

**Open Your Class With This Tomorrow**  
***Statistics Without Fear: A Primer for Non-Mathematicians***

**Statistics Without Fear - KEY**

**Learning Target:** Identify and apply descriptive statistics including measures of central tendency and measures of variance including standard deviation

**Directions:** Knowledge of statistics is helpful for evaluating real-life situations. Read each of the following scenarios. Using your knowledge of statistics, evaluate the evidence provided and make a recommendation for each of the following situations

**Situations:**

1. You have just taken your psychology and chemistry midterm exams. When your psychology test is handed back, you find that you received a score of 50. When your chemistry test is handed back, you find that you also received a score of 50. Given the statistical information of each test, explain how your '50' in each class can be interpreted differently. All in all, did you do equally well in each course? Explain why or why not. Include a description of percentile rank (assume both exams were normally distributed).

Assessment and distribution information

Test	Mean	Standard Deviation
Psychology	60	5
Chemistry	30	10

You have scored better in Chemistry because the score of 50 is two standard deviations above the mean. The Psychology score is two standard deviations below the mean. This individual's percentile rank for Chemistry is 97.5 while for Psychology it is 2.5. It appears that there were more outliers in the chemistry scores as indicated by the larger range of scores.

2. Psychological research methodologies and statistics are characterized by strengths and weaknesses in investigating behavior. Each method or statistic is best suited for certain research questions. For each pair below, describe a condition under which one is more appropriate than the other

- Mean, median
- Longitudinal study, cross-sectional study
- Single-Blind technique, double-blind technique
- Survey, case study
- Correlational study, experiment

**Example of A Response**

Mean/Median: The mean is most affected by extreme scores so may not be good for a data collection with extreme outliers as it may distort the data. The median is a single score, which may also misrepresent data with outliers because it says nothing of the variance of a set of scores. The mean works well in a normally distributed set of scores, and the median is useful for finding the middle point of a data set.

Books For Psychology Class

<http://booksforpsychologyclass.weebly.com/>

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3. Dr. Weindenbach wants to know in general how well the students are doing in his class. He will create a weekly study session for his students who are more than one standard deviation below the mean on two or more quizzes. He takes data from the semester quizzes so far, which is recorded below. Please compute the data and advise Dr. Weindenbach on who should attend his study sessions (those who are more than one standard deviation away from the mean on two or more quizzes).

**Quiz Scores from class**

Student Number	1	2	3	4	5	6	7	8
Quiz #1 Score	7	9	9	8	10	10	14	13
Quiz #2 Score	6	12	11	8	12	6	11	14
Quiz #3 Score	5	11	11	10	12	5	13	15

Calculate the Measures of Central Tendency:

	Quiz #1	Quiz #2	Quiz #3
<b>Range</b>	7	8	10
<b>Mean</b>	10	10	10
<b>Mode</b>	9,10	6,11,12	11
<b>Median</b>	9.5	11	11
<b>Variance</b>	5	7.75	11.25
<b>Standard Deviation</b>	2.24	2.78	3.35

**Recommendation:** (Which students should attend the study session?). Explain your recommendation

Students #1 and #6 should attend the review session. Student #1 fell more than one standard deviation below the mean on all three quizzes and Student #6 fell more than one standard deviation below the mean on quizzes #2 and 3.