



# The Ohio Academy of Science

## STUDENT PARTICIPANT GUIDELINES

### Scientific Inquiry and Technological or Engineering Design Projects

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# STUDENT PARTICIPANT GUIDELINES

## Before Beginning a Research Project

Before you begin a research project for Local or District Science Day participation, the information in the following sections should be thoroughly reviewed. If you have any questions, please discuss the issue with your parent, teacher, or contact The Ohio Academy of Science **before** you begin your research project.

### 1. Become familiar with the Ohio Academy of Science and the Science Day Standards, Rules and Judging Procedures for Scientific Inquiry & Technological or Engineering Design Projects.

For additional information or questions:

A. Contact: phone: 614.488.2228 email: [info@ohiosci.org](mailto:info@ohiosci.org)

a. Website: <http://www.ohiosci.org>

#### B. Required Components of ALL Science Research Projects

- a. An Identified Problem or Design Statement
- b. Research Plan and Project Data Book/Notebook
- c. Detailed Research Report including an Abstract
- d. Physical Display
- e. Oral Presentation

### 2. Locate a teacher or other professional that will supervise the work

Guidance by an adult professional is important in assuring that rules and special protocols are followed, and that safety in the use of equipment is maintained. Many scientific organizations, industries, as well as local schools and businesses will gladly give valuable aid if properly asked. If a teacher or another professional is not available, contact The Ohio Academy of Science to assist in locating an advisor. Email [info@ohiosci.org](mailto:info@ohiosci.org)

### 3. Review the Judging Criteria

#### A. Criteria for Individual and Team projects

*Student may earn a maximum of 10 in each criteria*



# STUDENT PARTICIPANT GUIDELINES

- Knowledge Achieved
- Effective Use of Scientific Method or Technological and Engineering Design
- Clarity of Expression
- Originality and Creativity
- Teamwork is an added criteria for Team projects

## ***Knowledge Achieved***

- Correct use and understanding of terms and principles
- Evidence that student acquired in-depth knowledge
- Literature search: extent of scientific, engineering or medical journals/sources or just popular literature citations
- Supplements answers/responses with additional relevant information

## ***Effective Use of Scientific Method or Technological and Engineering Design***

- Well-documented Project Data Book/notebook/ lab journal
- Experimental Design: Specific problem or question; a clearly stated hypothesis or technological design statement
- Experimental Design: Designed based testing rather than a summary of knowledge
- Experimental Design: Identified problem---how and why did the student develop the prototype
- Experimental Design: Clear method(s) with correctly defined and measured variables and controls; appropriate testing of prototype
- Experimental Design: sufficient understanding of methods from related studies in the literature
- Data handling: data tables, graphs, statistics; sufficient number of trials or samples for the problem
- Valid conclusion(s) or discussion of results
- Effective Use of professional equipment, or correct construction/use of home-made apparatus, equipment, experimental materials, or models



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## ***Clarity of Expression***

- Explanation and understanding of the project is demonstrated in Oral Presentation; questions answered clearly and correctly; clear statement of how/why the student was testing their design
- Written report: specific title, organization, results, citations, references
- Abstract with clear statement of results; need and results
- Ability to explain information included in the Abstract, the Research Report, and the Project Data Book/notebook/lab journal
- Visual Display: conveys essence of the idea or problem; the design statement or hypothesis; results and valid conclusions

## ***Originality and Creativity***

- New idea, concept, principle, hypothesis, insight or non-obvious approach or problem definition;
- Originality of the idea; did the student redesign the prototype based on their collected data
- Novel association or relationship of previous discoveries or knowledge; literature search includes scientific, engineering or medical journals/sources, patents awarded or just popular literature citations
- Inquiry or Designed based rather than a summary of knowledge
- Unique presentation; ingenious use of materials
- Evidence of initiative; rigorous analyses of extensive or robust data, or results that reveal previously unknown relations

## ***Teamwork*** (criteria only used for Team Projects with a 50-point rating scale)

- A Team includes a maximum of three 3 students, from the same school (district) and same grade brackets (grades 5-6), (grades 7-8), grades (9-12).
- Full names of all team members must appear on the Abstract and registration forms.
- A supplemental sheet of the contribution each member made towards the team project must be signed by each team member and must be included in the project display and in the Research Notebook.



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- All Team members must be present to be judged at District and State Science Day or project is disqualified.

## **Each member of the Team is expected to:**

- Show active participation, and understanding of the entire project
- Be able to serve as the spokesperson, and participate equally in the presentation
- Be fully involved in the project
- Be able to clearly express their personal contributions to the project
- Respond correctly and clearly to all questions

## **B. Ratings for Individual and Team Projects**

### Superior Rating

Individual student earns 36 to 40 points    Team of students earn 45 to 50 points

### Excellent Rating –

Individual student earns 24 to 35 points    Team of students earn 30 to 44 points

### Good Rating

Individual student earns 12 to 23 points    Team of students earn 15 to 29 points

### Satisfactory Rating ---

Individual student earns 04 to 11 points    Team of students earn 05 to 14 points



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## Beginning a Research Project

Now that you know what is expected and required, use the information below as you work through your research project.

### 4. Generate ideas involving various Scientific Inquiry and Technological or Engineering design projects

Inquiry projects shall have a hypothesis; technological and engineering design projects shall have a design statement with measurable criteria for success. Just as **scientific inquiry projects require** 1) the identification of a problem or question and 2) a proposed hypothesis that might offer a solution to the problem or answer the question, so too, **engineering and technological design projects require** 1) a problem or needs statement and 2) a design statement that identifies such limiting factors and criteria for success or meeting the design as cost or affordability, reliability, (mean time between failure MTBF), material limits (strength, weight, resistance to corrosion, color, surface texture, ease of manufacture or reproducibility), operating environment or conditions (temperature, humidity, barometric pressure, caustic conditions), ergonomics (human factors), health and safety, and general ease of use or operation.

In a manner similar to the development of methods used to test a hypothesis, engineering and technological design projects must test the design statement to see how close a prototype, for example, comes to meeting the design criteria. A prototype developed for an engineering and technological design project must achieve stated design objectives and satisfy specified constraints. Generally, the results of an engineering and technological design project will describe the extent to which the prototype met the design criteria. An inquiry project shall state the extent to which the results derived from experimentation validate or invalidate a hypothesis.

### 5. Determine multiple Resources to enhance research

The quantity and quality of the references are reviewed during Science Days by the Judges. Your resources help to demonstrate the scope and depth of the literature search. Consult a Research Librarian to assist in locating more scholarly and reliable reference materials. Science Journals, and other periodicals may have more current articles relating to your topic to give additional background information. It is essential to give proper documentation both in the text and in the listing of References at the end of your Research Paper, for all text information, photos, or graphs, taken from an author's work.



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## 6. State a Problem or Question or a Design Statement to solve

Scientific Inquiry projects require the identification of a problem or question and a proposed hypothesis that might offer a solution to the problem or answer the question. Generally the results derived from experimentation validates or invalidates the stated hypothesis. Engineering and technological design projects require a problem or needs statement and a design statement that identifies limiting factors and criteria for success. Generally, the results of an Engineering and Technological Design project will describe the extent to which the prototype met the design criteria.

## 7. Read background information regarding proposed topic

- A knowledgeable background of the topic is necessary to formulate a hypothesis or design statement or to develop a prototype.
- Students considering the use of vertebrate animals should review **OAS 6**
- Note taking of relevant material is necessary for use in the required Research Report **OAS 2**
- Your literature review should include a variety of reliable and scholarly resources

## 8. The Importance of Documentation

Science Projects are required to have three forms of documentation. The Research Plan **OAS 1**, the Research Report **OAS 2**, and the Project Data Book/notebook **OAS 3**.

### **Project Data Book/Notebook REQUIRED**

Research projects require written documentation from the very beginning of the project starting with gathering ideas for the project, locating references, resources, and the design statement or hypotheses and problems to be investigated. The information the student records in the bound notebook will be used to write the Research Plan for the project. Record the date on each page each time you add any notes to the Project Data Book/ notebook. Detailed notes are essential during the process of setting up the experiment, the conditions, variables, observations, measurements, calculations, graphing results, discussion of the conclusions and implications. Also include other records such as photographs, and discussion notes from your meetings with an advisor, teacher or mentor. Science Day Judges are instructed to review the records that students have documented in their Project Data Book/Notebook.

See <http://www.sciencebuddies.org/mentoring/project-laboratory-notebook.pdf>



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**Patents** also require documentation. Keeping a good Project Data Book/ research notebook is extremely important for students and for professional scientists especially if they ever apply for a patent. Record any original thoughts, concepts or procedures in the bound notebook, with numbered pages. Sign and date those pages and have an adult witness sign and date the page(s) to attest to the event. Use or disclosure of this written record may be required if a patent is applied for and may help assure the claim of originality.

## 9. State Hypothesis or Design Statement considering variables and testable applications

With the problem or question in mind, the student uses the knowledge gained through searching the literature, taking notes, and building a background of information to formulate a hypothesis or design statement. The hypothesis or design statement needs to state precisely what will be tested. The statement also will guide the investigation to answer the questions. Students should consider realistic implementation of the experiment or prototype design. The statistical treatment should be considered simultaneously. Answer questions, such as how will the data be analyzed and evaluated? The validity of the experiment should be addressed---did the experiment test the stated hypothesis? Or was the prototype tested appropriately? Did the prototype meet the design criteria?

Choosing the appropriate variables, the experimental groups, the controls, the limiting factors and/or criteria for success are extremely important. After you have an understanding and sufficient information to set up your investigation, be sure to consult with your teacher or advisor concerning your selection of variables and testable applications.

### Sampling and the use of Statistical Analysis

Projects must provide adequate sampling and analyze results using statistics. This may require a great deal of time and many trials. Due to the nature of projects, it is not possible to state minimum sample sizes. Sampling of subjects is of utmost importance. Students doing behavioral studies using vertebrates, should learn what the minimum number of subjects is needed for adequate sampling. In project abstracts and reports always state the number of trials or the population samples as (N=number). Consult with an advisor, mentor, science or mathematics teacher, or someone familiar with statistics for further information.





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## 10. Complete a Research Plan OAS 1 (Required)

All students who participate in Science Days sponsored by The Ohio Academy of Science, are required to complete a Research Plan before beginning their experimentation or research trials. Modifications in the plan are permitted during the process of research. The modifications must be prepared and dated as a Research Plan. If the modifications involve new protocols that must be approved before experimentation, the Modified Research Plan must be approved before the student resumes experimentation. The initial Research Plan must be kept if any data obtained before the modification will be used in the final project.

## 11. Complete Experimentation or Design Testing

All information regarding project designs and experimentation shall be recorded in a Project Data Book/Notebook **OAS 3**. *It is important to include every model or design or experiment attempted, regardless of the outcome or use.* A discussion of the variables, experimental groups, limiting factors and conditions should also be included in the Project Data Book/notebook. Many trials and designs are often necessary to obtain the desired process. Mention all of them detailing both quantitative and qualitative observations. Problem solving is a major part of acquiring the needed outcome. Discussion of all the trials, or the different designs or models attempted in your Project Data Book will reflect well and be an asset to your project.

## 12. Collect and Organize Data

Almost all scientific research involves statistics. A scientist should not draw a conclusion based on a single measurement or observation. Scientists usually repeat the same measurement three (3) or more times and then use statistics to express its reproducibility or significance. If the term “significant” is used, then the actual statistical test of significance must be stated. Other scientists may repeat the research to see if they can replicate your results. Consult your Mathematics or Science Teacher to provide you with an appropriate statistical method.

## 13. Analyze Data and Prepare Graphs

- Record all data, graphs, drawings, designs, models, etc. in your Project Data Book/Notebook.
- Interpret the data in a written account



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- Prepare appropriate graphing type to illustrate the data
- Analyze the data to identify patterns and verify findings
- Review various types of graphics available to represent your data

## After Experimentation and Data Analysis

Congratulations! The most difficult part might be behind you, but the following section is just as important as conducting experiments. It is critical that your work is presented clearly for judges so they can recognize the amount of work you put into your project. Make sure you approach the Research Report and Oral Presentation with the same level of detail that you gave your science!

Please note that the ISEF Ethics Statement on **OAS 7** is required to be signed by both student and parent. This statement is included on the applications for both District and State Science Day.

### 14. Prepare Final Research Report (Required)

Each project must include a Research Report, **OAS 2**, covering in detail all of the work, references consulted, and acknowledgement of assistance received. The experimental data, statistics, notes, and computations should be recorded in a Project Data Book/notebook. The report should include a description of the work, the results, and the conclusions. This report should follow an accepted form of technical reporting and be checked for correct punctuation, spelling, and grammar preferably by an English teacher. If possible, the report should contain illustrations in the form of photographs, sketches, graphs, data tables or charts that contribute to the effectiveness of the material presented. The Ohio Academy of Science recommends the following format for sections of the Research Report:

- Title Page including the date and name of student
- Table of Contents (optional for reports fewer than 10 pages)
- Abstract(250 words or fewer) explanation below & **OAS 4**
- Introduction-(background, problem and hypothesis or technical design statement
- Methods and Materials used to study the problem
- Results, including an analysis of collected data with graphs, tables, photographs, and diagrams to illustrate investigation
- Discussion including Conclusions and Implications for further research
- References or Literature Cited



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## Abstracts (OAS 4) REQUIRED

Abstracts have a 250 word limit and must be submitted with applications for both District and State Science Days. The abstract must contain a heading that includes a project title and name(s) of the author(s). The heading does not contribute to the word count.

The purpose of the abstract is to provide a summary of the project that will inform interested individuals of the contents. The wording must be written in a manner that any scientifically minded individual, who may not be familiar with the topic, can quickly understand the project's important points.

Summarize in a few sentences:

1. Background information necessary to understand the project and its importance
2. The problem that was investigated and the hypothesis or technological design statement
3. Outline the materials and methods used in the actual experimentation
4. Summary of the results obtained from experimentation
5. The conclusions drawn from results
6. The importance or potential applications that the research offers

Do not be concerned with including all of the details in the abstract. The key point to remember when writing an abstract is to keep the wording brief and concise. Use complete sentences. Avoid personal pronouns like "I" and "my".

Abstracts should provide only information essential to understand the project's basic points and importance. Omit needless words, especially adjectives and adverbs that have no statistical reference or validity. Further information can be found in **OAS 4**.

***Any form of plagiarism is cause for disqualification***

## 15. Outline the Oral Presentation

The student is expected to give a clear and concise oral presentation of their project, to answer questions, and to define any terms used. This brief presentation should completely summarize the project. The quality and quantity of knowledge attained by the student will be evaluated by this Oral Presentation. Students should not memorize a formal speech. An outline (notecards) that lists the variables, procedures, data collection,



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results, conclusions, references, and implications of the entire project may assist the student during the presentation. Use photographs or drawings of the equipment on the poster boards, in the Research Report, and in the Project Data Book/notebook to document and explain equipment used. Items on display should be used as visual clues to keep the student's Oral Presentation to the judges on track or to refer to when responding to a question. Students who are able to supplement their responses with additional, relevant information to the Judges' questions, provide evidence of knowledge achieved.

## 16. Expectations of Physical Display

***Displays at District and State Science Day are strictly poster format only.***

### ***A. Display Components:***

- One lightweight, usually tri-panel, bi-fold, single-sided display board with appropriate information (including graphs, data tables, drawings, sketches, diagrams, or photographs),
- Extra copies of the Abstract for Judges
- Required Documentation of the project:
  - Project Data Book/Notebook
  - Research Plan and Protocols
  - Research Report
  - Use **Appendix 5** for identifying photograph sources

### ***B. Table-Top Display***

The top of the display shall not be more than 85" (216 cm) above floor level or 55" (140 cm) above a 30" high table. Free standing floor projects are not permitted at District or State Science Days. Extension of a project beyond the stated limits will result in dismantling or severe modification of the display, and may disqualify the student's participation. Note that the physical display size at District and State Science Days is smaller than the size allowed at the International Science and Engineering Fair. **The score of the student's project may be impacted by the violation(s) if either the physical dimensions or physical items rules are not followed.**



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## ***C. Use of Kits***

Although the use of a “kit” model is discouraged, such models may be used if they make a definite contribution to the research approach. Models made by students are preferred, since they have a much greater instructional value and demonstrate that the participant has had a proportional gain in knowledge. Models, samples from a research project, or research equipment may not be displayed at District or State Science Days. Only drawings, sketches, diagrams or photographs may be used.

## ***D. Equipment***

Use commercial equipment especially when it would be impossible to conduct the research without it. However, if such equipment is used, the participant must be prepared to describe its operation, function, and the reason(s) for its use. Research equipment may not be displayed at District or State Science Days.

## ***E. Safe Project Displays***

Project displays shall not involve materials or elements that might be dangerous to exhibitors, judges or onlookers. Explosives, toxic elements, injurious chemicals or gases, open flames, or any unprotected moving parts, etc. may be necessary in the research project, but cannot be on the display poster, on the display table, or under the tables at any Science Day. The experimenter should always exercise the greatest care and conduct these phases of the work under qualified supervision and follow all protocols required by the Rules of the Intel International Science and Engineering Fair.

## ***F. Computer Simulation***

Battery-powered computers may be used only for simulation, modeling, animation or data display integral and essential to understand, analyze or interpret the project results; may not for general Power Point™ or other visual or sound presentations. Electricity will not be provided.

## **17. Review the Nine Appendices**

Students are encouraged to read and review all Appendices included at the end of this text. These supplements have been created to help students to understand and to meet



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the required elements of Science Day Projects sponsored by The Ohio Academy of Science. **Appendix 1 through 7** focus on the required elements needed for all student participants in District or State Science Days. Appendix 8 and 9 are Student Check Lists to assist students throughout the process. **Appendix 8** is a Time Line Guide and Check List approach to completing the entire Science Project process, and **Appendix 9** is a Check List to be used by the student at the completion of the project to assure adherence to rules and procedures.

## Student Appendices Include:

- OAS 1 Research Plan Format**
- OAS 2 Research Report**
- OAS 3 Project Data Book/Notebook**
- OAS 4 Writing an Abstract**
- OAS 5 Photographic/Graphics Source Identification**
- OAS 6 Human Informed Consent Form**
- OAS 7 ISEF Ethics Statement**
- OAS 8 Student Time Line Approach**
- OAS 9 Student Check List at Completion of Project**



# OAS Appendices

## Appendix: OAS 1

### **Required Research Plan**

All students who participate in District and State Science Days shall complete a Research Plan PRIOR to beginning their experimentation or research trials. Modifications in the plan are permitted during the process of research. The modifications must be prepared and dated as a Research Plan. If the modifications involve new protocols that must be approved before experimentation, the modified plan must be approved before the student resumes experimentation. The initial Research Plan must be kept if any data obtained before the modification will be used in the final project.

#### **A Research Plan shall include:**

1. Name and Address of each student involved in the research:
  2. Teacher and/or Research Supervisor:
  3. Project is New \_\_\_\_\_ Project is a Continuation \_\_\_\_\_
  4. Project Location: (where the work will be completed: home, school, lab or other institution)
  5. Project Title:
  6. Project Research Question or Problem:
  7. Project Hypothesis or Technical Design Statement:
  8. Experimental Methods or Procedures:
  9. List 5 major references specifically applicable to the proposed research:
  10. If the proposed research involves vertebrate animals, the research plan must also:
    - A) Provide a detailed justification for their use
    - B) Discuss non-vertebrate alternative
    - C) Give an additional animal care reference for the species being used
-



# OAS Appendices

## Appendix: OAS 2

### **Required Research Report**

The Research Report includes:

1. An Abstract

A maximum of 250 words that summarizes the investigation, the methods and results. (OAS 4)

2. A Search of the Literature

Use various forms of resources to gather background information on the topic, the possible variables, the sampling possibilities, the models, the designs, etc. This is the information that will be used in the student's Oral Presentation to provide Judges with evidence of in-depth knowledge acquired. Use articles from STEM (Science, Technology, Engineering and Mathematics) periodicals, and other reliable and scholarly references. Discuss the topic with Research Librarians at the school or local library. They will provide the name and location of current reference material that will address your topic.

3. Scientific Methodology—Technical Discussion

- the problem or question
- the hypothesis or design statement
- the methods, procedures, and materials used
- the data collected
- the analysis of data
- the significance of the results
- the conclusions or generalizations
- the questions or statements for further study





## OAS Appendices

4. A Title Page, a Table of Contents Page , and a listing of Resources and References documented in a standard format
5. Visual Graphics to assist in the explanation of the data collected such as tables, diagrams, maps, photographs, graphs, etc.

### **Other points to remember during the preparation of the Research Paper**

- Designate a note taking system---it's essential
- Use detailed titles and labels on all of the graphics
- Do not use first or second person pronouns (I, me, my or you) within the paper. If the paper has a personal/reflection section I and me are allowed
- Document everything
- Use quotation marks, and correct citations within the paper, as well as, at the end in the list of references.
- anyone should be able to replicate the experiment using the procedures, methods and materials described in the research paper
- Continually write explanations and observations in the Project Data book/Notebook during the entire project. Often these comments become significant and can be used in the Research Report when summarizing and analyzing data.
- Graphics and diagrams should be included within the paper, not just stacked at the end.
- Cite any patterns or trends in the investigation
- Mention all reasons that supported or did not support the hypothesis or design statement.
- All figures, diagrams, tables used in the Research Paper must be mentioned in sentences within the writing.
- All sources cited in parenthesis ( ) in the paper must have a corresponding entry in the Reference Listing.



## OAS Appendices

### Appendix: OAS 3

#### **Required Project Data Book**

Students will need project data book (logbook or journal) to record all aspects of their research project beginning with the background information, and the formulation of the design statement or hypotheses. The note book may be of many different types and sizes. Choose one that is appropriate for you and your project. The purpose of the notebook is to have one place to record data, procedures, thoughts, and graphics and to keep the sections of the project organized.

The Project Data Book/Notebook should include:

- Methods, Materials, and Procedures used;
- Qualitative and Quantitative Data collected;
- Independent and Dependent Variables,
- Samples, Trials, Models, Designs
- Results
- Possible Conclusions
- Other essential information
- Comments
- Explanations
- Questions for Future Study

Notes:

- An 8 ½ X 11 inch notebook will accommodate printed graphics, diagrams and computer print outs that may need to be taped or glued into the notebook.



## OAS Appendices

- A permanent marking pen is suggested so that the ink will not smear, and the data and wording remains as written initially. Pages should never be torn out, and correction fluid should not be used. If a mistake is made---it is suggested that a single line is drawn through the error, and the correct word or number is written next to it.
- Entries written in the Research Notebook are dated to record progress, and to maintain the order in which the content of the entry occurred.
- Teachers may request specific sections to be included within the Project Data Book: for example: Methods, Procedures, Materials, Qualitative data, Quantitative data, Correspondence, Results, and/or Conclusions. Follow the instructor's, or mentor's guidelines regarding the notebook sections.
- Hand Drawings, sketches, graphs, and photographs may also be included in the notebook. Be sure to label each entry clearly with the date and a detailed description. Specific labels, as well as the units used on data tables and other graphics should be clearly written. Photographs of human test subjects must have informed consent forms (OAS 6). Credit must be given to the source of all photographs and graphics used.



# OAS Appendices

## Appendix: OAS 4

### **Required Abstract**—250 word limit

Abstracts are often the first part of your research that is seen, and will often determine whether someone continues to read your report or examines your work further. Because of this, it is critical that your abstract is concise and clear. Abstracts should: 1) describe what was previously known and what your study added (Background), 2. How you carried out your research (Methods), and 3) what your studies found using statistical results when possible (Results).

Modified from Andrade, 2011

All abstracts should contain:

**Background:** What is already known about the subject, related to the paper in question? What is not known about the subject and hence what the study intended to examine (or what the paper seeks to present)?

Example: Based on sales numbers from car dealers, red cars have been the most popular car color for the past two decades. However, it remains unknown whether this is due to the consumers' preference or whether the dealers simply provide more models in the red color, essentially forcing the consumer to buy a red car. We hypothesized that when given the option of any color, red would not be the most popular option.

**Methods:** It should contain enough detail to allow the reader to understand how the work was done.

Example: This study surveyed 200 prospective car buyers (age 22-45) and asked, "If all colors were available, which color of car would you buy?"

**Results:** What did you find? When possible express your results in terms of statistical testing and significance.

Example: Interestingly, the most popular choice was silver (35%) with red being second (20%). This difference was statistically significant as tested using Analysis of Variance ( $p < 0.03$ ). These results suggest that car dealers are restricting the consumers' choice, and furthermore, that the dealers could possibly sell more cars if they had more models in silver.



## OAS Appendices

### Appendix: OAS 5

#### **Required Photographic/Graphics Source Identification**

Students shall complete and *post* the following 14pt type on the front of their display.

- “outside sources” below means the student did not create the graphics himself or herself. The graphics came from or were modified from computer clip art, the internet, books, journal articles or other printed or digital sources.

Photographs taken by: \_\_\_\_\_

Graphics from outside sources are from: \_\_\_\_\_

Photographic permissions were obtained and are located:

\_\_\_\_\_



# OAS Appendices

## Appendix: OAS 6

### Human Informed Consent Form

Student Researcher(s): \_\_\_\_\_

Title of Project: \_\_\_\_\_

I am asking for your voluntary participation in my science fair project. Please read the following information about the project. If you would like to participate, please sign on the appropriate line below.

Purpose of the project:

Time required for participation:

Potential Risks of the Study:

Benefits of the Study:

How confidentiality will be maintained:

If you have any questions about this study, feel free to contact:

Adult Sponsor/QS/DS: \_\_\_\_\_ Phone/email: \_\_\_\_\_

*Participation in this study is completely voluntary. If you decide not to participate there will not be any negative consequences. Please be aware that if you decide to participate, you may stop participating at any time and you may decide not to answer any specific question.*

*By signing this form I am attesting that I have read and understand the information above and I freely give my consent/assent to participate or permission for my child to participate.*

Adult Informed Consent or Minor Assent    Date Reviewed & Signed: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Printed Name of Research Participant:

Signature:

Parental/Guardian Permission (if applicable)

Date Reviewed and Signed: \_\_\_\_\_

Parent/Guardian Printed Name:

Signature:



## OAS Appendices

### Appendix: OAS 7

#### **Required ISEF ETHICS STATEMENT – ISEF Approval Form 1B**

The following statement is to be signed by both the student participant and parent/guardian of the participant. The signatures acknowledge that the student disclosed and cited where appropriate the specific source(s) of the idea for the project, all written reports, and Project Data Book/log book/journal, the Display and all aspects of the Project.

**Scientific fraud and misconduct are not condoned at any level of research or competition. Such practices include plagiarism, forgery, use or presentation of other researcher's work as one's own, and fabrication of data. Fraudulent projects will fail to qualify for competition in affiliated fairs or the Intel ISEF.**

_____	_____	_____
Printed Name of Student	Signature	Date

_____	_____	_____
Printed Name of Parent/Guardian	Signature	Date



# OAS Appendices

## Appendix: OAS 8

### Student Time Line Guide and Check List

#### Completion of a Scientific Research Project

- \_\_\_\_\_ Preview Sample Projects and check several resources for project ideas
- \_\_\_\_\_ Read Ohio Academy of Science Standards
- \_\_\_\_\_ Read OAS Student Participation Guide
- \_\_\_\_\_ Consider completion date of project    DUE \_\_\_\_\_
- \_\_\_\_\_ Choose Individual or Team Project
- \_\_\_\_\_ Note the assessment criteria to be used for the project
- \_\_\_\_\_ Note all required elements and forms needed
- \_\_\_\_\_ Begin the Required Project Notebook--# pages and add dates
- \_\_\_\_\_ Write all notes, ideas, problems, procedures, etc. in the Project Data Book
- \_\_\_\_\_ Choose a Scientific Inquiry or a Technical Engineering Design Project
- \_\_\_\_\_ Identify Problems or Questions to be researched and studied
- \_\_\_\_\_ Literature Review (Note taking) using a variety of resources--- minimum 5
- \_\_\_\_\_ Identify a documentation style that will be used throughout the project
- \_\_\_\_\_ Develop a Hypothesis or Design Statement
- \_\_\_\_\_ Secure all equipment and materials needed for implementation
- \_\_\_\_\_ Designate the methods and procedures to be followed
- \_\_\_\_\_ Formulate the Required Research Plan before experimentation begins
- \_\_\_\_\_ Read all the OAS and ISEF rules and procedures before any work begins
- \_\_\_\_\_ Implement Experiment or Test Prototype
- \_\_\_\_\_ Collect, Organize and Interpret Data
- \_\_\_\_\_ Prepare appropriate Graphics of the collected Data
- \_\_\_\_\_ Reread Judging Criteria and Standards





## OAS Appendices

- \_\_\_\_\_ Complete First Draft of Research Report
- \_\_\_\_\_ Construct visuals for the Report and/or Poster Display
- \_\_\_\_\_ Arrange Photographs for Report and/or Poster Display
- \_\_\_\_\_ Write the Required Abstract
- \_\_\_\_\_ Complete Final Draft of Required Research Report
- \_\_\_\_\_ Reread Display Rules for participation in the chosen competition
- \_\_\_\_\_ Plan Final Poster Display that meets all requirements
- \_\_\_\_\_ Create Oral Presentation that emphasizes Judging criteria
- \_\_\_\_\_ Complete all registration forms for entry in District and State Science Days

**Be Proud of Your Accomplishments!**



# OAS Appendices

## Appendix: OAS 9

### Student Check List at Completion of Research Project

- \_\_\_\_\_ I have completed the Required Research Plan.
- \_\_\_\_\_ I have completed the Required Research Report.
- \_\_\_\_\_ I have completed the Required Project Data Book/Notebook.
- \_\_\_\_\_ I have Checked all OAS Standards and ISEF Rules to ensure I followed all procedures and protocols.
- \_\_\_\_\_ I designed an experiment to test variables or a prototype to respond to a design statement.
- \_\_\_\_\_ I had adequate sampling and/or testing.
- \_\_\_\_\_ I listed all materials and equipment used.
- \_\_\_\_\_ I collected and organized my data.
- \_\_\_\_\_ I created graphics using the data I collected.
- \_\_\_\_\_ I wrote daily/frequently in my Project Data Book/Notebook.
- \_\_\_\_\_ I included dates, page numbers, thoughts, plans, and diagrams in my Project Data Book/Notebook.
- \_\_\_\_\_ I took photographs, or developed a flow chart, or drew diagrams of the experimentation or making of the prototype.
- \_\_\_\_\_ I reviewed the OAS Judging Criteria to make sure my project showed evidence of all criteria.
- \_\_\_\_\_ I took notes from each resource making sure that I identified the resource used for each page or card of notes.
- \_\_\_\_\_ I used a documentation style such as MLA or APA throughout my research paper.
- \_\_\_\_\_ I am able to pronounce and explain all terminology used in my reports, on my poster display and in my presentation.
- \_\_\_\_\_ I have included all important information regarding my experiment, design, model or prototype.



## OAS Appendices

\_\_\_\_\_ I have edited all of my written research reports (EXCEPT my Project Data Book/Notebook) checking for sentence structure, spelling, punctuation, and grammar.

\_\_\_\_\_ I have listed **all** of my resources both in the text and at the end of the paper.

\_\_\_\_\_ I have created all of my graphs, tables, charts, diagrams and poster display, OR if I used another source, I listed the source to give proper credit.

\_\_\_\_\_ I have developed my oral presentation with the evidence needed so that the judges will know that I am knowledgeable about my entire project.

\_\_\_\_\_ I have prepared my poster display with graphs, tables, charts and diagrams that will help me explain my project with detail.

\_\_\_\_\_ I have written the required Abstract that describes my project detailing all of the suggested sections. Copies of the Abstract will be exhibited with my project.

\_\_\_\_\_ I have used the required format of the Research Plan to be included with my applications to District and/or State Science Day.

\_\_\_\_\_ I have SIGNED both the Human Consent form and the ISEF Ethics Statement and sent them to the designated address for District and/or State Science Day.

\_\_\_\_\_ I have studied the Display Rules and measured my poster display and checked all of the items listed as Not Allowed at Science Day.

\_\_\_\_\_ I have attached onto my poster the three statement form that designates where my photos and graphics originated.

\_\_\_\_\_ I will contact the Ohio Academy of Science if I have any questions or concerns.

OAS phone number: 614-488-2228      email: [info@ohiosci.org](mailto:info@ohiosci.org)