Basics of a Research Plan

What is a Research Plan?

▪ A plan written/outlined in the **FUTURE TENSE BEFORE** start of experiment (**NOT** a Science Project Report).

▪ Plan must be **APPROVED PRIOR** to start of experiment by Sponsor and SRC/IRB (where applicable).

▪ The Research Plan states the method or steps that **WILL BE USED (FUTURE TENSE)**.

▪ It should **NOT HAVE** data or conclusion. Must be written in the **FUTURE TENSE NOT** in the past tense.

▪ Refer to the "*Intel Rules and Guidelines*" at *www.societyforscience.org*. Click on "*What We Do*" link and on "*Intel International Science and Engineering Fair*". On the next page, click again on "*Intel International Science and Engineering Fair*". Scroll down to *"Rules, Forms, and Resources"*. Click on "Forms*".* Scroll Down to "*Form 1A: Student Checklist/Research Plan Instructions"* link.

The Research Plan Format Should Include the Following:

A. Rational: A brief **BACKGROUND** summary that **SUPPORTS** the research problem **EXPLAINING WHY** the project is **scientifically important**. Could it have an impact on society? It is **NOT** the plan.

B. Question: A statement stated as a **question** leading to the study. Use the **QUESTION MARK!!!**

   Problem: Stated as the Purpose, Problem, Objective, or Engineering Goal.
   ▪ **DO NOT USE** personal pronouns! Verbs should be in the **FUTURE TENSE!**

   Hypothesis: A temporary answer/educated guess based on known information.
   ▪ Follows the Purpose (Problem, Objective, or Engineering Goal).
   ▪ Use "**IF/THEN**" format. **RELATE** it to the question and Purpose (Problem/Objective, etc.) **STAY AWAY** from "*I think that. . .*" It should be direct, clear, and **NOT** wordy.

C. Method or Procedure: (Use **FUTURE TENSE**)
   ▪ May be written as a stepwise outline, in sections, or in phases.
   ▪ Detail the procedure and experimental design that **WILL BE** used very clearly and complete!
   ▪ **STAY AWAY FROM** personal pronouns like "*I will . . ., We will . . ., Next I will . . . etc."*
   ▪ **Do NOT START OFF** with: "*Step 1. Gather all the supplies*". This is not part of the experiment!!
   ▪ **Use METRIC** Measurements. Include concentrations, quantities, and major equipment.
   ▪ **Risk & Safety**: Identify any potential risk and safety precautions needed.
   ▪ **Data Analysis:** Include a section describing the procedures that **WILL BE USED** to analyze data.
   ▪ **Discussion of Results & Conclusion**: FUTURE TENSE. Discuss data/results that **CAN BE DRAWN**

   Human Subject Studies (*Intel International Rules and Guidelines*)
   ▪ Include exactly what the Human Subjects **are being asked** to do.
   ▪ Give the number of subjects that **will be** involved, their ages, gender, recruitment, etc.
   ▪ Describe the Risk Assessment process and how risks **will be** minimized (Form 4).
   ▪ Explain what strategies **will be** used to protect privacy and confidentiality (Form 4).
   ▪ Submit a sample of **Inform Consent Form**. **EACH** Human Subject needs to sign one if applicable.
   ▪ If applicable, include a copy of surveys, questionnaires, or tests administered.

   Vertebrate Animal Studies (*Intel International Rules and Guidelines*)
   ▪ Justify the use of non-human vertebrate animals. What contribution **will** the study have?
   ▪ Give the number of animals **to be used**, their species, strain, sex, etc. and describe housing, daily care and all procedures/methods to minimize discomfort, pain, and injury.
   ▪ What **will** happen to the animals after the study?

   Potentially Hazardous Biological Agents (*Intel International Rules and Guidelines*)
   ▪ Give the Biosafety Level (BSL), source of agents, source of specific cell line, etc.
   ▪ Where **will** bacteria or fungi be collected, ordered from, cultured, observed, and disposed of?
   ▪ What **will be** the safety or sterilization procedures that **will be** used? Supervision?

   Hazardous Chemicals, Activities, & Devices (*Intel Intl. Rules & Guidelines*)
   ▪ Describe risks involved, the safety precautions, supervision, and procedures to minimize risk.
   ▪ Detail chemical concentrations, drug dosages, disposal, and type of hazardous equipment.

D. **Bibliography:** Need at least **5** major **RELIABLE** references. Use a proper format. *Internet resources* should have the: 1) author if given, 2) title of the article, 3) website, 4) **date** the article was posted on the website or the **date** it was retrieved by the student from the website. **DO NOT JUST GIVE A WEBSITE!!!**

   Note: Search for bibliography templates on the Internet or how to do a bibliography.