How to Average Numbers

Averaging numbers is a useful skill. An average can tell you what *usually* happens or what is likely to happen in a particular situation. For example, imagine that your family plans to take a vacation in August. You want to go to a state where tornadoes are not likely to occur. Before you decide where to go, you will need to know how many tornadoes usually occur in different states in August. To begin, look at the data in figure 1.

Year	Number of tornadoes in August in Nebraska	Number of tornadoes in August in Florida	Number of tornadoes in August in Wisconsin
2006	2	8	1
2007	3	0	0
2008	2	18	0
2009	1	2	6
2010	0	4	3

Figure 1: Tornado data for three states. Which state is most likely to have a tornado in August, when you plan to go on vacation?

When you look at these data, you can see that the number of tornadoes that occurred each year in each state was not the same. In some years, quite a few tornadoes occurred in August in these states. In other years, no tornadoes occurred. How can you predict how many tornadoes might occur this year in August? The best way to make a prediction is to find the **average** number of tornadoes that occurred in each year in August in each of the states.

To find an average, use the following steps:

1. **Find the sum, or total, of all the numbers by adding the numbers together.** This includes any zeroes that might be in your data. Looking at the data for Nebraska, you can see that the sum of tornadoes in August for 2006 through 2010 is

   $$2 + 3 + 2 + 1 + 0 = 8.$$

2. **Divide the sum by the number of data points you have.** In this case, you used data from 5 years, so you have 5 data points. Remember that the zero counts as one of your data points. The average number of tornadoes in Nebraska in August is

   8 total tornadoes in August ÷ 5 years = 1.6 tornadoes per year in August.

Clearly, you cannot have 1.6 tornadoes in a month. When the result is not a whole number, as in this case, you should round off the number. As a rule, if the number following the decimal point is 5 or above, you would round off to the higher number, and if the number following the decimal point is 4 or below, you would round off to the lower number. From this average of 1.6, you can say that you might expect 2 tornadoes in August in Nebraska. In some years, there will be more tornadoes. In other years, there will be fewer. The average simply tells you the number of tornadoes that usually occur in August in Nebraska.

Now, find the average number of tornadoes in August for Florida and Wisconsin.

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Averages can be useful for making predictions. Weather forecasters use averages when they discuss the weather. Sometimes temperatures in the summer might be unusually high. The weather forecaster might say, “The temperatures continue to be above average for this time of year.” This statement means that the temperatures are higher than those that usually occur in the summer.

All kinds of people use averages. If you are a baseball pitcher, you will want to know which players are more likely to hit the ball when they are up to bat. How could you find out? You can determine each player’s batting average. The batting average is the result of dividing the number of hits by the number of at bats for each player. Players with high batting averages are more likely to get a hit than players with low batting averages.

Can you think of other ways that averages are used? Listen carefully to news reports and other people talking. The next time you hear someone use the word “average,” you will know exactly what he or she means.

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