

Science 8H: Summer Assignment

Designing a Scientific Experiment: Factors That Impact Plant Growth

Welcome to 8th grade Honors Science! In the upcoming year we will be exploring Life Science concepts with an emphasis on your ability to process information about living things, their interactions and roles in the natural world and what it takes to be successful in nature. Get ready to explore and apply ideas in a diverse and unique way!

This assignment requires that you develop a valid scientific experiment based on sound research and experimental design. Over the course of the summer, you will be required to follow the guidelines provided to create a step by step process then carry out the experiment to test the concepts being examined.

Please follow the requirement checklist to ensure that you meet each component of the assignment in a timely manner. If you have any questions throughout the process, please feel free to contact me via email at tbutler@krhs.net. Keep in mind that there is no correct outcome, you are being evaluated on the process which you develop, the procedure you carry out and the data that you collect and analyze.

Good luck & happy growing!
Mrs Butler

Requirements:

You have been given a collection of seeds that will be used to test your own hypothesis about plant growth. Your goal is to determine optimal growth conditions for your plants by considering **one variable** that impacts plant growth. Most scientific experiments start with a question or a problem. The question you will consider for this project is, “**How does a given variable affect plant growth?**”. From this problem you must complete the following:

1. Choose the variable you want to test. This choice must be well thought out and based on sound background information. This will require that you provide 2 sources that support your choice in variable. Please make sure that the research upon which you are basing your idea is reliable (what is the source?) and appropriate for our setting (you must be able to read & interpret the information - do not choose something beyond the scope of your understanding...text can be TOO scientific at this level!) You need to provide these 2 resources so please make sure you are able to provide citations & copies as needed.
2. You need to create a hypothesis based on the variable that you will be testing. Keep in mind, hypotheses are **educated guesses** based on your background knowledge. Please write your hypothesis in the form of an **If, then** statement.

3. You will need to design an experiment using the plant seeds that have been provided to you. You will need to create a detailed materials list based on your individual design. Please focus on at least 2 test groups that differ **ONLY** by the variable being tested. This allows for valid data collection and analysis. Keep in mind the goal is to determine if your chosen variable affects plant growth - all other factors should remain constant.
4. You will be performing the experiment and collecting data along the way. In order to do this, you need to decide **HOW** you will monitor plant growth throughout the trial. Please create a method of data collection and include how you will record your data. (tables, charts, etc.)
5. You want to run the experiment for a period of time that will offer enough data for you to analyze and draw conclusions. At the completion of the experiment, you need to provide data analysis and draw conclusions on the results. Be sure to return to your hypothesis throughout this section. Analysis should be similar to "Show & Tell". **TELL** the reader what was determined in doing this experiment, and **SHOW** them by referencing your data values and results. Supporting your statements with data is the main way to make your ideas valid to the reader.
6. The summary should focus on the usefulness of the information you gain from your experiment. Oftentimes controlled experiments provide scientists and engineers valuable ideas that can be applied in the world around them. This could be from a professional and technical aspect, as well as for everyday applications. It is your responsibility to take the information gained through analysis and discuss with the reader how it may be useful in the world around us. Please consider this from the point of view of science and engineering professions as well as practical applications in everyday life. Finally, it is always useful to include reflection as to what you might do differently if you were to repeat this experiment again. Are there parts you might keep or change in another trial? Is the design one that can be easily repeated with reliable results or should changes be made to ensure a more valid outcome? Stay objective; it is your job to inform and report, there is no need for descriptive, adjective-filled writing in science reports.

Timeline:

You will be submitting your work through Google Classroom - class code **m u r f 3 u**

If you have any issues / concerns / problems along the way please contact me tbutler@krhs.net

Please follow the timeline provided below to submit required elements throughout the summer:

Friday, July 13th: last day to submit your choice of variable to be tested, your background research and a written hypothesis

- You will receive approval within the week which will enable you to begin developing your procedure & performing the lab

Wednesday, August 29th: Final report due / this must include the following:

1. Materials list
2. Detailed procedure
3. Data / Observations (feel free to include photos, sketches, journal entries)
4. Data Analysis (what does the data/observations tell you about the variable & its effect on plant growth? Graphs may be helpful here)
5. Conclusion: reflect on hypothesis (accept / reject - support w/evidence from data) changes to future experiment, real world applications

If you run into any issues along the way, please keep the lines of communication open. This is a learning experience for you; I encourage you to keep your family informed of what you are doing but it is your original experiment! Be consistent and attentive to your test subjects and show pride in your work - Enjoy!