Name_____

ABSOLUTE MEAN DEVIATION

Directions: Read the information below.

Absolute Mean Deviation

When we analyze a set of data, we sometimes use a method called the absolute mean deviation. Before we learn about this, there are some other basic concepts you will need to understand. It tells us, on average, how far away each value is from the mean. It is a measure of variability. If the absolute mean deviation in a set of data is far from the mean, we know there is a high level of variability. If the absolute mean deviation is close to the mean, then there is less variability.

Averages

Averages are also called means. This is the sum of each data point divided by the total number of data points. Think of it as something you do like watching videos online. Let's say the table below shows you how many minutes of video you streamed online each day for 10 days.

Minutes of Video Streamed Each Day				
12	**10**	**22**	**13**	**4**
37	**15**	**14**	**11**	**16**

If you want to know how many minutes of video you stream on average, you would add up all the values. Then, divide by the number of observations (which is 10 because you calculated the minutes for 10 days). The answer you get will be the mean. If you calculated it correctly, you should get an average of 15.4 minutes per day.

Absolute Values

Another concept related to calculating the absolute mean deviation is an understanding of absolute values. The absolute value of a number is simply its distance from 0, regardless of whether it's positive or negative. The number 5 has a distance of 5 values away from 0, thus the absolute value of 5 is 5. This seems to make sense for positive numbers, but it also works with negative numbers. Let's take the number -5. This number is 5 values below zero, hence why it's negative. Because it is 5 values away from zero (no matter positive or negative) the absolute value of -5 is 5. You may notice that 5 and -5 have the same absolute value. That's because they are both the same distance away from 0 on a number line. We use this in times where we don't care if the number is negative. In the example above with the minutes of streamed video per day, we want to know how many minutes more or less than the average (mean) you streamed each day.

Absolute Mean Deviation

Now we can combine these two concepts to answer this question: In your set of data, how far away is each value from the mean on average? Follow the steps below:

1. Using the mean calculated above, calculate how many minutes more or less each day's total is than the mean. Use absolute values.
2. Add up the absolute values; divide by the number of days. That answer is your absolute mean deviation.

Here is an example. In the example used above, the average number of minutes watched per day was 15.4. Now we will take each day's minutes and subtract it from 15.4, ignoring if the value is negative. Our results are:

Differences from the Mean for Each Day				
15.4-12 = **3.4**	15.4-10 = **5.4**	15.4-22 = -6.6=**6.6**	15.4-13 = **2.4**	15.4-4 = **11.4**
15.4-37 = -21.6=**21.6**	15.4-15 = **0.4**	15.4-14 = **1.4**	15.4-11 = **4.4**	15.4-16 = -0.6=**0.6**

Our differences from the mean are in the table on the previous page. This tells us how far away each value is from the average. Now you must find the average of these values. You do this the same way you calculate any average: add the numbers together and divide by the number of data points, in this case 10. If your answer was 5.76, then you were correct.

What does that answer mean? It means that on average you watched 15.4 minutes of streaming video per day, but on any given day it was likely 5.76 minutes above or below that mean.

Directions: After reading the text, answer the questions below.

Conduct a survey of the average ages of your classmates. Record your results below.

In the boxes below, write the age of each classmate you surveyed.

Mean of Data				

Number of data points: _____

Mean age of classmate: _____

Find the absolute mean deviation.

Difference of Each Value from Mean				

Average of the differences: _____

In this case, your average mean deviation was probably no more than 1. For this experiment, why would you not expect an average mean deviation of 2 or higher?