Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CFS:

* + **Annotations:** circle important numbers/underline what you’re solving for
  + All work is shown
  + All **means** and **medians** are clearly labeled
  + Comparison is provided

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

UNIT 10 LESSON 5

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| AIM: | SWBAT determine how changes to a data set affect measures of center |

**THINK ABOUT IT!**

Ali has taken four tests this year in Math. She scored a 88, 90, 92, and 86. She has one more test this year.

1. What is her current mean and median in math?
2. When she gets her next test score, her teacher will find the mean and median of all five tests to determine her new mean and median in Math. If Ali gets a 60 on her next test, which do you think will change more- the mean or the median? Why?

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1. Find the new mean and median of all five scores by including 60 in the data set.

**Test the Conjecture**

*Ex. 1)* Over the last ten days, the temperatures in Miami, Florida have been 80°, 78°, 80°, 76°, 85°, 84°, 82°, 79°, 76°, and 40°. The weatherman made an error and forgot to include the 40 degrees when finding the mean and median of the data. Should the weatherman report out the incorrect mean or the median in order to try to hide his mistake and report accurately about the weather? Prove your answer mathematically.

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Conjecture

|  |
| --- |
| Adding or taking away an \_\_\_\_\_\_\_\_\_\_\_\_ typically affects the \_\_\_\_\_\_\_\_\_\_\_ more than the median |

**PARTNER PRACTICE**

CFS:

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  + Comparison is provided

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| *Bachelor Level* |

1. The list below shows the number of push-ups students could complete in 1 minute.

14, 19, 20, 12, 14

1. Find the mean and the median of the data set above.

The Hulk can complete 47 push-ups in 1 minute.

1. If the Hulk’s data point is added to the students’ data set, do you think the mean will increase, decrease, or stay about the same? Why? Do not do any calculations.

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1. If the Hulk’s data point is added to the students’ data set, do you think the median will increase, decrease, or stay about the same? Why? Do not do any calculations.

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1. Find the mean and median of the data set including the Hulk’s pushups. By how much did the median and mean change?

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| *Master Level* |

1. Sarah keeps track of the average number of miles she runs every five days. This week, she ran every day after school for four days. The distances she ran are 7, 6, 8, and 9 miles. On the fifth day, she decided that she will not go for a run. Her mom asked her about how many miles she ran this week. If she wants to make her stats look good for her mom, should she report her mean or median for the five days? Why?

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1. Calculate the change in the mean of her data after including the fifth day in her data set.

**INDEPENDENT PRACTICE**

CFS:

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| *Bachelor Level* |

1. The weather in Miami is rainy, but also very warm. Luckily, the weatherman predicts the temperature to cool down on Tuesday to 66 degrees.



* 1. Find the mean and the median of the weather for Friday through Monday.
  2. By how much will the mean change as a result of Tuesday’s temperature?
  3. By how much will the median change as a result of Tuesday’s temperature?

|  |
| --- |
| *Master Level* |

1. The dot plot below shows the results of a recent survey at AFENYMS. Students were asked, “How many movies did you watch last month?”

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |

1. 1 2 3 4 5 6 7 8 9 10

The Principal decided to drop the three data points for 10 movies because they are so different from the other data points in the set. Is there a bigger impact on the mean or median after removing the three tens? How much were the mean and median each impacted?

1. What number could be added to the data set below, and the median would remain unchanged?

74, 85, 80

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Prove that the number you added works.

1. What number could be taken away from the data set below, and the mean would decrease?

136, 152, 136, 210

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Prove that the number you took away does in fact decrease the mean.

1. Jean Carlos formed the conjecture that if you add a number to a data set, it will always increase the mean. Is that always true? Provide an example that proves or disproves his conjecture.

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| *PhD Level* |

1. The conjecture we came up with today is not always true. Can you come up with a five data point set and remove an outlier that disproves our conjecture?

*Adding or taking away an outlier value has a bigger impact on the mean than the median*

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EXIT TICKET2**

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| Self-assessment | I mastered the learning objective today. | I am almost there. | Need more practice and feedback. |
| Teacher feedback | You mastered the learning objective today. | You are almost there. | You need more practice and feedback. |

1. Lauren recorded how many TV shows she watched each night. The results are in the table below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Monday | Tuesday | Wednesday | Thursday | Friday |
| 3 | 4 | 2 | 1 | 6 |

* 1. If Lauren watches 6 TV shows on Saturday, by how much will the mean number of TV shows she watches in a week change?
  2. Lauren’s father is frustrated that Lauren watches so much television Monday through Friday. He tells her that her average number of TV shows watched per week must decrease, significantly. Lauren decides that she will stop watching television one night a week. Which night should Lauren stop watching television in order to have the greatest impact on decreasing the mean? What will be the impact on the mean if she stops watching TV on that day?

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