

Warm-Up (11/29/17)

Copy down the following vocabulary list as we will be referring back to it in today's lesson.

Variability: this refers to the "spread" of the distribution

Deviation: this refers to the difference between one value of data and the mean.

Module 2: Lesson 4

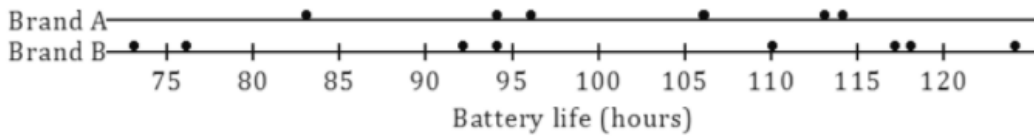
Summarizing Deviations from the Mean

Lesson Summary

- For any given value in a data set, the deviation from the mean is the value minus the mean. Written algebraically, this is $x - \bar{x}$.
- The greater the variability (spread) of the distribution, the greater the deviations from the mean (ignoring the signs of the deviations).

Exercises 1, 2, and 4

A consumers' organization is planning a study of the various brands of batteries that are available. As part of its planning, it measures lifetime (i.e., how long a battery can be used before it must be replaced) for each of six batteries of Brand A and eight batteries of Brand B. Dot plots showing the battery lives for each brand are shown below.



1. Does one brand of battery tend to last longer, or are they roughly the same? What calculations could you do in order to compare the battery lives of the two brands?

Calculate the mean $= \frac{606}{6} = 101$

A: $83 + 94 + 96 + 106 + 113 + 114$

B: $73 + 76 + 92 + 94 + 110 + 117 + 118 + 124 = \frac{804}{8} = 100.5$

A: 101 hours B: 100.5

2. Do the battery lives tend to differ more from battery to battery for Brand A or for Brand B?

Brand B

The table below shows the lives (in hours) of the Brand A batteries.

Life (Hours)	83	94	96	106	113	114
Deviation from the Mean	-18	-7	-5	5	12	13

4. Calculate the deviations from the mean for the remaining values, and write your answers in the appropriate places in the table.

$83 - 101 = -18$

$94 - 101 = -7$

$96 - 101 = -5$

Let's compare deviations

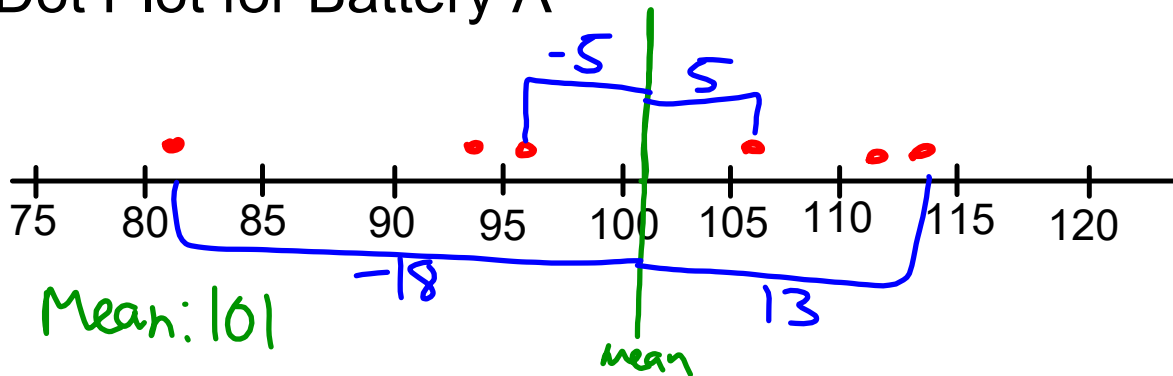
A

Life (Hours)	83	94	96	106	113	114
Deviation from the Mean	-18	-7	-5	5	12	13

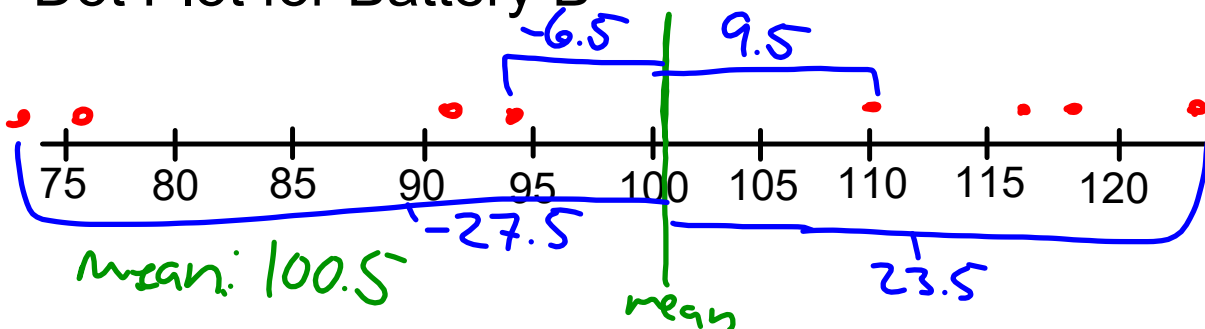
B

Life (Hours)	73	76	92	94	110	117	118	124
Deviation from the Mean	-27.5	-24.5	-8.5	-6.5	9.5	16.5	17.5	23.5

Dot Plot for Battery A



Dot Plot for Battery B

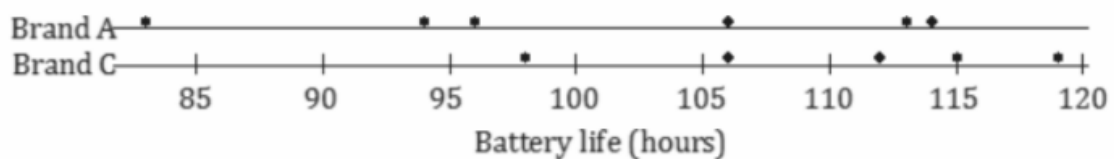


How does the variability of a distribution effect the deviation?

The larger the variability, the larger the deviation is from the mean.

Exercises 5-7

The lives of five batteries of a third brand, Brand C, were determined. The dot plot below shows the lives of the Brand A and Brand C batteries.



5. Which brand has the greater mean battery life? (You should be able to answer this question without doing any calculations.)

Brand C

6. Which brand shows greater variability?

Brand A

7. Which brand would you expect to have the greater deviations from the mean (ignoring the signs of the deviations)?

Brand A because it has a larger spread.

Exercises 8-10

The table below shows the lives for the Brand C batteries.

Life (Hours)	115	119	112	98	106
Deviation from the Mean	5	9	2	-12	-4

8. Calculate the mean battery life for Brand C. (Be sure to include a unit in your answer.)

110 hours

9. Write the deviations from the mean in the empty cells of the table for Brand C.

Classwork

S.32 - S.33: Problem Set #1 & 2 (all parts)