

Mount Washington Valley Youth STEM Expo

Rules & Guidelines

The goal of the Mount Washington Valley Youth STEM Expo is to inspire young people to *explore*, *experiment* and *innovate* using science and technology and to encourage scientific inquiry and pursuit of a project of scientific experimentation, investigation or engineering design.

General Project Requirements:

For all STEM Expo projects, students are expected to state a question and work to find an answer through experimentation or investigation using the Scientific Process (fair test) or to define a problem and design a solution using the Engineering Design Process (invention). Students will present their work by preparing an academic research poster. Effective research or design posters should summarize your research or design process and briefly but effectively communicate your results and what was learned. A suggested format includes:

- A Goal, which should
 - State a question or problem
 - propose a hypothesis or solution
- A Plan, which should include
 - Your methods or procedure
 - Relevant materials and equipment
- Results and Analysis, including
 - Relevant data collected
 - Analysis – trends, patterns, anomalies, errors, new questions for future research, etc.
 - Concluding statement about what was found
- Communication
 - Research Poster
 - Interview
 - Lab notes or a lab report, including research and sources

Project entries must:

- Be new research projects done in the current school year.
- Be entirely the work of the individual student or team. Team members will be addressed and scored on individual participation.
- Be original work. Plagiarism will result in disqualification.
- Follow the Scientific Inquiry Process or the Engineering Design Process and seek an answer to a question or solution to a problem. Demonstrations or models will not be allowed.
- Follow Academic Research Poster guidelines outlined in this document

Academic Research Posters

Research Posters are widely used in the academic community, and research conferences. Effective research posters summarize research and results concisely and attractively to help publicize it and generate discussion. A poster is usually a combination of brief text mixed with tables, graphs, and

pictures. At the STEM Expo, the researcher stands by the poster display while other participants and judges can come and view the presentation and interact with the author.

Categories

Students can enter projects in any of the following categories:

1. Behavioral & Social Science
2. Computer Science & Robotics
3. Earth & Environmental Sciences
4. Flora & Fauna
5. Energy & Space
6. Inventions & Innovation
7. Physics
8. Biology
9. Chemistry
10. Food Science
11. Electricity & Electronics
12. Behavioral & Social Sciences

Project Display Guidelines

Students must adhere to all display guidelines provided in this manual. If the MWV Youth STEM Expo Committee considers the presence or operation of any equipment or material to be dangerous or unsafe, it shall have the right to prohibit the presence or operation of such equipment or material. Exhibitors may demonstrate the safe use of materials through photographs, videotapes, charts, diagrams, and other simulations. During judging and exhibition times, students must remain with their projects. Cell phone use is not allowed during judging.

- All STEM Expo participants must attend to the safety aspects of their projects as follows: Projects must fit into a 40" x 26" table space.
- Wall space for posters is not available. Design your exhibit so that all posters, charts, and displays are free-standing.
- Mercury thermometers are prohibited.
- Knives and other sharp objects may not be displayed.
- Microorganisms may not be displayed.
- Drugs, over-the-counter medications, antibiotics, and vitamins may not be displayed.
- All power-driven parts must be suitably guarded to prevent unauthorized or accidental access.
- Access to electrical outlets is limited, so please bring a heavy-duty/three-pronged extension cord. Details will be collected from you and your group about your need for access to an electrical outlet
- All exhibits that require an external (non-battery) source of electricity for operation must be designed for a standard 110-125 volt AC supply.
- Bare wire and exposed knife-type switches are permitted on 12-volt DC circuits or less. Approved standard enclosed switches are required for all other electrical installations.

- Wet-cell batteries with open tops are not permitted. Closed-cell or dry-cell batteries are permissible.
- The operation of high-pressure vessels and pressurized systems is not permitted. There must be no open flame, torch or burner in the display area.
- All microwave and radio frequency sources must be designed and operated in compliance with state and federal regulations and applicable standards of the American National Standards Institute.

Research Restrictions - For Safety Reasons, all projects must observe the following restrictions

1. The following subject areas are not allowed at any stage of the project under any circumstances.

- Ingestion or inhalation of any substance by human subjects
- Recombinant DNA
- Hazardous chemicals -See OSHA List of Hazardous Chemicals
- <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.119AppA>
- Compressed gas (including, but not limited to CO2)
- Explosive chemicals
- Hazardous substances or devices (including, but not limited to BB guns, paintball guns, potato cannons, air cannons)
- High voltage equipment
- Highly toxic chemicals
- Lasers (any strength)
- Ionizing radiation X-rays or Radioactive materials

2. The following subject areas **may be** allowed on a **limited basis** with the approval of the Safety Committee and subject to the following restrictions.

- Human Projects
- Nonhuman vertebrate animals and tissue cultures
- Biological or potentially pathogenic agents
- Controlled substances
- Human Subjects - All projects involving human subjects are prohibited except for the following.
- Anonymous survey-based projects (may not collect personal data or pose health risks)
- Noninterfering behavioral observations in a public setting
- Nonhuman Vertebrate Animals and Tissue Cultures - Projects involving vertebrate animals (alive, dead, parts, tissues, etc.) and their parts are not allowed except the following.
 - The use of meat or meat by-products obtained from stores, restaurants or packinghouses animal hair obtained through normal bushing procedures
 - Observations of normal animal behaviors in a non-interfering manner.
 - Plant tissues
 - Established cell and tissue cultures (e.g., obtained from the American Type Culture Collection). The source and catalog number of the cultures should be identified in the Research Plan
 - Biological or Pathogenic Agents - disease-causing or potential disease-causing

organisms such as bacteria, viruses, viroids, prions, rickettsia, fungi, mold, and others are not allowed. Organisms collected, isolated, and/or cultured from any environment (e.g., air, soil) are considered potentially pathogenic and experiments using these procedures will not be allowed. Raw or partially processed human/animal waste is considered to contain potentially pathogenic agents.

The following categories may be exempted on a limited basis under the supervision of a qualified mentor in an appropriate lab setting, including

baker's yeast and brewer's yeast, except when involved with rDNA studies • *Lactobacillus*, *Bacillus thurgensis*, nitrogen-fixing, oil-eating bacteria, slime mold and algae-eating bacteria introduced into their natural environment (not exempt if cultured in a petri dish environment that could potentially be contaminated);

studies of mold growth on food items if the experiment is terminated at the first evidence of mold
Research using manure for composting or other non-culturing experiments and fuel production.

* Controlled Substances - include DEA-classed substances, prescription drugs, alcohol and tobacco.

Approval - All such projects must obtain approval from the MWV Regional STEM Expo safety committee before beginning research. To receive Safety Committee approval, students must submit the following: A copy of the research plan and copies of any standardized or student-prepared tests or surveys. Please email the above materials to the MWV Regional STEM Expo Safety Committee c/o Emily Calderwood (e_calderwood@sau9.org)

Please refer any safety questions or petition for exceptions to the above rules to MWV Youth STEM Expo Review Committee: Emily Calderwood (e_calderwood@sau9.org)