**22-23 Polk Regional Science & Engineering Fair General Research Plan**

All projects must have a Research Plan **written prior to experimentation** following the instructions below to detail the rationale, research question(s), methodology and risk assessment of the proposed research.

**(Research Plan/Project Summary Instructions, ISEF Rules and Guidelines, page 33**).

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| Title of Project  |
| Name  |
| School  |
| Category  |
| Teacher  |

**Question or Problem being addressed**

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**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.

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**Research Question/Hypothesis/Engineering Goals/Expected Outcomes**

How is this based on the rationale described above?

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**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**

Numbered step by step detail of procedures and experimental design to be used for data collection including proper disposal if needed. See statements below for specific areas.

See pages 8-20 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

 **Human participant research**: USE HUMAN PARTICIPANTS RESEARCH PLAN TEMPLATE

 **Vertebrate animal research**: USE VERTEBRATE ANIMALS RESEARCH PLAN TEMPLATE

 **Engineering project**: USE ENGINEERING RESEARCH PLAN TEMPLATE

 **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**.

**Step by Step Procedures**

*Detail all procedures and experimental design including methods for data collection, and when applicable the source of data used. Describe only your project. Do not include work done by mentors or others.*

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**Risk and Safety**

 Identify any potential **risks** and **safety precautions** needed.

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**Data Analysis**

Describe the **procedures** that will be used to **analyze the data** that answers the research question, hypothesis, or engineering goals.

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**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.

* Use **APA or MLA** formatting.
* Include MSDS/SDS citation for all **hazardous chemicals** used in experimentation.
* If you plan on using **PHBA**s, one of the references must include aseptic technique.
* Include ISEF rules book – pages that refer to your specific topic.

List of possible references/resources are included in the ISEF Rules and Guidelines, pages 23-25)

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