We will use the Normal model and the **One-Proportion z-Test** to test a hypothesis using a four-step process:
- ✓
- ✓
- ✓
- ✓

Hypotheses

The **Null Hypothesis** is a claim about an unknown population parameter and is noted as   .

It is called null because

The **Alternative Hypothesis**, noted as   , will use either a…
two-tailed test (are we looking for   ), or a
one-tailed test (has something   ).

Model

List the assumptions and check the conditions. This is **NOT** optional. Use full and complete sentences and correct vocab. It is **NOT** good enough to merely state the condition $np \geq 10$, you are expected to **SHOW** that you have actually checked the condition with the correct data: $np = 120(0.2) = 24 \geq 10$.

Name the test. State that

Mechanics

Write down all of your statistics (sample size, observed number of successes, sample proportions, etc.).

Draw a curve depicting the sampling model. Locate the

Conclusion

Link the P-value to

State your decision about the null hypothesis – either you

You enter the question assuming the null is

Your calculations give you a number to help you decide if it's likely that the results were just the result of the random selection of your sample, or if the results are so unusual (a P-value that's so very low) that you need to reject the null.

A few more things...

There is no magical P-value you're looking for. It is a matter of personal opinion rooted in the specific question. A P-value of .08 as a change in teen smoking may be very low, but the same P-value of .08 in the test strength of the rivets that hold a plane's wings together may be huge.

You **NEVER**

When looking at the data, ask yourself:
- ✓
- ✓
- ✓

Smoke Detectors

A 1996 report from the US Consumer Product Safety Commission claimed that at least 90% of all American homes have at least one smoke detector. A city's fire department has been running a public safety campaign about smoke detectors consisting of posters, billboards, and ads on radio and TV and in the newspaper. The city wonders if this concerted effort has raised the local level above the 90% national rate. Building inspectors visit 400 randomly selected homes and find that 376 have smoke detectors. Is this strong evidence that the local rate is higher than the national average?
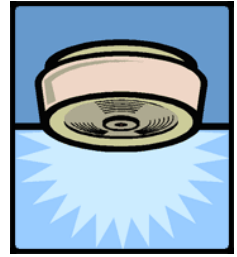
Orange

According to Mars, Incorporated, the makers of M&Ms, there are supposed to be 20% orange in a bag. The bag of 122 that you just opened had only 21 orange ones. Does this contradict the company's 20% claim?