

TI-Nspire Activity: Resistance and the Empirical Rule

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Activity Overview

The students will examine two separate concepts of measures of central tendency and dispersion – resistance and the Empirical Rule. In the first problem, students manipulate a data set to discover which measures are resistant. In the second problem, students compare two data sets to determine if and how they follow the Empirical Rule.

Concepts

Discover the measures of central tendency that are resistant.

Describe a data set using the Empirical Rule.



Teacher Preparation

The students should be able to:

- move points in a Data & Statistics page.

Before beginning the lesson the document **Resistance_and_ER.tns** must be loaded on the handhelds.

The Classroom

This activity has been designed for students to work in pairs. In order for students to move the points on page 1.3, they will have to press   to move to the bottom of the split screen. It would be helpful if the students have been exposed to the Empirical Rule prior to beginning the activity.

Assessment and Evaluation

At the end of the lesson, the teacher should lead a discussion about the meaning of resistance and the Empirical Rule. This discussion will lead to an informal assessment of the students' knowledge.

Student Document Key

- 1) mean = 10, median = 10, population s. d. = 2.69, sample s. d. = 2.90
- 2) mean = 9.4, median = 10, population s. d. = 3.69, sample s. d. = 3.98
- 3) mean = 10.8, median = 10, population s. d. = 4.31, sample s. d. = 4.65
- 4) The median is resistant, and it is resistant because it describes the number in the middle of the data, which has nothing to do with the location of the end data points.
- 5) The standard deviations were not resistant. They both increased when the extremes were included.

6)

	Data Set A	Data Set B
Mean	50	50
Median	50	50
σ	19.6	2.41
s	20	2.45

7) Each data set has the same mean and median, but their standard deviations are very different.

8) Data Set A is more dispersed than Data Set B because Data Set A has standard deviations that are higher.

9)

	1 Stand Dev to Left	Mean	1 Stand Dev to Right
Data Set A	30	50	70
Data Set B	47.5	50	52.5

10)

A: 10 20 20 30 30 30 40 40 40 40 50 50 50 50 50 50 60 60 60 60
70 70 70 80 80 90

B: 45 46 46 47 47 47 48 48 48 48 49 49 49 49 49 50 50 50 50 50
50 51 51 51 51 51 52 52 52 52 53 53 53 54 54 55

11) A: $\frac{20}{26} = 77\%$ B: $\frac{24}{36} = 67\%$

12) Data Set A has a higher percentage than the Empirical Rule describes. Data Set B follows the Empirical Rule very closely.

13) A normal data set may not strictly follow the Empirical Rule because there are so few points in the data set.