P-value: the probability of getting the observed result, given _____

How low is low enough?

What does a low P-value tell us?

Alpha level: The threshold for our _____ that helps us define it as "rare"

- Common alpha levels:

- Must determine the alpha level _____ you look at the data

- If our data fails to have a P-value below our alpha… (talk about it in context of the problem)

- Think about the sample size. If too _____, data might have a low P-value, but it might hard to tell for sure because the sample size.

Statistically Significant: When our P-value meets our _____ level, then we can say that the results are statistically significant.
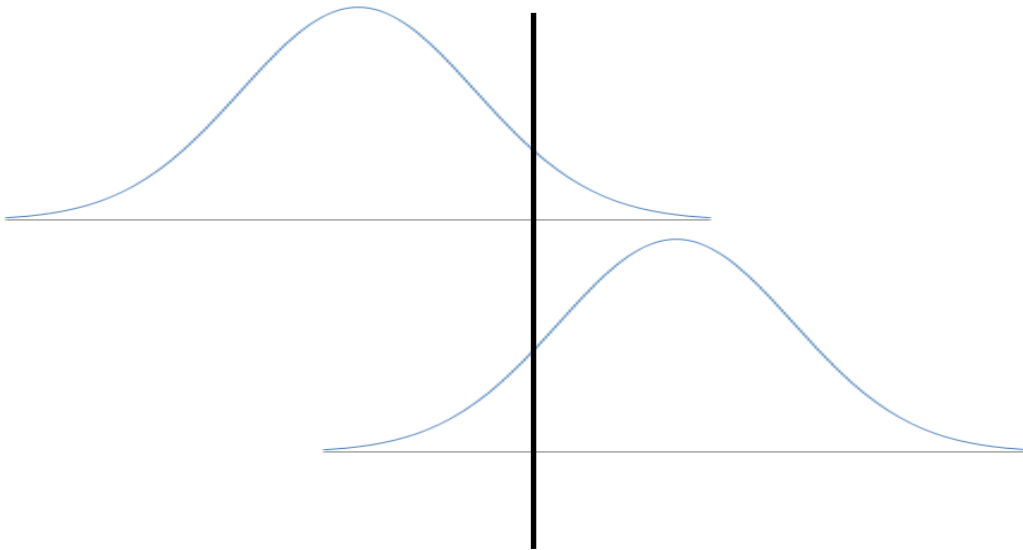
<u>Type I error</u>:   The null hypothesis is _____, but we mistakenly reject it.

- Type I errors can only occur when the H_0 is true!

<u>Type II error</u>:   The null hypothesis is _____, but we fail to reject it

- Type II errors occur when H_0 is _____ but we fail to reject it (β)

<u>Power</u>:   the probability that it _____

Determine an appropriate alpha level for each situation.

1.   A company's old antacid formula provided relief for 70% of the people who used it. The company tests a new formula to see if it is better.

2.   A survey investigating whether the proportion of today's high school seniors who have their own cars is higher than it was a decade ago.

3.   In the 1980's it was generally believed that congenital abnormalities affected about 5% of the nation's children. Some people believe that the increase in the number or chemicals in the environment has led to an increase in the incidence of abnormalities.

4.   It's believed that 4% of children have a gene that may be linked to juvenile diabetes.

State the null and alternative hypothesis. State what a Type I and Type II error would be.
Determine which type of error would be worse for the situation.

5.   In 2003 the Department of Commerce reported that 68.3% of American families owned their homes. In one small city, census data reveal that the ownership rate is much lower. The City Council is debating a plan to offer tax breaks to first-time homebuyers in order to encourage people to become homeowners. They decide to adopt the plan on a 2-year trial basis and use the data they collect to make a decision bout continuing the tax breaks. Since the plan cost the city tax revenues, they will continue to use it only if there is strong evidence that the rate of home ownership is increasing.