

Glossary

Abstract- a brief written summary of a research project that provides any pertinent information in 200-250 words.

Affiliated Fair- a science and engineering fair in which finalists compete in a higher level fair, ultimately leading to the International Science and Engineering Fair (ISEF). Each of the regional fairs in Colorado is affiliated with CSEF; CSEF and each regional fair are additionally affiliated with ISEF.

Alternatives- in the context of research on vertebrate animals in student projects, this refers to substitutes for live animals. The consideration of alternatives is required by the SRC for approval of any projects involving vertebrate animals.

Animal Care Supervisor- an individual that is responsible for the care of all non-human vertebrate animal projects and must be well acquainted with the care and handling of all research animals used in the project.

Approval Forms- forms that must be completed for all projects that involve any restricted areas of research. This includes the names and signatures of all necessary persons giving permission for the project before experimentation begins. The student signature indicates that the student will adhere to both the DMRSEF and ISEF ethics statement.

Bibliography- part of the research plan which lists at least five major references including but not limited to scientific journal articles, books, and internet sites. If vertebrate animals are used, an additional animal care reference is required. This should be in APA format.

Breach of Confidentiality- Providing identifiable or personal information on any subjects involved in the study. To preserve confidentiality is to take the necessary measures to ensure that the research data and/or responses are not disclosed to the public or unauthorized individuals with identifiable information that links the data with a specific individual or group of individuals.

BSL- Biosafety Level. These range from BSL1 to BSL4, only levels one and two are permitted.

Conclusion- a brief summary of how the results of an experiment support or contradict a hypothesis.

Consent Forms- permission from human subjects to have their data collected and used within the confines of your research. Required for all projects that involve human subjects.

Continuation- the act of extending or prolonging research in a given subject or project area; also, a project which may reference prior work, but which follows a new line of investigation. A valid continuing project for the DMRSEF must demonstrate new and different research from that done previously with a new hypothesis/purpose.

Controlled Substances- any substance controlled by the Drug Enforcement Administration, Bureau of Alcohol, Tobacco and Firearms, or Food and Drug Administration including those that are illegal for use by minors.

Data book- a documentation of the work done during an experiment. It includes the findings, called data, collected during an experiment, as well as any observed responses, reactions and results

Demonstration project- a project that retests an experiment already conducted by someone else. A demonstration project can also show how something works. Adding a variable to a demonstration can make it into an experiment.

Designated Supervisor- an adult properly trained in the specific procedures used in the investigation who will directly supervise the student. The Designated Supervisor cannot be the student's parent. A teacher may act in this capacity.

End Date- the complete date (month, day, and year) when laboratory experimentation ceases and/or the date when the allowable twelve-month research period stops.

Ethics Statement- an ethical statement that each student is required to adhere to and sign as part of the research plan and application process.

Failure to qualify- at any point in the competition process DMRSEF has the right to deem your project unsuitable for completion due to violation of DMRSEF rules and expectations.

Graph- a diagram that illustrates a relationship, typically between two variables. Each variable is measured along one of two axes, positioned at right angles.

Hazardous Substance- any dangerous chemical, organism, equipment, or radioactive material that exposes a researcher or research subject to risk or harm.

Human and Vertebrate Animal Tissue- includes viable flesh, tissue, organs, human or animal parts (including blood), blood products, teeth, primary cell cultures, and body fluids. Use of any of the above requires a Form (6A) or Form (6B) and SRC Approval before the beginning of experimentation.

Human Subject- a person who a researcher (professional or student) obtains data from.

Hypothesis research- a proposed explanation for a phenomenon. In science, a hypothesis is an idea that hasn't yet been rigorously tested. Once a hypothesis has been extensively tested and is generally accepted to be the accurate explanation for an observation, it becomes a scientific theory.

IBC- Institutional Biosafety Committee

Identifiable Information- any information that could be used to identify a subject or subjects as participating in a research study. Basic identifiers include names, social security numbers, birth dates, and phone numbers. In some situations, variables such as race and ethnicity may identify a subject when there are very few individuals of a particular race in the sample.

Individual Project- one student working to complete a science project in which one research report is produced. An individual project cannot become a team project within a single year.

Informed Consent- is a process that involves providing detailed information to potential research subjects (and parents/guardians, when appropriate) about the proposed research project so that the potential subjects (and parents/guardians) can make an informed decision about whether to participate. Informed consent procedures require the subject (and the parent/guardian) to sign a DMRSEF Informed Consent Form prior to participation in the research.

Institutional Animal Care and Use Committee (IACUC)- a committee that must approve all animal research within an institution and must supply a copy of the approval document for review by the Scientific Review Committee (SRC).

Institutional Laboratory- a formal, established laboratory within an academic, commercial, medical, or government setting, but not in the home or high school.

Institutional Review Board (IRB)- a committee of specific composition at an affiliated fair, high school or institution that reviews research plans and consent forms to evaluate potential physical or psychological risk of research involving human subjects. Each school must have an IRB to oversee local projects. The regional and state SRC acts as the IRB at those levels.

Invasion of Privacy- stating facts or asking questions that are considered private information (history of abuse, drug use, opinions, fingerprints, genetic material, blood samples, tissue samples, etc.).

Literature research- an organized review of books, articles and published research on a specific topic.

Mentor- a person who helps a student with a project. The mentor may be a teacher, Qualified Scientist, or a person that helps a student with a field research project

Pathogenic Agents- disease-causing or potentially disease-causing agents (including soil bacteria).

Plagiarism- the offering of another's work as one's own by copying, imitating, forging, stealing, etc.

Potential Pathogen- any organism that has or may have the latent ability to cause disease in humans, vertebrate animals or plants.

Project Category- when registering a project, students will select a category which he/she would like to be judged, or best fits the subject matter of their research. Please be aware this categorization will differ from DMRSEF to future fairs.

Project Year- the present project year includes research conducted over a maximum, continuous 12 month period between January of the previous year and ending in May during the year of the Fair.

Qualified Scientist- an individual who possesses (1) an earned doctoral degree in science or medicine or (2) a master's degree with equivalent experience and/or expertise, and who has a working knowledge of the techniques to be used by the student.

RAC- rDNA Advisory Committee

Recombinant DNA (rDNA)- According to the National Institutes of Health (NIH) guidelines, recombinant DNA molecules are either: (1) molecules that are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell or (2) DNA molecules that result from the replication of those described.

Regional Fair- there are thirteen regional fairs in the state that feed into the Colorado Science and Engineering Fair. Please see CSEF Website to ensure you are registering with the correct regional fair.

Registered Research Institution- a scientific or medical facility or organization involved in the study and investigation of scientific, medical or engineering topics such as university laboratories, National Institutes of Health (NIH), medical centers, pharmaceutical firms, private foundations and which are registered for grant application with the federal government.

Research Plan- must include the question being addressed, the hypothesis/problem/engineering goals, a detailed description of methods and procedures including chemical concentrations and drug dosages, and a bibliography. See research plan with Student Checklist (1A) or more required information. (Also referred to as the protocol.)

Research Report- paper that organizes data and thoughts. It should include a title page, table of contents, introduction that includes a summary of previous literature review, hypothesis, problem or engineering goals, an explanation of what prompted the research, what the student hopes to achieve, methods and materials, data, graphs, and statistical calculations, discussion, conclusion, acknowledgements, and a reference bibliography.

Results- a statement that explains or interprets the data produced in an experiment.

Risk Determination- the local IRB evaluates the research plan and all materials (surveys, questionnaires, tapes, exercises, etc.) to be used before any experimentation (research) begins. The local IRB evaluates the risk value. Copies of the research plan and all supplementary materials are then sent to the regional and state fair committees for final approval.

Risk- the potential for psychological or physical harm to human subjects as a result of participation in a research project. Risks may be physical in nature (e.g., fatigue, illness, injury, death) or psychological in nature (e.g., emotional stress, invasion of privacy, breach of confidentiality).

Safety Committee- a group of qualified individuals responsible for checking compliance of exhibits with display and safety rules that are active at each fair.

Scientific Fraud or Misconduct- the act of misleading or deceiving others by intentionally falsifying scientific data or statements as research or by misbehavior or improper actions.

Scientific method- a sequence of steps followed in investigating natural phenomena.

Scientific Review Committee (SRC) - a group of qualified individuals that is responsible for evaluation and approval of student research, certifications, research plans, and exhibits for compliance with the DMRSEF Rules and Guidelines.

Special Needs Person- a person regardless of age who has been classified as such according to Title 45CFR, including but not limited to gifted, learning disabled, medically disabled, mentally or emotionally disabled, or mentally compromised (e.g. persons with Alzheimer's disease or Parkinson's disease).

Start Date- the date (month, day, and year) on which actual experimentation and data collection in a project begins, excluding a literature search.

Supervision- direct guidance by a knowledgeable adult in the planning, execution, and evaluation of student research.

Teacher- the researcher's science/engineering/math /computer science teacher of record for the year the project began. This teacher may fill out Form (1) attesting to the fact that he/she has reviewed the Rules and Guidelines, reviewed the student's Forms and Research Plan, and discussed risks involved with the project. The teacher may serve as a Designated Supervisor or Qualified Scientist.

Team Project- two or three students working to complete one science and engineering fair project in which one research report is produced. A team project cannot become an individual project or vice versa within the same project year. Individual research from a previous year can be continued as a team project in future years and vice versa.

Trial- one of a number of repetitions of an experiment.

Variable- in research, something that can be changed or altered during an experiment. Each variable that is to be tested would represent a different test condition