

Just In Time Quick Check
Standard of Learning (SOL) 6.11b

Strand: Probability and Statistics

Standard of Learning (SOL) 6.11b

The student will determine the effect on measures of center when a single value of a data set is added, removed, or changed.

Grade Level Skills:

- Determine the effect on measures of center when a single value of a data set is added, removed, or changed.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

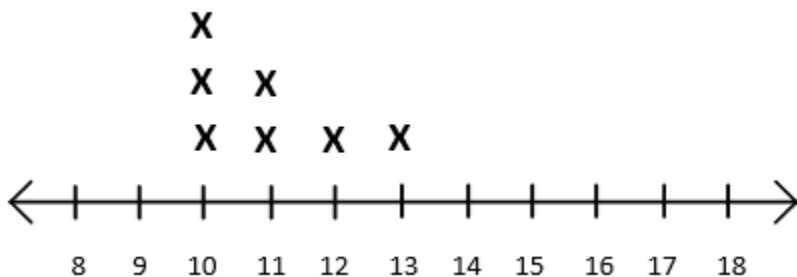
Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - 6.11b - [Effects on Measures of Center](#) (Word) / [PDF Version](#)
- VDOE Word Wall Cards: [Grade 6](#) (Word) | ([PDF](#)) Mean
 - Median
 - Mode
 - Range
- VDOE Rich Mathematical Tasks: Screen Time Task
 - 6.11 [Screen Time Task Template](#) (Word) / [PDF Version](#)
 - 6.11 [Screen Time Student Version of Task](#) (Word) / [PDF Version](#)
 - 6.11 [Screen Time Anchor Papers](#) (Word) / [PDF Version](#)
 - 6.11 [Screen Time Anchor Papers Scoring Rationales](#) (Word) / [PDF Version](#)
- VDOE Instructional Videos for Teachers:
 - [Mean as Balance Point](#) (grades 5-6)
- Desmos Activity
 - [Mean or Median?](#)

Supporting and Prerequisite SOL: [6.11a](#), [5.17a](#), [5.17b](#), [5.17c](#), [5.17d](#)

SOL 6.11b - Just in Time Quick Check

- Amber has 5 tests in Science this semester. Her scores on these tests are 93, 99, 83, 100, and 65.
 - What are the mean, median, and mode of Amber's science test scores?
 - Amber retook the test she received a 65 on and earned an 85. How did changing this one test score affect the mean, median, and mode?
 - Which measure of center do you think Amber would want the teacher to use for her report card grade? Explain your thinking.
- Susan made the line plot below to represent how many laps she ran around the track each day. She then determined the mean, median, and mode of the data.



Each X represents 1 day.

The next day she runs 18 laps and records this on the same line plot. She recalculates the mean, median, and mode. Which measure of center does this addition affect the most? Explain your thinking.

3. Drevon reads every night and records the minutes in his reading log.

Monday	Tuesday	Wednesday	Thursday	Friday
30	30	40	20	30

- What is his average or mean number of minutes for these five days?
- If Drevon forgets to read on Friday, what is his average number of minutes for the other days?
- What happens to Drevon's mean of number of minutes if he doesn't read on Friday?

SOL 6.11b - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. Amber has 5 tests in Science this semester. Her scores on these tests are 93, 99, 83, 100, and 65.

- What are the mean, median, and mode of Amber's science test scores?

Some students may obtain an incorrect mean, median, or mode. Some students may not realize that it is possible to have no mode for a data set, or may not put the numbers in ascending order to calculate median. These students may need additional review on how to calculate these measures of center and what they mean in terms of representing a data set.

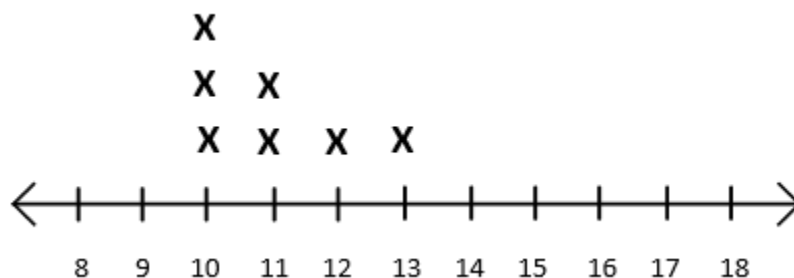
- Amber retook the test she received a 65 on and earned an 85. How did changing this one test score affect the mean, median, and mode?

In changing the data point from 65 to 85 students may accidentally add the 85 rather than replacing the 65. The use of manipulatives to model a situation like this can aid students as they will physically remove one data point and add another. The students should indicate that the mean became higher, while the median became lower. The teacher may wish to engage students in discussions about why this happened. Does this always happen? What would happen if a different data point was changed?

- Which measure of center do you think Amber would want the teacher to use for her report card grade? Explain your thinking.

A student's explanation will give the teacher insight into understanding and/or misconceptions. In this situation, Amber would want the teacher to use the mean since it increased. Students would benefit from investigating different scenarios and their effect on the measures of center as well as which measures of center better represent a data set.

2. Susan made the line plot below to represent how many laps she ran around the track each day. She then determined the mean, median, and mode of the data.



Each X represents 1 day.

The next day she runs 18 laps and records this on the same line plot. She recalculates the mean, median, and mode. Which measure of center does this addition affect the most? Explain your thinking.

In adding a new data point, students may face difficulties in determining the effect on the measures of center. In this example both the mode and median remain the same, while the mean increases. Teachers may wish to provide students with many examples of situations of what happens to measures of center when another data point is added so that students can look for patterns and similarities. Does the mean always change? By how much would the mean change if you add an even higher value? Or a lower value? When would the mean not change? When would the median not change? Can you think of an example where the mode would not change?

3. Devron reads every night and records the minutes in his reading log.

Monday	Tuesday	Wednesday	Thursday	Friday
30	30	40	20	?

- What is his average or mean number of minutes for these five days?
- If Devron forgets to read on Friday, what is his average number of minutes for the other days?
- What happens to Devron's mean of number of minutes if he doesn't read on Friday?

When removing a data point, students may have difficulty explaining how this affects mean of the data set. In this case, the mean will remain at 30. Due the question of "What happens to Devron's mean number of minutes if he doesn't read on Friday?," students may jump to the conclusion that the mean must change. It would be beneficial to engage students in discussions as to why the mean did not change in this situation. Relating this to the idea of mean as a fair share may assist students in understanding why the mean did not change. Teachers may wish to provide examples of data where a data point is removed, and depending on the data point removed, the mean either changes or stays the same.