prize to the class that is the most consistent. Compare the range of both classes to determine the winner.

Race Times (seconds)

Classroom A	12.7	13.0	13.3	13.4	14.0	14.1	15.2	15.4	15.4	15.5	15.8	17.2	18.3	20.0
Classroom B	13.2	13.5	13.8	13.9	13.9	14.1	14.2	14.7	15.6	15.9	16.4	17.9	18.1	18.3

Compare the range of both classes to determine the winner.

Compare the interquartile ranges of the classrooms to determine the winner.

Got It?

Here are the measures of variation of Classroom A and Classroom B. Which measure of variability would you use to choose the winner? Explain.

Measures of Center and Variability of the Data can help us make decisions about the data we collect. Look at the following examples and analyze the data to help make decisions.

Got It?

Median and mean are measures of center. Interquartile range and mean absolute deviation are measures of variability related to median and mean, respectively. Which measure of variability would you use for this data set? Explain.

Data set: 2, 4, 6, 7, 8, 9, 14, 15, 16, 18, 19, 60

Got It?

You are the coach of the girls' basketball team. Two of your players each claim to be the star player on the team.

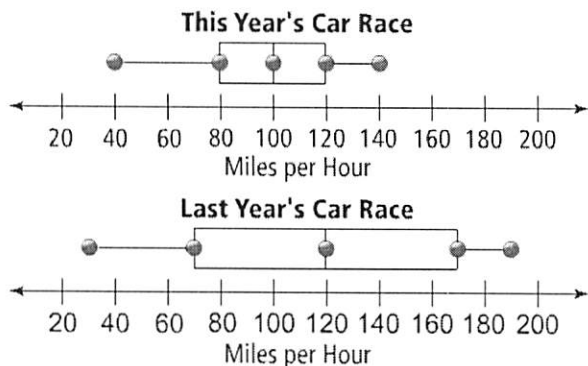
Use at least one statistical concept – median, mean, variability, or mean absolute deviation – to compare the players. Describe the qualities of each player and decide which player is the team's star.

Points per Game

Player A	Player B
28, 8, 11, 4, 33, 2, 40	16, 19, 14, 18, 20, 17, 22

Got It?

Which race was more competitive, this year's or last year's?



Got It?

A coffee shop wants to serve coffee at the same temperature every time for the best taste. On average, both shop workers hit the shop goal. However, the shop manager thinks one worker does a better job than the other.

Tell what temperature the shop wants the coffee to be. Then explain who the manager thinks did a better job.

Coffee Temperature by Cup (°F)

Worker A	155	160	150	145	170	175	165
Worker B	155	160	163	157	162	158	165

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Classroom B	13.2	13.5	13.8	13.9	13.9	14.1	14.2	14.7	15.6	15.9	16.4	17.9	18.1	18.3

Compare the median of both classes to determine the winner.

Classroom A: 15.3

Classroom B: 14.45

Classroom B Wins!

Compare the mean of both classes to determine the winner.

Classroom A \approx 15.2

Classroom B: 15.3

Classroom A Wins

Got It?

Classroom B was the winner when you compare the medians, and Classroom A was the winner when you compare the means. If you had to decide the winner based on a measure of center, which classroom would you choose? Explain.

You might choose Classroom B

because its median race time is

the lowest time among all

measures of center

Example

- » The student council is determining the winner of a two-classroom running race. The table shows the race times of the students of Classroom A and Classroom B. The student council wants to give the prize to the class that is the most consistent. Compare the range of both classes to determine the winner.

Classroom A	12.7	13.0	13.3	13.4	14.0	14.1	15.2	15.4	15.4	15.5	15.8	17.2	18.3	20.0
Classroom B	13.2	13.5	13.8	13.9	13.9	14.1	14.2	14.7	15.6	15.9	16.4	17.9	18.1	18.3

Compare the range of both classes to determine the winner.

Classroom A: 7.3

Classroom B: 5.1

Winner?

↳ Classroom B doesn't have as high values

Compare the interquartile ranges of the classrooms to determine the winner.

Classroom A: Q1: 13.4

Classroom B: Q1: 13.9

Q3: 15.8

Q3: 16.4

IQR = 2.4

IQR: 2.5

Winner?

Got It?

Classroom A has less variability

Here are the measures of variation of Classroom A and Classroom B.

Which measure of variability would you use to choose the winner?

Explain.

Classroom B has the more consistent data so they'd win!

Measures of Center and Variability of the Data can help us make decisions about the data we collect. Look at the following examples and analyze the data to help make decisions.

Got It?

Median and mean are measures of center. Interquartile range and mean absolute deviation are measures of variability related to median and mean, respectively. Which measure of variability would you use for this data set? Explain.

Data set: 2, 4, 6, 7, 8, 9, 14, 15, 16, 18, 19, 60 ^{outlier}

B/c of the outlier I would use median or IQR

Got It?

You are the coach of the girls' basketball team. Two of your players each claim to be the star player on the team.

Points per Game

Player A	Player B
28, 8, 11, 4, 33, 2, 40	16, 19, 14, 18, 20, 17, 22

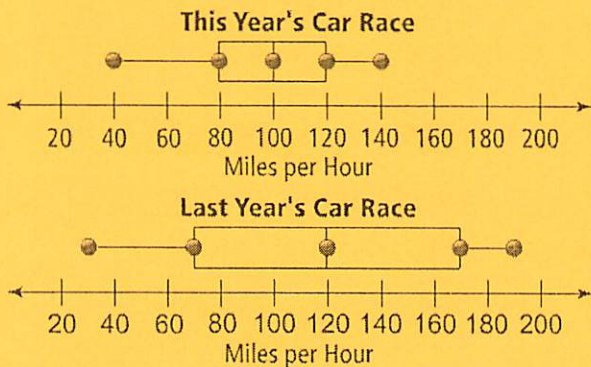
Use at least one statistical concept – median, mean, variability, or mean absolute deviation – to compare the players. Describe the qualities of each player and decide which player is the team's star.

Player A has capability of scoring more while B is more consistent.

More Consistent = Less Variability = Better Player (B)

Got It?

Which race was more competitive, this year's or last year's?



This years: Less variability in speeds.

Got It?

A coffee shop wants to serve coffee at the same temperature every time for the best taste. On average, both shop workers hit the shop goal. However, the shop manager thinks one worker does a better job than the other.

Tell what temperature the shop wants the coffee to be. Then explain who the manager thinks did a better job.

$$\text{Mean} = 160^\circ$$

Coffee Temperature by Cup (°F)

Worker A	155	160	150	145	170	175	165
Worker B	155	160	163	157	162	158	165

Worker B is more consistent and does the better job!