**AP Statistics NAMES: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Marshmallow Spitting Experience**

Your group has two bags of marshmallows from which you will chose a sample that you will spit. One of these brands is a “name brand” & the other is a store brand. The name brand costs $2.19 while the store brand costs $0.78. One really has to wonder that if, in the realm of competitive marshmallow spitting, 180% price increase actually makes a difference in the distance that they can be spat!

So, here is the proposed experience…

I will provide training as to how to most effectively split a marshmallow, as well as provide several examples of a quality spit. You each will then be allowed to take a few practice spits, after which you will clear the spitting field. Your task then is to conduct a well-designed experiment in which you address the potential difference between the distances each brand can be spat.

This will be a **two-sample** procedure, necessitating statistics from two **independent random samples**. To begin, define these two parameters:

$$μ\_{NB}=$$

$$μ\_{SB}=$$

Now, decide with your group what your hypotheses will be, in words or symbols, and explain why you wrote them this way.

$$H\_{o}:$$

$$H\_{a}:$$

Why did you choose these hypotheses?

*Before you continue on, raise your hand and I’ll quickly look at what you have. Also, I’ll want a quick outline of the proposed design of your experiment.*

Now, give a detailed enough explanation that another group could follow your experiment’s design. Be sure to consider **randomization**, **replication**, & **control** in the design of your experiment. Then, give exchange this page with another group.

Follow the designed experiment given to you. Considering the design that you followed, give a couple of sentences about how each of the principles were implemented in the design.

**Randomization:**

**Replication:**

**Control:**

Now, record your data below:

Distance spat (round to the nearest foot!)

*Then calculate your sample statistics for each*

|  |  |
| --- | --- |
| Name brand – nNB= | Store Brand – nSB= |
|  |  |
| $$\overbar{x}\_{NB}$$ | $$s\_{NB}$$ | $$\overbar{x}\_{SB}$$ | $$s\_{NB}$$ |

Consider the size of each sample – make a dotplot below of each set of sample data. Judging from other inferential procedures you have done, why might this be important?

Does your experiment provide evidence supporting your original hypothesis? Provide statistical evidence here. You can do this own your own using an example from the text, or wait until we get in the classroom and I’ll walk you through a guided example.

Now, exchange your results with the group you switched experiments with. Original group – respond to comments below. The turn in the experience.