

Agenda for Monday, November 30th 2015

Agenda	Homework
1. SDRO Life Cycle Project	- You decide.

Which NGSS practices, DCIs, and CCs are we meeting?	
<p>Science and Engineering Practices</p> <ul style="list-style-type: none"> • Conduct explanations supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories. • Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon • Develop and use models to describe systems. • Obtain, evaluate, and communicate information. <p>Crosscutting Concepts</p> <ul style="list-style-type: none"> • Cause and effect • Structure and Function • Energy and Matter • Systems and Systems Models 	<p>Disciplinary Core Ideas</p> <ul style="list-style-type: none"> • LS1.B: All organisms grow, develop, and reproduce. • LS1.C: All organisms obtain and use the matter and energy they need to live and grow. • LS1.D: Sense receptors respond to different inputs. • LS2.A: Organisms are dependent on their environmental interactions both with other living things and nonliving factors. • LS2.B: Matter and Energy move through an ecosystem. • PS3.D: Chemical reactions in plants produce complex food molecules; plants and animals release energy stored in food.

Why are we doing this?
<p>We have spent considerable time studying our Fast Plants and cabbage white butterflies. Today we begin a 2-week long project closely examining three characteristics of these organisms: how they have grown and developed, how they have obtained and used energy, and how they have reproduced. This project will show us that these organisms, like all others, have the same characteristics; albeit, they meet these characteristics in different ways.</p>

Today's Procedure

Part 1: SDRO Project Data Sheet Creation

1. Create a new Google Sheet and share this with your partner. (Only one of you needs to do this.) Title the Google Sheet something relevant to the project.
2. Create a tab for each set of data in your new sheet (e.g. "Nutrient Solution", "Fast Plant A", and so on).
3. Copy the layout of the tables from your tracking sheet and insert the data into your sheets.

Part 2: SDRO Project Data Analysis (Nutrient Solution)

1. Create a new column called "Days Since Filled".
2. Calculate the number of days between each time you refilled the container.
 - A. For example, for the first time you filled, there had been 0 days since you had previously filled it.
 - B. On your second filling (10/6), 5 days had passed since you filled it on 10/1.
3. Create a new column called "Daily Use Rate (mL)".
4. In the first cell under this new column, use this formula (without quotes) " $= (C2/D2)$ " Replaced C2 and D2 with whatever your first cells are for the solution added and the days since filled. You should get an error that says you cannot divide by zero. This is okay.
5. Use the fill option to copy this formula into the remaining cells in this column. To do this, select the cell with the formula in it. This will turn the cell blue and a blue circle will appear in the lower right corner. Click, hold, and drag the blue circle down to as many rows as you need. Tap in any of the selected cells. A box will appear and you should have an option that says "Autofill." Click it.
6. Create a graph of the data (this needs to be done on a laptop). Select the first three columns and all rows of your data. Select Insert > Chart from the menu.
 - A. Review your chart options. Which will be the best to show your data? Recall that a line graph is best to show constant change over time and a bar graph is best to show fixed values and to make comparisons. Do you see an option that lets you nicely combine and compare the amount of nutrient solution remaining and how much you had to add? If you're not sure, try out a few and see what they look like. Google Sheets will provide previews. If you still need help, ask Mr. Ower (but you better be ready to explain what you've already done).

Part 3: SDRO Project Data Analysis (Fast Plants)

1. Create a new column called "Days since Measured"
2. Calculate the number of days between each time you measured the Fast Plant
 - A. For example, for the first time you measured, there had been 0 days since you had previously measured it.
 - B. On your second measurement (10/6), 5 days had passed since you measured it on 10/1.
 - C. The numbers *should* be the same as your Nutrient Solution, but they may not.
3. Create a new column called "Change in Height Per Day"

4. In the first cell under this new column, use this formula (without quotes) $=(C2/F2)$ Replaced C2 and F2 with whatever your first cells are for the solution added and the days since filled. You should get an error that says you cannot divide by zero. This is okay.
5. Use the fill option to copy this formula into the remaining cells in this column. To do this, select the cell with the formula in it. This will turn the cell blue and a blue circle will appear in the lower right corner. Click, hold, and drag the blue circle down to as many rows as you need. Tap in any of the selected cells. A box will appear and you should have an option that says "Autofill." Click it.
6. Create a graph of the data (this needs to be done on a laptop). Select the first two columns and all rows of your data for the Fast Plant. (You may want to select the new rate column you created. Select Insert > Chart from the menu.
 - A. Review your chart options. Which will be the best to show your data? As with step 6A above, review your options and make the best choice. Use the preview to determine if your graph seems most appropriate for your data. If you're still not sure, ask me but be ready to explain what you've done already.
 - B. Repeat these steps for each sheet of Fast Plant data you have.