AMDM—Unit 3: Statistics Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd\_\_\_\_

**Margin of Error**

*Vocabulary you should know*:

**Population**—set of all individuals in a particular group

**Sample**—a subset of a population

**Parameter**—a calculation for a population (for example, the mean, the median, the standard deviation, etc.)

**Statistic**—a calculation for a sample

*Ideas you should understand*:

* Parameters are usually estimated (and unknown) since populations are normally too large to collect data from all individuals. For example, if you wanted to find the average number of texts sent per day by people between the ages of 15 and 18 years old, the population is too large to actually collect the number of texts from everyone and then average them.
* We use statistics (sample calculations) to estimate parameters (population calculations). For example, if you wanted to find the average number of texts sent per day by people between the ages of 15 and 18 years old, you could find the average of a sample of maybe 1000 people from that population. The sample mean would not necessarily be exactly the same as the true population mean (it could be), but it should be pretty close.
* Since we can use a statistic (sample mean) to estimate a parameter (population mean), we like to give an interval of values that the true parameter will probably fall within. To find this interval (called a confidence interval), we add or subtract the **margin of error** to the sample mean.

*Things you should be able to do*:

* Use the margin of error to find the confidence interval.
* Explain what the interval tells you about the situation.

*Practice*

1. It has been found that the amount of copper in the hair of males can help predict the occurrence of epilepsy. If a sample of 22 men have an average of 14 micrograms of cooper in their hair, and the margin of error is 9 micrograms, what is an interval that would probably contain the true mean amount of copper for all men?
2. If a class of 25 statistics students got an average of 3.3 on the AP exam and the margin of error is 0.4, in what range would the population mean score probably fall? If another class scored an average of 2.2, does that mean the calculations are wrong?
3. One mayoral candidate is leading in the polls with 57% of the vote while another candidate has 38%. The poll has a 3% margin of error. What does that tell you about each candidates standing in the election?