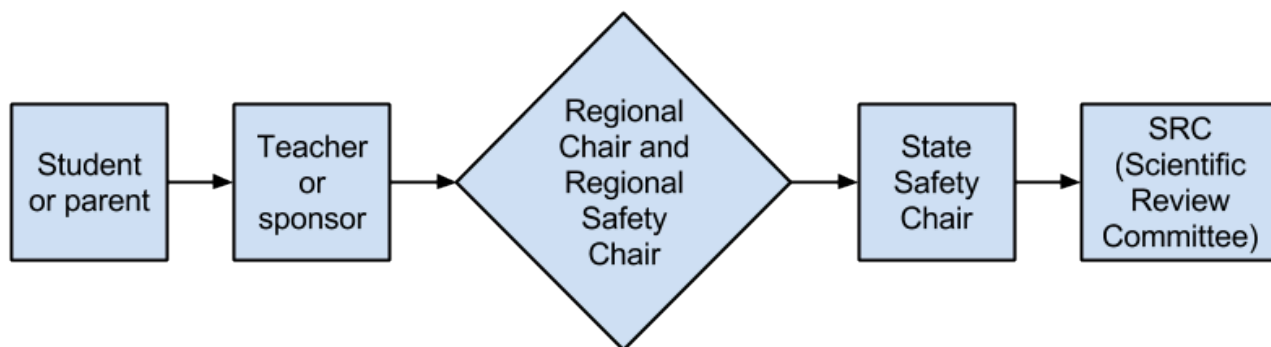


Safety Guidelines for Experiment and Design Investigations

All questions or clarifications regarding these safety regulations will be made by sponsors (not students or parents) to the Regional Chair in writing, by email, a minimum of one week prior to beginning the investigation. These regulations are designed for the safety of the fair participants, test subjects, judges, and visitors. There will be no deviation from these regulations.

Safety Flowchart



- Students should always wear eye protection and appropriate protective clothing when working on their investigation.
- The student should work under the supervision of a responsible adult.

Chemical Safety

- Before beginning a project, review the recommended procedures for safe use and handling of the chemical. The student and the sponsor should seek data from a textbook, Merck Index, Safety Data Sheet (SDS) or other responsible source regarding the health hazards, combustibility, and compatibility of the chemical with other chemicals.
- All chemicals must be disposed of in accordance with State and Federal Environmental Rules and Regulations.
- The Safety Sheet must include a statement as to the proper handling of any chemicals.
- Students who produce alcohol in connection with a science fair project must follow the Safety Flowchart above prior to beginning the investigation.

Electrical and Mechanical Safety

- All electrical apparatus that operates with 115-volt current should be constructed in accordance with the National Electrical Code (NEC). If in doubt, contact a competent electrician.
- Many experiments can be done using a low amperage, 6 or 12-volt, electrical source. As these are much safer electrical sources, their use should be considered when doing a project.
- The Safety Sheet must include a statement as to proper electrical construction and an explanation of protective measures.

Fire and Radiation Safety

- Students using radiation sources (laser, U-V light, X-ray, microwaves, or high intensity radio waves) should be adequately shielded from such sources. Many experiments using these sources should not be undertaken unless under the direct supervision of an adult familiar with the equipment and hazards involved.
- No student may work with any radioactive materials unless the work is conducted in a licensed laboratory under the direct supervision of a licensed individual.
- The safety sheet must include an explanation of protective measures.

Biological Safety

Use and Care of Humans as Test Subjects

Recognizing that human beings are animals needing different criteria, the following policies will govern the use of human beings. No project will be allowed that is in violation of any of these rules.

No person may perform any experiment for the student that violates any of these rules. **No** person may give permission for a project that is in violation of these rules except in special cases as described in the section "Special Circumstances/Exceptions" (see page 18).

If using humans as test subjects, the following rules must be observed.

- Students who have a project involving human test subjects must complete, with their sponsor, the Humans as Test Subjects Endorsement form (see Appendix- page 45) that is included in this policy manual. Feel free to duplicate as needed.
- Humans must not be subjected to treatments that are considered hazardous and/or that could result in undue stress, injury, or death to the subject.
- **No primary or secondary cultures** (the incubated growth of microorganisms, tissue cells, or other living matter in a specially prepared nutrient medium) taken directly (mouth, throat, skin, and so forth) or indirectly (eating utensils, countertops, doorknobs, toilets, and so forth) will be allowed. However, cultures obtained from reputable biological suppliers or research facilities are suitable for student use (see Microorganisms section, pages 17-18).

- Quantities of food and non-alcoholic beverages are limited to normal serving amounts or less and must be consumed in a reasonable amount of time. Normal serving amounts must be substantiated with reliable documentation. This documentation must be attached to the Humans as Test Subjects Endorsement form. No project may use over-the-counter drugs, prescription drugs, illegal drugs, or alcohol in order to measure their effect on a person.
- Only human blood and/or other bodily fluids (urine, saliva, tears, cerebrospinal fluid, etc.) may be used are those samples/specimens, which are either purchased or obtained from a blood bank, hospital, or laboratory. No blood may be drawn or other fluids collected from any person specifically for a science project. This rule does not preclude a student making use of data collected from tests run on blood or other fluids that were collected for a purpose other than exclusively for a science project.
- Projects that involve exercise or physical activity and its effect on pulse, respiration rate, blood pressure, and so on are allowed provided the exercise is not carried to the extreme. Electrical stimulation is not permitted. A valid, normal physical examination must be on file for each test subject. Documentation from authorized school personnel of that examination must be attached to the Humans as Test Subjects Endorsement form (see Appendix page 45).
- Projects that involve learning, ESP, motivation, hearing, vision, and surveys require the Humans as Test Subjects form (see Appendix page 45).

Use and Care of Non-Human Vertebrates

The basic aim of experiments involving animals is to achieve an understanding of life processes and to further society's knowledge. Experiments requiring the use of vertebrates must have a clearly defined objective, investigate a biological principle, and/or answer a scientific inquiry. Such experiments must be conducted with a respect for life and an appreciation of humane considerations.

To the degree possible, all students should be cautioned about doing projects that involve vertebrates. However, if the teacher and the student feel that vertebrates must be used, the following rules must and will apply. This policy will place the Illinois Junior Academy of Science in close accord with the "School Code of the State of Illinois."

It is strongly recommended that living organisms such as plants, bacteria, fungi, protists, worms, snails, insects or other invertebrates be used. Their wide availability, simplicity of care, and subsequent disposal make them very suitable for student work.

No non-human vertebrate projects will be allowed that are in violation of any of these rules. No person may perform any experiment for the student that violates any of these rules. No person may give permission for a project that will be in violation of these rules except in special cases as described in the section "Special Circumstances/Exceptions" (see page 18).

- Students who have projects that involve non-human vertebrates must complete, with their sponsor, the Non-Human Vertebrate Endorsement form (see Appendix page 46) that is included in this policy manual. Feel free to duplicate as needed.
- The student and the sponsor have the responsibility to see that all animals have proper care in well-ventilated, properly lighted locations with proper nutrition, proper temperature, adequate water, and sanitary surroundings. Care must be taken to see that the organisms are properly cared for during weekends and vacation periods.

- No primary or secondary cultures (the incubated growth of microorganisms, tissue cells, or other living matter in a specially prepared nutrient medium) involving warm-blooded animals taken directly (mouth, throat, skin, etc.) or indirectly (cage debris, droppings, countertops, and so forth.) will be allowed. However, cultures purchased from reputable biological supply houses or research facilities are suitable for student use (see Microorganisms section, pages 17-18).
- No intrusive or pain-producing techniques may be used. These prohibited techniques include, but are not limited to, surgery, injections, taking of blood, burning, electrical stimulation, or giving of over-the-counter drugs, prescription drugs, illegal drugs, or alcohol to measure their effect.
- No changes may be made in an organism's environment that could result in undue stress, an injury, or death to the animal.
- No vertebrates can be used as the independent or dependent variables in an experiment that could result in undue stress, an injury, or death to the animal.
- For maze running and other learning or conditioning activities, food or water cannot be withheld for more than 24 hours. If the animal has a high metabolic rate, then food or water cannot be withheld for a length of time that would produce undue stress on the animal.
- Chicken or other bird embryo projects are allowed, but the treatment must be discontinued at or before 72 hours before scheduled hatch day. At that time, the egg must be destroyed.
- Projects that involve behavioral studies of newly hatched chickens or other birds will be allowed if no changes have been made in the normal incubation and hatching of the organism, and that all vertebrate rules are followed (only non-manipulated eggs may be hatched).

Use and Care of Microorganisms

No microorganism projects will be allowed that are in violation of any of these rules. **No** person may perform any experiment for the student that violates any of these rules. No person may give permission for a project that will be in violation of these rules except in special cases as described in the section "Special Circumstances/Exceptions" (see page 18).

- Students who have a project involving microorganisms must complete, with their sponsor, the Microorganisms Endorsement form (see Appendix page 48) that is included in this policy manual. Feel free to duplicate as needed.
- All microorganism experimentation must be conducted in a laboratory setting such as a science classroom or professional research facility. Experiments with microorganisms may not be done at home.
- This area of science may involve many dangers and hazards while experimenting. It is the sole responsibility of all teacher(s)/sponsor(s) to teach students proper safety methods and sterile techniques.
- The Illinois Junior Academy of Science prohibits the use of primary or secondary cultures taken from humans or other warm-blooded animals in any project because of the danger from unknown viruses or other disease-causing agents that may be present. Pure cultures of microorganisms known to inhabit warm-blooded animals may be obtained from reputable suppliers and used in proper settings.

- **Culture:** the incubated growth of microorganisms, tissue cells, or other living matter in a specially prepared nutrient medium.
 - A **primary culture** is one taken from a vertebrate animal, living or dead. For example, a culture may not be taken from a mouth, throat, skin, hamburger, meat, chicken, or fish.
 - A **secondary culture** is a culture taken from an object that has come in contact with a vertebrate animal. For example, a culture may not be taken from eating utensils, doorknobs, toilets, countertops, milk, eggs, and so forth.
- Projects involving viruses and recombinant DNA projects should be done with the help of a professional and should comply with the National Institutes of Health (NIH) Guidelines unless the project is limited to a kit obtained from a legitimate supply house.
 - All cultures must be destroyed by methods such as autoclaving or with a suitable NaOCl (bleach) solution before disposal.
 - For information on “Microorganisms for Education”, visit: www.science-projects.com/safemicrobes.htm

Safety Questions and/or Clarifications

Please see the IJAS web site for contact information for the IJAS Safety Chair: www.ijas.org.

Special Circumstances/Exceptions

Exceptions to the rules will be granted only in two circumstances:

1. The student performs the experiments and is supervised in a university lab, a research facility, or other professional facility. In these circumstances, the student must have a letter on the organization/research facility’s letterhead from the supervisor stating that the student worked under constant supervision and that all rules and regulations were followed.
 - This original letter must directly follow the required endorsement form in the student’s original written paper.
 - A copy of this letter must be displayed on the front of the display board with the other endorsement sheets.
2. If the student will not be supervised in a professional research institute, approval for any exceptions to the rules will be granted only if the following conditions are met:
 - The sponsor must seek approval for the project before experimentation begins and/or as needed.
 - The student (under the supervision of the sponsor) must prepare a detailed proposal of the project that includes the hypothesis, the proposed methods of experimentation, and must be able to demonstrate that safety measures will be taken that reflects professional protocols.
 - The proposal is submitted to the IJAS Scientific Review Committee (SRC) Please see the IJAS website. For contact information: www.ijas.org.
 - If the proposal receives approval, the project may be entered into the State Exposition if it qualifies at the Region. A written reply to the sponsor regarding the decision will be made no later than two weeks following receipt of the request.
 - A copy of the approval letter is displayed on the front of the display board with the other endorsements.
 - The approval letter is inserted into the student’s written paper directly following the appropriate endorsement.