

confidently about their work. They simply want to talk with students about their research to see if they have a good grasp of the research project from start to finish.

## 2. Helpful hints for judging:

- Greet the judges and introduce yourself.
- Appearance, good manners, appropriate attire, and enthusiasm for what you are doing will impress the judges.
- Judges need to see if you understand the basic principles of math, science, engineering, or technology behind your project and topic area.
- Judges want to know if you have correctly measured and analyzed the data.
- Judges want to know if you can determine possible sources of error in your project and how you might apply your findings in the 'real' world.
- Judges seek to encourage you in your research efforts and future goals and career in the field.
- Finally – and most importantly – relax, smile, and enjoy your time to learn from them and your interaction with them. You should be applauded for all your hard work!

## Student Research Papers

**A student research paper must be submitted, in addition to any relevant forms and paperwork, in order to complete the NYCSEF application. All application materials must be POSTMARKED no later than December 16, 2015 in order to compete in any of the NYCSEF events.**

Student research papers will be used in conjunction with scores received in the Preliminary and Finals round to select the top projects that will represent NYC at the Intel ISEF in May. Below are suggestions for the different sections of a research paper. Keep in mind that some suggestions may not apply depending on the nature of the project.

### Abstract

The abstract is a non-critical, informative summary of the significant content and conclusions of the paper. The abstract should not exceed 500 words and should be written in the past tense. The abstract:

- does **not** include any references to tables or figures in the paper or cited literature;
- does **not** include detailed descriptions of systems, equipment, or processes.

### Introduction

The introduction provides a brief, historical background and description of the work discussed in the paper. The purpose

of the investigation is clearly stated and placed in the context of the field of study and contains properly cited references.

This section:

- describes the nature and significance of the research project;
- provides definitions of new or unusual terms, or those having special meaning related to the project.

### Materials and Methods

The materials and methods should be written in paragraph form – step listings will not be accepted – and detailed enough to allow any reader to repeat the experimentation if necessary. However, it is not necessary to include every single step (i.e. how many grams of NaCl was added to water – just the final concentration). This section:

- does not contain any results;
- describes any apparatus that was specifically constructed or modified for use in the study;
- could include a flowchart or diagram for clarification of a complex procedure or apparatus.

### Results

The results section summarizes the data in narrative form with tables, graphs, and figures. Tables, graphs, and figures should be integrated into text with verbal elaboration and used to make data coherent, encourage comparison, indicate relationships, and simplify complicated information. This section:

- contains tables, graphs, and figures that are clearly labeled with concise captions;
- does not contain ALL of the raw data collected but should highlight the data relevant to the study;
- does not contain any guesses, conclusions, or interpretations based on the data.

### Discussion and Conclusions

The discussion section provides an interpretation of results and how it relates to the original hypothesis and project rationale. This section:

- offers possible explanations of the findings;
- provides recommendations for further study and for improving experimentation.

### References / Literature Cited

Students should take care to indicate the sources of the information and include in-text citations using either APA or MLA format for citations – not both. References should:

- contain at least five major references from scientifically and academically accepted sources;
- not include encyclopedias or Internet search engines. These are acceptable starting points for gathering background information but should not be the only sources of reference.

## Submission Summary

Students should retain ALL original signed NYCSEF application forms – including the student research paper.

**NOTE: In order to successfully apply for NYCSEF, students must submit:**

- 1) **ONE (1) printout of the NYCSEF On-line application Confirmation Form**
- 2) **ONE (1) set of the signed NYCSEF required and supplemental forms (where applicable)**
- 3) **TWO (2) copies of the research paper**

**Only students who follow the proper rules and guidelines and submit ALL necessary materials will be eligible to have their application reviewed by the NYCSEF Scientific Review Committee and be considered for competition in any of the NYCSEF events.**

## Appendix I: USDA Pain Categories and Definitions for projects involving vertebrate animals:

USDA Pain Categories & Definition	NYCSEF Guidelines
<b>Category A:</b> <i>Live animals will receive non-painful manipulation. Animals may be euthanized to obtain tissues, cells, etc.</i>	Permitted only with proper training and certification
<b>Category B:</b> <i>Live animals will receive momentary pain or stressful stimulus without anesthesia, which results in a short term response. Examples include but are not limited to: injections, field trapping/tagging, blood sampling and standard agricultural husbandry practices.</i>	Permitted only with proper training and certification
<b>Category C:</b> <i>Live animals will have significant manipulations, surgery, etc., performed while anesthetized. The animals will be euthanized at the termination of the procedure without regaining consciousness. <u>Euthanasia may not be performed by the student(s).</u></i>	Permitted only with proper training and certification in a Registered Research Institution.
<b>Category D:</b> <i>Live animals will have manipulations performed while anesthetized and are allowed to recover and/or animals will develop discernible clinical signs indicating pain, distress, or significant physiological changes spontaneously or as a result of specific experimental procedures. Examples include, but are not limited to: Survival surgical procedures of any type and some studies which would include tumor development.</i>	PROHIBITED for entry into NYCSEF
<b>Category E:</b> <i>Live animals will experience significant / severe pain or distress, without benefit of anesthetics, tranquilizers, or analgesics.</i>	PROHIBITED for entry into NYCSEF