2025 Rural Utah Science Symposium
Core Rules of Competition

The Rural Utah Science Symposium (RUSS) is a Utah San Rafael Energy Lab sponsored STEM program for high school students enrolled in grades 9-12 who engage in research investigations in the sciences, technology, engineering, or mathematics (STEM). Students are invited to compete in the local event to showcase their research to fellow students and the public.

Eligibility Rules:

1. Citizenship. Students must be a citizen or legal permanent resident of the United States or U.S. territory to participate in RUSS.
2. Continuation projects. Students may continue a research investigation; however, a study which merely adds data from a previous year's project is not considered a strong continuation project. If a continuation project is submitted, the student must discuss how the project was expanded (e.g., methodology, new variables); discuss any revisions in experimentation and present new data.
3. A student may present a report on work done as part of a class project, or as a science fair project, or summer research project.
4. Team projects - A team leader should be selected to register and present the results of the group work. The research may not be presented by any other member of the team. The judging criteria used to judge all RUSS presentations remains the same. The presentation should focus on the coordinated efforts of all team members and properly acknowledge the contributions of the team (students, mentors, and/or teachers).
5. Team project awards. Scholarships and other awards available are awarded to the presenter.
6. Projects that are demonstrations, 'library' research or informational projects are not appropriate for RUSS.
7. The date/time for the student's presentation is determined by symposia leadership. A student must be present for the assigned time or risk disqualification.

Students who wish to apply to RUSS should utilize the registration link to apply and submit all required work for submission. At the time of registration, students should be prepared to:

- Submit a written report of the completed research investigation through the application page for review by a panel of judges.
- Complete registration with all application materials through the application page by the submission deadline.
- Comply with RUSS rules and policies that apply to the preparation of written reports and presentations.

The written and oral reports should present the results of the student's original research investigation. Assistance from teachers, mentors, parents, or other students may be obtained. However, students must clearly communicate their role in the completion of the investigation and understanding of the research results. RUSS specifically forbids the use of ChatGPT or any other generative artificial intelligence (AI) tools to write their report.

Students do not need teacher or mentor sponsorship to register for RUSS.

Schedule and Deadlines

Eligible high school students are invited to apply to the RUSS. The application is due by March 7, 2025 at 11:59pm.

March 7, 2025	RUSS applications due
March 14, 2025	Students notified of presentation status
April 9, 20245	Symposium held

Core Rules and Guidelines for RUSS Submissions

Students apply to RUSS by submitting a written report of the completed research investigation through the application link. A first round of judging is conducted by Utah San Rafael Energy Lab faculty and other STEM personnel who review the student's submissions to select those students who will compete in the RUSS. Selected students will be invited to present their research in an oral competition and the remainder will be selected to present in the poster competition. Selected presentations will represent the finest efforts of high school students toward either original laboratory research, field research, or applied research.

Abstract Preparation

All RUSS student applicants must submit a 250-word maximum abstract in electronic format during the application process. The abstract should accurately convey the essential nature of the research conducted and the most significant conclusions reached. A further purpose of the abstract is to attract the interest and curiosity of the non-specialist reader and thus encourage exchange, discussion, and elaboration between various authors and between authors and readers.

Symposium proceedings will include abstracts. Please carefully proofread your submission since abstracts will not be retyped or edited. Abstracts should be submitted as text during the application process.

Research Paper Preparation

Requirements for the research paper follow.

- The paper must be in APA Style student format. For help with APA, see the APA Guide and Purdue OWL. Both sites also have sample papers as examples.
- The paper should be a minimum of 5 pages and a maximum of 40 pages double-spaced, including appendices and references.
- Submitted papers must be double-spaced.
- Photography, graphs, tables, diagrams, charts, or other graphic representation presented in the paper must be simply presented.
- A recommended outline for the research paper includes:
    - a title page, or cover page stating the student's name, school address, and title of the research,
    - acknowledgement of major assistance received,
    - as applicable, statement that "research involving non-human vertebrates or human subjects was conducted under the supervision of an experienced teacher or researcher and followed state and federal regulatory guidance applicable to the humane and ethical conduct of such research",
    - table of contents,
    - introduction,

- materials and methods,
- results (data or findings),
- discussion and conclusions,
- references, or literature cited, and
- appendices (if necessary but please keep in mind that the introduction is far more valuable in the judging process than appendices of raw data)

Plagiarism

All abstracts and research papers submitted to RUSS events must be the original work of the students. Research papers may include supporting materials that were created by another person if an accurate citation of the quoted material is included. Quotations from materials printed in newspapers, magazines or books are permissible if an accurate citation is included. If citations are not included, this is a form of plagiarism.

No submission may include any trademarked material(s) without the written permission from the owner(s) of the trademarked material(s). In addition, no research paper may include material that was created by another person without permission to quote such materials by the creator or owner of such intellectual property, such as unpublished documents or documents that explicitly state obtain permission to use, and a copy of such permission must be made available to RUSS. RUSS expects that all work students submit will be their own. RUSS specifically forbids the use of ChatGPT or any other generative artificial intelligence (AI) tools to write their research paper or abstract.

Plagiarism will result in the submission being disqualified from the RUSS event.

Research Involving Vertebrate Animals or Human Subjects

Research involving vertebrate animals or human subjects must be conducted under the direct supervision of a qualified teacher or mentor with an approved active protocol which complies with local, state, or federal regulations for such research. The RUSS requires students to acknowledge in their written research report that proper procedures and protocols were followed. Projects which were conducted without proper supervision will be disqualified.

The RUSS Program recognizes that students may conduct research in a high school setting, and both students and teachers may have questions on how to obtain proper approvals if the research is conducted in a school, home, or field research setting versus in a university laboratory.

General guidelines follow on experimentation involving vertebrate animals (adapted from Bonkalski et al, 1994)

- Only animals that are lawfully acquired shall be used in experimentation and their retention and
- use shall be in every case in strict compliance with state and local laws and regulations.
- Animals used in experimentation must receive every consideration for their bodily comfort; they
- must be kindly treated, properly fed, and their surroundings kept in a sanitary condition.
- No intrusive techniques may be used, including surgery, injections, or taking of blood.
- When animals are used by students for their education or the advancement of science, such
- work shall be under the direct supervision of a committee of individuals knowledgeable of
- applicable regulations governing the care of animals in the conduct of the project.
- At no time should a student do harm to a vertebrate animal in the conduct of the research.

General guidelines follow on research involving human subjects (adapted from Bonkalski et al., 1994)

- No project may use drugs, food, or beverages in order to measure their effect on a person.
- Projects that involve exercise and its effect on pulse, respiration rate, blood pressure, and so on
- are approved if a valid normal physical examination is on file and provided the exercise is not
- carried to the extreme.
- If your research involves administration of questionnaires or surveys, a proper consent from
- subjects must be obtained.
- No human cultures of any type – mouth, throat, skin, or otherwise – will be allowed.
- Tissue cultures purchased from reputable biological supply houses or research facilities are
- suitable.
- The only human blood that may be used is that which is either purchased or obtained from a
- blood bank, hospital, or laboratory. No blood may be drawn by any person or from any person
- specifically for a science project. This rule does not preclude a student making use of data
- collected from blood tests not made exclusively for a science project. Blood may not be drawn
- exclusively for a science project.
- Experimentation involving human subjects requires direct supervision of a committee of
- individuals knowledgeable of applicable regulations governing the conduct of such research.
- Non-regulated research institutions (i.e. high schools) should establish a committee of
- knowledgeable teachers and other mentors to view the research plan prior to the conduct of the
- research.

Requirements for the Oral Presentations

Session Timing

The research presentation may not exceed 15 minutes, followed by a maximum 7-minute question period. A session moderator will aid the student speaker in maintaining this schedule and in fielding questions from the audience. At the 15-minute point, the student speaker must stop the presentation even if he or she has not finished. Following the presentation, the session moderator will ask for judging panel questions. If time permits, the speaker may entertain questions from the audience while the exchange appears interesting and relevant. Questions intended to harass the student speakers will not be allowed by the session moderator. The speaker should repeat a question before answering so the audience may understand the entire dialogue. Presenters are not allowed to bring anything to the presentation such as proof of design or materials. Everything presented must be in the presentation slides alone.

PowerPoint Suggestions

Student presenters are reminded to:

- Embed any video, or other presentation developed through other software, into PowerPoint.
- Save the PowerPoint presentation to a thumb drive and plug into available PC-based equipment with that thumb drive.
- Bring back-up media.
- If using video, students must comply with the following ground rules:
    - The video component cannot make up more than one (1) minute of the presentation and must be directly relevant to the project.
    - No audio or background music is permitted other than sounds that are an integral part of the research. Recorded or mechanically produced narration is not permitted. Narration must come from the speaker.

- Videos (and audio, if any) may be used only for those aspects of the presentation that cannot adequately be presented in a slide. Video material presented must be an integral part of the research and should not be a substitute for presentation of data. Videos must not be used for presentation of common procedures, illustrating equipment or showing laboratory facilities. Videos should illustrate work that was done and should not be used for stimulation or aesthetic value.

Requirements for the Poster Presentations

Display

Students must be prepared for a short 'elevators speech' of up to 3 minutes to share with judges and answer any questions asked by judges during the review of their posters. Materials for the poster may be pre-printed or handwritten and may be attached to a tri-fold board as one large sheet or in pieces. Posters for competition must include and or meet the following standards:

- Poster board dimensions are 36" high x 48" wide. The poster board includes two folds; fold dimensions are 12" x 24" x 12".
- Header boards are allowed and must be no larger than 10" high x 36" wide. The Header board should only contain a title.
- The poster should be visible from a 4-foot distance.
- The Title should be at least one inch (72 pts) in height. The student's name and school should be included and should be (48 pts). All other lettering should be in 24-point font size. (Point size indicated above is suggested size only).
- The poster should be balanced and organized in a logical, sequential order.
- Keep the amount of text to a minimum.
- There should be more emphasis on graphics, tables, charts, and graphs. These items should be cited on the poster board.
- Photographs in addition to other illustrations may be used. Figures may be in color.
- No hazardous materials are allowed. No specimens, no apparatus, no chemical reagents, no models are to be used during the presentation. Only printed material, affixed to the poster, will be allowed for the poster presentation.
- All materials must be prepared (printed) and "poster ready" in advance of arriving.

Suggestions to Prepare for the Presentations

Remember, you are the expert. No one in the audience knows as much about your research investigation as you. Therefore, remember to explain your research in enough detail so the audience will understand what you did, how you did it, and what you learned.

Whenever possible, avoid jargon or unnecessary terminology. If it is essential to use specialized terms, remember to explain the specialized term briefly. Give your audience enough time to understand what you are trying to convey. Graphs, tables and other representation help explain your results. Keep them simple and uncluttered. Focus on important information; for example, remember to name the variables on both axes of a graph, and state the significance of the position and shape of the graph line.

Deliver your presentation at a comfortable pace. It helps to practice your presentation before a nonspecialized audience. Practice will help perfect the presentation and the timing. Do listen to the advice of your non-specialized audience but also get help from a teacher or other advisors as needed.

Judging Process

Oral Presentation Rubric

Topic	Subtopic	Criteria
Content (60 points)	Scientific Merit (15 points)	• Demonstrates a clear understanding of scientific principles. • Presents a well-defined research question or problem. • Utilizing appropriate scientific methods and techniques.
	Innovation and Creativity (15 points)	• Displays innovative thinking in approaching the research. • Demonstrates creativity in experimental design or problem-solving. • Presents original and unique ideas.
	Clarity of Hypothesis and Objectives (15 points)	• Clearly states the hypothesis or objectives of the research. • Articulates the research goals with precision and conciseness. • Ensures alignment between the hypothesis/objectives and the research findings.
	Results and Data Analysis (15 points)	• Presents results in a clear and organized manner. • Demonstrates effective data analysis and interpretation. • Supports conclusions with relevant and well-presented data.
Presentation Skills (30 points)	Organization and Structure (10 points)	• The presentation has a logical and coherent structure. • Transitions between sections are smooth and well-paced.
	Engagement and Delivery (10 points)	• Maintains eye contact with the audience. • Speaks clearly and audibly. • Demonstrates enthusiasm and passion for the research.
	Visual Aids (5 points)	• Effective use of visual aids to enhance understanding. • Slides are clear, visually appealing, and directly support the presentation.
	Time Management (5 points)	• Stays within the allotted time for the presentation. • Balances each section appropriately to cover all key aspects.
Questions and Answers (10 points)	Response to Questions (5 points)	• Provides clear and concise answers to questions. • Demonstrates a deep understanding of the research.
	Handling Challenges (5 points)	• Responds effectively to unexpected questions or challenges. • Adapts to unforeseen inquiries with composure and insight.
Impact (10 points)	Overall Presentation Impact (10 points)	• Leaves a lasting and positive impression on the audience. • Effectively communicates the significance and impact of the research.

Poster Presentation Rubric

Topic	Subtopic	Criteria
Content (60 points)	**Scientific Merit (15 points)**	• Demonstrates a clear understanding of scientific principles. • Presents a well-defined research question or problem. • Utilizing appropriate scientific methods and techniques.
	Innovation and Creativity (15 points)	• Displays innovative thinking in approaching the research. • Demonstrates creativity in experimental design or problem-solving. • Presents original and unique ideas.
	Clarity of Hypothesis and Objectives (15 points)	• Clearly states the hypothesis or objectives of the research. • Articulates the research goals with precision and conciseness. • Ensures alignment between the hypothesis/objectives and the research findings.
	Results and Data Analysis (15 points)	• Presents results in a clear and organized manner. • Demonstrates effective data analysis and interpretation. • Supports conclusions with relevant and well-presented data.
Presentation Skills (30 points)	**Organization and Structure (10 points)**	• Logical and coherent structure of the poster. • Easy to follow transitions between sections.
	Visual Appeal and Clarity (10 points)	• Clear, visually appealing design. • Effective use of images, charts, and graphs. • Direct support of poster content
	Engagement and Explanation (5 points)	• Ability to engage the audience with the poster. • Clear and articulate verbal explanation. • Demonstrations of enthusiasm and passion for the research.
Questions and Answers (10 points)	**Response to Questions (5 points)**	• Provides clear and concise answers to questions. • Demonstrates a deep understanding of the research.
	Handling Challenges (5 points)	• Responds effectively to unexpected questions or challenges. • Adapts to unforeseen inquiries with composure and insight.
Impact (10 points)	**Overall Presentation Impact (10 points)**	• Leaves a lasting and positive impression on the audience. • Effectively communicates the significance and impact of the research.