Compiled by: Mr. Loren L. Spencer

Recipe for Success: 1-Sample Proportions
Confidence Interval

1. **Define parameter p_0** *(the population proportion)* **in context**
2. **Write the Conditions**
   - **Simple Random Sample**
   - **$n\hat{p} \geq 10$**
   - **$n\hat{q} \geq 10$**
   - **n is less than 10% of the population $\frac{n}{.1}$**
3. **Write the Equation**

$$\hat{p} \pm z^* \sqrt{\frac{(\hat{p})(\hat{q})}{n}}$$

4. **List the Values**
   - $\hat{p} = \frac{x}{n}$ sample proportion of successes-those that met criteria
   - $\hat{q} = 1 - \hat{p}$ the sample proportion of failures
   - **z***= the number of standard deviations a value is from the center
   - **x** = the number of successes or measured outcomes of interest
   - **n** = the size of the sample
5. **Calculate z***
   - 2^{nd} Vars
   - Inverse Norm
   - Area = $\frac{(1-Confidence\ level)}{2}$
   - $\mu = 0$ and $\sigma = 1$
6. **Plug in the values**
7. **Calculate the Interval**
   - Stat Tests
   - **1-PropZInt**
   - ***x*** comes from the problem or the data
   - **n** comes from the problem or the data
   - **C-Level** Confidence level comes from the problem
8. **Write the interval**
9. **Write the Conclusion**

   We are _______% confident that the true population proportion for __________________________ lies within the interval ________________.

   Restate the definition of the p_0

10. **Explain the meaning of the confidence level-***if asked*

    In repeated sampling, we expect that this method will capture the true population proportion _________________________percent of the time.

    Restate the Confidence Level

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Recipe for Success: 1-Sample Proportions Hypothesis Test

1. **Write the Hypothesis**
   - Null H_0: p_0 =
   - Alternative H_A: p_0 ≠ or < or >
2. **Define parameter p_0 in context**
3. **Write the Conditions**
   - **Simple Random Sample**
   - **$n\hat{p} \geq 10$**
   - **$n\hat{q} \geq 10$**
   - **n is less than 10% of the population $\frac{n}{.1}$**
4. **Write the Equation**

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{(p_0)(q_0)}{n}}}$$

z = the number of standard deviations a value is from the center
p_0 = the population **proportion** or what is assumed to be true
q_0 = 1 - p_0 (q_0 = the expected proportion of failures)
n = the size of the sample
x = the number of successes
$\hat{p} = \frac{x}{n}$ sample proportion of successes-those that met criteria
$\hat{q} = 1 - \hat{p}$ the sample proportion of failures

5. **Draw the graph and Shade H_A**
6. **List & Label all of input values**
   - p_0 should be given
   - $q_0 = 1 - p_0$
   - x = the number of successes from the sample
   - n = the sample size
   - $\hat{p} = \frac{x}{n}$
   - $\hat{q} = 1 - \hat{p}$
7. **Plug values into the equation**
8. **Calculate the z and the p-value**
   - Stat Tests
   - 1-proportion z-test
   - p_0 comes from the problem
   - x comes from the problem or the data
   - **n** comes from the problem or the data
   - Choose ≠ or < or > *(using Shaded graph of H_A)*
9. **State the Decision**
   - The p-value is____
   - If the p-value is less than alpha, Reject the Null
   - If the p-value is greater than alpha, Fail to reject the Null
10. **Write the Conclusion**

Reject the Null: Our p-value is ____. We reject the Null. There is sufficient evidence at alpha = ___ to suggest that the true population proportion for ____________________________
Restate the definition of the p_0

is ______________________________
Restate H_A ≠ or < or > p_0

Fail to Reject the Null: Our p-value is ____. We Fail to reject the Null. There is not sufficient evidence at alpha = ___ to suggest that the true population mean for

______________________________ is ______________________________
Restate the definition of the p_0 *Restate H_A ≠ or < or >* p_0