



SENIOR DIVISIONS

RESEARCH PLAN FOR GRADES 9-12 SCIENCE & ENGINEERING PROJECTS

Student's Name: _____ Grade: 9th ☐ 10th ☐ 11th ☐ 12th ☐

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Teacher's Name: _____

School: _____

Project Title: _____

SECTION 1: RATIONALE & BACKGROUND

EXPLAIN THE PURPOSE AND SCIENTIFIC BACKGROUND OF YOUR PROJECT. CONSIDER:

- What problem, phenomenon, or topic are you investigating?
- What is already known about this topic?
- What previous research helped shape your project?
- Why is this research important?
- How does your project build upon or differ from previous work?

SECTION 2: RESEARCH QUESTION, HYPOTHESIS, OR ENGINEERING GOAL

FOR A SCIENTIFIC INVESTIGATION:

- What is your research question?
- What is your hypothesis?
- What scientific reasoning supports your hypothesis?

FOR AN ENGINEERING PROJECT:

- What problem are you trying to solve?
- What are your design criteria and constraints?
- What will determine whether your solution is successful?

SECTION 3: PROJECT DESIGN & METHODS

VARIABLES & CONTROLS (IF APPLICABLE)

- Independent variable: ____
- Dependent variable: ____
- Controlled variables/constants: ____
- Control/comparison group: ____

MATERIALS

List the materials, equipment, organisms, chemicals, software, datasets, or other resources you will use.

PROCEDURES

Describe your procedures in enough detail that another researcher could understand how the project will be conducted.

INCLUDE:

- What you will do, step by step
- Where the research will take place
- How many trials, samples, and/or participants will be used
- How measurements will be taken
- How data will be recorded
- What the student researcher will do versus what others will do

SECTION 4: RISK, SAFETY & REQUIRED APPROVALS

IDENTIFY POTENTIAL RISKS AND EXPLAIN THE SAFETY PRECAUTIONS YOU WILL USE.

Important: Some projects require additional forms and/or approval before experimentation begins. This template does not replace required AzSEF/ISEF forms or approvals.

Does your project involve any of the following?

- ☐ Human participants
- ☐ Vertebrate animals
- ☐ Potentially hazardous biological agents
- ☐ Microorganisms/tissues
- ☐ Hazardous chemicals, devices, or activities
- ☐ Controlled substances
- ☐ Research conducted at a university, laboratory, hospital, or other regulated research institution
- ☐ None of the above

SECTION 5: DATA COLLECTION & ANALYSIS

Describe the data you will collect and how you plan to analyze it. Consider:

- What measurements or observations will you record?
- How will data be organized?
- What graphs, calculations, comparisons, or statistical analyses will you use?
- How will you determine whether your results support your hypothesis or meet your engineering goal?

SECTION 6: BIBLIOGRAPHY

List the credible sources you used to develop your research plan and understand the scientific background of your topic.

BEFORE YOU BEGIN EXPERIMENTATION

- ☐ I have completed my research plan.
- ☐ I have identified the forms required for my project.
- ☐ My Adult Sponsor has reviewed my project.
- ☐ I have obtained all required SRC/IRB or other approvals.
- ☐ I understand that required approvals must be obtained before experimentation begins.