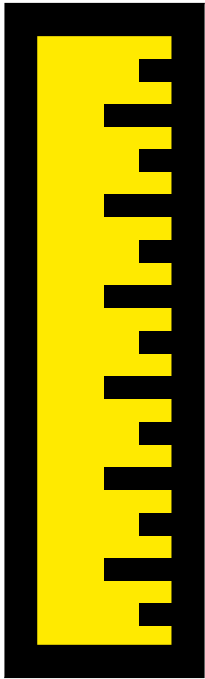


Comparing Reaction Times

Name _____

Statistics Activity Math B



Object: to measure how long it takes a person to stop a meter stick that starts falling between the thumb and forefinger.

Directions: Students work in groups. One student holds the meter stick vertically at the 100 cm. end. Another student, whose reaction time is being measured, rests his/her hand on a desk and places the thumb and forefinger around the 0 cm. mark but not touching it (approximately 2 cm. away). When the student holding the top of the meter stick drops the stick, the other student (looking only at the bottom of the stick) catches the stick as quickly as possible by pressing the fingers together. Read the millimeter mark that is just above the thumb. Record this reading. Have each student record 3 or 4 drops.

Conclusion: The length of meter stick from 0 cm. to the “catch” position is proportional to the elapsed time from the drop to the catch and can be used to measure reaction time.

Statistical Workup with the Graphing Calculator

| Student | 1 | 2 | 3 | 4 |
|---------|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

1. Record the reaction times for all of the members of the group.
2. Enter your data into L_1 .

3. Produce a histogram of the data.
Please indicate your scales.

4. Does your data appear to be forming a normal curve?

5. Repeat these steps using data obtained from all of the participating groups. Place this class data in L_2 .

6. What is the standard deviation for the class data? _____ The mean? _____

7. How many reaction times are within one standard deviation of the mean? _____

8. Does the class data form a normal curve? _____ How did you make this decision?

Further examination with the Graphing Calculator

This examination will first deal with your group data and will then deal with the class data. You will be using your data to create cumulative reaction times in the following manner:

The number 1 will correspond to one reaction time.

The number 2 will correspond to two reaction times added together.

The number 3 will correspond to three reaction times added together and so on.

To prepare this new list of data using the TI-83+ calculator functions:

Highlight L₄.

2nd LIST → OPS #6 cumSum(
(for cumulative sum)

Enter the list that contains the reaction times and hit ENTER.

1. Your group data is already entered in L₁.
2. Enter the numbers from 1 to the number of pieces of data from your group in L₃.
3. Prepare a cumulative listing of the data in L₁ as described in the box at the left, placing the results in L₄.

4. Produce a scatter plot of the data from L₃ and L₄. Please indicate your scales.

5. Which regression best models this data? _____

The equation: _____

The correlation coefficient _____

6. Repeat these steps using the class data in L₂. Put the numbers from 1 to the number of reaction times in L₅. Place the cumulative listing in L₆.

7. What is the new correlation coefficient? _____ Was a change in the correlation coefficient expected? _____ Why, or why not? _____
