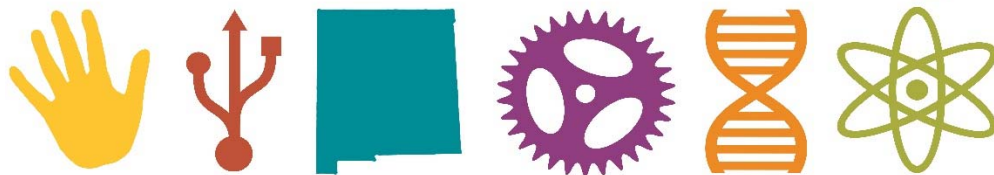


K-5

Inquiry-Based Student Research Project Rules & Forms

Central New Mexico
STEM Research Challenge



UNM STEM-H Center

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K-5 Research Projects Quick Rules Guide

The following rules are based on the [International Rules for Pre-College Science Research](#) but have been simplified for elementary use. All ISEF Affiliated Fairs in New Mexico enforce the use of safe research practices for all participants at all levels and must adhere to the safety guidelines provided by ISEF. Accordingly, ISEF regulations will be the final authority on questions regarding health and safety of participants.

DISPLAY AND SAFETY REGULATIONS *(the following pertain specifically to the project boards/displays students present at the CNM-STEMRC, not necessarily to use in the project)*

- ✓ **NO** organisms, living or dead, including plants, animals, and microbes are to be displayed. This does not include the materials (wood and paper) of which the display board is constructed.
- ✓ Photographs depicting vertebrate animals (including humans) in other than normal conditions must be in a notebook to be presented only during certification and judging. All pictures of human subjects **MUST** be accompanied by a consent form (4B or 4B/Photo) which grants permission to use the pictures.
- ✓ **NO** soil or waste samples are allowed. Rocks and minerals that have no special hazardous chemicals must be displayed in a covered and secured case.
- ✓ **NO** nonfunctional apparatus or chemical containers, empty or otherwise, may be displayed, unless it is original to the project and approved by the Research Challenge coordinator.
- ✓ **NO** human or animal parts, histological sections, or wet mounts.
- ✓ **NO** gases under pressure or super-cooled gases, including dry ice.
- ✓ **NO** small objects that are not encased or attached to the project.
- ✓ **NO** loud, disturbing, or distracting sounds will be produced by a project's equipment
- ✓ **NO** bright or distractive lights.
- ✓ **NO** liquids.
- ✓ **NO** human or animal food
- ✓ **NO** sharp or sharp-edged items (*i.e.*, syringes, needles, pipettes).
- ✓ **NO** flames or highly flammable display materials. **NO** temperatures in excess of 75°C.
- ✓ **NO** batteries (dry, wet, or gel cell).
- ✓ **NO** unshielded high-voltage equipment, large vacuum tubes, or ray generating devices.
- ✓ **NO** uninsulated wiring or connectors.
- ✓ **NO** bare wire or exposed knife switches.
- ✓ **NO** car or motorcycle batteries.
- ✓ **NO** awards, medals, business cards, flags, or acknowledgments may be displayed.
- ✓ **NO** unshielded belts, pulleys, chains, or moving parts that pose a hazard **MAY BE OPERATED** (display only).
- ✓ **NO** lasers (or other scientific instrumentation) which do not meet ISEF standards (Class II, student-operated, sign, protective housing, power disconnect). **NO** Class III or IV lasers operated. Lasers **MUST** have original undamaged label.
- ✓ **NO** glass allowed except computer monitors, television screens. Picture frames should be acrylic.
- ✓ If deemed unsafe or unnecessary by consensus of the Research Challenge Committee, the item or items must be removed.

K-5 Research Projects Quick Rules Guide

HUMAN SUBJECTS

- ✓ All projects involving human subjects **must be reviewed** and approved by an Institutional Review Board before experimentation begins.
- ✓ **Human Participants studies are ones that involve living individuals where there is** intervention or interaction of any kind with subjects **&/OR** collection of identifiable private information
- ✓ Only projects that involve **no more than minimal risk** to participants are acceptable. No more than minimal risk is defined as: *The probability & magnitude of harm/discomfort anticipated in the research are NOT GREATER (in & of themselves) than those encountered in everyday life or during performance of routine physical/psychological exams or tests.*
- ✓ Informed consent (signed forms) **must** be obtained for all human subjects used in research projects. Signed consent forms **MUST** be kept confidential and stored in a secure location to protect participants' privacy.

VERTEBRATE ANIMALS

- ✓ Research **must be reviewed** and approved by the Research Challenge Committee before experimentation begins.
- ✓ Alternatives to the use of vertebrate animals for research **must** be explored.
- ✓ All animals **must** be legally acquired from reputable animal breeders or dealers. The use of wild animals will not be permitted for science projects at the Elementary School level
- ✓ Proper animal care must be provided daily. Documentation of care is recommended.
- ✓ Elementary level students should **NOT** conduct vertebrate animal projects involving alteration of normal diet. Projects involving supplementation (ex: treats, vitamins, etc.) **MUST** have a veterinarian's approval. Any changes, no matter how subtle, to an animal's normal diet can have significant negative consequences.
- ✓ Experimental procedures that cause unnecessary pain or discomfort are prohibited.
- ✓ Experiments designed to kill vertebrate animals are **NOT** permitted.
- ✓ Students may **NOT** perform euthanasia.
- ✓ Alcohol, acid rain, insecticide, herbicide, and heavy metal toxicity studies are **PROHIBITED**.

MICROBIOLOGY

- ✓ Microorganisms (bacteria, molds, fungi, viruses, etc.) collected, isolated, and/or cultured from any environment are considered to be potentially pathogenic (see ISEF rules) and **MUST** be done in an appropriate laboratory setting (never at home). Consequently, they are **NOT** appropriate for research projects at the Elementary School level.

PROJECTS NOT RECOMMENDED FOR ELEMENTARY STUDENTS

The following areas of research are permitted under ISEF rules, but are **NOT** recommended at the Elementary School level. If students insist on conducting their research in any of these areas, they **MUST** meet with the Research Challenge Review Committee and obtain written approval prior to the start of any experiments.

- ✓ Research involving **Recombinant DNA**
- ✓ Research that utilizes **Controlled Substances** (including prescription drugs, alcohol, tobacco)
- ✓ Research involving **Hazardous Substances or Devices** (including hazardous chemicals, radioactive materials, firearms, carcinogens, explosives, paintball/airsoft guns, rockets, pesticides, etc.).
- ✓ Research involving **Human and Animal Tissue** (e.g., human teeth, human blood or other body fluids including saliva and urine).

K-5 Research Projects Form Information

The 4th & 5th Grade Division of the Central NM STEM Research Challenge (CNM-STEMRC) requires the specific forms simplified for elementary use based on the forms required of students in the Junior/Senior Divisions of International Science and Engineering Fair (ISEF) affiliated student research competitions. If the nature of the experiment or safety/ethics are questionable, the CNM-STEMRC Scientific Review Committee will **NOT** approve the project and the project cannot compete in at the CNM-STEMRC.

FORMS 1 and 1A – APPROVAL & RESEARCH PLAN FORMS

All Projects are required to have an Approval and Research Plan Form. The approval form requires the signature of the **classroom teacher** and at least **one parent or guardian**. It is recommended that at least one other person from the school (another teacher, science fair committee chair, etc) review projects as well. Reviewing all projects **before they begin** will eliminate many disqualification questions and concerns. The Research Plan form is also an important tool for students and reviewers. A well written and executed research plan will not only result in good, reliable science but will also help to identify any potential issues with the methods and/or potential violations of the rules.

FORMS 2 & 2B – HUMAN SUBJECTS FORMS

If the project involves the use of human participants, the project will **require the PRIOR approval of an Institutional Review Board**. A school can set up its own review committee if at least one adult from the school has completed the STEM-H Center's "Research Challenge Bootcamp." **IF YOUR SCHOOL DOES NOT HAVE A COMMITTEE, HUMAN SUBJECTS PROJECTS MUST BE SENT TO THE STEM-H CENTER FOR REVIEW AND APPROVAL.** Many elementary classes conduct engaging tasks to collect data. These are great multi-sensory experiences to involve students in their learning. At the CNM-STEMRC, it is required that these experiments have **PRIOR approval and informed consent** from all participants. Use Forms 2 & 2B - Human Subjects Forms to obtain these approvals.

FORM 3 – VERTEBRATE ANIMAL FORM

This form is required for projects that intend to safely investigate/test vertebrate animals (usually pets). Elementary students **cannot** conduct any experimentation on wild animals. The intention of the form is primarily for typical domesticated pets. **THESE PROJECTS MUST BE REVIEWED AND APPROVED BY THE STEM-H CENTER BEFORE THE EXPERIMENT BEGINS** or the project will not qualify to participate at the CNM-STEMRC. Use Form 3 – Vertebrate Animal Form to obtain these approvals.

FORM 4 – RISK ASSESSMENT FORM

This form is required for projects that involve hazardous or dangerous chemicals, activities or devices. Examples include flammable or corrosive chemicals, open flames, explosives, firearms or other weapons, use of unfamiliar tools and other activities not usually conducted in day-to-day life. This is not an exhaustive list, if you are unsure about a material or activity, it's best to complete a risk assessment and/or contact the Research Challenge office. **Prior approval is not required, HOWEVER, direct supervision by an adult is REQUIRED and ONLY the adult should handle and dispose of the materials.**

FORM 5 – ABSTRACT ELEMENTARY FORM

Abstracts are required from all student participants and will be entered directly into the online registration. Official abstracts will then be generated and placed on student displays at the CNM-STEMRC.

K-5 Research Project Checklist

Teachers: Please **attach** this form on the outside front cover of each project folder.

Double-check to make sure that all appropriate forms are completed properly **before** the project is submitted for any needed approval.

DEADLINES:

November 23, 2020: Prior Approval Deadline

February 10, 2021: Online Entry Deadline,

All Paperwork & Entry Fee (\$22.50/student) Due

Form

Form Name

- | | |
|---|--|
| <input type="checkbox"/> Form 1 | Approval Form (required for EVERY project) |
| <input type="checkbox"/> Form 1A | Research Plan (required for EVERY project) |
| <input type="checkbox"/> Form 2 | Human Subjects Form for Approval PRIOR to Experimentation |
| <input type="checkbox"/> Form 2B | Human Subjects Form for Informed Consent/Permission |
| <input type="checkbox"/> Form 3 | Vertebrate Animal Form for Approval PRIOR to Experimentation |
| <input type="checkbox"/> Form 4 | Risk Assessment |
| <input type="checkbox"/> Form 5 | Abstract (required for EVERY project) |
| <input type="checkbox"/> Signature Page/Medical Release | (required for EVERY student) |

Please **PRINT** below (Note: projects may only have **3** representatives per project present at judging)

1st Student Name: _____

2nd Student Name: _____

3rd Student Name: _____

Teacher Name: _____

School: _____ **Grade Level:** _____

This is a/an (please check ONE):

INDIVIDUAL PROJECT

TEAM PROJECT

CLASSROOM PROJECT

K-5 Form 1 Project Information & Approval

Project Information (K-5 ONLY)

This form is required for ALL projects.

Title of Project: _____

Teacher Name: _____ E-Mail: _____

School: _____ Grade: _____

Student 1 Name: _____

Student 2 Name: _____

Student 3 Name: _____

Project Start Date: _____ Project End Date: _____

This project was conducted at:

School Field Home Other: _____

The following projects require review and approval by the Regional Science Expo Committee.

Check **ALL** items below that apply to your research.

- Humans involved in project **requires PRIOR approval** with Form 2 and 2B
- Nonhuman vertebrate animals project **requires PRIOR approval** with Form 4
- Potentially hazardous materials/chemicals/devices OR any microbiology related projects **require PRIOR approval BELOW.**

Approval Form (K-5 ONLY)

This form is required for ALL projects.

APPROVAL SIGNATURES

Classroom Teacher: _____ Date: _____

Parent 1/Guardian 1: _____ Date: _____

Parent 2/Guardian 2: _____ Date: _____

If PRIOR APPROVAL is required (see above), the following signature is needed BEFORE the project can begin.

Committee Chair: _____ Date: _____

K-5 Form 1A Research Plan

This form is required for ALL projects. Use additional pages if necessary.

Title of Project: _____

Student Name(s): _____

Research Question/Engineering Goal: _____

Hypothesis/Expected Outcome: _____

Procedures: _____

Data Analysis (what data are you collecting? how will you evaluate your data to know if your hypothesis was correct or your outcomes achieved?)

Potential Risks/Safety Concerns? What precautions will you take if necessary?

K-5: Form 2 Human Subjects Form

This form is REQUIRED for ALL projects involving human subjects. Use additional pages if necessary.

Title of Project: _____

Student Name(s): _____

Human Subjects Information: *(use additional pages if necessary)*

A) Who will be participating in your project? (number, age, gender) Where will you recruit them?

B) What will participants be asked to do? _____

C) Are there any risks or potential discomforts to participants? How will you minimize them?

D) Describe the benefits of this research: _____

E) Will personal information be recorded (i.e. names, ages, genders, etc.) YES NO
If yes, you CANNOT include any identifiable information in your paper, board, final work products. It is very important that the identities of participants remain confidential.

F) Are you using a survey, questionnaire, or test? YES NO
If yes, include a copy with your paperwork.

To Be Completed by Research Challenge Review Committee Chair OR Designee

The project as described is:

- Acceptable, you may begin your project
- Informed Consent Form 2B needed for ALL Participants
- Not Acceptable/Unsafe (Project must be revised.)

Committee Chair/Designee: _____ Date: _____

K-5: Form 2B Informed Consent/Permission

K-5 Form for INFORMED CONSENT/PERMISSION to Participate in HUMAN SUBJECTS Research

A completed consent form is required for each participant. If minors are participating, parents are required to give their permission. If a survey is being used, attach to this consent form so parents can review before signing.

Title of Project: _____

Student Name(s): _____

I/We will be conducting a research experiment for this year's science expo. I am asking for your/your child's voluntary participation in my project.

My/our human subjects will be asked to do the following *(describe, in detail, what the participants will be doing):*

Potential Risks of Study: _____

Benefits of Study: _____

If you have any questions about this study, you may contact:

Adult Sponsor: _____ Email: _____

To Be Completed PRIOR to Experimentation

- I have read and understand the project stated above and give consent for myself/ my child to participate in this research project.
- I understand that this consent is voluntary and can be withdrawn at any time.
- I consent the use of visual images (video, photos) involving my/ my child's participation in this research project *(optional) Participant identities will otherwise remain confidential.*

Participant's Name: _____ Date: _____

Participant Signature: _____

Parent/ Guardian Signature (if applicable): _____

K-5: Form 3 Vertebrate Animal Form

K-5 Form for Prior Approval of VERTEBRATE ANIMAL Research Projects

This form is REQUIRED for ALL research involving non-human vertebrate animals (please use additional pages if needed)

K-5 students CANNOT test wild animals, but may do purely observational studies (ex: bird counts, etc.) with permission of the Science Expo Committee.

Title of Project: _____

Student Name(s): _____

1) Type and number of animals to be used: _____

2) The following alternatives to the use of vertebrate animals have been explored: _____

3) Where will animal(s) be obtained? _____

4) Cage size: _____ Number of animals per cage: _____

5) Type/Brand of Food: _____

6) How often fed and given water? _____ How much food? _____

7) Where does the animal(s) live (*inside, outside, combination*)? _____

8) Describe ***in detail*** the procedures as related to animal involvement (continue on separate page if needed):

Consent for pet use by owner:

I have read and understand the project stated above and give consent for my pet to participate in this research project. I will supervise all interaction for the safety of my pet and student researcher.

Name of Adult Pet Owner: _____

Pet Owner Signature: _____ Date: _____

To Be Completed by Research Challenge Review Committee Chairperson OR Designee

The project as described is:

- Acceptable, you may begin your project
- Acceptable, but get OK from Vet (*Bring note from Vet saying project is not going to harm the animal(s) AND that he/she will provide emergency medical care if needed.*)
- Not Acceptable/Unsafe; project must be revised.

Committee Chair/Designee: _____ Date: _____

K-5 Form 4 Risk Assessment

*This form is required for projects involving hazardous chemicals, activities, or devices.
Use additional pages if necessary.*

Title of Project: _____

Student Name(s): _____

List all hazardous chemicals, activities or devices that will be used:

Identify and assess the risks involved in this project:

Describe the safety precautions and procedures that will be used to reduce the risks:

Describe the disposal procedures that will be used (when applicable):

List the source(s) of safety information:

To be completed and signed by a designated supervisor (*i.e. adult directly supervising the project*)

I agree with the risk assessment and safety precautions and procedures described above. I certify I have reviewed the Research Plan and will provide direct supervision.

Designated Supervisor's Printed Name

Signature

Date

Form 5: Abstract

ABSTRACTS are required for all projects.

Students will be provided copies of their abstract to give to judges. See box below.

A Good Research Project Abstract...

- ✓ Follows the format of the scientific method.
- ✓ Is written in the 3rd person.
- ✓ Assumes scientists are the audience.
- ✓ Uses complete but concise sentences.
- ✓ Uses present tense for the existing body of facts.
- ✓ Uses past tense for the completed research.
- ✓ Defines specialized terminology and abbreviations.
- ✓ Is 50 to 250 words long.
- ✓ Is typed neatly, single spaced using 12 point font size and an easily readable font.
- ✓ Has 1" to 1.5" margins.

What's In a Good Research Project Abstract?

- ✓ Write a sentence making broad statement about the topic of research.
- ✓ Write the next sentence or two focusing more narrowly on the particular intent of the research.
- ✓ Write several sentences indicating the problem to be solved and the hypothesis that was posed.
- ✓ Write a very brief statement to describe the methodology employed (*This may be omitted if space or time is short*).
- ✓ Write several concise statements indicating which variables were explored and compared and if the data obtained supported the hypothesis. These sentences summarize the results and discussion sections of the research paper.
- ✓ Write a sentence that gives the conclusion(s) of the research work and a statement of the direction for future research.
- ✓ Count the number of words for the sentences you just wrote. If you need to, edit your sentences to bring your abstract within the required 50- 250 word count.
- ✓ Put all previous sentences in paragraph form.
- ✓ Be sure to check your spelling AND grammar. Remember, you may soon have judges reading your work!! You might even want to have your teacher and/or a classmate review your abstract for you.

The body of the abstract should be no more than 250 typed words. The abstract is a summary/synopsis of your project. Including specific detailed data is not necessary. However, you do want the reader to fully understand your project. The abstract should be written once the project is complete. Do not include references or bibliography in the abstract.

IMPORTANT: Students will type or copy/paste the abstract into the online entry form when registering for the CNM-STEMRC. Research Challenge staff will then print "**official abstracts**" using the abstract entered online. Copies of the official abstract will be provided to each participant during project set-up to place on their display. ***The official abstract will be the ONLY allowable abstract to be displayed or given to judges at Research Challenge.*** Any unofficial abstracts will be removed from the display area.