Section 1

The following are the rules used in the annual AACS Science Fair Competition. The rules are significantly simplified from the 2006 version; the objective is to have more easily understood rules while providing a baseline of guidance for each contestant to build on. All questions of experiment appropriateness and safety requirements should be answered by and be in compliance with the Intel International Science and Engineering Fair Rules. To view the rules, search on internet at Intel Science Fair Document Library and then click on 2014 (or the latest posted year) Rules and Guidelines.

To ensure student safety and compliance with federal and state guidelines **all students must complete Form A and include it in the Forms and Addenda Notebook**. The purpose of the form is to require adult review of the student's experimental ideas ensuring a safe and adequate method and use of equipment to conduct the experiment, acknowledgment of and compliance with the state and federal government safety requirements, and to provide the necessary adult oversight throughout the entire experiment.

To best prepare for science fair competition, each contestant should use a copy of the science fair judging form (included in the forms portion of the National Competition Manual) as a personal critique sheet.

Introduction

1. Participants are divided into two categories: Biological or Physical Science. A student may enter only one of the two categories.
2. AACS recognizes the following areas of competition within the Biological and Physical Science categories:

Biological Science	Physical Science
1. Behavioral and Social Science	1. Chemistry
2. Biochemistry	2. Computer Science
3. Botany	3. Earth Science
4. Medicine and Health	4. Environmental Science
5. Microbiology	5. Mathematics
6. Zoology	6. Physics

The Log Book

The Log Book is the **most extensive portion** of the science fair project. The book contains all pertinent information regarding the project to include the thought process as to the choice of the topic and the development of the experimental procedure eventually used. It should include the observed results of the experimental process. It should have sufficient detail so that a person, after reading the Log Book, would be able to duplicate the experiment and achieve the same results without any help from the author.

Form and Addenda

The notebook **must contain a completed copy of the required Form A**. Further, as the project progresses, there will be information collected that cannot be practically inserted into the Log Book (information such as pictures, certain graphs, correspondence, referenced photocopies, material printed from Internet sources, etc.). Material such as this should be placed in the notebook. Information cited from the Internet must be copied (including webpage address and date printed) and included here. Internet sources are of varying levels of integrity and will be judged accordingly.

Research Paper

1. Before starting any research on the Internet, Form A, Research Plan, Safety Assessment and Approval, (Parent or Guardian Approval section) must be completed.
2. Any research information cited from websites must be printed out and included as part of the Forms and Addenda Notebook.
3. The basic structure of the paper should be a title page, an abstract, the main body, and the bibliography.
4. The abstract (a separate page) summarizes in 250 words or less the entire project. The abstract defines the experiment, briefly explains how it was conducted and summarizes the results.
5. The main body of the paper should flow coherently from start to finish. Appropriate pictures, graphs and other types of visual information may be inserted as required, but are not considered as part of the minimum length of the paper. The required length of the paper should be a minimum of ten double spaced pages. The font should be 12 point, margins approximately one inch, and of a style that is easily read. Pages should be numbered.

Experiment

The experiment is the single most important aspect of the project. It is the project. The entire project revolves around this part. An experiment is a series of tests undertaken in order to verify or refute a hypothesis. The experiment must have a single variable and be controlled; whereas the majority of the experimental population has alterations applied to it, the control portion of the population is set aside and remains unaltered. The observed results of the experimentation should be recorded in the Log Book and be used to draw conclusions concerning the veracity of the hypothesis. The experiment should be repeated multiple times in order to verify the results.

Project Display

The project display will be positioned on a table such that the project's maximum height (as measured from the floor) will not exceed 96 inches; the maximum width will not exceed 48 inches. The project display will include a display board positioned on the table with the following items positioned on the table in front of the board: the experimental apparatus (if available), the Log Book, the Forms and Addenda Notebook, the research paper, and three copies of the appropriate judging form. Note: Do not assume that electrical connections will be available at the display location at the AACS National Competition.

The display board will include a project title, hypothesis, abstract, description of materials, procedure, results, and conclusion.

1. Project Title: Wording of the student's choosing that has a professional appearance.
2. Hypothesis: A stated explanation of an observed or considered event or phenomenon.
3. Abstract: A 250 (or less) word summary which defines the experiment, briefly explains how the experiment was conducted and summarizes the results.
4. Description of Materials: A description of the equipment used in the experimental process.
5. Procedure: A step-by-step explanation of how the experiment was conducted.
6. Results: The data observed—presented in a format of student's choosing.
7. Conclusion: The student's assessment as to whether the hypothesis was verified or refuted.

Section 2

This section contains abbreviated guidelines pertinent to AACS science fair projects. In general, the Intel International Science and Engineering Fair Rules will determine the appropriate experiment and safety requirements. However, where applicable, AACS science fair projects will be restricted to comply with the following rules.

1. Experiments Involving Human Subjects and Living Vertebrate Animals
   a. Experimentation directly involving human subjects is prohibited. This includes all areas of research with the exception of statistical studies.
   b. Experimentation endangering the life of vertebrate animals is prohibited.
   c. Statistical studies are permissible if they comply with the following:
      (1) The student researcher is not directly involved in the acquisition of raw data from humans. Material must be obtained from reliable, outside sources.
      (2) The material obtained does not compromise the anonymity of the human individuals surveyed.
      (3) The project may not deal with a subject that violates or contradicts biblical standards of morality. Competition officials shall have full authority for making any determination in this regard. Projects determined to be inappropriate will be penalized.
      (4) The student researcher may be directly involved in the acquisition of raw data from living vertebrate animal subjects but only if it involves observation of the animals in their natural habitat undisturbed by the student researcher. An exception for domesticated farm animals is such that the farm is considered the animal's habitat.
      (5) The student researcher must comply with all existing federal, state, and local laws during the course of his experiment.
2. Experiments Involving Bacteria, Fungi, Microorganisms, etc. (including rDNA)
   a. Experiments involving agents classified as bio-safety level risk group 3 or 4 (BSL-3 and BSL-4) are prohibited.
   b. Experiments involving rDNA that requires containment are prohibited.
   c. Experiments may involve material that are agents classified as bio-safety level risk 2 and may also include non-containment rDNA. These projects should be undertaken with the risk well understood and include the following additional regulations:
      (1) All research must be under the direct supervision of a qualified scientist or certified expert.
      (2) All experimentation must be at an institution where proper bio-safety protocol can be observed.
      (3) The qualified scientist or certified expert will be solely responsible for the acquisition and disposal of all material in accordance with procedures appropriate to the material used.
      (4) The student researcher must be educated by the qualified scientist or certified expert in regard to the risks involved with such material.
   d. Disposal of all biological agents must be in accordance with their bio-safety levels. The qualified scientist or certified expert will manage acceptable methods of disposal.
   e. **No** experimental material from this category may be displayed. Pictures should be properly referenced in the Forms and Addenda Notebook. All display apparatus will be properly sterilized to ensure that no experimental or hazardous material is on this apparatus.

3. Experiments Involving Animal Tissue (Non-Human)
   a. The tissue utilized must be safe for student researcher handling. Experiments involving diseased or infected tissue are prohibited.
   b. The tissue must have been already dead or obtained as a result of an otherwise required/necessary procedure for the health of the animal (e.g. tooth removal resulting from a dental cleaning). Removal of the tissue must be performed by the qualified scientist or certified expert, and any tests performed must be at a research institution, veterinary clinic, or equivalent.
   c. The qualified scientist or certified expert must educate the student researcher as to proper handling of animal tissue. Dispose of tissue in accordance with generally accepted procedures.
   d. No tissue may be displayed. Pictures should be properly referenced in the Forms and Addenda Notebook.
4. Experiments Involving Controlled or Radioactive Substances are prohibited, i.e., radiation, prescription or otherwise illegal drugs and tobacco.
5. Experiments Involving Hazardous or Dangerous Substances or Potentially Dangerous Apparatus (including Firearms, Explosives, etc.)
   a. The purchase and use of firearms, ammunition, powder, etc., is regulated by law. All federal, state, and local laws must be obeyed in the course of the project.
   b. The student researcher must be educated as to the danger of the substance, protective measures necessary, legal disposal and procedures regarding the accidental spillage of these substances. Until properly trained, substances deemed hazardous, toxic, or dangerous must be handled only by the qualified scientist or certified expert. Safety precautions, protective clothing, protective shielding, etc., should be in place prior to any experimentation. Material Safety Data Sheets must also be on hand.
   c. If the apparatus utilized is potentially dangerous, then it must be operated in the presence of the adult supervisor, qualified scientist or certified expert.
   d. No hazardous or dangerous substances may be displayed. Pictures should be properly referenced in the Forms and Addenda Notebook. The apparatus may be displayed at the competition but must not be operated. If the apparatus has items that are sharp, dangerous, or that might potentially be considered hazardous, then it must be shielded or somehow enclosed.
6. Experiments Involving Voltages Greater Than 250V AC or DC
   a. The adult supervisor, qualified scientist or certified expert must approve the experiment device prior to its operation. The apparatus must have a clearly visible and accessible disconnect or on/off switch. The circuitry must be protected by appropriate fuses or circuit breakers and appropriate insulation or shielding must be in place prior to any experimentation.
   b. The apparatus must be in accordance with the National Electric Code and any federal, state, or local regulations. Unless required by the experiment protocol, all wiring must be UL approved. All wire must be sized per load.
   c. Any device which stores electricity must be properly insulated or discharged prior to the competition.
   d. The apparatus may be displayed at the competition but must not be operated. If the apparatus has items that are dangerous, or that might potentially be considered hazardous, then it must be shielded or somehow enclosed.

Form A

Complete front and back portions of this form and additional page and insert into the Forms and Addendum Notebook.

Research Plan, Safety Assessment, and Approval

*This form is required for **all** projects and to be approved **prior** to experimentation.*

To be completed by the Student:

Name _____ State _____

School _____ City _____

Teacher's Name _____ Grade _____

Title _____ Date Project Started _____

Where will you conduct your experiment or lab work (include address if not at school or home)? _____

_____

_____

Use one additional page and append it to this form in the Forms and Addendum Notebook. Include the following:

a. The hypothesis
b. A brief step-by-step experimental procedure
c. The expected results

To be completed by the Teacher, Qualified Scientist, or Certified Expert:

Risk Assessment and Approval:

1. Check below the items or substances used in the course of this experiment.

- ☐ Hazardous chemicals
- ☐ Bacteria or fungi
- ☐ Tissue (living or dead)
- ☐ Voltages greater than 220V
- ☐ Radioactive material
- ☐ Firearms
- ☐ Compressed gas canisters
- ☐ Toxins, carcinogens, mutagens, etc.
- ☐ Other substances considered dangerous
- ☐ Apparatus that could be considered potentially dangerous
- ☐ Pathogens
- ☐ Controlled Substances
- ☐ Vertebrate animals
- ☐ Lasers
- ☐ Devices emitting harmful radiation
- ☐ Potentially explosive devices
- ☐ Recombinant DNA
- ☐ High amperage devices
- ☐ BSL-1 or BSL-2 agents

2. Based on the items checked above and personal discussion with the student in regards to the experiment, I assess the potential risk to the student as:

_____ Low _____ Moderate _____ High _____ Extreme

Comments_____

_____

Continued

Form A (continued)

(Reverse of Form A)

Research Plan, Safety Assessment and Approval

All required signatures must be in place before the student can proceed with the stated project.

3. The student has explained to me the proposed project, process of research and experimentation. I approve of the project and agree to provide general oversight as the project progresses.

I ☐ have/ ☐ have not (check one) reviewed the research plan and agree that the Internet would be a useful tool in acquiring information regarding this project.

I ☐ have/ ☐ have not (check one) instructed the student as to how to conduct research on the Internet.

Print Name _____ Signature _____ Date _____

To be completed by the Student:

I understand the possible risks associated with this project. I certify that I will obey the rules, regulations, safety precautions, and any state or federal rules and regulations associated with this experiment. I further certify that all work performed in this project, unless otherwise noted, will be original, not fabricated and my own.

I ☐ will/ ☐ will not (check one) be using the Internet for any research or investigation in regards to this science fair project.

Print Name _____ Signature _____ Date _____

To be completed by the Parent or Guardian:

I understand the possible risks associated with this project and herewith give my consent to my child to proceed with the project. I understand and accept all the time and costs associated with this project.

I understand that my child must obey the competition rules and regulations, safety precautions, and any state or federal rules and regulations associated with this experiment. I further understand that all work performed in this project, unless otherwise noted, will be original, not fabricated and the student's own.

Because the Internet can be a source of great good or great evil, I understand that parental approval is required prior to any student access to the Internet. I am providing this approval and will assume all the responsibility for my child's involvement in research on the Internet. I will directly supervise my child's activity on the Internet or will approve another person to supervise my child. I will instruct my child in the evils associated with the Internet, and I therefore authorize access for the scope of this project.

Supervisor, if applicable _____

(Check one) _____ I consent to Internet access. _____ I do not consent to Internet access.

Print Name _____ Signature _____ Date _____

SCIENCE FAIR

(Check Category)

☐ **Biological Science** ☐ **Physical Science**

Name _____ State _____

School _____ City _____

Title _____ Project # _____

FACTORS EVALUATED	COMMENTS	POINTS
Creativity and Scientific Thought 1. Is the project unique? Is the approach practical, and is the apparatus and/or testing method appropriate? 2. Is the procedure well thought through, and is the hypothesis testable? 3. Is the project realistic and the solution beneficial? (20 points possible)		(20 pts)
Research and Experimentation 1. Did the student conduct enough background research to be qualified to conduct the experiment? 2. Was sufficient data collected? Does the data appear to be accurate and realistic? 3. Was the experiment controlled, repeated, and/or did it contain sufficient population to yield accurate results? (30 points possible)		(30 pts)
Presentation and Documentation 1. Does the Log Book contain sufficient information in order to reconstruct the project? 2. Does the presentation of material and/or student interview reflect a well-balanced knowledge of the project? 3. Does the research paper meet all requirements? Are all required and applicable forms complete? (25 points possible)		(25 pts)
Thoroughness and Technical Skill 1. Are all areas of the project thoroughly covered and discussed? 2. Is the apparatus or testing procedure well-constructed, and did the student do his own work? 3. Does the student have recommendations as to further or alternate methods to do additional projects based on the results? (15 points possible)		(15 pts)
Clarity and Dramatic Value 1. Is the presentation clear and easy to follow? Are the conclusions and findings appropriately presented? 2. Is the presentation professional in appearance and appropriate for the project? 3. Is the information correctly presented, and are data presented in a correct, easy-to-follow manner? (10 points possible)		(10 pts)

STATEMENT OF ORIGINALITY

I certify that this project is my own original and authentic work and that I received no help in completing this project other than general instruction and supervision.

Total (100 possible points) _____

_____
Student's Signature

_____
Judge's Signature