**Bottleneck Lesson Plan- Falsifiable Hypothesis**

**PSYCH 200 Elementary Statistics in Psychology, 200, primarily psychology majors but some other humanities majors require it as well.**

Briefly outline your answers to the following:

1. **The bottleneck—What are students unable to do?**
* - some of the hypotheses are not falsifiable- explained by something else
* some of the hypotheses cannot be tested because they are not operationalized properly
1. **Mental Action—What mental actions does the expert perform to get past the bottleneck?**
* operationalizing- look at the literature to see how something difficult was defined and measured
* the hypotheses (null and alternate) should leave no room for a third explanation of the experimental outcome. experts think of the possible outcomes of the alternate hypothesis and refine the hypothesis until it is narrow enough that only two outcomes are possible
1. **Model the thinking—What analogy will you use to model these mental actions?**
* is this a yes/no hypothesis, a black and white hypothesis like the picture?
* Is it snowing or not?
* are you in stats class or not? there is only one answer
1. **Practice and Feedback—How will the students practice these mental actions? How will they receive feedback to make improvements?**
* worksheets and chalkboard practice
* identifying exclusive and nonexclusive constructs- identify the good ones, fix the bad ones.
	+ Trains pass through Erie every day (average)
	+ People can text and walk the same speed as just walk (good)
	+ Texting does not affect walking (poor)
	+ Dr. Elliott wears all pink to class on Wednesday (good)
* Generate 10 constructs - give a general hypothesis and 10 different ways to operationalize it.
	+ people who go to Penn State have more friends than people who go to NYU
	+ make it a competition - the longest list of measurable and mutually exclusive hypotheses gets 1 pt extra credit for each + 5 pts for the longest list
1. **Motivation—What will I do to hold students accountable and disrupt ritual ways of learning?**
2. **Assessment—How will I assess student mastery of the mental actions?**

 pre and post test- Is this a good hypothesis? true or false

why is this not a good hypothesis

make up your own experiment

Prepare a brief summary of the results of the pre- and post CATs—including, if possible, some quantities. What inferences can you draw from the data? For example, “On the pre-test, 33% were able to do XXX, while on the post-test, 57% did XXX and 22% still could not. These results show a 24 improvement, though about one-fifth of the class are still struggling with XXX.” Or “The majority of students correctly answered 5 of the 8 test questions on the bottleneck concept.”

1. **How will you share what you learned?**

 In a paper with Joan.