# Rules for Elementary and Middle School Science Research for the 2023 East Central Indiana Regional Science Fair (EMSR)

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DIVISIONS AT THE ECI REGIONAL SCIENCE FAIR

- **Elementary Division**: Grades 3 to 4
- **Junior Division**: Grades 5 to 8

PROHIBITED AND LIMITED PROJECTS

- Projects involving the below are not allowed. This list is not exhaustive.
  - Working with prescription drugs and/or illegal substances
  - Causing harm to human or animal subjects
  - Administering any drug or medical treatment
  - Diagnosing disease or providing medical advice

- Limitation for projects involving bacteria and other potentially infectious microbes.
  - Student must be in grade 6 or above to work with microbes.
  - Microbial projects are not allowed to be conducted at home!
  - Microbial projects must be done under appropriate Biosafety Level laboratory conditions.
  - Microbial projects are limited to those requiring no higher than Biosafety Level 2 conditions.

- Projects involving the below require special precautions. See the section Projects Involving Special Circumstances for more information.
  - Devices, activities, or substances that can cause harm
  - Vertebrate animals
  - Microbial species
  - Human participants

TEACHER AND GUARDIAN RESPONSIBILITIES

- Students must submit a project proposal to their teacher and receive approval for their project before beginning work on it.

- Teachers and/or guardians are responsible for ensuring that rules in this packet are followed, that the project is safely and ethically designed and conducted, and that the student is supervised at all times while working on the project.
SCIENTIFIC INTEGRITY

- Participants submitting work not done by them will be disqualified from competition.
  - Scientific fraud and misconduct are not accepted at any level of scientific research.
- Projects that are found to have methodology copied from a published source without proper attribution will be disqualified from competition.
  - If procedures are taken from an outside source (such as Science Buddies), the student must: rewrite the procedures in their own words (or use direct quotation if that is not possible), cite the source at the time of use in any materials, which includes the Experimental Methods box on the Research Plan section of the SEFI website, and provide a full citation in a bibliography.

REGISTRATION AND APPLICATION INFORMATION

- Registration and project application will take place online through the Science Education Foundation of Indiana (SEFI) website: https://sefi.org/register/.
- The registration deadline is Monday, February 6, 2023.
  - Registration entails teachers entering their students into the system and fair participants entering their demographic and basic project information.
- The project application deadline is Monday, February 13, 2023.
  - The project application entails participants fully completing everything required of them in the SEFI website: demographic and basic project information, research plan, and uploading any required forms.
- The abstract deadline is Monday, February 20, 2023.
  - Only Participants in the Junior Division are required to submit an abstract.

PROJECT APPLICATION MATERIALS

- **Participants in the Elementary Division** must briefly summarize their project in the Experimental Methods box of the Research Plan section on the SEFI registration website. No forms are required for elementary division projects.
- **Participants in the Junior Division** must complete all of the boxes in the Research Plan section on the SEFI registration website. No forms are required for projects that do not involve special circumstances.
  - All participants with projects involving special circumstances must answer specific questions about their project and upload that information to the SEFI website as a PDF document.
Additionally, participants working with humans, at a research institution, and/or with a scientist must fill out the ISEF forms corresponding to their circumstances if they wish to be considered for advancement to the state fair.

The determination of special circumstances needs to be done before participants begin their projects!

- **Participants in the Junior Division** must type or copy/paste an abstract into the appropriate box on the SEFI website. Abstracts must not exceed 250 words.
  - Abstracts are a summary of your project. An opening sentence that addresses your project’s purpose (to science/knowledge, to the real world, or just why you were interested in the topic) is encouraged. The following parts should be addressed as you summarize: your question and/or hypothesis, your procedure (brief explanation of methodology, NOT every step), main or summarized results, and your conclusion (answer to your question and/or hypothesis).

### Projects Involving Special Circumstances

- Teachers, guardians, and older student should contact us at sciencefair@bsu.edu with questions about the existence and handling of special circumstances.
- Projects involving the following all require a description of the risks and safety and sometimes require forms. Note: all files uploaded to the SEFI website must be in PDF form.

### Hazardous Devices and Substances

- Safety procedures must be used for all devices or activities that can cause harm.
  - Devices or activities that can cut, crush, electrocute, catch fire to, etc. The user or those nearby are considered hazardous.
  - Most hazardous devices or activities will require direct adult supervision, and some hazardous devices or activities will require operation by an adult only.
- Safety procedures must be used for all substances that can cause harm.
  - Substances that can damage the skin, eyes, respiratory system, and/or are harmful when ingested are considered hazardous.
  - Most hazardous substances will require direct adult supervision during handling, and some hazardous substances will require handling by an adult only.
- Must submit a response to the following as a PDF uploaded to the SEFI website.
  - For each hazardous device, activity, or substance used:
    - Explain what it is and its necessity to the project.
▪ Explain how it can be harmful and the safety precautions taken.
▪ Indicate which of the following best applies.
  • Hazard handled/operated by adult sponsor (teacher).
  • Hazard handled/operated by adult guardian.
  • Hazard handled/operated under direct supervision of adult sponsor (teacher).
  • Hazard handled/operated under direct supervision of adult guardian.

**Vertebrate Animal Use**

- Procedures and a safety plan must be approved by a veterinarian or animal trainer to advance to state.
- Must submit a response to the following as a PDF uploaded to the SEFI website.
  - For each vertebrate animal species used:
    ▪ Type and number of vertebrate animals used.
    ▪ Indicate all of the following that apply. The animal(s) used included those:
      • Owned by the family.
      • Owned by people known to the family.
      • Owned by people previously unknown to the family.*
      • At a shelter or similar.*
      • Purchased for use in the project.^
      • Other, explain.*^  
        - For those with an *, describe how permission was obtained to use the animal(s) and whether a safety plan was discussed. For those with a ^, briefly describe the housing and care of the animal and describe the fate of the animal after the project.
  - Briefly summarize all procedures involving the animal(s).
  - Describe the safety plan.
    ▪ Describe any risks to the animal and explain how any risks were reduced.
    ▪ Explain how the safety of the animals and handlers was maintained.
  - Indicate whether the procedures and safety plan were approved by a veterinarian or animal trainer.
**MICROBES**

**MICROBES NOT REQUIRING SPECIAL PRECAUTIONS**
- Baker’s or brewer’s yeast
- Food mold if in sealed bag and disposed of properly at first sign of growth
- Protist species that do not cause disease: non-toxic algae, paramecium, amoeba, etc.

**LIMITATIONS**
- Student must be in grade 6 or above to work with microbes.
- Microbial projects are not allowed to be conducted at home!
- Microbial projects must be done under appropriate Biosafety Level laboratory conditions.
- Microbial projects are limited to microbes requiring no higher than Biosafety Level 2 conditions.

**REQUIREMENTS**
- Students in grades 6 to 8 may work with microbes in a school with the following restrictions:
  - Workspace must meet appropriate biosafety level requirements.
  - Microbes, samples, and media must be handled and disposed of properly.
  - Inoculated media must be sealed after inoculation and remain sealed through disposal.
  - May only work with non-pathogenic microbes or sample areas thought to be devoid of pathogenic microbes.
- Students in grades 6 to 8 may work with microbes in a research institution with the following restrictions:
  - Workspace must meet appropriate biosafety level requirements.
  - Must follow all ISEF rules for working with microbes.
  - Must work with a qualified scientist.
- Must submit a response to the following as a PDF uploaded to the SEFI website.
  - Where was the project conducted (place and location in the room)?
  - Did you work with a known microbial sources?
    - if yes, list all species used and from where they were obtained.
  - Did you take environmental samples potentially containing microbes? Z
    - if yes, list the types of locations sampled.
  - Describe the handling and disposal of sampling instruments and/or samples.
  - Did you culture microbes on media (growth substance for microbes)?
    - if yes, what type of media (agar or broth) and answer the remaining questions.
• if no, describe what you did that involved microbes, address any potential safety concerns, and end here.
  o Describe the safety precautions during inoculation (introduction of the sample) of the media.
  o Describe how the media was secured during incubation (growth of microbes) and viewing of resulting microbial growth.
  o Describe how inoculated media was disposed of.

• Some microbial projects will require ISEF forms.
  o For growth of unknowns and for growth of species that are pathogenic: ISEF Form 6A
  o For conducting work in a research lab: ISEF Form 1C
  o For conducting work with a trained scientist: ISEF Form 2

HUMAN PARTICIPANTS
• All students working with human participants must submit a response to the following as a PDF uploaded to the SEFI website.
  o Indicate all of the following that apply. Human participants included:
    ▪ Immediate family members
    ▪ Other family members and/or close family friends
    ▪ People not previously known to the experimenter
    ▪ Children (17 and under) in a classroom, daycare, or similar setting
  o Did you observe human participants without directly interacting with them?
    ▪ if yes, did you do your observations in a public or non-public setting?
    ▪ if yes, did you manipulate the participants or environment in any way? Explain.
  o Did you have participants complete a survey or task?
    ▪ if a survey, provide a brief summary in this pdf and submit a separate pdf of an uncompleted survey.
    ▪ if a task, describe it.
  o Describe all potential risks involved to participants and how you reduced those risks.
  o Describe whether and how you obtained consent from participants.
• Students working with human subjects who wish to be considered for the State Fair must additionally do the following.
  o Must follow the ISEF rules for human participants research, which include:
    ▪ Composing a project protocol and filling out ISEF form 4 before the project is started.
• Having the project reviewed and approved by the school institutional review board (IRB) before the project is started. (see school IRB help section for more information.

• When the school IRB determines necessary, submit:
  o Completed ISEF Form 4 with IRB signatures.
  o A PDF of the consent/permission form given to participants.
    ▪ Do not submit (and do not display) consent forms that have been completed by human participants!

**School IRB Help**

• The school Institutional Review Board (IRB) must consist of a school administrator, a school medical professional (school nurse, school psychologist, etc.), and a teacher.

• Each student conducting human participants research must submit the following to the school IRB.
  o ISEF Form 4 with the top box completed by/for the student.
  o Research Plan/Project Summary addressing all areas in the Human Participants Section of the Research Plan/Project Summary instructions.
  o A draft of an informed consent form for the project.
  o Any surveys or questionnaires that will be used for the project.

• The school IRB will:
  o Review materials to determine if the proposed study is safe, ethical, and follows the ISEF rules for human participants research.
  o Determine whether the project requires documentation of written informed consent for adults and of parental permission for minor.
    ▪ All projects require verbal consent for adults and verbal assent for minors.
    ▪ See page 9 of the ISEF rules document for information.
  o Provide corrections to the protocol and consent form, when necessary.
  o Require corrected protocol and consent forms be submitted as many times as necessary.
  o Only complete and sign ISEF Form 4 once they have deemed the project to meet the ISEF rules for human participants research.
  o Return the completed ISEF Form 4 to the student.