K-5 Inquiry-Based Student Research Project Rules & Forms

Central New Mexico STEM Research Challenge

UNM STEM-H Center

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http://stemed.unm.edu
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 distracting 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.
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.

ABSTRACT

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.
Central NM STEM Research Challenge ~ Prior Review & Approval Process Flowchart

Vertebrate Animals

Does your school have its own local Institutional Review Board (IRB)?
Note: at least one representative from your school must complete the STEM-H Center’s Research Challenge Bootcamp either in person or online to set up a local committee.

IRB minimum membership requirements:
- 1 school administrator
- 1 educator
- 1 medical or mental health professional

Paperwork must be sent to STEM-H Center’s Regional IRB for prior review and approval.* Experimentation cannot begin until approval is received from the local IRB.

Student & Teachers will:
- Provide all required documents with appropriate signatures
- Submit a DETAILED research plan
- Respond to reviewer requests in a timely manner

Reviewers will:
- Conduct timely reviews in accordance with ISEF rules
- Maintain contact with student researcher regarding missing documents, requesting additional information, etc.
- Document and notify student of approval status
- Sign appropriate forms once project is approved

Local committee can review and approve in accordance with ISEF and other applicable rules. Experimentation cannot begin until approval is received from the STEM-H Center.

Vertebrate Animal Approvals
- SRC chair (or designee) signs:
  - Form 5A
  - Form 1B (box 2A)

Human Subjects

Human Subject Approvals
- 3 member IRB completes and signs Form 4
- IRB chair (or designee) signs Form 1B (box 2A)

Potential Hazardous Biological Agents (PHBAs)

PHBA Approvals
- SRC chair (or designee) signs:
  - Form 6A
  - Form 1B (box 2A)

Is any part of the experiment being conducted in a UNM lab or facility?**

SRC minimum membership requirements:
- 1 school administrator
- 1 educator
- 1 biomedical scientist (must have earned graduate degree)

Paperwork must be sent to STEM-H Center’s Regional SRC for prior review and approval.* Experimentation cannot begin until approval is received from the STEM-H Center.

Local committee can review and approve in accordance with ISEF and other applicable rules. Experimentation cannot begin until approval is received from the local SRC.

PHBA Approvals
- SRC chair (or designee) signs:
  - Form 6A
  - Form 1B (box 2A)

The Central NM STEM Research Challenge reserves the right, at any time in the process, to disqualify a project from competition for failure to comply with ISEF Rules for Pre-College Research.

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** This includes UNM Main Campus, Health Sciences Campus, all branch campuses, and the Sandoval Regional Medical Center. UNM’s Biosafety Officer MUST approve any PHBA projects conducted at UNM.

** Local/school officials must sign Form 4 BEFORE sending to the regional IRB for review. School administrator, educator and medical professional must sign to acknowledge the school is aware of the project and ok for it to proceed as written (pending final approval from the regional IRB).

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UNM STEM-H Center 505-277-4916 scifair@unm.edu stemed.unm.edu
K-5 Research Project Checklist

Please include this form as the first page of each project packet.

DEADLINES:
November 21, 2022: Prior Approval Deadline*
February 8, 2023: Online Entry Deadline,
All Paperwork & Entry Fee ($30.00/student) Due

*Prior Approval Deadline refers only to those projects that need review and approval from the STEM-H Center’s regional SRC/IRB. Refer to flowchart found in this packet to determine which projects need approval and by whom.

Form # Form Name

- Form 1 Approval Form (required for EVERY project)
- Form 1A Research Plan (required for EVERY project)
- Form 2 Human Subjects Form for Approval PRIOR to Experimentation
- Form 2B Human Subjects Form for Informed Consent/Permission
- Form 3 Vertebrate Animal Form for Approval PRIOR to Experimentation
- Form 4 Risk Assessment
- Abstract (required for EVERY project)
- Media Release/Medical Information Form (required for EVERY student)

Note: this form is not included in this packet but can be found on the STEM-H Center website.

Please PRINT below (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
# Project Information (K-5 ONLY)

*This form is required for ALL projects.*

<table>
<thead>
<tr>
<th>Title of Project:</th>
<th>E-Mail:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Name:</td>
<td></td>
</tr>
<tr>
<td>School:</td>
<td>Grade:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student 1 Name:</th>
<th>Student 2 Name:</th>
<th>Student 3 Name:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Project Start Date:</th>
<th>Project End Date:</th>
</tr>
</thead>
</table>

This project was conducted at:
- [x] 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.
- [x] Humans involved in project **requires PRIOR approval** with Form 2 and 2B
- [ ] Nonhuman vertebrate animals project **requires PRIOR approval** with Form 3
- [ ] Potentially hazardous materials/chemicals/devices OR any microbiology related projects **require PRIOR approval** with Form 4

## Approval Form (K-5 ONLY)

*This form is required for ALL projects.*

**APPROVAL SIGNATURES**

<table>
<thead>
<tr>
<th>Classroom Teacher:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent 1/Guardian 1:</td>
<td>Date:</td>
</tr>
<tr>
<td>Parent 2/Guardian 2:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

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

Committee Chair: Date: __________________________

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K-5 Form 1 PROJECT INFORMATION & APPROVAL (Last Revised 8/11/2022; UNM STEM-H Center; EG)
Adapted with permission from The Education Foundation of Indian River County, Inc.
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 IRB 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 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:** ______________

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**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):** __________________________________

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Adapted with permission from The Education Foundation of Indian River County, Inc.
K-5: Form 3 Vertebrate Animal Form

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 SRC 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
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 Central New Mexico STEM Research Challenge