

2018 New York City Science and Engineering Fair - Application

PROJECT SUMMARY (4 Parts)

The project summary is a succinct detailing of the rationale, research question(s), methodology, and risk assessment of your research project and should be completed after experimental research. This project summary must specifically address Part 1 clearly and concisely in 750 words or less. For most math, computer science, or engineering projects, the 4 sections of the project summary should be used to explain how you came up with and executed your project. Although your project may not fit each section directly, you must use the spaces provided to give detailed accounts regarding your project.

Part 1 of 4: What was the **RATIONALE** for your project? Please include a brief synopsis of the background research that supports your research problem and explain why this research is important scientifically and, if applicable, explain any potential societal impact of your research. Please include citations in your project rationale.

Part 2 of 4: State your **HYPOTHESIS(ES) / RESEARCH QUESTION(S) / ENGINEERING GOAL(S) / EXPECTED OUTCOMES**. Describe how your research question(s), hypothesis(es) and/or goal(s) build on the research described in your project rationale.

Part 3 of 4: Part A & B

PART A: Describe in detail your research methods and conclusions.

- **Procedures/Data Collection:** Detail experimental design, including all procedures used for data collection. Be sure to describe in detail only those methods and procedures you (and your teammates) conducted, and not those of your mentor, teacher, or from any other researcher.
- **Data Analysis:** Describe the procedures to be used to analyze your data and answer your research question(s).
- At a minimum, preliminary data and conclusions **MUST** be described.

PART B: Be sure to address all questions in Part B that are relevant to your research project.

- **HUMAN PARTICIPANTS** (See pages 8-10 of the Rules and Guidelines)
 - **Participants.** 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).
 - **Recruitment.** Where will you find your participants? How will they be invited to participate?
 - **Methods.** 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 participant? Please include a copy of the survey or questionnaire (if used) in the research study and provide information as to how the survey questions will inform the research project.
 - **Risks.** What are the risks or potential discomforts (physical, psychological, time involved, social, legal etc) to participants? How will you minimize the risks?
 - **Benefits.** List any benefits to society or each participant.
 - **Protection of Privacy.** Will any identifiable information (e.g., names, telephone numbers, birthdates, 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?
 - **Informed Consent Process.** 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 ANIMALS** (See pages 11-13 of the Rules and Guidelines)
 - What **POTENTIAL ALTERNATIVES** to vertebrate animals were considered for this project? Be sure to present a detailed justification for use of vertebrate animals.
 - What procedures or methods that will be used to minimize potential discomfort, distress, pain and injury to the animals during the course of experimentation and any detailed chemical concentrations and drug dosages. Projects containing procedures classified as USDA Pain Category D or E are **PROHIBITED** for NYCSEF. Experiments that cause death of a vertebrate animal due to the experimental procedure are **PROHIBITED**.
 - **Pain Category.** Name the Pain Category associated with your project. Refer to Appendix I on page 5 of the Rules and Guidelines.
 - How many animals will be used in this study? Provide the species, strain, sex, age, etc of the animal and how the animals will be housed and cared for daily. Justify the number of animals planned for this study.
 - How will the animals be disposed of at the termination of the study? Experimental procedures involving toxicity studies, predator/vertebrate prey experiments, or studies where students performed euthanasia on a vertebrate animal are **PROHIBITED** for NYCSEF.
- **POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS** (See pages 14-17 of the Rules and Guidelines)
 - Provide a description of the Biosafety Level Assessment process and BSL determination (see page 16 for details).
 - Where did you obtain the specimen, agent, source of specific cell line, etc.?
 - What safety precautions will be used during experimentation?
 - How will any potentially hazardous biological agents be disposed of at the end of the study?
- **HAZARDOUS CHEMICALS, ACTIVITIES & DEVICES** (See pages 18-20 of the Rules and Guidelines)
 - Provide a description of the Risk Assessment process and results.
 - Provide a brief summary of the chemical concentrations and drug dosages that will be used in experimentation.
 - What safety precautions and procedures will be used to minimize risk?
 - How will any hazardous chemicals or materials be disposed of at the end of the study?

Part 4 of 4: Provide a list of **AT LEAST FIVE (5) MAJOR REFERENCES** used to form the basis of your research project. References must be from science journal articles, books, or other publications. Encyclopedias and Internet search engines (e.g. Google, Yahoo, WebMD, Wikipedia, etc.) are not considered as major references and **WILL NOT** be accepted.

2018 New York City Science and Engineering Fair - Application PROJECT SUMMARY (Part 1 of 4)

The project summary is a succinct detailing of the rationale, research questions, methodology and risks of your research project and **should be written upon completion of your experimental research**. This project summary must specifically address Part 1 clearly and concisely in 750 words or less.

Part 1 of 4: What is the **RATIONALE** for your project? Please include a brief synopsis of the background research that supports your research problem and explain why this research is important scientifically and, if applicable, explain any potential societal impact of your research. Please include citations in your project rationale.

Title

Student's Name(s)

School Name

Start typing the body of your rationale here beginning at the left margin

2018 New York City Science and Engineering Fair - Application PROJECT SUMMARY (Part 2 of 4)

The project summary is a succinct detailing of the rationale, research questions, methodology and risks of your research project and **should be written upon completion of your experimental research**. This project summary must specifically address Part 2 clearly and concisely in 250 words or less.

Part 2 of 4: **State your HYPOTHESIS(ES) / RESEARCH QUESTION(S) / ENGINEERING GOAL(S) / EXPECTED OUTCOMES.**

Describe how your research question(s), hypothesis(es) and/or goal(s) build on the research described in your project rationale.

Title
Student's Name(s)
School Name

Start typing the body of your hypothesis or goal here beginning at the left margin

2018 New York City Science and Engineering Fair - Application

PROJECT SUMMARY (Part 3 of 4)

The project summary is a succinct detailing of the rationale, research questions, methodology and risks of your research project and **should be written upon completion of your experimental research**. This project summary must specifically address Part 3 clearly and concisely in 500 words or less.

Part 3 of 4: Part A & B

PART A: Describe in detail your research methods and conclusions.

- **Procedures/Data Collection:** Detail experimental design, including all procedures used for data collection. Be sure to describe in detail only those methods and procedures you (and your teammates) conducted, and not those of your mentor, teacher, or from any other researcher. For non-inquiry based research projects describe the process used to arrive at the mathematical solution.
- **Data Analysis:** Describe the procedures to be used to analyze your data and answer your research question(s).
- At a minimum, preliminary data and conclusions must be described.

Be sure to address all questions in Part B that are relevant to your research project.

PART B - For projects with:

- HUMAN SUBJECTS (See pages 8-10 of the Rules and Guidelines)

- **Subjects.** 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).
- **Recruitment.** Where will you find your subjects? How will they be invited to participate?
- **Methods.** 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? Please include a copy of the survey or questionnaire (if used) in the research study and provide information as to how the survey questions will inform the research project.
- **Risks.** What are the risks or potential discomforts (physical, psychological, time involved, social, legal etc) to participants? How will you minimize the risks?
- **Benefits.** List any benefits to society or each participant.
- **Protection of Privacy.** Will any identifiable information (e.g., names, telephone numbers, birthdates, 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?
- **Informed Consent Process.** 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 ANIMALS (See pages 11-13 of the Rules and Guidelines)

- What POTENTIAL ALTERNATIVES to vertebrate animals were considered for this project? Be sure to present a detailed justification for use of vertebrate animals.
- What procedures or methods that will be used to minimize potential discomfort, distress, pain and injury to the animals during the course of experimentation and any detailed chemical concentrations and drug dosages. Projects containing procedures classified as USDA Pain Category D or E are PROHIBITED for NYCSEF. Experiments that cause death of a vertebrate animal due to the experimental procedure are PROHIBITED.
- **Pain Category.** Name the Pain Category associated with your project. Refer to Appendix I on page 5 of the Rules and Guidelines.
- How many animals will be used in this study? Provide the species, strain, sex, age, etc of the animal and how the animals will be housed and cared for daily. Justify the number of animals planned for this study.
- How will the animals be disposed of at the termination of the study? Experimental procedures involving toxicity studies, predator/vertebrate prey experiments, or studies where students performed euthanasia on a vertebrate animal are PROHIBITED for NYCSEF.

- POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS (See pages 14-17 of the Rules and Guidelines)

- Provide a description of the Biosafety Level Assessment process and BSL determination (see page 17 for details).
- Where did you obtain the specimen, agent, source of specific cell line, etc.?
- What safety precautions will be used during experimentation?
- How will any potentially hazardous biological agents be disposed of at the end of the study?

- HAZARDOUS CHEMICALS, ACTIVITIES & DEVICES (See pages 18-20 of the Rules and Guidelines)

- Provide a description of the Risk Assessment process and results.
- Provide a brief summary of the chemical concentrations and drug dosages that will be used in experimentation.
- What safety precautions and procedures will be used to minimize risk?
- How will any hazardous chemicals or materials be disposed of at the end of the study?

2018 New York City Science and Engineering Fair - Application PROJECT SUMMARY (Part 3 of 4)

The project summary is a succinct detailing of the rationale, research questions, methodology and risks of your research project and **should be written upon completion of your experimental research**. Please note that this is to be submitted as part of your online registration.

Part 3 of 4: State your **RESEARCH METHODS/ANALYSIS** and address **PART B QUESTIONS** below.

Title
Student's Name(s)
School Name

Start typing your research methods, analysis, and Part B here beginning at the left margin

2018 New York City Science and Engineering Fair - Application PROJECT SUMMARY (Part 4 of 4)

The project summary is a succinct detailing of the rationale, research questions, methodology and risks of your research project and **should be written upon completion of your experimental research**. This project summary must specifically address Part 4 clearly and concisely in 250 words or less.

Part 4 of 4: **Provide a list of AT LEAST FIVE (5) MAJOR REFERENCES** used to form the basis of your research project.

References must be from science journal articles, books, or other publications. Encyclopedias and Internet search engines (e.g. Google, Yahoo, WebMD, Wikipedia, etc.) are not considered as major references and WILL NOT be accepted.

Title
Student's Name(s)
School Name

Start typing your list of major references here beginning at the left margin