

2023 STEM Fair Guidelines and Judging Criteria

Here are some guidelines for the 2023 STEM Fair, including further explanation of the 4 qualities to be assessed by the judges: Creativity, Thoroughness, Clarity, and Student Independence.

Cleanliness and Logistics

These projects will be displayed in the same Gym which the students will use the next day for P.E. and Lunch. Any components brought in to illustrate the project results should not be prone to making messes. Projects will be placed on cafeteria tables for display and should not require any special accommodation like floor-space.

The Principle of the Class Gradient

Each project will be assessed for the 4 qualities described below. However, it should be understood that there is a gradient for each class level. That is, Kindergarten projects would not be expected to demonstrate a large amount of any of these qualities as they are just learning about the process; Fifth graders would be expected to demonstrate a great deal more of each quality given their level of education. The judges will take this into consideration as they review the projects. Ideally, students at all levels should be having fun while stretching themselves to learn something new by this experience.

Judging Criteria for Smith STEM Fair 2023

- **Creativity**

The most creative projects are those that are new and different, that not everyone else is doing too, and that are more than the use of a pre-packaged kit. If the project starts with a kit or a common idea, creativity can be demonstrated by doing more, taking it to the next level, or taking the investigation in a different direction than the provided directions. Creative projects should definitely consider real-world applications and solutions. For example...

In Science: Rather than simply using a crystal growing kit, use house-hold materials to make your own setup, try using or comparing different materials to grow crystals, or investigating different conditions. Choose a scientific concept that has personal meaning for you.

In Technology: Rather than using a game or application you coded during an after-school program, apply the lessons you learned to develop a new game. Demonstrate creative thinking by creating applications to solve problems in a different way than we currently solve them or by tackling problems we haven't yet solved.

In Engineering: Rather than simply building a circuit or a mechanism from a kit, or one created for another class or organization, experiment with adding complexity to the existing build to make it do more than originally designed or invent something entirely new.

In Mathematics: Rather than replicating other math games and puzzles you have played, demonstrate creative thinking by combining ideas in a new way or experimenting with new concepts that you've never tried before.

- **Thoroughness**

A thorough project reflects that the student thought about the entire process from planning to execution to data collection (if appropriate) to reporting of results or providing instructions for the use of an invention. Materials lists, hypotheses, methods of investigation or design, test and analysis and other traditional elements of the scientific method and technological development do not have to be called out specifically as they have in years past but should be incorporated to indicate a student's grasp of the process.

- **Clarity**

Clarity refers to the orderliness of the materials offered for critique. A tri-fold board which is visually appealing, easy to read, and enables a viewer to quickly understand the nature of the problem, the plan, and the results should score well with regard to clarity. A product or mechanism which is visually appealing and functions as designed should score well with regard to clarity.

- **Student independence**

All projects should reflect the work of the student or team of students involved. Most students are inspired by a mentor – a teacher, friend, or family member – who share an interest in a STEM field and may even have expertise in one of those fields. In order for all the students to get the most out of this project experience, it is important that mentors merely guide and inspire and let the students do all the “dirty work” (except where safety is a concern, of course). It is one thing to show them how and another to do it for them and we trust our parents and mentors to encourage our students to do it for themselves! In this age of computers, it is often encouraged (rightfully so) that our students use computers as a tool to type their explanations and produce data charts and graphs. It is certainly easier and cleaner and in the interest of clarity! Of course, it does make it harder for a judge to discern who is doing the typing and data analysis. Therefore, anything you can do to illustrate the student's independence in producing the materials presented at the STEM Fair would be most appreciated. Again, younger students are encouraged and older students are required to stand with their project during the judging in order to answer any questions and demonstrate their personal grasp of the lessons learned.