



1. Two classes took the same mathematics test. Summary measures for the two classes are as follows:

	Mean	MAD
Class A	78	2
Class B	78	10

- a. Suppose that you received the highest score in your class. Would your score have been higher if you were in Class A or Class B? Explain your reasoning.
- b. Suppose that your score was below the mean score. In which class would you prefer to have been? Explain your reasoning.
2. Eight tomato plants each of two varieties, LoveEm and Wonderful, are grown under the same conditions. The numbers of tomatoes produced from each plant of each variety are shown:

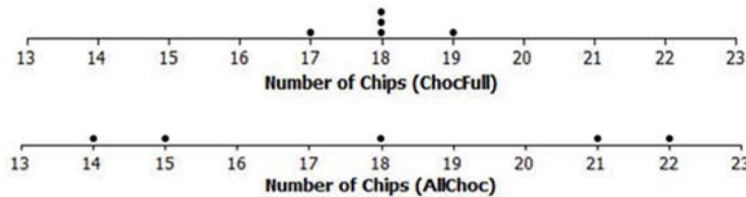
Plant	1	2	3	4	5	6	7	8
LoveEm	27	29	27	28	31	27	28	27
Wonderful	31	20	25	50	32	25	22	51

- a. Draw dot plots to help you decide which variety is more productive.
- b. Calculate the mean number of tomatoes produced for each variety. Which one produces more tomatoes on average?
- c. If you want to be able to accurately predict the number of tomatoes a plant is going to produce, which variety should you choose – the one with the smaller MAD, or the one with the larger MAD? Explain your reasoning.
- d. Calculate the MAD of each plant variety.

You need to decide which of two brands of chocolate chip cookies to buy. You really love chocolate chip cookies. The numbers of chocolate chips in each of five cookies from each brand are as follows:

Cookie	1	2	3	4	5
ChocFull	17	19	18	18	18
AllChoc	22	15	14	21	18

- a. Draw a dot plot for each set of data that shows the distribution of number of chips for each brand. Use a scale for your dot plots that cover the same span for both distributions.



- b. Find the mean number of chocolate chips for each of the two brands. Compare the means.

*Students should look at both graphs and immediately determine that the means are both 18 chips, since the distributions are symmetric around 18.*

- c. Looking at your dot plots and considering variability, which brand do you prefer? Explain your reasoning.

*Students could argue either way:*

- *Students who prefer ChocFull may argue that they are assured of getting 18 chips most of the time, with no fewer than 17 chips, and a bonus once in a while of 19 chips. With AllChoc, they may sometimes get more than 20 chips, but would sometimes get only 14 or 15 chips.*
- *Students who prefer AllChoc are the risk-takers who are willing to tolerate getting only 14 or 15 chips for the chance of getting 21 or 22 chips.*

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- a. Suppose that you received the highest score in your class. Would your score have been higher if you were in Class A or Class B? Explain your reasoning.

*Class B, because the means are the same. And the variability, as measured by the MAD, is higher in that class than it is in Class A.*

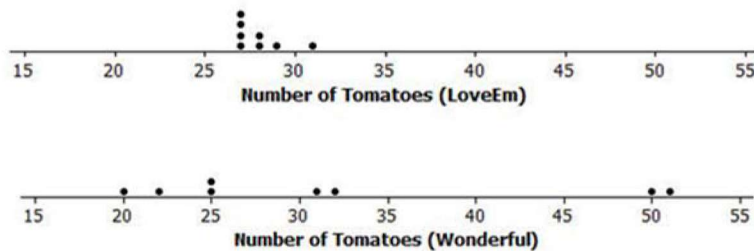
- b. Suppose that your score was below the mean score. In which class would you prefer to have been? Explain your reasoning.

*Class A because the variability, as measured by the MAD, indicates a more compact distribution around the mean. Whereas, a score below the mean in Class B could be far lower than in Class A.*

2. Eight tomato plants each of two varieties, LoveEm and Wonderful, are grown under the same conditions. The numbers of tomatoes produced from each plant of each variety are shown:

Plant	1	2	3	4	5	6	7	8
LoveEm	27	29	27	28	31	27	28	27
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- a. Draw dot plots to help you decide which variety is more productive.



- b. Calculate the mean number of tomatoes produced for each variety. Which one produces more tomatoes on average?

*Guessing a mean, and checking by summing deviations, is not as obvious for these distributions. So, using the formula is probably more efficient. The mean number of LoveEm tomatoes is 28, and the mean number of Wonderful tomatoes is 32.*

- c. If you want to be able to accurately predict the number of tomatoes a plant is going to produce, which variety should you choose – the one with the smaller MAD, or the one with the larger MAD? Explain your reasoning.

*LoveEm produces fewer tomatoes on average but is far more consistent. Looking at the dot plots, its variability is far less than that of Wonderful tomatoes. Based on these data sets, choosing LoveEm should yield numbers in the high 20s consistently, but the number from Wonderful could vary wildly from lower yields in the low 20s, to huge yields around 50.*

- d. Calculate the MAD of each plant variety.

*The MAD for LoveEm is 1 tomato.*

*The MAD for Wonderful is 9.25 tomatoes.*