EXHIBITOR MANUAL

This manual was updated January 2022 for a Virtual Fair.
If you find errors in this manual, please email webmaster@wwsef.ca

WELCOME TO the WWSEF!

The Waterloo-Wellington Science and Engineering Fair is a non-profit registered charity that operates the regional science fair. We are affiliated with Youth Science Canada and are entitled to send some of our best projects to the Canada-Wide Science Fair. Over the past years, several of our exhibitors have been part of Team Canada at the Intel International Science & Engineering Fair.

Use this manual as you organize your project and prepare it for the fair so you will encounter fewer problems.

Some sections of this manual apply to all projects and some only apply if your project includes using animals or humans as subjects.

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ELIGIBILITY CRITERIA

1. Exhibitors must be under twenty-one years of age as of June 30 in the year of participation.
2. The project has to be the work of the exhibitor(s) from start to completion.
3. If your school has a science fair, you must be in grades seven to twelve.
4. If you are home-schooled or an independent exhibitor, you should contact the WWSEF Registrar (registrar@wwsef.ca) for a ruling on your eligibility before beginning work.

Notes:

1. Group projects with a maximum of two exhibitors entered will be placed in the age division of the senior member of the group.
2. Exhibitor(s) may not exhibit more than one project each year.
3. A project cannot be entered in more than one school science fair per season, which is registered for competition leading to participation in the WWSEF.
4. A project cannot be entered in the WWSEF for more than one year without significant changes.
5. Exhibitors who have successfully entered the WWSEF may be selected to represent our region at the CWSF (Canada-Wide Science Fair).

PROJECT TYPES

The most common types of science fair projects are experiments, innovations and studies. Projects of each type are equally capable of winning top awards at the fair, providing they meet the necessary criteria.

Experiment: This is traditionally the most common type of science fair project. A winning exhibit of this type should involve an original scientific experiment to test a specific hypothesis in which the exhibitor(s) recognize(s) and controls all significant competing variables and demonstrates excellent collection, analysis, and presentation of data. It must be recognized that it is the design rather than the results that are most important.

Innovation: A project of this type would involve the development and evaluation of new (or significant improvements to existing) devices, models, techniques or approaches in fields such as technology, engineering, or computers (both software and hardware). A winning project should integrate several technologies, inventions, or designs and construct an original innovative technological system that will have commercial application and/or human benefit. It must demonstrate how the innovation was designed or developed on the basis of a sound understanding of the scientific, engineering, or technological principles involved.

Study: This type of project involves the collection and analysis of data from other sources to reveal evidence of a fact, situation, or pattern of scientific interest. This could include a study of cause and effect relationships or theoretical investigations of scientific data. A winning exhibit in this area must be able to demonstrate that the methods used to obtain the original data involved sound scientific techniques and controls, and demonstrate insightful analysis.

GRADE DIVISIONS

Junior: Grades 7 and 8.
Intermediate: Grades 9 and 10.
Senior: Grades 11 and 12.

Note: Partner projects with a maximum of two exhibitors may be entered and will be placed in the grade division of the oldest partner.

CATEGORIES

Engineering:
Any topic in applied science, using electricity and magnetism, robots, pulleys, gears, rocketry, solar energy, lasers, aeronautics, structures, chemical processes to achieve a purpose, development of computer hardware, software or applications, etc. is Engineering.

Life Science:
Projects dealing with living organisms, factors affecting growth, etc., whether biology or social science, are Life Science. Biotechnology, the application of knowledge of biological systems to solve a problem, create a product or provide a service, are included in this category.

Physical and Mathematical Science:
Studies of chemical or physical phenomena, optics, colour and sound, radiation, comparison of similar products, corrosion, and studies in mathematics are examples of projects in this category.

Note: Many projects contain elements of two or more categories. The stated purpose or hypothesis of the project may be the best indicator of the exhibitor's thinking, and indicate into which category a project should be registered.

ACADEMIC INTEGRITY

Whether it is a Science Fair project or research conducted in a research institute, there are some rules of academic integrity and ethics that all scientists must follow. For your safety and the safety of others, all projects must also comply with the WWSEF safety requirements. Failure to follow these rules and requirements can result in disqualification at the fair. So, make sure to read the rules and requirements below before you start your project to ensure your work is conducted properly.

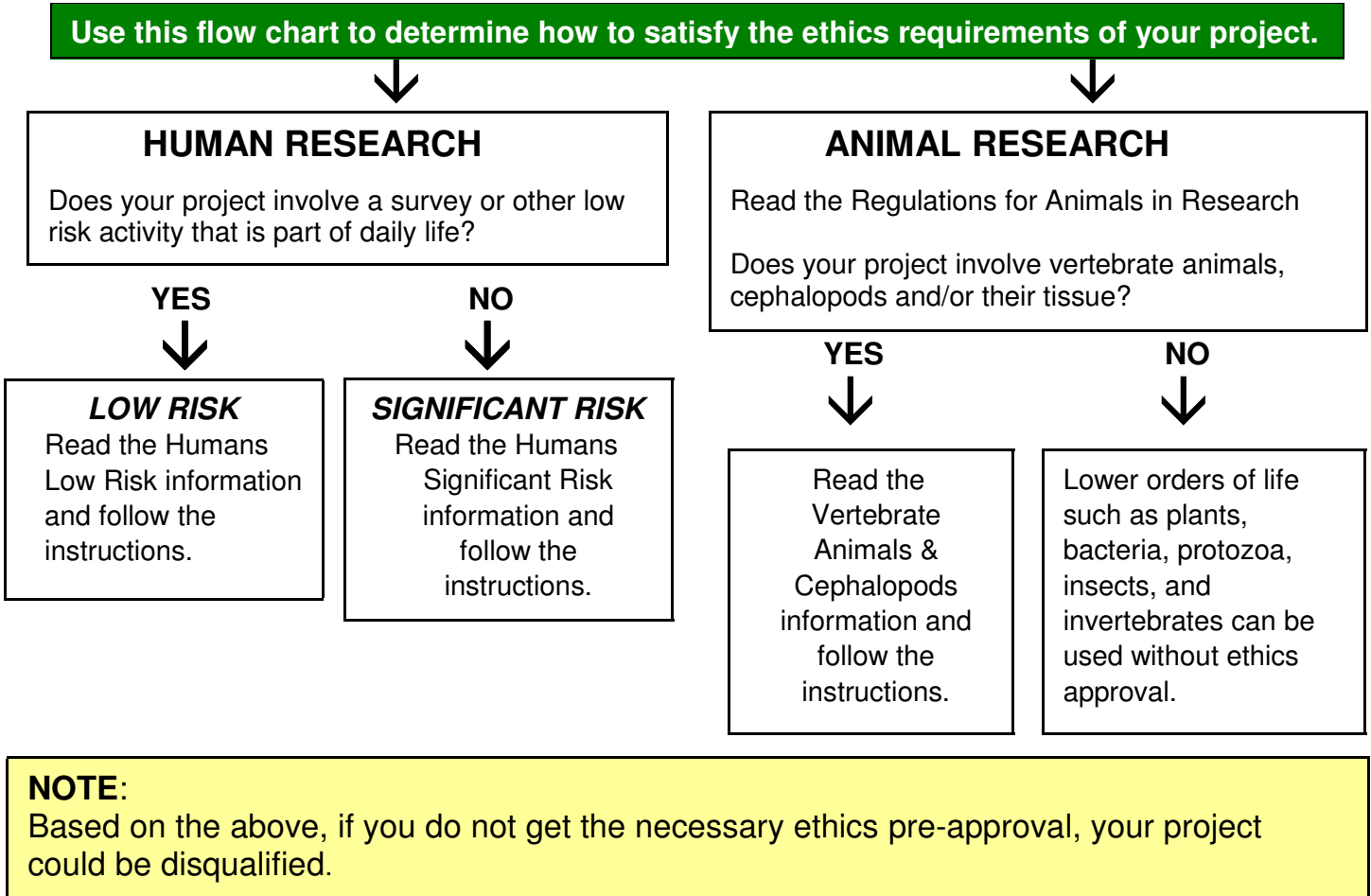Some specific examples of violations of academic integrity:

- Plagiarism – presenting the work of others as your own without acknowledging the source. In this case, "work" means scientific results, conceptual development of a topic and substantive formulation or reformulation of a problem. This includes work done by a family member or a mentor.
- Fabricating and/or falsifying data.
- Fabricating and/or falsifying registration information.
- Forging signatures.
- Entering a project that is either derived from a previous project, or a continuation or revision of a previous project by the student (or by another), without documentation of the previous work.
- Entering a project that is derived from the input of, or controlled by, another person eg. Parent, Adult Supervisor, other family members, etc. (See Eligibility Criteria #2 above)

Are you a returning Science Fair participant? Make sure that your project for this year is different from your previous one, or ensure that it is a significant expansion or extension from your first project! The project must only present work completed since the previous fair. We strongly recommend documenting, in detail, your previous work and having it with you at this year's Fair for reference. A project that is substantially the same as a project exhibited at any previous Regional or Canada-Wide Science Fair will not be eligible.

ETHICS

If you plan to use human or animal subjects in your science fair project, read this!

Any Information listed below can be found in the Ethics section on the Project & Exhibitor Information page of the website.

Use this flow chart to determine how to satisfy the ethics requirements of your project.

HUMAN RESEARCH

Does your project involve a survey or other low risk activity that is part of daily life?

YES   **NO**

LOW RISK
Read the Humans Low Risk information and follow the instructions.

SIGNIFICANT RISK
Read the Humans Significant Risk information and follow the instructions.

ANIMAL RESEARCH

Read the Regulations for Animals in Research

Does your project involve vertebrate animals, cephalopods and/or their tissue?

YES   **NO**

Read the Vertebrate Animals & Cephalopods information and follow the instructions.

Lower orders of life such as plants, bacteria, protozoa, insects, and invertebrates can be used without ethics approval.

NOTE:
Based on the above, if you do not get the necessary ethics pre-approval, your project could be disqualified.

DEFINITIONS

Human Research refers to any project that involves the generation of data about persons beyond that which is necessary for the person's well being. This includes non-invasive methods such as: surveys, interviews, observations of, or field work with, individuals, administration of psychometric and other tests, examination of records, and exercise testing. It may also involve invasive procedures, such as blood sampling, tissue sampling, and insertion of cannulae.

A **Researcher** is an Exhibitor, or assistant, who collects data or information and is involved in research activities involving humans.

A **Participant** is a person, who by virtue of his/her participation in a data-generating situation or activity, is a source of primary data, and bears any risk as the research is being carried out.

A **Supervisor** is an adult who is responsible for ensuring the safe and ethical production of projects dealing with human and animal subjects.

PROJECT DISPLAY SAFETY

Read and follow these safety requirements carefully when preparing your display for the fair!

The safety inspection team will check all projects after they are set up. (Not applicable during a virtual fair.)

Those not meeting the WWSEF regulations will need to be corrected before they are accepted for display and judging.

The judges evaluate work that is already completed. Therefore, you do not need to demonstrate exactly what you did; you just need to describe it.

The rules and guidelines listed below are based on those used by Youth Science Canada.

General Safety:

Safety is an essential part of the WWSEF. Precautions must be taken to ensure that no serious personal injury, property damage, or legal action could result.

1. Moving parts such as belts, gears, pulleys, and blades must be appropriately attached and shielded.
2. Motors must contain safety shut-offs.
3. Remove, or otherwise protect, all sharp edges or corners of prisms, mirrors, enclosures, glass and metal plates, etc.
4. No compressed gas cylinders are allowed; partial vacuums will be assessed on site by the safety inspection team.
5. Keep hoses and/or extension cords within your display space to eliminate tripping hazards.
6. Aisles and exits must not be obstructed.
7. Projects containing materials and/or equipment that may be hazardous will be restricted to supervised demonstration during judging. At other times, these materials and/or equipment must be stored at the command centre.
8. Remote controlled devices, robots, flying devices, and those launching projectiles are not to be activated except with the permission and direct supervision of fair officials.

Fire Safety:

Fire extinguishers of the proper size and rating will be available in the exhibition area.

1. Open heat sources are not allowed. (flame, candle, torch, hot plate, etc.)
2. Excessive packing material under the table must be contained.

Electrical Safety:

Allowed: Dry cells (Alkaline, NiCad, NiMH, Lithium Ion, etc.) and sealed lead-acid batteries (gel cells).

The following are not allowed.

1. Inappropriately grounded electrical plugs or sockets.
2. Modifications of CSA approved electrical equipment.
3. Wet cell batteries such as lead acid.

Notes:

Electronic equipment created by exhibitors are permitted if they have:

1. As low a voltage and electric current as possible.
2. A non-combustible enclosure.
3. An insulating grommet at the point where the electrical service enters the enclosure.
4. All exposed terminals must be covered.
5. Pilot light to indicate when the device is powered.

Chemical Safety:

The following are not allowed.

1. Toxic, corrosive or flammable chemicals.
2. Drugs (both over-the-counter and prescription), cleaners and solvents.

3. Radioactive sources and materials (for example, smoke detector sources).
Notes:
1. For #2 & #3 above, an original empty container can be used as a substitute in your display.
2. The use of substitutes is mandatory. They should be clearly labelled with the name of the substance they represent and the word "simulated". Use food colouring and water to simulate chemicals if necessary.

Biohazard Safety:
The following must be in sealed containers:
1. Soil containing organic material.
2. Cultures – Petri dishes containing media, Ziplocs with spores, etc.
3. Cell or tissue samples (including blood and blood products, except on sealed microscope slides)
Note: Biological toxins are not allowed to be on display. – use and label a substitute.

Images of Humans:
1. The project display may include pictures of participants if prior permission has been obtained and is available for judges to check.
2. *Not allowed*: Any device that senses/scans humans so that personal biological and/or other information is compromised.
Note: Projects dealing with forensic science topics must preserve the anonymity of any human victims, and project displays must avoid sensational or gratuitous, macabre images.

Animals and Animal Parts:
1. Live animals or micro-organisms are not allowed. *Note*: Items naturally shed by an animal or parts properly prepared and preserved (e.g. quills, shed snake skin, feathers, tanned pelts and hides, antlers, hair samples, skeletons or skeletal parts) are acceptable.

Firearms, Hazardous Materials, and Equipment:
The following are not allowed.
1. Firearms, ammunition, dangerous goods, or explosives. The manner in which such materials were used in a project may be conveyed through text, photos, video, computers or simulation.
2. Images of humans or animals that have been injured by the use of firearms or explosives shall not be displayed. Such images are deemed unsuitable for general public viewing and do not contribute to the scientific value of a project.
3. X-ray or hazardous radiation-producing equipment.
4. Radioisotopes or compounds containing radioisotopes that emit activity levels above normal background.