LESSON MAKER PRO

Center Shift Lab

Track how one value changes the center.

GRADE 6 · 6.PS.2.b

6.PS.2.b "Determine the effect on measures of center when a single value of a data set is added, removed, or changed."

NAME _____ DATE _____

WATCH THE CENTER

Adding, removing, or changing one value can change the mean, median, or mode. For the mean, find the new total and divide by the new number of values, and for the mode, compare how often each value appears. To find the median, order the data, and if there is an even number of values, average the two middle values.

WORKED EXAMPLE

Data set: 6, 10, 14. The value 14 is changed to 20. Find the new mean and describe the effect.

1. Original sum: 6 + 10 + 14 = 30.
2. Original mean: 30 / 3 = 10.
3. New sum: 6 + 10 + 20 = 36.
4. New mean: 36 / 3 = 12, so the mean increases by 2.

Answer: The new mean is 12. The mean increases by 2.

PRACTICE 6 problems

1 Data set: 1, 5, 9. A value of 21 is added. Find the original mean, the new mean, and the effect on the mean.

ANSWER _____

2 Data set: 7, 11, 15, 19, 23. The value 23 is removed. Find the original median, the new median, and the effect on the median.

ANSWER _____

3 Data set: 4, 4, 7, 9, 9. A value of 9 is added. What happens to the mode?

ANSWER _____

4 Data set: 5, 7, 11, 15, 19. The value 19 is changed to 1. Find the original mean, the new mean, and the effect on the mean.

ANSWER _____

5 Data set: 21, 25, 25, 33, 35. The value 21 is removed. Find the original median, the new median, and the effect on the median.

ANSWER _____

6 Data set: 8, 8, 8, 13, 17. One value of 8 is changed to 13. What happens to the mode?

ANSWER _____

APPLY IT Show your work

1 A player earns 5, 9, 13, and 17 badge points on four game quests. A fifth quest score of 21 points is added. Find the original mean, the new mean, and the effect on the mean.

WORK SPACE

ANSWER _____

2 During five animation club sessions, Kai records 11, 15, 19, 23, and 27 minutes of editing time. Kai learns that the 27-minute entry is a duplicate and removes it. Find the original median, the new median, and the effect on the median.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Data set: 1, 5, 5, 9, 13, 17. One value of 5 is changed to 21. Explain how the mean, median, and mode change.

WORK SPACE AND ANSWER

ANSWER KEY

Center Shift Lab

GRADE 6 · 6.PS.2.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Data set: 1, 5, 9. A value of 21 is added. Find the original mean, the new mean, and the effect on the mean.	**Original mean: 5. New mean: 9. The mean increases by 4.**
2	Data set: 7, 11, 15, 19, 23. The value 23 is removed. Find the original median, the new median, and the effect on the median.	**Original median: 15. New median: 13. The median decreases by 2.**
3	Data set: 4, 4, 7, 9, 9. A value of 9 is added. What happens to the mode?	**The original modes are 4 and 9. The new mode is 9 only.**
4	Data set: 5, 7, 11, 15, 19. The value 19 is changed to 1. Find the original mean, the new mean, and the effect on the mean.	**Original mean: 57/5. New mean: 39/5. The mean decreases by 18/5.**
5	Data set: 21, 25, 25, 33, 35. The value 21 is removed. Find the original median, the new median, and the effect on the median.	**Original median: 25. New median: 29. The median increases by 4.**
6	Data set: 8, 8, 8, 13, 17. One value of 8 is changed to 13. What happens to the mode?	**The original mode is 8. The new modes are 8 and 13.**

PART 2 · APPLY IT

1. **Original mean: 11 points. New mean: 13 points. The mean increases by 2 points.** Add the first four scores and divide by four to get 11. Add the fifth score, then divide the new total by five to get 13.
2. **Original median: 19 minutes. New median: 17 minutes. The median decreases by 2 minutes.** With five ordered values, 19 is the middle value. After removing 27, average the two middle values, 15 and 19, to get 17.

CHALLENGE

The mean changes from 25/3 to 11, so it increases by 8/3. The median changes from 7 to 11, so it increases by 4. The mode changes from 5 to no mode because every value appears once.

Accept equivalent fraction and decimal forms for mean changes. For the challenge, accept "no mode" or an equivalent statement that no value occurs more often than the others.