Summer Assignment

Independent Science Project Proposal Exploration and Research

"The best way to understand the nature of science is to DO science." Ms Brasfield

Course Title: Intensified Chemistry

Teacher: Stacy Brasfield

Teacher contact information: Stacy.Brasfield@apsva.us You may also email your teacher over the summer and/or during the 1st 2 weeks of school if you would like advice and feedback. Keep in mind that I do not always check email every day in the summer and I go on vacations. So be patient for replies. Thank you!

Purpose of Assignment:

Having an understanding of the nature of science is one of the most valuable things you can learn, and the best way to understand science is to DO science, so in this assignment you will design a high school level project and submit it as a formal proposal. This proposal may become your science project. Depending on your ambition and interest, you may enter your project into the school science fair or compete at a state level at VJAS. These opportunities are very valuable and highly regarded in the college admissions process as academic honors and/or awards.

The beginning of the school year is a busy time of adjustment to new classes, new schedules and new teachers, forms to fill out, and things to remember. **To help make this a smooth start for you,** I am giving you information about the independent science project now, so you can think about it at your leisure this summer before you get bombarded with things to do**.**

Meaningful completion of this assignment meets an important Standard of Learning (SOL) in Chemistry (SOL CH1) *The student will investigate and understand that experiments in which variables are measured, analyzed, and evaluated produce observations and verifiable data*. (Full text listing essential skills are found at http://www.doe.virginia.gov/testing/sol/standards_docs/science/2010/courses/stds_chemistry.pdf

Estimated time to complete Assignment: 2- 6 hours. This can be completed over the summer and/or during the 1st 2 weeks of school.

Due date and method of assessment for Assignment: Monday September 16th, 2024.
This assignment will be graded and feedback given in preparation for a final formal proposal due later in October. Students are not required to participate in Science Fair, but they do need to make a plan.

Instructions for Assignment: Use the next page or its same format to submit your proposal. *The proposal should be typed and include the Bold Headings. Once school starts, I will open up a Canvas assignment for you to submit your proposal.*

Independent Science Project Proposal
Science Project Assignment #1

TITLE: *"The effect of _____(independent variable/s) on _____(dependent variables)"*

BACKGROUND:
Write a 2-3 paragraph rationale explaining the scientific theory behind the project. This may serve as the beginning of a larger introduction section for a science paper. It should be written in 3rd person with no pronouns. You do need to do research to write this. No bluffing!

INDEPENDENT VARIABLE(s):
You may decide to have more than one independent variable (IV), if that is the case, list them all.

- ✔ **LEVELS OF INDEPENDENT VARIABLE**
  If you have more than one IV, you need to fill this table out more than once.
  - *Level 1 (Control):*
  - *Level 2:*
  - *Level 3:*
  - *Level 4:*
  - *Etc.*

- ✔ **Number of Trials per level =**
  - *Minimums All projects = 15 trials per level,*
  - *For Plant Projects = 25 trials per level,*
  - *For Human Projects = 30 participants per level*

DEPENDENT VARIABLES:
Your dependent variable (DV) must be measured quantitatively. You need to also think about what instrument you plan to use. Some equipment may be available from your science teacher, but students typically are required to collect their own materials. Include:

- ✔ *Instrument Used to Measure Dependent Variables*
- ✔ *Units of Measurement: METRIC UNITS ONLY – Celsius, cm, mL, grams etc. DO NOT USE Fahrenheit, inches, cups, ounces, pounds etc..*

CONSTANTS:
To isolate the effect of the IV on the DV, you must keep everything else constant. Without constants, you may have interference in your results and thus, experimental error. List at least five parameters that will be held constant

HYPOTHESIS:
Your hypothesis is not a wild guess, it must be informed by research. Use the following format:

- ✔ Research Hypothesis: If _____(planned change in independent variable) then _____(predicted change in dependent variables) because _____(reason for your hypothesis based on your research.)

- ✔ Null Hypothesis:
  State explicitly the "null hypothesis."

PROCEDURE:

- ✔ *Write a step by step list for your procedure as you envision it at this point. The more details you give the more likely this will be approved! This should be in present tense 3RD person list form. This means "NO PRONOUNS – USE PASSIVE VOICE*

- ✔ *Be sure to include not only the set up and collection of data but also what you will do with your data once you collect it (Examples: Find the mean, find the standard deviation, determine significance using an ANOVA test)*

- ✔ *Safety, Ethical and Environmental Considerations section: (List all precautions). Show evidence of full awareness of the significant **safety,** ethical or environmental issues that are **relevant to the methodology of the investigation.***

BIBLIOGRAPHY:

An alphabetized bibliography (in APA) that includes at least five peer reviewed/ scholarly sources to this research plan. You may list more than 5 sources. Be sure to separate Peer Reviewed/Scholarly sources from No- Peer Reviewed sources in your bibliography