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

Acknowledgments: Much of this document was taken liberally from Rules for Indiana Elementary and Middle School Science Research document published the Science Education Foundation of Indiana. Much of that document was taken liberally from the Intel International Science and Engineering Fair (ISEF) document “International Rules for Precollege Science Research: Guidelines for Science and Engineering Fairs 2017-2018”, which are the rules followed by regional and state fair participants in grades 9 to 12. Current year ISEF document available online: https://student.societyforscience.org/rules-all-projects

Divisions at the ECI Regional Science Fair

- The Elementary Division includes grades 3 and 4
- The Junior Division includes grades 5 to 8

Submission of Materials

- Submission of materials and registration will take place online through the Science Education Foundation of Indiana (SEFI) website: https://sefi.org/register/
- All appropriate materials should be submitted by teachers and/or participants to this website
- Materials must be submitted no later than the registration deadline of Friday, January 31, 2020

Forms

- Participants in the Elementary Division do not need to complete any forms
  - It would be much appreciated if elementary division participants could fill out as much information as possible in the Research Plan section on the SEFI registration website so that we have a summary of their project, but this is optional
  - Fourth grade participants who wish to be considered for the Hoosier Science and Engineering Fair (the Indiana state science fair) must follow the rules and use the forms for the Junior Division
- Participants in the Junior Division need to complete the Junior Division Form
  - Participants with projects involving special circumstances will need to complete the second page of the Junior Division Form by describing how they are safely and ethically dealing with the special circumstances of their project
  - Participants working with humans, at a research institution, and/or with a scientist will need to fill out the ISEF forms corresponding to their circumstances
Approval of Projects

- Students must submit a project proposal to their teacher and receive approval for their project BEFORE beginning work on it.
  - For students in grades 3 and 4, we suggest that students use a teacher created simple project proposal form/assignment, which can be an edited version of the Junior Division
    - A Junior Division Form is not required to enter the ECI Regional Science Fair for students in grades 3 and 4
  - For students in grades 5 to 8, we suggest that students use the Junior Division Form for their project proposal, or use an equivalent teacher created project proposal form/assignment
    - A properly completed Junior Division Form is required to enter the ECI Regional Science Fair for students in grades 5 to 8
- Teachers and parents 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

- Scientific fraud and misconduct are not accepted at any level of scientific research
- The submitted work must be the student’s own
- Using work from another student or other source will lead to disqualification from competition
- If a procedure is obtained from another source, the source must be acknowledged in any proposals or papers written about the project and on the fair display

Category Selection

- See our website for category descriptions
- Many projects could easily fit into more than one category
- Choose the category that most accurately describes the project
- Answer the following questions to help in the selection of a category:
  - What is the emphasis of the project?
  - What area of expertise is the most important for someone judging the project?
  - If the project could fit in multiple categories, what characteristic or part of it is the most innovative, unique, or important?
**Display at the Fair**

- All displays must be representative of the work of the student.
- The display area is limited to 48 inches wide by 54 inches tall by 30 inches deep.
- The display must include a board/poster.
  - The board/poster size must not exceed the display area size.
  - The board/poster must be constructed of a durable material and be able to stand on its own on a table.
  - Teachers and/or parents are encouraged to review spelling and grammar on the board/poster.
- Items relevant to the project may be displayed but must fit within the display area.
- Demonstrations for judges or the public must be performed within the display area.
- Some photographs, materials, items, and demonstrations may not be allowed or may have restrictions. Please see our Display Guidelines document for details.

**Projects Involving Special Circumstances**

- The remainder of this document consists of information on working with human subjects and information on activities prohibited or restricted. The list of prohibitions and restrictions is not comprehensive. Teachers, parents, or students who have concerns about projects should contact the Regional Fair SRC Chair or Director for guidance.

**Students with Projects Involving Human Subjects**

- Must follow the ISEF guidelines for working with human subjects
  - See our website for ISEF packet, forms, and helpful documents
  - See this part of the ISEF website for additional advice
- Must complete both sides of the Junior Division Form
  - Including clear project methods on the front and how the guidelines for working with human subjects will be followed on the back
- Must complete the following forms from the ISEF packet:
  - Form 4 Human Participants
  - Include a blank parental assent and/or consent form(s)
    - Note: for many projects involving human subjects, written parental assent must be obtained for subjects age 17 and under, and written informed consent must be obtained by subjects age 18 and older
    - The ISEF materials contain a sample Human Informed Consent Form
- Must have their project approved by a school administrator and a school medical professional (school nurse, school psychologist, etc.) before beginning the project
  - These individuals should review the student’s proposal materials and complete the appropriate portions of ISEF Form 4
Activities Prohibited
The activities below are prohibited for students in grades K through 8. This list is not exhaustive.

- Deliberately causing harm to animal subjects
- Inoculating (introducing specimens onto) agar plates with microbial (bacteria, fungi, protists) species other than the allowable species (see below)
- Deliberately causing harm to human subjects
- Administering any drug or medical treatment to human subjects
- Using prescription drugs
- Using illegal substances

Activities Permitted With Restrictions
Vertebrate Animal Use

- Must be reviewed by a Veterinarian to ensure safety of the student and animals.

Allowed Microbial Species

- Allowable non-bacteria microbial species that can be used in all schools
  - Baker’s or brewer’s yeast
  - Food mold if disposed of properly at first sign of growth
  - Protist species that do not cause disease

- Allowable bacterial species that can be used in only BSL-1 or better schools by students in grades 5 through 8
  - *Lactobacillus spp.*, *Bacillus thuringiensis*, nitrogen-fixing bacteria, oil-eating bacteria, or algae-eating bacteria introduced into their natural environment
    - These are NOT allowed if cultured (grown on media)
  - *E. coli* k-12
    - These may be cultured (grown on media)

Culturing (Growing) Bacteria

- Elementary Division (grades 3 and 4) students are NOT allowed to use or produce bacteria
- Junior Division (grades 5 to 8) students may conduct projects involving bacterial cultures in a research institution with the following restrictions:
  - A qualified scientist must serve as the supervisor
  - Supervisor and laboratory must be certified for BSL-1 work or better
  - Follows all ISEF rules for working with bacteria
    - See our [website](https://example.com) for ISEF packet, forms, and helpful documents
    - See [this part](https://example.com) of the ISEF website for additional advice
  - Must complete the following forms from the ISEF packet:
    - Form 1C Regulated Research Institution
    - Form 2 Qualified Scientist
    - Form 6A Potentially Hazardous Biological Agents (when necessary)
• Junior Division (grades 5 to 8) students may conduct projects involving bacterial cultures in school with the following restrictions:
  o If teacher and school are certified for BSL-1 work or better:
    ▪ Can inoculate agar plates with *E. coli* k-12
    ▪ Can inoculate agar plates with certain environmental samples
    ▪ Samples and agar plates must be handled as indicated by the guidelines for specimens of their biosafety level
    ▪ Samples and agar must be disposed of as indicated by the guidelines for specimens of their biosafety level
  o If teacher and school are NOT certified for BSL-1 work or better:
    ▪ Can inoculate agar plates with certain environmental samples
    ▪ Agar plates must be sealed immediately after inoculation and remain sealed through disposal
    ▪ Samples and agar plates must be disposed of properly
• Junior Division (grades 5 to 8) students may NOT conduct projects involving bacterial cultures outside of a research institution or school
• All students working with bacteria must complete both sides of the Junior Division Form
  o Including clear project methods on the front and how the guidelines for working with bacteria will be followed on the back