The Ohio Academy of Science

STUDENT GUIDE TO SCIENCE DAYS

Scientific Inquiry, Meta-Analysis Research and Engineering Design Projects

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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.

- **For additional information or questions:**
- **Contact: phone: 614-389-2182.**
- **Email: info@ohiosci.org**
- **Website*: http://www.ohiosci.org***
- ***The* International Rules for Pre-college Science Research: Guidelines for Science and Engineering Fairs https://www.societyforscience.org/isef/international-rules/**

Required Components of ALL Science Research Projects

- An Identified Problem or Design Statement
- Completions of ISEF and Consent Forms
- Research Plan and Project Data Book/Notebook
- Detailed Research Report including an Abstract
- Project Display
- Oral Presentation

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

Teachers, other professionals, scientific organizations, industries, and parents can and will give much valuable aid if the request is made in the proper way. Reasonable response time, courtesy, and consideration, coupled with sincere expressions of appreciation, will eliminate many of the rough spots for a young scientist. Remember, others may advise and give aid, but they must not do any work for the participant.

3. Register on ProjectBoard to develop your project.

ProjectBoard is an online social learning platform used by the Ohio Academy of Science for building, submitting, and judging projects for Science Days. Students must create an account at https://ProjectBoard.world/oas to participate in Science Days. Here you will have access to resources, be able to build projects within the template, receive feedback from teachers and mentors, and finally submit projects for District and State Competitions.

4. Review the Judging Criteria for Individual and Team projects

Individual and Team Projects will be judged on the following criteria:	Max. Points
• Depth of Understanding (considering student's age and grade level)	10
• Experimental or Engineering Design	15
• Oral, Written & Visual Communication	10
• Originality and Creativity	05

Depth of Understanding (considering the student's age and grade level)

- Adequate age-appropriate background research (journals, textbooks, websites, etc.)
- relevant to the project, which provides a basis for the hypothesis and age-appropriate use
- of terms and principles.
- Supplements answers with relevant information reflecting knowledge gained during the project.
- Describes how the project applies to the student, the community, and the natural world (i.e., the "why" would this project be important for people to know).
- Age-appropriate exploration of science in subject, depth of investigation, and/or sophistication of project.

Experimental Design

- The project addresses a clear, focused problem or question with a hypothesis that is testable using scientific methods. If a Meta-Analysis project, then the hypothesis is testable using data from multiple peer-reviewed research papers. If an Engineering Design project, then the project addresses a clear, focused Engineering Design problem or need; criteria for success are identified; preliminary designs are prepared; a prototype is created and tested with results clearly communicated.
- The project plan and data collection methodology identify variables and controls and are not a summary of already known science. If an Engineering Design project, the student identifies and applies established engineering principles in their design.
- Reproducible and sufficient data are collected, or if a Meta-Analysis project, enough scientific data is synthesized from other sources to address a question/problem. Data used were collected using appropriate and safe scientific protocols. If an Engineering Design project, then the student used materials and processes effectively to correctly build a prototype or model.
- Data are properly analyzed. Appropriate graphs and/or tables illustrate the data. Statistics appropriate to the age of the student are correctly used. If an Engineering Design project, then sufficient testing of the prototype or model is completed; and data are properly measured, presented, and analyzed.
- Includes discussion of results and forms valid conclusions reached from the data obtained with sources of error identified. If Engineering Design, then the prototype successfully meets the criteria that were established for the project.

STUDENT PARTICIPANT GUIDELINES

Oral, Written & Visual Communication

- Written: Final Research Report (includes relevant background information, research question and testable hypothesis, experimental design and procedures, data acquisition techniques, data analysis, conclusion, and works cited). For Engineering Design projects, include an Engineering Design statement, design plan, and discussion of prototype development and testing.
- Oral: Correct and concise explanation of project, design, and analysis. Responses reflect an accurate understanding of experimental results and limitations of, expansions of, and/or impact of the project.
- Visual: Logical organization of material, neatly displayed, graphics and legends appropriate to the project, easy to read and understand. Photos and graphics cited.

Originality and Creativity

- The project displays originality in concept, relative to grade level (i.e., not "cookbook", not classroom lab, not a simple extension of "found" idea). The project is a new idea, concept, principle, insight, or non-obvious approach. There is novel association or relationship of previous knowledge and particularly rigorous analyses that reveal previously unknown relations, etc.

Teamwork

(Judges will consider member contributions in scoring the four sections previously described).

- A team shall consist of a maximum of three students. Those students cannot be separated by more than a single grade level in grades 5-8. Students from any combination of grade levels in grades 9-12 can constitute a team. A District Science Day may only allow a maximum of two students per team due to local space limitations. Teams may not have more than three members at a local science day and then eliminate members to qualify for District or State Science Day. In a subsequent academic year, a continuing team project may be converted to an individual project or vice versa.
- Team projects shall be accepted at all District Science Days. Individual and team projects shall be considered equally when District Science Day directors select projects to fill quotas to attend State Science Day.
- All currently active team members must be present to receive an official recorded score. Team projects with a missing participant at an in-person judged event will be evaluated with comments but a final score will not be given. Such projects will not be eligible for sponsored awards. Also, all team members must contribute to the presentation in a virtually judged competition for the project to be scored and/or awards given. This will be in effect at District and State Science Day.
- Each team shall appoint a team leader to coordinate the work and act as the primary spokesperson. However, each member of the team should be able to serve as a spokesperson, be fully involved with the project, and be familiar with all aspects of the project.
- The final work should reflect the coordinated efforts of all team members.

- The full names of all team members must appear on the abstract and registration forms. At in-person events, the Judges will be instructed to ask each team member for a one or two-sentence description of what they consider to be their most important contribution.

Ratings for Individual and Team Projects

Each criterion is rated with a cumulative of 40 points being the maximum

- Superior range is 36-40 points
- Excellent range is 24-35 points
- Good range is 0-23 points

Beginning a Research Project

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

5. 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.

6. 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.

7. 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.

8. 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 should review the ISEF rules before beginning the project. https://www.societyforscience.org/isef/international-rules/
- Note taking of relevant material is necessary for use in the required Research Report.
- Your literature review should include a variety of reliable and scholarly resources.

9. The Importance of Documentation

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

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

- **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.

10. 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.

11. Complete a Research Plan (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.

12. Complete Experimentation or Design Testing

All information regarding project designs and experimentation shall be recorded in a Project Data Book/Notebook. *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.

13. 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.

14. 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
- 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!

15. Required Written Material

- **Abstract **REQUIRED for all Student Participants****

All students at Local, District, and State Science Days shall have an abstract and written research report, which documents that the student has researched relevant literature, stated a question and/or tested a hypothesis or technological design statement, collected and analyzed data, and drawn conclusions.

Abstracts of 250 or fewer words are required 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 the name(s) of the author(s). The heading does not contribute to the word count. The purpose of an abstract is to provide a summary of the project that will inform interested individuals of the contents. The wording must be written so that any scientifically minded individual, who may not be familiar with the topic, can quickly understand the project's important points. Keep the wording brief and concise and use complete sentences.

Summarize in a few sentences:

- background information necessary to understand the project and its importance
- the problem that was investigated and the hypothesis or technological design statement
- outline the materials and methods used in the actual experimentation
- summary of the results obtained from experimentation
- the conclusions drawn from results
- the importance or potential applications that the research offers

- **Final Research Report *REQUIRED for all Student Participants***

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 ISEF.

All written reports and logbooks (paper or digital) must disclose and cite, where appropriate, the specific source(s) of the idea for the project. Citations must be fully documented with references such as author(s), date, publication, and URL, if a website.
The Research Report must follow an accepted form of technical writing such as MLA, APA, or others.

Required Final Research Report
Each project must include a research report covering in detail all the work, references consulted, and acknowledgment of assistance received. The experimental data, statistics, notes, and computations should be recorded in a research 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, and 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 the student(s)
- Table of Contents (optional for reports fewer than 10 pages)
- Abstract
- Background Information
- Problem and hypothesis or problem and 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 the investigation
- Conclusions and Implications for further research
- References or Literature Cited

- **Research Plan *REQUIRED for all Student Participants***

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 plans 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, it 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 student research plan shall include: 1) The name and address of each student involved in the research, 2) The teacher's name or name of the research supervisor, 3) Whether the project is a continuation of work or a new project, 4) Where the work will be done (home, school, research institution, industry, or in the field), 5) The project title, 6) The research question (s) or problem, 7) The hypothesis or technological design statement, 8) The experimental methods or procedures, and 9) At least five major references specifically applicable to the proposed research, e.g., science journal articles, books, or internet sites. For internet sites, research plans must cite the complete URL, the report's title, the author's name, if known, and the date of the publication or update of the site.

If the proposed research involves vertebrate animals, then the research plan must also: 1) provide a detailed justification for their use, 2) briefly discuss non-vertebrate alternatives, and 3) give an additional animal care reference for the species being used.

- **Additional Student Research Plan for Special Protocols or Adult Supervision *REQUIRED*** https://www.societyforscience.org/isef/international-rules/

  These projects include those associated with:
  - human subjects
  - nonhuman vertebrate animals, including observation projects
  - potentially hazardous biological agents, including microorganisms, recombinant DNA technologies, human or animal fresh tissues, blood, or body fluids
  - controlled substances, alcohol, and tobacco
  - hazardous substances or devices, including certain chemicals, equipment, firearms, radioactive substances, and radiation

- **ISEF and Consent Forms **REQUIRED for all Student Participants****

An online Consent and Release Form must be read and agreed to by all students and parents to register for District and State Science Days.

The International Science and Engineering Fair Forms

The documents for the ISEF are available at https://www.societyforscience.org/isef/. Procedures of a particular year must be used by all students participating in District and State Science Days of the same year. These rules require adherence to special student research protocols and supervision, including **prior approval of student research projects** by local scientific review committees (SRC) or, in the case of human subjects, institutional review boards (IRB). **Local schools or counties must appoint and manage these committees.** Depending upon the project(s), committee members must have sufficient professional expertise through education and experience to review both human subjects and non-human vertebrate projects**.**

Any form of plagiarism is cause for disqualification.

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.

16. Outline the Oral Presentation/Video

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, results, conclusions, references, and implications of the entire project may assist the student during the presentation. For State Competition students must record their oral presentation and upload the video to ProjectBoard for submission.

17. Expectations of Physical Displays at District and State Science Day

- **Expectations of Display: Present Results**

There will be several options for displays at in-person District Science Days. Each District Council may determine which option or options may be used in their respective District.

A digital quad chart uploaded to ProjectBoard is required for District and State Competition. Districts will designate their display requirements which may include a physical tri-fold project poster, a physical print of the quad board in ProjectBoard, or a computer viewed or projected version of the quad chart.

- Traditional tabletop Tri-Fold poster. Table-top display dimensions shall not exceed 36 inches (91 cm) wide by 30 inches (76 cm) deep. The top of the display shall not be more than 85 inches (216 cm) above floor level or 55 inches (140 cm) above a 30-inch-high table. There shall not be any lettering or display materials extending more than 1 cm from the vertical front surface of a display board.
- Printed Quad Board. May be attached to a tri-fold poster or flat poster with braces to hold it upright. The top of the display shall not be more than 85 inches (216 cm) above floor level or 55 inches (140 cm) above a 30-inch-high table. There shall not be any lettering or display materials extending more than 1 cm from the vertical front surface of a display board.
- Tabletop Laptop presentation of digital Quad Board and/or slide presentation from ProjectBoard, simulation, modeling, animation, or data display is integral to the project results.
- Screen projected presentation of digital Quad Board and/or slide presentation from ProjectBoard, simulation, modeling, animation, or data display integral and essential to the project results.

Students are expected to **present the results** of their original research and experimentation/design plan. They **are not expected** to perform, demonstrate, or repeat an experiment for judges or visitors. Students should have already completed an experiment or conducted many research trials, and thus have adequate results in the form of charts, graphs, data tables, and a required research notebook (printed or digital in ProjectBoard) — all recorded with dates — which should be with project display. ***Equipment used in research is not required for a presentation but is permitted if needed to explain a procedure to judges.*** Use photographs or drawings of equipment on poster boards, in the technical report, in the research notebook, or in ProjectBoard to document and explain the equipment used. Items on the display backdrop/poster board, or in ProjectBoard should be used as visual cues to keep the students' oral presentation to the judges on track or to refer to when responding to questions. The whole project, in simple form, should be visible on the poster board or in ProjectBoard. Abstracts, a research notebook, technical reports, and additional data should be in folders (paper or digital) for immediate reference. At in-person events with physical displays, "**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."**

Displays for virtually judged Science Days (District 18 and State Science Days) are provided via ProjectBoard, including the Abstract, the Final Report, and a video that may include a PowerPoint (or similar software program) presentation of the same visual information required of poster presentations and an oral presentation as would have been provided to judges at an in-person Science Day.

• Required Photographic/Graphics Source Identification Form

Outside sources means the student did not create the graphics himself/herself. The graphics came from or were modified from computer clip art, the internet, books, journal articles or

other printed or digital sources. For any "outside source" graphic, students shall complete the information in the following form in 14-point type and POST it on their display board.

Photographs taken by: _____

Graphics from outside sources are from: _____

Photographic permissions were obtained and are located: _____

_____

- **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.

- **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.

- **Safe Project Displays**

Project displays at in-person events shall not involve materials or elements that might be dangerous to exhibitors, judges, or onlookers. However, it is understood that some hazardous materials or devices may be necessary in a research project. The experimenter should always exercise the greatest care and conduct these phases of the work under qualified supervision and follow all protocols as required and listed by the Rules of the International Science and Engineering Fair. **These materials or elements cannot be on the display poster, on the display table, or under the table at an in-person Science Day.**

- **Items ALLOWED at Project Display with the Restrictions Indicated**

For in-person Science Days, physical posters should display an abstract and data tables, diagrams, charts, photographs, and graphs that summarize results. The same items should be included if using a digital presentation from ProjectBoard. Research notebooks, Final Research Reports, research plans, and documentation of research protocols are expected and may be in physical notebooks or folders on the table, or digitally provided in ProjectBoard for use by Science Day officials and judges. Information such as postal, web and e-mail addresses, and telephone and fax numbers is allowed only for the exhibitor. The only photographs or visual depictions of identifiable or recognizable people allowed are photographs of the exhibitor, photographs taken by the exhibitor (with displayed individuals documented permission), or photographs/graphics for which credit is displayed (such as from magazines, newspapers,

journals, websites, or other electronic media). Battery-powered computers may be used only for project slide presentation or visualization of digital Quad Board on ProjectBoard, simulation, modeling, animation, or data display integral and essential to the project results.

- **List of Items Permitted at Project Display at In-Person Science Day**

Equipment or materials used, or developed, as part of this project may be displayed if:
it fits within the display dimensions given by the event and
it is not listed in "Items NOT ALLOWED at Project Displays"; and
it meets Safety Regulations found below and is deemed safe by the Display and Safety Committee upon inspection.

Permitted items may include Engineering Design prototypes and equipment designed and built to complete scientific research and to collect data for a project, assuming it meets the criteria above. (Note: All items included in the project display must fit within the display dimensions described in these Science Day Standards, Section III. General Information, part g) "Expectations of Display".)

- **Items NOT ALLOWED at Project Displays**
  - Living organisms, including plants
  - Soil, sand, rock, cement and/or waste samples
  - Taxidermy specimens or parts
  - Preserved vertebrate or invertebrate animals
  - Human or animal food as part of the exhibitor demonstration of the project.
  - Human/animal parts or body fluids (for example, blood, urine) NO exceptions for teeth, hair, nails, dried animal bones, histological dry mount sections, and completely sealed wet mount tissue slides.
  - Petri dishes or culture tubes with living or dead cultures
  - Plant materials (living, dead, or preserved) that are in their raw, unprocessed, or non-manufactured state (Exception: manufactured construction materials used in building the project or display)
  - All chemicals, including water (Exception: sealed bottled water for human consumption)
  - All hazardous substances or devices (Example: poisons, drugs, firearms, weapons, ammunition, reloading devices)
  - Large vacuum tubes or dangerous ray-generation devices (exceptions: computer monitors on battery-operated notebook computers when used for computer modeling projects
  - Items that may have contained or been in contact with hazardous chemicals (Exception: Item may be permitted if professionally cleaned and document for such cleaning is available)
  - 3-D Printers
  - Dry ice or other sublimating solids
  - Sharp items (for example, syringes, needles, pipettes, knives)

- Flames or highly flammable materials (including magnified light sources). A Fresnel Lens cannot be used in conjunction with a light source – it becomes an open flame.
- Any apparatus producing heat above room temperature (e.g., heat lamp, hotplates, Bunsen burner)
- Batteries with open-top cells or wet cells
- Glass, or glass objects, (including mirrors in hologram or laser apparatus), unless deemed by the Display and Safety Committee to be an integral and necessary part of the project (for example, glass that is an integral part of a commercial product such as a computer screen)
- Any apparatus deemed unsafe by the Scientific Review Committee, or the Display and Safety Committee (Example: empty tanks that previously contained combustible liquids or gases, pressurized tanks, etc.)
- The Display and Safety Committee reserves the right to remove any project for safety reasons or to protect the integrity of the State Science Day and its rules and regulations.
- Awards, medals, flags, etc. (Exceptions: Academy membership or State Science Day lapel pins)
- Organizational/school/mentor/grant provider/etc. logos or reference statements.

- **Other Display Safety Regulations (at in-person events)**
  - Any inadequately insulated apparatus producing extreme temperatures that may cause physical burns is not allowed
  - Any apparatus with unshielded belts, pulleys, chains, or moving parts with tension or pinch points must be for display only
  - Project sounds, lights, odors, or any other display items must not be distracting. Exceptions to this rule may be permitted for judging demonstrations. Approval must be given prior to judging. Exhibitors must endeavor to limit the distraction to be as brief as possible. Extended distraction(s) may cause the exception to be revoked by the Safety and Display Committee.

    <u>Electrical Regulations at State Science Day (at in-person events)</u>
  - No AC electrical power will be provided or shall be used.
  - Battery-powered devices must be protectively enclosed. Any enclosure must be non-combustible. All external non-current carrying metal parts must be grounded.
  - Energized wiring, switches, and metal parts must have adequate insulation and over-current safety devices (such as fuses) and must be inaccessible to anyone other than the student(s) for the project.

    <u>Laser Requirements (at in-person events)</u>
  - Any Class 1 or Class 2 lasers, along with only Class 3A or 3R lasers, are allowed to be used provided a finalist avoids indiscriminate exposure to other finalists, judges, or visitors (except if passed through magnifying optics such as microscopes and

telescopes, in which case they may not be used). No other lasers may be used or displayed.

- Any laser must be labeled by the manufacturer so that power output can be inspected. Lasers without labels will NOT be "cleared."
- LEDs that consume over 1 watt, unless they are in a commercial light bulb/fixture or otherwise shielded, will not be allowed.
- Lasers will be confiscated with no warning if not used in a safe manner. Serious offenses may result in failure to qualify.
- Due to the unavailability of an electrical power supply at State Science Day, the use of lasers is limited to battery-powered equipment (Laser classifications defined: https://www.rli.com/resources/articles/classification.aspx)

STUDENT PARTICIPANT GUIDELINES

Student Check List at Completion of Research Project

- ○ I have created an account in ProjectBoard online platform.
- ○ 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, developed a flow chart, drew diagrams of the experimentation, or made a 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 can pronounce and explain all terminology used in my reports, in my Quad Chart, on my poster display(if needed), and in my presentation.
- ○ I have included all important information regarding my experiment, design, model, or prototype.
- ○ I have edited all my written research reports (EXCEPT my Project Data Book/Notebook) checking for sentence structure, spelling, punctuation, and grammar.
- ○ I have listed **all** my resources **both** in the text and at the end of the paper.
- ○ I have created all my graphs, tables, charts, diagrams, Quad Chart, and poster display(if needed), 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 Quad Chart and poster display (if needed) with graphs, tables, charts, and diagrams that will help me explain my project in detail.
- ○ I have written the required Abstract that describes my project detailing all the suggested sections. Copies of the Abstract will be exhibited with my project.
- ○ I have reviewed, completed, and signed all the required ISEF forms needed and uploaded them in the ProjectBoard submission template for District and/or State Science Day submission.
- ○ My parent and I have reviewed, completed, and signed the Consent and Release form and the COPPA form (13 or under) and uploaded them in the ProjectBoard submission template for District and/or State Science Day submission.
- ○ I will contact the Ohio Academy of Science if I have any questions or concerns.

Additional Policies & Procedures

- **Harassment Generally – Policy (In-person or Online Communications)**

This policy prohibits harassment of any kind against any student, volunteer, or employee by an adult, another student, volunteer, Science Day committee member or employee, or third party for any reason including, but not limited to: age, national origin, race, color, religion, gender, gender identity, sexual orientation, marital status, disability, ancestry and/or veteran status. Harassment includes but is not limited to slurs, epithets, threats, derogatory comments, unwelcome jokes, and teasing.

Any student or other person who feels that he or she is a victim of such harassment at an Ohio Science Day program should promptly report the matter to a member of the Event Staff or a Committee member (of the respective State or District Science Day Committee) or other adult authority who must immediately present it to the proper Science Day authority. If a Science Day employee or adult volunteer becomes aware of such a situation, he or she is under the responsibility to report it to the proper Science Day event authority (Ohio Academy of Science-CEO or Junior Academy Council Director for State Science Day, or District Council Chair or designated council member for each respective District Science Day). Upon receipt of an allegation(s), the appropriate representative of the Host Institution will be contacted, and an investigation will be initiated following the established policy and procedure of the Host Institution. All such reports will be handled as confidentially as possible. The Science Day event authority, the Host Institution, or both organizations, may take appropriate disciplinary action against any person found to have violated the harassment policy. This includes contacting appropriate law enforcement agencies if deemed necessary.

No adverse action or retaliation will be allowed to be taken against a person who reports a violation or who participates in an investigation of this policy in good faith. Knowingly false accusations are prohibited and will be treated by disciplinary action comparable to that which would be applied to actual misconduct.

- **Sexual Harassment – Policy (In-person or Online Communications)**

Sexual harassment of or by any person attending any Science Day event (State or District level) is prohibited. Sexual harassment includes but is not limited to unwelcome sexual advances, requests for sexual favors, and/or verbal or physical conduct of a sexual nature, including, but not limited to, drawings, pictures, jokes, teasing, or uninvited touching.

In accordance with this policy, unwelcome sexual advances, requests for sexual favors, sexual demands, or other verbal or physical conduct of a sexual nature will constitute sexual harassment when:

- The conduct has the purpose or effect of unreasonably interfering with an affected person's performance, or creating an intimidating, hostile, or offensive environment;

or in third-party situations, one or more individuals are reasonably offended by the sexual interaction, conduct, or communications between others.

- The conduct has the effect of creating actual, perceived, or potential conflicts of interest, favoritism, disruption, or lack of objectivity.
- Any student or other person who feels that he or she is a victim of sexual harassment at an Ohio Science Day program should promptly report the matter to a member of the Event Staff or a Committee member (of the respective State or District Science Day Committee) or other adult authority who must immediately present it to the proper Science Day authority. If a Science Day employee or Adult volunteer becomes aware of such a situation, he or she is under the responsibility to report it to the proper Science Day event authority (Ohio Academy of Science-CEO or Junior Academy Council Director for State Science Day, or District Council Chair or designated council member for each respective District Science Day) Upon receipt of an allegation(s), the appropriate representative of the Host Institution will be contacted and an investigation will be initiated following the established policy & procedure of the Host Institution. All such reports will be handled as confidentially as possible. The Science Day event authority, the Host Institution, or both organizations, may take appropriate disciplinary action against any person found to have violated the harassment policy. This includes contacting appropriate law enforcement agencies if deemed necessary.

No adverse action or retaliation will be allowed to be taken against a person who reports a violation or who participates in an investigation of this policy in good faith. Knowingly false accusations are prohibited and will be treated by disciplinary action comparable to that which would be applied to actual misconduct.

- **Accommodation of Students with Disabilities at Science Day – Policy**

When a teacher, parent, or student gives advance notice of a disability that would affect the student's ability to attend or remain all day at a Science Day, without some accommodation regarding access or schedule, the event administrators should determine the exact needs of the student and identify solutions which would allow the student to present their project as best they can. This may include access to facilities for project presentations, seating if not in a wheelchair, restroom access, early judging, and being excused from staying for awards if needed. Students would still need to meet established judging criteria and earn a Superior rating to move on.

If no advance notice is given, the event committee should consider options on a case-by-case basis, with the goal to accommodate the student's needs if possible. If unable to accommodate needs, give involved parties an explanation why and allow them to suggest other ideas or options not considered by the event committee (students may have been in similar situations in the past).