Name **_____**   Period **_____**

Biology   Date **_____**

GENERATING HYPOTHESES & EXPERIMENTAL DESIGN 2

1. General Idea

   Example: *I think that the amount of fertilizer has an effect on the growth rate of plants*

   _____

   _____

2. Hypothesis Development

   a. Factors that you think have a relationship:

   Example*: fertilizer & growth rate of plants*

   _____   _____

   b. Describe the type of relationship (**positive**, **negative**, **neutral**):

   Example*: I think fertilizer will increase plant growth, so "positive"* _____

   c. Prediction of how a **change** in one factor affects the **change** in the other.
   Example*: more fertilizer will increase the growth rate of plants*

   _____

   _____

   d. If that relationship is accurate, then predict the actual changes that you will be able to *measure* during the experiment.

   Example*: When I increase the amount of fertilizer given to my bean plants then my bean plants will grow taller.*

   _____

   _____

   e. Restate as a hypothesis: specific, includes a prediction & is testable (try to put it in an "*If…, then…*" format):

   Example*: If there is a positive relationship between fertilizer and plant growth, then when I increase the amount of fertilizer applied to my bean plants, my bean plants will grow taller.*

   _____

   _____

3. Experimental Design

    a. Which is your *measured* (**dependent**) variable? _____

      Example*: height of plants (because I didn't know how that was going to change therefore I had to <u>measure</u> how its change was <u>dependent</u> on the amount of fertilizer).*

    b. Which is your *manipulated* (independent) variable? _____

      Example*: amount of fertilizer (because I <u>manipulated</u> how much fertilizer was given; it changed only how I chose it to change and was <u>not dependent</u> on any other factor in the experiment)*

    c. List three **confounding variables** that you would have to control to isolate your tested variable.

      (*Confounding* means *confusing*, so confounding variables would be other factors that could affect the results and therefore confuse your interpretation of the results)

      Example*: amount of water, type of soil, temperature, amount of light, age of plants…*

      _____

    d. Describe the experimental groups for your experiment.

      Example*: each group of 10 plants is treated with a different amount of fertilizer: 0 tsp/gallon, ¼ tsp/gall, ½ tsp/gall, 1 tsp/gall (recommended), 2 tsp/gall, 4 tsp/gall*

      _____

    e. Describe the control group(s) for your experiment.

      Example*: the group receiving only water ("standard" or no treatment condition)*

      _____

    f. Suggest a **sample size** for your test groups in this experiment. _____

      Example: just NOT one plant; consider at least 10 or more per group

    g. What result would cause you to conclude that your hypothesis is **supported**?

      Example*: the plants that are given more fertilizer grow taller than the ones given less.*

      _____

      _____

    h. What result would cause you to **reject** your hypothesis?

      Example*: the plants that are given more fertilizer do NOT grow taller than the ones given less*

      _____