

**Science Research Project
Experimental Design Proposal**

Due date: _____

Directions: Complete the following sections regarding your science project proposal. Model your SRP # 1 assignment after this document or simply use it electronically as a template for your specific project proposal. DO NOT answer every single bullet point. Use the bullet points to guide your proposal writing and simply put the information below each heading. Be sure to number your procedure list, however. The work is expected to be typed in 12-sized, Times New Roman font. **Do not include any personal pronouns in your assignment (i.e. I, you, we, my).** You may not start your research/experiment until the assignment has been graded and approved by your teacher and/or school’s SRP committee/Science Department.

TOPIC CATEGORY:

- Refer to ISEF Guidelines to determine which scientific/competition category the project best fits. See Page 5 of the ISEF rules on the following website:
 - ISEF website: http://www.societyforscience.org/isef/students/research_categories.asp

TITLE:

- The title should describe the experiment. It may be in the form of a question, or a statement.
- Example:
 - How does _____ affect _____?
I.V. D.V.
 - The Effect of _____ on _____.
I.V. D.V.

STATEMENT OF THE PROBLEM/PURPOSE:

- What is the question the experiment is trying to answer, or the problem it is trying to solve? (this may be similar to the title)
- In addition to writing the problem, give a brief description of why the problem is scientifically significant. The purpose of the experiment/research.

HYPOTHESIS:

- What is the prediction, or guess, about the outcome of the experiment?
- Is the prediction logical? Is the hypothesis high school level? ** No I, you, we
- This statement should be written in future tense, using an “**If/then**” or **prediction** format.

INDEPENDENT VARIABLE:

- What will be purposefully changed or altered in the experiment?

DEPENDENT VARIABLE:

- What will be measured?
- Include how the dependent variable will be measured (including what instrument or tool will be used), and in what metric units?

<p>Helpful Hint: How does _____ affect _____? (independent variable) (dependent variable)</p>

CONTROL GROUP:

- What will be used as a standard for comparison? The control is the standard to which all experimental groups are compared.
- The control represents the “normal” situation, or the condition that is typically used and not altered in any way.

CONSTANTS:

- What things in the testing environment will stay the “same” for all parts of the experiment?

LITERATURE REVIEW:

- What topics and subtopics will be researched in the library, or using on-line databases?
- What background information is needed to design the experiment?
- This may be in the form of questions that need to be researched to support the experimental problem.

PROCEDURES:

- Using numerical steps, write a general procedure for the experiment. This is a work in progress. It will probably have to be edited several times as the experimental design is developed throughout 9th grade and early on in 10th grade. Do the BEST job possible at this point. Refer to the rubric as well for help.
- The steps need to be as specific as possible, and should include all safety precautions, quantities, units of measurement, scientific names, and crucial steps that an experimenter needs to perform to correctly (error free) conduct the experiment.
- Try to write the procedure as if someone was performing it for the first time.

Things to remember before presenting the proposal to your teacher:

- 1- *Is the answer to your problem/question already known?*
 - *Can the answer be found in a textbook, or science article?*
- 2- *Do you think this proposal idea is interesting to others?*
- 3- *Can the problem be experimentally tested and/or tested safely?*
- 4- *Can the results be presented in metric units?*
- 5- *Are the materials & equipment readily available to you, or do you need to purchase some items? How much will this cost? Where will I get the items?*
- 6- *Is the experiment repeatable? Keep in mind that at least 15, or more, trials per variable/condition will need to be completed to make the results statistically valid.*
- 7- *Can the experiment be completed in the fall or winter months? If not, you will need to plan ahead, get early approval from the school’s SRP committee/Science Department, and begin your experiment during the spring/summer between Honors Earth Science and Honors Biology.*
- 8- *You may need to follow additional teacher guidelines instructing you to get signatures/suggestions from other teachers. FOLLOW DIRECTIONS!!*

SRP # 1: Experimental Design Proposal Rubric
 Due Date: _____

Name: _____
 Date: _____ Period/Block: _____

**Science Research Project
 Experimental Design Proposal Rubric**

Items Required for the Project Proposal:	Possible Points 100	Your Review Grade	Peer Review Grade	Teacher Grade
Format/Word Processing Requirements: –Typed, Times New Roman, 12 font –Model after directions, or electronically use directions as a template	6			
Topic Category: –Choose from the ISEF list of 17 categories on page 5 of the ISEF rules. Website listed above.	2			
Title of Project: This may be changed as the project is developed. It should include a description of both variables. (Ex: The Relationship Between the I.V. and the D.V. OR The Effect of I.V. on D.V. OR How Does I.V. Affect D.V.?)	5			
Statement of the Problem: –Type the problem using a question format. (What do you want to find out about your experimental project?) –Type a reason / purpose about why finding the results to this problem is scientifically significant ~~~~~Things to remember~~~~~ –Is the answer to the problem already known? If so, think about another question. –Is the question interesting to others? –Is the question testable? (Can results be measured safely in metric units?) –Is equipment available / can the materials be ordered easily? –Are the materials needed low cost (\$) ? –Can the experiment be completed in the fall, next year?	5 y / n y / n y / n y / n y / n			
Hypothesis*: (*It may change throughout research process—from 9 th to 10 th grade.) –Type a hypothesis in future tense using an if / then format (Ex: If the rubric is followed specifically, the score will be higher.) ~~~~~Things to remember~~~~~ –Is the prediction logical? –Is the prediction high school level?	10 ~~~~~ y / n y / n			
Independent Variable (IV): –List the IV that the experimenter can control ~~~~~Things to remember~~~~~ –Is the independent variable specific? –Can at least 15 trials be tested per IV condition & for the control group for more statistically valid results	10 ~~~~~ y / n y / n			
Dependent Variable (DV): –List item(s) that will change & be measured in metric units. –Explain how the item(s) will be measured and with what?	10			
Control/ Control Group: – Explain the standard for comparison in the experiment & how all trial groups will be compared to this standard (control) group.	6			

Constants: –List all the items in the experiment that will stay the same	6			
Literature Review: –List topics or questions that can be used to support the experimental problem/question, hypothesis & experimental procedures/materials What types of previous information on your topic/sub topics needs to be read/researched	7			
Procedure: –Use numerical steps to list general procedures developing the experiment. Be as specific as possible & include all safety precautions and metric units.	7			
Your Review & Peer Review – Rubric columns completed on both sides of this sheet	2			
This Rubric include name, date, and block/period	4			
On time	5			
Total number of points	100			

This is a working document. Editing is a large part of the research process. You may be asked several times to edit/change any items on your proposal and any other SRP assignments.