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SCIENCE DAY PROGRAM UPDATE 2020-2021

September 1, 2020

To all State Science Day Officials, District Councils, Teachers, Mentors, Judges and Students,

In March of this year, the entire Ohio Science Day Program was almost halted by the COVID-19 pandemic and the resulting restrictions on large events like Science Days. Not wishing to abandon the program, the Ohio Academy of Science and the Junior Academy Council swiftly developed a new virtually-judged on-line platform so that students could still present their projects for evaluation at the District and State levels. Fortunately, almost all Local, County and Independent Fairs had already occurred when the March shutdown took place.

In 2021, the State Science Day will once again be held as a virtually-judged program in May, with Sponsored Awards and Scholarships awarded in June. Projects may qualify for the Virtual State Science Day by earning a "Superior" rating at the Virtual District Science Day which will take place in March with Sponsored Awards and Scholarships awarded in April. Unlike previous years, any approved and completed STEM project may directly register for the Virtual District Science Day without the requirement of having presented and qualified at a Local, County, or Independent Fair. It is anticipated that many schools will be unable to hold an in-person fair and may not have the resources or staff to hold a local "virtual" fair this year.

Topic Categories: 2021 topic categories and sub-categories will follow ISEF list found here: https://www.societyforscience.org/isef/categories-and-subcategories/

Sincerely,

Michael Woytek, CEO
Office: 614-389-2182 / Cell: 614-620-9902

THE OHIO ACADEMY OF SCIENCE 2020-2021

SCIENCE DAY STANDARDS

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I. Introduction to Student Participants

Participation in a Science Day should be a rewarding experience. It offers an opportunity: 1) to learn and practice the principles of scientific research, 2) to meet others interested in scientific study, and 3) to earn recognition for academic excellence. Thus, those involved should not be limited to the gifted, although all should be aware of the long tedious work involved in scientific investigation. Accurate prediction of a student's potential is impossible until he or she has attempted a project a number of times. Most will not achieve perfection on the first attempt, but proficiency will come to those who are persistent.

When issues arise that are not covered in these standards, the student or teacher should seek guidance from the latest edition of the Rules for the Intel International Science and Engineering Fair. (See https://www.societyforscience.org/isef/international-rules/
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.

II. Scientific Inquiry, Meta-analyses Research and Engineering Design Projects

Not all **scientific inquiry projects** require a physical experiment be completed by the student researcher. **Meta-Analysis Research Projects**, or more precisely, "Statistical Meta-analyses", are projects which collect, process, or produce statistical data from multiple publicly available scientific studies or data reports, combining and/or using the information to explore a relationship that had not previously been explored, or to evaluate the combined data in a broader scope.
Meta-analysis projects require a well-documented lab journal with background and research notes, source data and graphs; and a research report including relevant background, research question and hypothesis and how it relates to the background; discussion of experimental design and procedures used by source researchers; data analysis and interpretation, conclusion and bibliography. Meta-analysis projects do NOT require the researcher to perform first-hand physical experiments.

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 condition), 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 the prototype, for example, comes to meeting the design criteria. A prototype developed for an engineering or technological design project must achieve stated design objectives and satisfy specified constraints. Generally, the results of an engineering or 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. Thus a *hypothesis* is to *inquiry* as *design* is to *engineering* and *technology*. In all cases, the students must present the results of repeated trials. Use the figure below to determine whether your project is testing a hypothesis or a design/engineering.

Scientific inquiry vs. technological or engineering design projects

The Scientific Method	The Technological or Engineering Design Process
State a question or problem	Define a problem or need
Gather background information	Gather background information
Formulate hypothesis; identify variables	Establish design statement or criteria for success
Design experiment; establish procedure(s)	Prepare preliminary designs
Test hypothesis multiple times by an experiment	Build a prototype and test multiple times
Analyze results & draw conclusions	Analyze results; verify, test & redesign as necessary
Present results.	Present results

III. General Information

a) Grade Levels

Participants in local science days may be in any grade level. Each Junior Academy Council District Science Day has the option of accepting participants in grades 5-12 or 7-12. Participants must earn a superior rating (36-40 points) to submit their projects to the next-in-line science day.

b) Adherence to the Standards by Teachers

Teachers promoting local student research projects and conducting local science days leading to District and State Science Days, are expected to have their students follow the official Science Day Standards outlined here. Included in these Standards are the Judging Criteria for both Individual and team projects that teachers should use locally and that must be used at all District Science Days**. The Ohio Academy of Science discourages the assignment or use of special points or a scoring rubric unique to local science days, and does not permit their use by District or State Science Days.**

c) Project Duration

A student research project shall be used for only one year. It must not be repeated nor given to another person to represent his or her work. Each student may enter only one project which covers research done over a maximum of 12 continuous months between January of the year before the Science Day and May of the year of the State science Day. A project may continue only if it involves new or revised objectives, hypotheses or methods, and presents substantially new or different results each succeeding year.

d) 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. Science or mathematics teachers, mentors, or advisors should be consulted to determine an adequate number.

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 or more times, and 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 the stated results. Sampling of subjects is of utmost importance. Students doing behavioral studies using vertebrates should learn what is the minimum number of

subjects needed for adequate sampling. In project abstracts and reports always state the number of trials or the population samples as (N=number).

e) Policy Statements: Preventing, Detecting and Penalizing Plagiarism in Science Projects:

- Any claim of plagiarism in a project made prior to, during or within one week after State Science Day shall be judged as usual, but all scores, ratings, and awards shall be retained until a review of the project is completed by the Academy office and/or its delegated inspectors. If the project is found to be plagiarized, the registration fees for State Science Day as well as awards and ratings will be forfeited. The district and school from which the project originated will be contacted. The student(s) future project(s) will be required to pass a review prior to presentation in any Academy Science Days.

- 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.

f) Team Project Policies

- A team shall consist of a maximum of three students. A District Science Day may only allow a maximum of two students per team due to local 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 participate to receive an official recorded score. Team projects with a missing participant will be evaluated with comments but a final score will not be given. Such projects will not be eligible for sponsored awards. 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 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. A supplemental sheet of the contribution each member made toward the team project shall be signed by each member and shall be displayed with the project and included in the research notebook, project report and with the applications to attend District and State Science Days.

- Full names of all team members must appear on the abstract and registration forms.

g) Expectations of Display: Present Results

For Virtual District and State Science Days, there is no physical display required. Poster presentation will be via a power point slide containing all of the components of a physical poster.
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. 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—all recorded with dates. ***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 the poster, the whole project, in simple form, should be visible on the poster. Abstracts, a research notebook, technical reports, and additional data should be available for reference.

h) Safe Project Displays

Does not apply to Virtual Science Days.

i) Items ALLOWED at Project with the Restrictions Indicated

Does not apply to Virtual Science Days.

j) Items NOT ALLOWED at Project Display

Does not apply to Virtual Science Days.

Other Display Safety Regulations
Does not apply to Virtual Science Days.

Electrical Regulations at State Science Day
Does not apply to Virtual Science Days.

Laser Requirements
Does not apply to Virtual Science Days.

k) Eligibility for District Science Day

Any approved and completed STEM project may directly register on STEM Wizard for the Virtual District Science Day without the requirement of having presented and qualified at a Local, County, or Independent Fair. Ohio students will be accepted from any public school, private school, on-line school, or home school. If a school does hold a local science fair, it is expected to use the same forms, follow the same rules and criteria on safety and judging as the District and State Science Days.

l) Eligibility for District Science Day Under Extraordinary Circumstances

Does not apply to Virtual Science Days.

m) Policy for District Procedures for Registering Students for State Science Day

Students selected to enter Virtual State Science Day will have their District Registration STEM Wizard account materials automatically "promoted" to the State Science Day STEM Wizard site. Students are still personally responsible for completing the registration process on the State Science Day STEM Wizard site prior to the posted deadline.

n) **Eligibility for State Science Day**

Students must earn a Superior rating at the Virtual District Science Day to qualify for the Virtual State Science Day. There will not be a quota imposed on Districts in 2021.

o) **Preparation for State Science Day**

District Science Day Directors shall make special efforts to communicate with all eligible students, parents and teachers or mentors well in advance of State Science Day **to coach and prepare students for participation in State Science Day. Special emphasis shall be given to display rules, quality of abstracts, data analysis and display, and report writing.**

IV. Required Material

a) Abstract: **REQUIRED for all Student Participants**

Adapted from
https://static1.squarespace.com/static/545d32b5e4b0719cb5aae580/t/5d8002dbf4ff1d21e7f321d2/1568670427939/How+to+prepare+abstract.pdf

AN ABSTRACT MUST BE PREPARED for STEM student project reports. An abstract is a concise summary of the educational, scientific, engineering, or technological research contents of the paper, and not merely a general description of what the paper is about. Tell what the specific facts are, not what they are going to be when you talk. Avoid personal pronouns. Quality abstracts are highly structured and contain all the following elements: (1) background or introduction including goals, objectives, purpose, problem and hypothesis, (2) methods and materials, (3) results, data or observations, and (4) discussion or conclusion(s). Phrases like "will discuss, will review, will talk about, or will present" are unacceptable in an abstract. All important facts should be stated with brevity, but not such sparing use of words as to leave ambiguity. Abstracts should be 250 words or fewer. Tables and graphs should not be included. New techniques or new apparatus and their functions should be mentioned. New constants, critical data or formulae should be included. Names of new species should not be listed in the abstract but use full scientific names for all organisms. Use the term “significant” only if you state the statistical test(s) used. Always define the sample(s), population, or trials (n=?). NEVER use the phrase “Results show” without first stating the results. The value of abstracts is real and considerable, not only for those in attendance, but also for others unable to attend. The first author of multi-authored abstracts must obtain permission from all authors to submit the content of the abstract.

Abstracts shall be **informative** and not indicative. See Section 6 from:
https://groups.niso.org/apps/group_public/download.php/14601/Z39-14-1997_r2015.pdf

b) Research Report: **REQUIRED for all Student Participants**

The following statement is REQUIRED to be signed by both student and parent:

***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.**

- **All written reports and log books 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 website.**

- The Ohio Journal of Science follows the citation and reference plan of the 8th Edition of Scientific Style and Format: The CSE (Council of Science Editors) Manual for Authors, Editors and Publishers.
- Research Report must follow an accepted form of technical writing such as: MLA, APA, and others.

Required Research Report

STUDENTS COMPLETING STEM RESEARCH PROJECTS for Local, District, and State science days shall write reports with **section headings** in the order below. Guidance publications of The Ohio Academy of Science should always include the section headings and definition text, unless space does not permit including both. Other Academy pre-college student programs, such as Believe in Ohio, may have specific format or style variations that must be followed, but should endeavor to match the following as closely as possible.

Title. A title should be as descriptive and succinct as possible, especially for field-based studies. Avoid "cute" or "trick" titles. Stick to the science.

Author names. Include author names and affiliations and designate corresponding author by providing complete mailing information, phone number and email address.

Include date. Use this format: day month year (e.g., 25 August 2020).

***Abstract.** Within 250 or fewer words, using simple, declarative sentences, state the contents of the paper including the study's purpose, question or hypothesis, engineering design, methods, results, and conclusions or significant new understandings.

Key Words for Indexing. Provide 3 to 5 terms (metadata) for indexing the submission. Separate terms with semicolons (term1; term2; term3). **Not required for pre-college students unless they submit a manuscript to *The Ohio Journal of Science***.

Running head. State 3 to 5 words, primarily from the first few words of the title, which will be used at the top of the printed page in the final layout. **Not required for pre-college students unless they submit a manuscript to *The Ohio Journal of Science***.

Introduction. Describe the knowledge and cite the literature that gave rise to the project's objective, goal, problem, question examined by, or the hypothesis or engineering design posed for the research.

Methods and Materials. Describe the research design, the methods and materials used in the research (subjects, their selection, equipment, laboratory, or field procedures), and how the findings were analyzed.

Results. The text of the results should be a descriptive narrative of the main findings. This section should not list tabulated data in text form. Parenthetically include references to figures and data tables. Indicate (n=x) the number of trials, samples tested, or subjects surveyed. Here or in the Discussion section, use the term "significant" only if the results of a statistical test are reported.

Discussion. Compare and contrast the data collected with that previously reported in the literature. State the extent to which the results answer the research question or support the hypothesis. Include conclusions or significant new understandings. Briefly describe the limits of the study and suggest or describe additional research needed only if you can be exceedingly explicit.

Acknowledgments. Recognize colleagues, mentors or institutions that provided financial or other support for the research or preparation of the manuscript.

Literature Cited or References. Arrange references to scientific literature cited in the text alphabetically by last name of first author. There must be a 1:1 concordance between in-text (name-year) citations and the list of references. Do not include references that are not cited in the text.

Terms to avoid

"Works Cited" and "Bibliography" are terms that derive from the Modern Language Association writing style but should not be used in STEM research reports. Use Literature Cited or References and include ONLY sources with in-text citations. A bibliography in science usually contains hundreds or thousands of references and is not an appropriate report heading or substitute for Literature Cited or References.

Footnotes—permitted in both fiction and non-fiction writing—are generally not used in scientific reports except to clarify possible questions within data tables, noted by asterisks, daggers, or other symbols to avoid confusion with numerical data tables.

c) **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 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, a title of the report, the name of the author 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.

d) ***Additional*** **Student Research Plan for Special Protocols or Adult Supervision *REQUIRED***

These projects include those associated with:

- Human subjects
- Nonhuman vertebrate animals including observation projects
- Potentially hazardous biological agents including microorganism, recombinant DNA technologies, or human or animal fresh tissues, blood or body fluids
- Controlled substances and alcohol and tobacco
- Hazardous substances or devices including certain chemicals, equipment, firearms, radioactive substances and radiation

e) **ISEF Forms** ***REQUIRED for all Student Participants***

The Intel International Science and Engineering Fair Forms

The documents for the Intel ISEF are available at https://www.societyforscience.org/isef/international-rules/ and at https://www.ohiosci.org/requirements a particular year must be used by all students who participate 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). **FOR 2020-2021 the Ohio Academy of Science will have both an SRC (Scientific Review Committee) and an IRB (Institutional Review Board). Independent students who need an SRC or IRB approval can send an email to forms@ohiosci.org** Depending upon the project(s), committee members must have sufficient professional expertise by way of education and experience to review both human subjects and non- human vertebrate projects**. When in doubt, review all projects and contact info@ohiosci.org.**

V. Judging Information

a) Instructions to Judges

The attitude and conduct of the judges determine the success of any Science Day Activity. Therefore, it is vital that each judge understands thoroughly his or her duties and obligations. All judges need to have a genuine interest in young people combined with a desire to offer encouragement and guidance in their efforts to pursue learning in the various fields of science.

Students shall have an opportunity to present their project through an on-line format to two judges, one of whom (where possible) should be a K-12 teacher. Scores will be averaged. Each judge shall score the project using an on-line form. Only Science Day officials may inform the student of the scores or ratings after judging.

- Judges should have full knowledge of all The Ohio Academy of Science's requirements and expectations for Science Day participants.

- Judges are required to check through the abstract, the research plan, and research report to determine their quality. A check of the references will assist in making fair determination of the scope and depth of the literature search. The quality and quantity of the references should be taken into account to evaluate the student's research methodology.

- Judges should determine the span of sustained interest in the particular field of science, as well as the approximate amount of time spent in developing the project being evaluated. Some premium should be granted for considerable extended interest and effort to encourage this quality of persistence.

- Judges are expected to write statements to the student/s in a professional manner using the on-line form. The scores will be returned to the student thus the comments should reflect reasons for the rating, as well as suggestions for improvement.

b) Judging - The Process

The score received by a project is the average of the scores of the two judges. Fractional scores should be rounded up.

Minimum number of points for each rating:

Individual Projects: Superior 36, Excellent 24, Good 12, Satisfactory 4 (Satisfactory not given at State Science Day).

Team Projects: The work of each teammate should be evaluated and used in the scoring within the four sections of the rubric.

All students at local, District or State Science Days shall have an abstract and a written report, which documents that the student has searched relevant literature, state a question and/or tested

a hypothesis or technological design statement, collected and analyzed data, and drawn conclusions.

For a superior rating, an individual student shall receive a minimum of 36 points, based on the criteria of: 1) Knowledge Achieved, 2) Effective Use of Scientific Method or Technological Design, 3) Clarity of Expression, 4) Originality and Creativity.

c) Judging Criteria for Individual and Team Projects

- **Individual Projects will be judged on the following criteria:**
  - Knowledge Achieved (considering student's age and grade level)
  - Effective use of Scientific Method or Technological Design
  - Clarity of Expression
  - Originality and Creativity

Each criterion is rated 1 through 10 points with 40 points being the maximum

- Superior range is 36-40 points
- Excellent range is 24-35 points
- Good range is 12-23 points
- Satisfactory range is 04-11 points (not used at State Science Day)

d) The Criteria Interpreted

The following explanations interpret the various criteria on which the student's project or exhibit will be judged. The bullets do not have pre-determined numerical value.

1) For all projects, except those involving Engineering Design

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

- 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 with additional information

Experimental Design

- Well-documented Project Data Book/notebook/ lab journal.
- Specific problem or question, clearly stated hypothesis or technological design statement
- Clear method(s) with correctly defined and measured variables and controls
  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

For Meta-analyses Research Projects:

- *Analytic design: project addresses a clear, focused problem or question with hypothesis that is testable using data from multiple relevant research papers and/or data reports.*

• Well-designed plan and data collection methodology which identifies variables and controls used by source researchers.
• Sufficient amount of scientific data is synthesized to address question or problem. Data used were collected using appropriate scientific protocols.
• Data properly combined, analyzed and interpreted. Statistical analysis was in-depth and used correctly (age appropriate). Graphs and/or tables illustrate the data correctly.
**Valid conclusions are reached from the data obtained. Age appropriate discussion of results. Sources of errors identified.*

Oral, Written & Visual Communication

- Oral: Correct and concise explanation of project, design, and analysis. Responses reflect correct understanding of the experimental results as well as limitations of, expansions of, and/or impact of project.

- Written report: title, organization, results, citations, references Written: Well documented lab journal (background and research notes, raw data and graphs) AND Research Report (includes relevant background, research question and hypothesis showing how it is related to background, experimental design and procedures, data acquisition techniques, data analysis, conclusion and bibliography citing journals, textbooks, etc.). Abstract with clear statement of results.

- Visual: Logical organization of material, neatly displayed, graphics and legends appropriate to project, easy to read and understand. Photos and graphics cited. Follows display rules.

Originality and Creativity

- New idea, concept, principle, hypothesis, insight or non-obvious approach or problem
- Novel association or relationship of previous discoveries or knowledge
- Inquiry or Designed based rather than a summary of knowledge
- Unique approach to a problem, ingenious use of materials
- Evidence of initiative; rigorous analyses of extensive or robust data or results that reveal previously unknown relations

2) For projects involving Engineering Design

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

- Correct use and understanding of terms and principles
- Literature search: appropriate use of scientific, engineering or medical journals /sources vs just popular literature citations
- Student shows they have gained knowledge and understanding unique to their project
- Adequate depth of knowledge and skills in technology systems involved
- In interview student supplements answers with additional relevant information

Use of Engineering Design

- Engineering design: specific problem or need defined, background information gathered and analyzed, criteria for success established, preliminary designs prepared and prototype or model created, prototype or model tested and results analyzed, results clearly communicated
- Sufficient testing of the prototype or model; data appropriately measured, presented and analyzed

- Prototype meets criteria for success that were established
- Well-documented design/engineering notebook
- Student effectively used materials and processes to correctly build prototype or model
- Student identifies and applies scientific principles in their design

Oral, Written and Visual Communication

- Oral Presentation: Correct and concise explanation of project, design and analysis reflecting clear understanding of the design process. Responses are clear, complete and correct.
- Written: Well documented design engineering notebook (sketches, photos, iterations, testing data, results and references) with clear statement of technical problem and criteria for success AND Written Report (includes unambiguous title, organization, results, conclusions, reflections, correct grammar and spelling). Both documents are present.
- Visual: Logical organization of material, neatly displayed, graphics and legends appropriate to project, easy to read and understand. Photos and graphics cited. Follows display rules.

Originality and Creativity

- New idea, concept, principle, design, or non-obvious approach
- Novel association or relationship of previous designs or knowledge
- Design effectively addresses problem or need creatively
- Design-based rather than a summary of knowledge

3) For team projects

Teamwork

- A team shall consist of a maximum of three students. A District Science Day may only allow a maximum of two students per team due to local 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.

- All currently active team members must participate to receive an official recorded score. Team projects with a team member absent from the video presentation will be evaluated with comments but a final score will not be given. Such projects will not be eligible for sponsored awards. 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 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

- Full names of all team members must appear on the abstract and registration forms.

e) **Ranking vs Criteria**

The Ohio Academy of Science does not rank students at local, District, or State Science Days. Rather, Judges for the Academy compare students against the judging criteria described above.

f) Re-judging Criteria to be used at Local, District and State Science Days

Teachers promoting local student research projects and conducting local science fairs or science days leading to District Science Days and to State Science Day are expected to have their students follow the official Science Day Standards outlined herein. Included in these Standards are the following Re-judging Criteria for both individual and team projects that teachers should use locally and that must be used at all District and State Science Days.

- Two judges will judge each project for the Ohio Academy of Science ratings.
- If each judge grants a total score within any one rating category (Superior, Excellent, Good, or *Satisfactory), that specific rating (Superior, Excellent, Good, or *Satisfactory) will be granted to the student and no re-judging is permitted.

- Re-judging is automatic *if all three* of the following conditions apply:
  - The judges' final ratings are in different categories,
  - The average of the judges' scores is in the lower category, and
  - If the judges differ in their total points by more than five points.

  *Satisfactory category is not used at State Science Day

No project will be re-judged at State Science Day based solely on rating.

Under exceptional circumstances, a project may be re-judged at District Science Day with the approval of the District Science Day Director or designee.
Under exceptional circumstances, a project may be re-judged at State Science Day with the approval of the CEO of The Ohio Academy of Science, or the Director of the Junior Academy Council, or designee.

g) Provisional Judging Policy

Does not apply to Virtual Science Days.

h) Judging Ethics

Judges shall:

- **Contact Science Day officials if (1) you know the student, (2) the project is out of your area of expertise, or (3) there are language issues that may impair communication.**

- **Keep in mind that the Mission of the Ohio Junior Academy of Science is to discover and foster interest in science, technology, engineering and mathematics among students in grades 5-12.**

  - Have no prior involvement with the participant or project

  - Adhere to all Ohio Academy of Science Guidelines

  - Judge students against CRITERIA not against other students

  - Listen carefully to student's complete presentation

- Evaluate theoretical and applied projects without bias toward either
- Provide written, constructive criticism and suggestions for improvement
- Avoid discussion of ratings with others prior to public release

V. Additional Policies & Procedures

a) Harassment Generally - Policy

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 & procedure of the Host Institution. All such reports will be handled as confidentially as possible. The Science Day event authority or 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.

b) Sexual Harassment - Policy

Sexual harassment of or by any person in attendance at 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 or 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 and 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.

c) Accommodation of Students with Disabilities at Science Day– Policy

When teacher, parent, or student gives advance notice of a disability which 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 presentation, seating if not in a wheelchair, restroom access, early judging and to be excused from staying for awards if needed. Student would still need to meet established judging criteria and earn a Superior rating to move on.

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