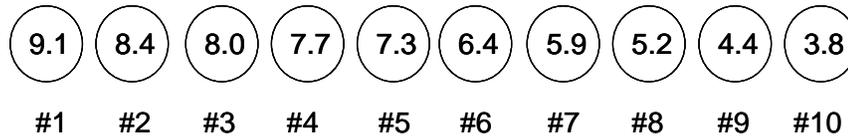
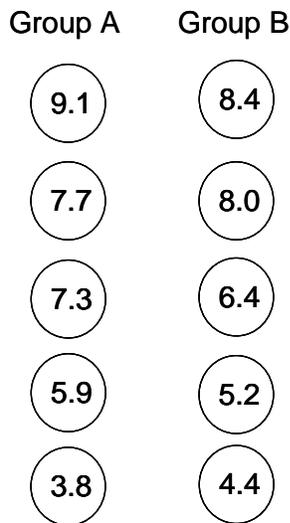


Here are the 10 tomatoes with their weights shown. They have been ordered from largest to smallest based on weight.



For now, do not be concerned about which tomatoes received the additional nutrients. The object here is to randomly assign the tomatoes to two groups.

Imagine that someone assisting you uses a random number generator or some other impartial selection device and randomly selects tomatoes 1, 4, 5, 7, and 10 to be in Group A. By default, tomatoes 2, 3, 6, 8, and 9 will be in Group B. The result is illustrated below.



2. Confirm that the mean for Group A is 6.76 ounces, and calculate the mean for Group B.

3. Calculate the difference between the mean of Group A and the mean of Group B (that is, calculate $\bar{x}_A - \bar{x}_B$).

Exercises 7–8: Additional Random Assignments

7. Below is a second random assignment of the 10 tomatoes to two groups. Calculate the mean of each group, and then calculate the value of Diff for this second case. Also, interpret the Diff value in context using your responses to the previous questions as a guide.

Group A	Group B
9.1	7.7
8.4	5.9
8.0	5.2
7.3	4.4
6.4	3.8

8. Here is a third random assignment of the 10 tomatoes. Calculate the mean of each group, and then calculate the value of Diff for this case. Interpret the Diff value in context using your responses to the previous questions as a guide.

Group A	Group B
9.1	8.4
7.7	8.0
7.3	6.4
5.2	5.9
3.8	4.4

Lesson Summary

In this lesson, when the single group of observations was randomly divided into two groups, the means of these two groups differed by chance. These differences have a context based on the purpose of the experiment and the units of the original observations.

The differences varied. In some cases, the difference in the means of these two groups was very small (or 0), but in other cases, this difference was larger. However, in order to determine which differences were typical and ordinary versus unusual and rare, a sense of the center, spread, and shape of the distribution of possible differences is needed. In the following lessons, you will develop this distribution by executing repeated random assignments similar to the ones you saw in this lesson.

2. Create a dot plot that shows the 20 Diff values obtained from the 20 possible randomizations. By visual inspection, what is the mean and median value of the distribution?
3. Based on your dot plot, what is the probability of obtaining a Diff value of 8 or higher?
4. Would a Diff value of 8 or higher be considered a difference that is likely to happen or one that is unlikely to happen? Explain.
5. Based on your dot plot, what is the probability of obtaining a Diff value of -2 or smaller?
6. Would a Diff value of -2 or smaller be considered a difference that is likely to happen or one that is unlikely to happen? Explain.