# Hypothesis testing null and alternative hypothesis.

In this activity we will review the procedure for identifying null and alternative hypothesis.

We will consider only the first three steps in the flowchart for “Procedure for Hypothesis Tests.”

As we proceed, try to remember these two key points:

1. We always express the null hypothesis using ONLY the equal sign;
2. We express the alternative hypothesis using one of the following:

the less than condition, the greater than condition, or the condition of inequality.

The alternative hypothesis does NOT include a condition of equality. Let’s begin by considering the following example.

A company claims that it has improved its quality control and is now able to manufacture batteries so that fewer than 5% are defective.

We begin by identifying the claim. In this case, the claim is that fewer than 5% of batteries are defective, which is expressed in symbolic form as “*p* < 0.05.”

Next, we need to determine the symbolic form that must be true if the original claim is false. What is the symbolic form that must be true if the original claim is false?

That is incorrect. Please try again. Correct!

The symbolic form of the claim that must be true if the original claim is false is *p* ≥ 0.05.

The next step is to identify the null and alternative hypothesis.

Of the two symbolic expressions, the one that *does not* include equality is the alternative hypothesis. Of the two symbolic expressions obtained so far, which of them becomes the alternative hypothesis?

That is incorrect. Please try again.

Of the two symbolic expressions, the one that *does not* include equality is the alternative hypothesis.

Correct! In this case, the alternative hypothesis is *p* < 0.05.

Remember, this expression is the alternative hypothesis because it *does not* include equality.

Next, we must identify the null hypothesis.

The symbolic expression that uses the equal sign is the null hypothesis.

Incorrect. Please try again.

Remember, the symbolic expression that uses the equal sign is the null hypothesis. Correct! The null hypothesis is *p* = 0.05.

The symbolic expression that uses the equal sign is the null hypothesis.

Now, it is time to test your knowledge.

Let’s try another one.

In this activity we reviewed the procedure for identifying null and alternative hypothesis.

Remember these two key points:

1. We always express the null hypothesis using ONLY the equal sign;
2. The alternative hypothesis does NOT include a condition of equality

This activity covered the first three steps in the procedure for hypothesis tests.

If you would like to continue with this procedure, please click the button labelled Procedure for Hypothesis Tests.

Congratulations, you have mastered an important concept of Statistics!

If only I had a null hypothesis joke.

In an alternative universe, I would.