

2.22: Standard Deviation (3 of 4)

Learning Objectives

- Next we summarize our observations with a focus on comparing the two groups:

From this analysis, we can see that the group of students in the fifth and seventh grades are carrying more weight on average in their backpacks. The mean weight for this group is 14.2 pounds compared to 5.8 pounds for the group of first and third graders. There is also more variability in backpack weights in the fifth- seventh-grade group. The standard deviation for this group is 7.2 pounds, compared to 2.1 pounds for the younger students.

One plausible explanation is that as children get older, they are assigned more homework, so they carry more in their backpacks. But at this age, we may also see more students making independent decisions about how much homework they will do, so some students will carry more books home and others will carry fewer.

Learn By Doing

Consider the following two quantitative data sets:

- <https://assessments.lumenlearning.co...sessments/3458>

Can two data sets have the same mean but different standard deviations? Can two data sets have different means but the same standard deviation? Use the simulation to investigate these questions in the next two activities.

Instructions for adding or removing data points:

- [Click here to open this simulation in its own window.](#)

An interactive or media element has been excluded from this version of the text. You can view it online here: <http://pb.libretexts.org/sss/?p=92>

Activity 1

Learn By Doing

<https://assessments.lumenlearning.co...sessments/3463>

Activity 2

Learn By Doing

<https://assessments.lumenlearning.co...sessments/3464>

Remark:

The examples we constructed in the preceding activity should make it clear that the mean and standard deviation measure independent characteristics of a data set. The mean is a measure of center, and the standard deviation is a measure of spread. The size of the mean does not give us information about the size of the standard deviation. Similarly, the size of the standard deviation does not give us information about the size of the mean.

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