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| NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_ | **Statistics and Probability** |
| 8-3 Confidence Intervals d2 | **DATE: Wednesday, January 20, 2016** |

Intervals: Problems where we conduct a sample and want to predict population average.

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| Where:   * is the sample average * is the standard deviation (use the sample one if you don’t have population stand dev) * **n** is the sample size. This is the size of your sample. | Find Confidence Interval(E).     * **Z is below**   + 90% confident = 1.64   + 95% confident = 1.96   + 99% confident = 2.57 |

Practice problems:

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| Chandler conducts a survey and measures how long cars stop for at Stevens and Ludlow. He timed 45 cars. On average, they stopped for 1.7 seconds, with a standard deviation of 1.5 seconds. Create a 95% confidence interval for the true avg. stopping time of all cars. | Joey and Paolo asked 70 people how many friends on facebook they have. On average people said 72 with a standard deviation of 32. Create a 90% confidence interval for the true avg. stopping time of all cars. |

Practice Hypothesis Testing

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| It has been reported that the average electronic screen time for teenagers is 8 hours a day. Jacob and Ben want to test this for a final project. They survey 60 random students and find the average only 5 with standard deviation of 3 hours. Do they have evidence (at 95% confidence level) that Deering students are different from the national average? | It is said that the average working teenagers makes $8.50 an hour. Maddie and Alex are going to test this for a final project. They ask 80 random working teenagers and find they make $9.50 an hour with standard deviation of $2.25. Is this evidence (at 95%) that Portland teens are different than national stat? |

**Hypothesis Testing for means:**

When you start with a claim and test your result and see how likely that result would be IF THE CLAIM WAS TRUE.

Example:

Walmart says the average they pay non-management people is $12 an hour. You think this is high. You want to test this, you survey 50 random Walmart workers and find the average pay $11.50. Do you have evidence (at 95% confidence) that Walmart is lying?

Steps:

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| 1. Assume the claim is true. | 1. Lets go with Walmart’s figure is true. |
| 1. Find mean and standard deviation.   Mean is claimed percentage  standard deviation is | 2. So if claim is true and we sampled 50 people, the mean salary should be $12 and the  Standard deviation would be: |
| 1. Now put in calculator online |  |
| 1. Make conclusions  * if probability is really small (below .05 usually)– you have evidence original claim is false * else you have no evidence claim is false (doesn’t mean claim is true) | 4. If Walmarts claim is true, there is a 7.6% chance we would have gotten such wage of $11.50 or less. Because this is above 5%, we **do not** have evidence that Walmart is wrong about the $12 an hour wage. |