

Science & Engineering Fair Research Plan

Name
School
Category
Research Teacher

Question or Problem being addressed - Title

Rationale

Brief synopsis of the background that supports your research problem and explain why this research is important scientifically and if applicable, explain any societal impact of your research.

Research Question/Hypothesis/Engineering Goals/Expected Outcomes

Materials List

List of all items used in research. Make sure to include concentrations of all chemicals, source and amount of all living organisms, and all equipment used.

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Procedures

Detail all procedures and experimental design to be used for data collection (see Research Plan/Project Summary Instructions, ISEF Rules and Guidelines, page 31). See pages 7-23 of the ISEF Rules and Guidelines for specific inclusions involving Human subjects, vertebrate animal, potentially hazardous biological agents, and/or hazardous chemicals, activities or devices. **Make sure to clarify which procedures were completed by the researcher and which were completed by others.**

Human participant research: Procedure must include the following items!

- Describe **who will participate** in your study (age range, gender, racial/ethnic composition).
- Identify any **vulnerable populations** (minors, pregnant women, prisoners, mentally disabled or economically disadvantaged).
- **Where will you find your participants?**
- **How will they be invited to participate?**
- What will participants be **asked to do?**
- Will you use any surveys, questionnaires or tests?
- What is the **frequency and length of time** involved for each subject?

- What are the **risks or potential discomforts** (physical, psychological, time involved, social, legal, etc.) to participants?
- **How will you minimize the risks?**
- List any **benefits to society or each participant**.
- **Will any identifiable information (e.g., names, telephone numbers, birth dates, email addresses) be collected?**
- Will data be confidential or anonymous? If anonymous, **describe how the data will be collected anonymously**. If not anonymous, **what procedures are in place for safeguarding confidentiality?**
- **Where will the data be stored?**
- **Who will have access to the data?**
- **What will you do with the data at the end of the study?**
- **Describe how you will inform participants about the purpose of the study, what they will be asked to do, that their participation is voluntary and they have the right to stop at any time.**

Vertebrate animal research: Procedure must include the following items!

- **Describe potential ALTERNATIVES to vertebrate animal use and present a detailed justification for use of vertebrate animals.**
- Explain potential impact or contribution this research may have to science.
- Include **methods used to minimize potential discomfort**, distress, pain and injury to the animals during the course of experimentation.
- Detail chemical concentrations and drug dosages (if applicable).
- **Animal species (common and scientific name)**
- **Detail animal numbers, strain, sex, age, source, etc.**
- Describe housing and oversight of daily care and **disposition of animals at the termination of the study**.
- **Complete a Mortality Form** after experimentation has ended.

Potentially Hazardous Biological Agents: Procedure must include the following items!

- Describe **Biosafety Level Assessment process and resultant BSL determination**.
- Complete appropriate Biosafety Form. **Include source of agent, source of specific cell line**, etc.
- **Detail** safety precautions and **specify methods of disposal**.

Hazardous Chemicals, Activities & Devices: Procedure must include the following items!

- **Describe Risk Assessment process.**
- **Detail chemical concentrations and drug dosages.**
- **Describe safety precautions and procedures to minimize risk.**
- **Specify methods of disposal.**

Procedures (Research Methods)

Description in detail of method/procedures, risk and safety, and proper disposal if needed. See statements above for more information.

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Risk Assessment

Analyze all activities and determine any risk associated with them.

Risk Mitigation

Analyze all activities and determine appropriate procedures to reduce risk, like wearing PPE including goggle, gloves, etc.

Data Analysis

Describe the procedures you will use to **analyze the data** that answer research question, hypothesis, or engineering goals.

Bibliography

List at least five (5) major references (e.g. science journal articles, books, internet sites) from your literature review. Please use a **variety of sources**, five sources from the internet will not suffice.

- If you plan to use **vertebrate animals**, one of these references must be an animal care reference.
- If you plan on using **human subjects**, one of these references must be from the listing of human subject reference in the ISEF Rules and Guidelines.
- Include MSDS/SDS citation for all **hazardous chemicals** used in experimentation.
- If you plan on using **PHBAs**, one of the references must include aseptic technique.

SSEF FY25 Rulebook:

State Science and Engineering Fair of Florida. "2024-25 Rules Supplement to the International Science and Engineering Fair Rules." Retrieved August 27, 2024, from <https://ssefflorida.com/rules/>.

ISEF FY25 Rulebook:

Regeneron ISEF, A Program of Society for Science & The Public. "International Rules for Pre-college Science. Research: Guidelines for Science and Engineering Fairs 2023-2024." Retrieved August 27, 2024, from <https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2022/Rules/Book.pdf>.