

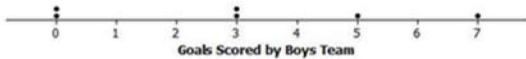
Name _____

Date _____

Variability in a Data Distribution

1. Consider the following statement: Two sets of data with the same mean will also have the same variability. Do you agree or disagree with this statement? Explain.

2. Suppose the dot plot on the left shows the number of goals a boys' soccer team has scored in 6 games so far this season, and the dot plot on the right shows the number of goals a girls' soccer team has scored in 6 games so far this season.



- a. Compute the mean number of goals for each distribution.
- b. For which distribution, if either, would the mean be considered a better indicator of a typical value? Explain your answer.

1. The number of pockets in the clothes worn by seven students to school yesterday were 4, 1, 3, 4, 2, 2, 5. Today those seven students each had three pockets in their clothes.
 - a. Draw one dot plot for what the students wore yesterday, and another dot plot for what the students wore today. Be sure to use the same scales. Show the means by using the balancing Δ symbol.
 - b. For each distribution, find the mean number of pockets worn by the seven students.
 - c. For which distribution is the mean number of pockets a better indicator of what is “typical?” Explain.

2. The number of minutes (rounded) it took to run a certain short cross-country route was recorded for each of five students. The resulting data were 9, 10, 11, 14, and 16 minutes. The number of minutes (rounded to the nearest minute) it took the five students to run a different cross-country route was also recorded, resulting in the following data: 6, 8, 12, 15, and 19 minutes.
 - a. Draw dot plots for the two distributions of the time it takes to run a cross-country route. Be sure to use the same scale on both dot plots.
 - b. Do the distributions have the same mean?
 - c. In which distribution is the mean a better indicator of the typical amount of time taken to run its cross-country route? Explain.

3. The following table shows the prices per gallon of gasoline (in cents) at five stations across town as recorded on Monday, Wednesday, and Friday of a certain week.

Day	R&C	Al's	PB	Sam's	Ann's
Monday	359	358	362	359	362
Wednesday	357	365	364	354	360
Friday	350	350	360	370	370

- a. The mean price per day over the five stations is the same for the three days. Without doing any calculation and simply looking at Friday's prices, what must the mean price be?
- b. In which daily distribution is its mean a better indicator of the typical price per gallon for the five stations? Explain.

1. Consider the following statement: Two sets of data with the same mean will also have the same variability. Do you agree or disagree with this statement? Explain.

Students should disagree with this statement. There were many examples in this lesson that could be used as the basis for an explanation.

2. Suppose the dot plot on the left shows the number of goals a boys' soccer team has scored in 6 games so far this season, and the dot plot on the right shows the number of goals a girls' soccer team has scored in 6 games so far this season.



- a. Compute the mean number of goals for each distribution.

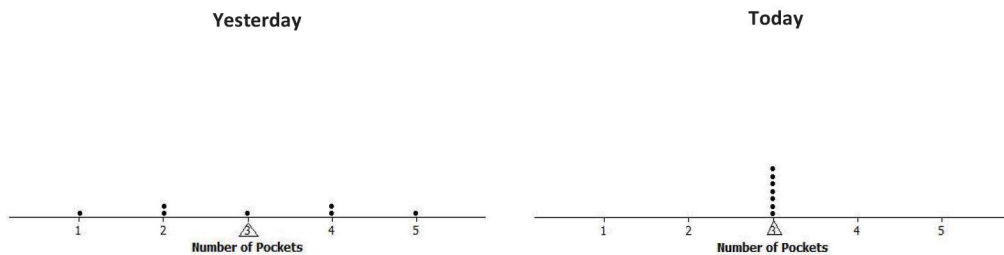
The mean for each is 3 goals. If your students found the mean by the formula, have them verify the answer by summing the negative and positive deviations.

- b. For which distribution, if either, would the mean be considered a better indicator of a typical value? Explain your answer.

Variability in the girls' distribution is less than in the boys', so the mean of 3 goals for the girls' is more precise.

1. The number of pockets in the clothes worn by seven students to school yesterday were 4, 1, 3, 4, 2, 2, 5. Today those seven students each had three pockets in their clothes.

- a. Draw one dot plot for what the students wore yesterday, and another dot plot for what the students wore today. Be sure to use the same scales. Show the means by using the balancing Δ symbol.



- b. For each distribution, find the mean number of pockets worn by the seven students.

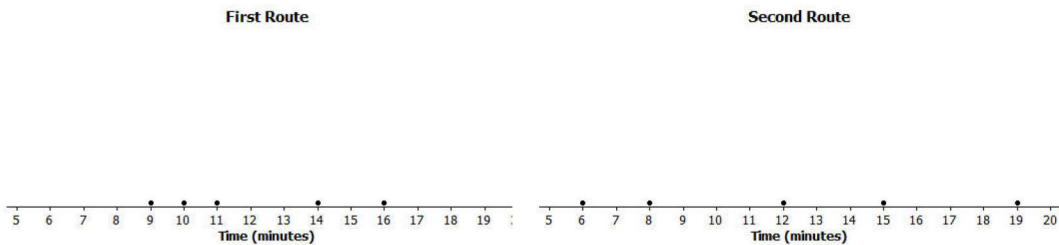
Students should not need to use the formula to calculate the means for either of these distributions. The first is clearly balanced around 3 pockets, and the second only has 3 as its data value.

- c. For which distribution is the mean number of pockets a better indicator of what is “typical?” Explain.

There is certainly variability in the data for the yesterday’s distribution, whereas today’s distribution has none. The mean of 3 pockets is a better indicator (more precise) for today’s distribution.

2. The number of minutes (rounded) it took to run a certain short cross-country route was recorded for each of five students. The resulting data were 9, 10, 11, 14, and 16 minutes. The number of minutes (rounded to the nearest minute) it took the five students to run a different cross-country route was also recorded, resulting in the following data: 6, 8, 12, 15, and 19 minutes.

- a. Draw dot plots for the two distributions of the time it takes to run a cross-country route. Be sure to use the same scale on both dot plots.



- b. Do the distributions have the same mean?

Yes, both distributions have the same mean, 12 minutes.

- c. In which distribution is the mean a better indicator of the typical amount of time taken to run its cross-country route? Explain.

Looking at the dot plots, the times completing the second route are more varied than those in the first route. So, the mean in the first route is a better indicator (more precise) of a typical value.

3. The following table shows the prices per gallon of gasoline (in cents) at five stations across town as recorded on Monday, Wednesday, and Friday of a certain week.

Day	R&C	Al’s	PB	Sam’s	Ann’s
Monday	359	358	362	359	362
Wednesday	357	365	364	354	360
Friday	350	350	360	370	370

- a. The mean price per day over the five stations is the same for the three days. Without doing any calculation and simply looking at Friday’s prices, what must the mean price be?

Friday’s prices are symmetric around 360 cents. So, the mean is 360 cents.

- b. In which daily distribution is its mean a better indicator of the typical price per gallon for the five stations? Explain.

Note that the data are not in numerical order across the stations for Monday and Wednesday prices. So, encourage students to draw dot plots to help them answer this question. From the dot plots, the mean for Monday is the most precise (least variability), and the mean for Friday is the least precise (most variability).