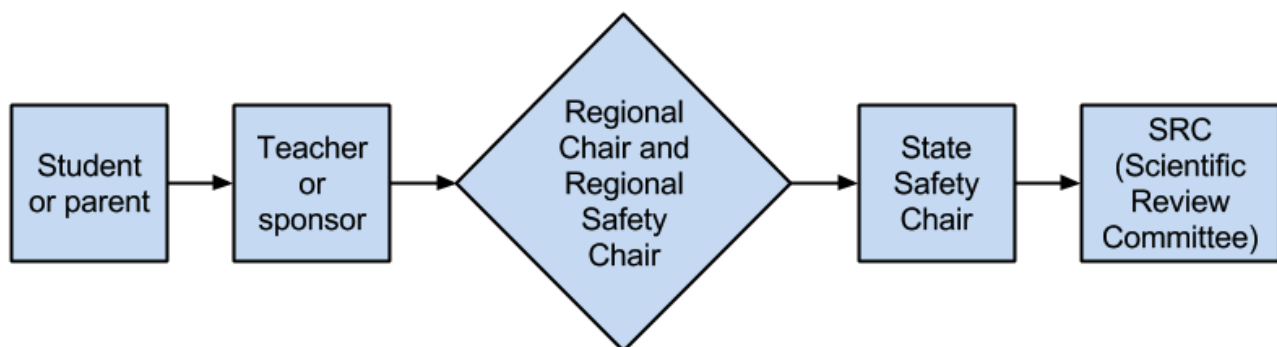


- Normal wear and tear on the exhibit is to be expected during the time that the exhibit is open to the public. If valuable equipment is with display (such as a computer), it is your responsibility for its supervision
- Neither the Illinois Junior Academy of Science nor the sponsors assume any responsibility for loss or damage to such equipment, materials, or research paper.

### 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 Contact Flowchart



- Students should always wear eye protection and appropriate protective clothing when working on their investigation.
- Students 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 and distill 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.
- Any student working with burning materials should perform the experiment under a fume or chemical hood or in an open air environment.
- The Safety Sheet must include an explanation of all protective measures.

### **Firearms and Explosive Safety**

The provisions of this section shall not apply to model rocketry, provided any demonstration or experiment involving a model rocket is supervised by a parent, guardian or teacher over 21 years of age and all local, municipal, state and federal laws are strictly adhered to at all times concerning any model pocket, rocket engine or accessory.

**No demonstrations or experiment using firearms or explosives can begin without prior approval from the Safety Review Committee. Make sure your Request for Use of Firearms letter is filed as soon as possible to allow enough time for the Safety Review Committee to review and process it. The letter MUST describe in detail the experimental procedure and the list the adult who will conduct the experiment as described below. Any advance permission issued shall be valid to conduct experiments or demonstrations for a period of thirty (30) days following approval, after which further experiments or demonstrations may not be conducted unless the advance permission is renewed or separate advance permission for a new or different demonstration or experiment is given.**

- The student may not possess, handle or utilize any firearm at any time for conducting the demonstration or experiment for a science fair project; and the student and all bystanders, if present during the demonstration or experiment, must be behind a ballistic shield and wear eye and ear protection.
- The firearm must be handled at all times and the demonstration or experiment must be directly conducted at all times by a person over 21 years of age who is certified as a police officer by the Illinois Law Enforcement Training and Standards Board or by a person himself or herself licensed as a Private Detective or Private Security Contractor and in possession of a currently valid Firearms Control Card issued by the Illinois Department of Financial and Professional Regulation (“IDFPR”) (Note: a Concealed Carry License issued by the Illinois State Police SHALL NOT SUFFICE, and a Permanent Employee Record Card “PERC” issued by the IDFPR SHALL NOT SUFFICE).
- The police officer or IDFPR-licensed professional conducting and supervising the demonstration or experiment must provide a written statement describing the demonstration or experiment in detail, provide a copy of all of his or her credentials, and certify under the police officer’s or IDFPR-licensed professional’s signature that the demonstration or experiment is safe to all persons involved; and explain why and how the demonstration or

experiment is safe to all persons involved. **This letter must be attached to the Safety Sheet (see page 45).**

- The police officer or IDFPR-licensed professional supervising the demonstration or experiment must provide a Certificate of Liability Insurance in the amount of no less than \$1,000,000.00 naming the Illinois Junior Academy of Science, Inc., as “ADDITIONAL INSURED”; the facility where the demonstration or experimentation will be conducted must be recognized by the Illinois State Police and will be required to provide a Certificate of Liability Insurance in the amount of \$1,000,000.00 naming the Illinois Junior Academy of Science, Inc., as “ADDITIONAL INSURED”.
- The student, parent, guardian, police or professional supervisor, and all persons present during the conduct of the demonstration or experiment must provide a release of liability for the benefit of, and in a form agreeable to, the Illinois Junior Academy of Science, Inc., such form shall be provided when the student is granted permission to conduct the demonstration or experiment.
- The demonstration or experiment must not involve the hand loading or reloading of ammunition and may not utilize any black powder or muzzle loading gun.
- Any demonstration or experiment involving a firearm must utilize at all times commercially-loaded fixed cartridge ammunition manufactured according to SAAMI standards.
- The firearm utilized must be commercially-manufactured and may not be older than fifty (50) years of age.
- The demonstration or experiment shall not involve making or testing modifications or alterations to the firearm itself.
- All local, municipal, state and federal laws and regulations must be strictly adhered to at all times.
- No firearms or ammunition can be present at any level of science fair (school/district science fair, Regional Fair, State Fair and ISEF).

### **Drone Safety**

- Drones may be used in a science project provided the use complies with all Federal, State and community rules, regulations and ordinances. In addition, the use of a drone for a science project may not infringe on anyone’s privacy or air space.

### **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. To avoid potential disqualification, contact the Regional Safety Chair prior to experimentation if you are uncertain that the treatment may cause undue stress, injury, or harm.
- **No primary or secondary cultures** (the 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, such as a food label. 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.
- Any project involving human teeth must have the teeth sterilized prior to experimentation.
- 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. A letter from authorized school personnel, such as a school nurse, stating that all of the participating students have a physical examination on file indicating that they are physically able to participate, must be attached to the Humans as Test Subjects Endorsement form. (See Appendix page 46).
- Projects that involve learning, ESP, motivation, hearing, vision, and surveys require the Humans as Test Subjects form. (See Appendix page 46).

### **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 19).

- Students who have projects that involve non-human vertebrates must complete, with their sponsor, the Non-Human Vertebrate Endorsement form (see Appendix page 47) 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 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 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 without prior approval (See Special Circumstances/Exceptions on page 19).
- 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 19).

- Students who have a project involving microorganisms must complete, with their sponsor, the Microorganisms Endorsement form. (See Appendix page 49) 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, except for *Saccharomyces cerevisiae*, (Baker's yeast), may not be done at home.
- Any projects involving growth of mold or rotting of organic material must be done in science classroom or professional research facility.
- 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 aseptic techniques. Students should wear

safety goggles, gloves and wash hands after each experiment.

- 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 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](http://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](http://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](http://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.