

## *Plant Growth Research Project Environmental Systems - 2018*

**Central Question:** What are the primary factors that can affect plant productivity?

**Objective:** Test multiple factors that may impact plant growth and productivity in addition to recording and analyzing data.

**Value:** 100 possible Lab points. With an additional 5 extra credit points available. That's neat!

- Responses will be checked for plagiarism and individuality. How neat is that?



**Synopsis:** Our class will conduct an 8-week lab where we will be testing a variety of different variables and their effect on plant growth. Measurements will be taken and recorded weekly. **Write-ups will be submitted weekly.** This is a long-term, partner intense project. Since you are being provided with all the required information ahead of time, **you are expected to turn in all assignments either in class or online weekly.** If you require an exception for a legitimate excuse, it is your responsibility to talk to me AHEAD of time. Otherwise, late work will be penalized.

### **Bi-Weekly Requirements (Monday & Thursday):**

- Observation Journals: Write down reflections on the weekly observation journals provided.
- Photo Library: Each group must take one photograph per plant 2x a week. (Submit through Google)
- Measure the temperature and UV intensity at the garden plot using the UV sensors (record data)
- Measure the relative humidity using the humidity sensors (record data)
- Gauge the sky, estimate the % of cloud cover
- Update data sheet (as needed)
- Plant Height Recording
  - Record the height of each of your four plants in centimeters on data sheet using a measuring tape
- At the end of the 8 weeks, we will be uprooting your largest/tallest plant and weighing it in grams. Next, we will be drying it out (desiccating). After all of the liquid is removed, we will weigh the biomass in grams.



### **Weekly Requirements:**

You may choose the order in which you complete the following assignments (**except for the Recorded Data Questions, that is the final weekly assignment**). All total, you will be completing eight weekly assignments. The assignments in the first set are **required**. You can **choose** any four of the assignments in the second set.

**Set #1** – All assignments require a 1 page typed (double spaced, 12 point font, standard margins) response. 10 Lab points each. Must complete all 4. Write which question you are responding to at the top of the page. List any sources used, no need to cite properly.

- What are the primary factors that can affect plant productivity?
- How would the effects of global climate change impact the growth productivity of your plants?
- What are the values in growing your own food versus buying from the supermarket? What are the benefits and drawbacks of both? Which do you support the most?
- Complete the Recorded Data Questions (**Must be completed during the final week**).

**Set #2** - All assignments require a 1 page typed (double spaced, 12 point font, standard margins) response. 10 Lab points each. Select 5 assignments to complete in any order you choose. Write which question you are responding to at the top of the page. List sources used, no need to cite properly.

- Research an alternative technique (think wives tales) to encourage plant growth (include a minimum of 2 sources).
- What are 2 ways to improve the reliability/efficiency of the Plant Growth Research Project? Identify 1 factor in this project that is out of our control and explain.
- What makes a fertilizer organic or conventional? Does using conventional fertilizer make the food less healthy?
- Consider the potential outcomes for this experiment in terms of fertilizer usage. How would this information have real world impacts on agriculture?
- Consider the potential outcomes for this experiment in terms of humidity and UV intensity. How might we know if humidity and UV are having a significant impact on our plant's growth? How would this information have real world impacts on agriculture?
- Why are some crops more susceptible to changes in temperature than others? What does this infer about restrictions in agriculture areas?

**Extra Credit** - Select one or the other: Either grow your own garden at home and take weekly photographs of yourself tending to your garden OR visit a farm and ask the farmer 3 of the Set #2 Questions and write down the responses and compare them to your own. **Explain the similarities and differences.**