Summer Assignment: dwarf pea plants, *Pisum sativum* L. (from Home Depot landscape dept). Additional materials needed will be dependent on what you choose to do for this experiment. Seed germination can be done in paper toweling and plants can grow initially in small paper cups with drain holes poked in and soil (regular soil from your backyard/ trail area will be fine- no need to get a huge bag of soil from Home Depot unless you want to). Larger plants will require larger cups and some degree of support- peas are vining plants.

Two stages depending on what you choose to do with the seeds provided: Germination or Growth. You will need to use a portion of your seeds as a control condition- the established, ‘optimal’ conditions and the remainder of your seeds divided into two different levels of your chosen variable.

For instance, there are a few conditions that plant seeds need to germinate.

Germination: conditions that could be varied: moisture, temperature ,compaction

If you wanted to evaluate moisture levels on plant seed germination, you could vary the amount of moisture that you subjected the different plants seeds to .

* First group ( the control group) of seeds would get the optimal level of water\*
* Group 2 would get 50% more moisture and
* Group 3 would get 75% more moisture.

\* You will have to look up reference(s) for this and site them in your lab book. You can also establish your own reference based on trial and error ( this will require you to get more dwarf pea seeds than was provided.;readily available at Home Depot)

 You would record all your germination conditions and record the timing, growth or whatever outcome you want to measure. You must choose the variable you want to change and you must choose the outcome you are going to measure- ie, time of germination, size after germination, etc . Document all your results and either take pictures or sketches of the seeds progress. Keep track of the time and day you are documenting things in your lab book.There should be a clear progression of results and images from beginning to end

Materials needed: .

Plant growth: variables are much greater to choose from as well as outcome to measure. Plants have specific growth conditions and you can choose to vary the soil porosity ( how fast does water move through the soil), pH conditions ( adding varying levels of acidic or basic solutions to the water), light levels ( growing the plants in different levels of sunlight or different distances from the same set of windows or with filtered light). Caution: Atlanta summer full sun will likely harm the plants so plant accordingly.

Outcomes can be plant growth, plant leaf size, plant stem length, plant growth rate etc.

Other outcomes besides plant growth can be evaluated.

* Water use/transpiration can be evaluated indirectly by treating leaves to affect transpiration rates and then measure impact on growth or water use;
* Wind levels can be varied (by plant distances from a consistent wind source) and evaluating different levels of water utilized by the plants. Contact me if you are interested in doing these.
* Co2 levels can be evaluated as well. You will need to make sure to control the amount of CO2 the plant gets exposed to, it can be done relatively simply by sealing up the plants for periods of the day and adding different amounts of CO2 to the plants.

 Contact me if you are interested in doing this.

Other things you could examine: impact of supports on plant growth,impact of gravity on plant growth, etc. If you have an idea that you want to try, send me an email and let me know.

Choose your variable, choose your outcome, record all data in your lab book and document with either pictures or sketches the plants progress.

Same basic background information about garden peas to get you started-this is a garden reference and is to be used for general background information only.

<http://macon.ces.ncsu.edu/2013/02/garden-peas-its-already-time/>

Plant growth, germination, and photosynthesis references on class website Topics: Plants