** Optional Summer Assignment**

**Independent Science Project Proposal Exploration and Research**

***Preparation* for Science Project Assignment #1**

**Course Title:** Intensified Biology, Intensified Chemistry, and Intensified Earth Science

**Teacher names:** Stacy Brasfield, Lea Bohn, Dawn McCoart, Elizabeth Wood, Jason Brodowski, Katherine Hedderly, Stephanie Sarimento, Lourdes Sotomayor

**Teacher contact information:**

You may contact your science teacher once they are assigned to you

Or Dawn.McCoart@apsva.us

Virginia Junior Academy of Sciences Co-Sponsor

**Purpose of Assignment:**

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,** the Intensified Science Teachers are giving youinformation about the independent science projectso 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 each of the 3 science courses.**

**Estimated time to complete Assignment:** The summer exploration can be take from 0 to 6 hours since work in the summer is NOT mandatory. The assignment will take 2-6 hours, but can also be completed during the 1st week of school.

**Due date and method of assessment for Assignment:** \_\_\_**DUE: SEPT 10 or 11th**\_\_\_\_. **It can be completed during the 1st week of school.** This assignment will be graded and given feedback in preparation for a final formal proposal due later in September.

**Instructions for Assignment**: Please see attached sheet. **The Intensified Science Teachers have put together a CANVAS Class, that you can join that has ideas and information about the science project proposal. It is called the Washington Lee Science Fair Help Site**

 **To Enroll, go to** [**https://apsva.instructure.com/enroll/8LXTAA**](https://apsva.instructure.com/enroll/8LXTAA)

You may also email these subject area expert teachers over the summer and/or during the 1st week of school if you would like advice and feedback. Keep in mind that we do not always check email every day in the summer and we go on vacations. So be patient for replies. Thank you!

For Chemistry, Medicine& Health,: Stacy.Brasfield@apsva.us

For all types of Biology and Environmental Projects Dawn.McCoart@apsva.us Kristen.Johnston@apsva.us

For Computer Science, Math and Engineering Projects: Paul.Bui@apsva.us Kristen.Poland@apsva.us

For Physics Projects: Mary.clendenning@apsva.us or Christopher.cook2@apsva.us

In addition, we have group of older students called the “**Science Project Mentors**” will be available for advice and help and who will be holding workshops all year to help you through the process of writing your paper and preparing for the VJAS conference. Their contact information will be posted on the CANVAS site and also reminders and alerts about these workshops will be sent out.

Intensified Science Project Proposal FORMAT

 ***Instructions****: The proposal should be typed, follow this format and include the Bold Headings .*

**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 your science project. It must be written in the passive voice with no pronouns.*

**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**

* *Level 1 (Control):* ***ex: no fertilizer***
* *Level 2:* ***ex: Miracle Grow***
* *Level 3:* ***ex: Jobes***
* *Level 4:* ***ex: Bonide***
* *Etc.*
* **MINIMUM Number of Trials per level =**
* *All projects = 15-20 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 are typically required to collect their own materials.*

*Include:*

* *Instrument Used to Measure Dependent Variables*
* *Units of Measurement:* ***METRIC UNITS ONLY*** *– Celsius, Meters, Liters and Grams ONLY.*

**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.) You **MUST** have a REASON for your hypothesis)

EX: *“****If radish plants are treated with different fertilizers, then those treated with Miracle Grow will show the greatest growth because Miracle Grow it has the highest concentration of fertilizer.”***

* Null Hypothesis: State explicitly the “null hypothesis.” Essentially, it staes that your IV’s will all have the same effect on your DV. “***If radish plants are treated with different fertilizers, there will be no difference in amount of growth of the radishes”***

**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 FUTURE tense PASSIVE VOICE list form. This means “NO PRONOUNS – USE PASSIVE VOICE.” (EX: “****Fifity milliters of 20% fertilizer solution will be used to treat each plant****.”)*
* *Be sure to include not only the set up and how you will collect 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* ***ANNOTATED\**** *bibliography (in APA format) that includes at least five peer reviewed/ scholarly sources to this research plan. . Be sure to separate Peer Reviewed/Scholarly sources from Non- Peer Reviewed sources in your bibliography (\*****ANNOTATED*** *means that you* ***write 3-4 sentences*** *for* ***EACH*** *SOURCE describing the information from this source that will be useful to your research.)*

*Check out the W-L Library Science Fair Site for information on APA citation format and on the difference between peer and non-peer reviewed sources:* [*https://washingtonlee.apsva.us/academics/library-home/sciencefair/*](https://washingtonlee.apsva.us/academics/library-home/sciencefair/)