Exhibit Registration and Regulations
2017

All information needed to prepare an outstanding STEM fair Project can be found in STEM fair Instructional Packet. Special attention should be given to the important Dates page of this packet.

Who can Participate?

- Students-
- Elementary thru High School
- Anyone in Heartland community
- Excepting.....Elem(10 students), Middle (10 students), High(10 students) only

    - All students in Elementary, Middle, and High School grades are required to complete a STEM fair project. All projects will be judged by a community of judges.
    - Each participant must complete either a science or an engineering project
    - All projects must be completed independently by the student. Partnered projects will be allowed allowed. Only minimal adult assistance is allowed. Projects are to be completed at home.
    - All projects will be judged by community judges. No names or identifying pictures should be on the front of the display board or on the journal. Participants must put their name on the back of these items. Students should be prepared to deliver an oral presentation explaining their projects to the judges.
- Awards will be presented to the students whose projects the judges deem best at each grade level.
        - First, Second, and third place in each of the following areas:
            - Biological Science, Consumer Science, Health and Behavioral Science, Physical Science, Innovation, and Engineering.
    - Students who win will be featured in Heartland newsletter and possible local news.

What are the Rewards?

Rewards: 1, 2, 3rd place winners in each category for Elementary,Middle, And High School including Tablet, Drone, Cowboy Ticket, Walmart Gift card, sonic card, and featured in the news

What are the requirements of each project?

Requirements:

Tri-fold presenting a innovative project with scientific research, a research project that gives details of its hypothesis and conclusion using the Scientific method, or an engineering concept that assist with everyday human need that will explain the Engineering design process.

Go to https://www.sciencebuddies.org/science-fair-projects/project-ideas/list
for any help with ideas to use. The more innovative or detailed researched the better the chances of winning cool prizes.

STEM fair Oct. 28, 2017
Informational Packet Contents

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Engineering Design Process Display Board

Important Dates

Sept. 7: Registration for STEM fair begins

Oct. 6 : Category and Question (Science) or Problem (Engineering) Due Send your parent approved project to s_i@steminnovations.org Must include Hypothesis (Science) or Problem (Engineering) with project title

Oct. 13: acceptance letters will be sent via email

Oct. 27 All grades STEM fair Projects are Due (including journal and Display board)

Location: Gym
Time: Oct. 27, 2017 @ 4pm

Oct. 28: Participant and parent lounge viewings scheduled during event.

3:00pm Judges will evaluate

4pm Judges announces winners

Rules for Projects

Students must construct all projects independently, with minimal assistance from adults
The project must be an original project, not reused from previous years
Project involving starvation or cruelty of any kind to animals or humanity will not be permitted.
****Projects involving dangerous chemicals and explosives will not be permitted.

Rules for displays

Emphasis should be placed on communicating the details of the students work. The fair is not for demonstrating. The use of graphing, photography and summaries are encouraged. The use of props is discouraged

Maximum table space for an entry is limited to the height of four feet above the top of the table. Space limit is three feet across the front and twenty-eight inches front to back. All posters and charts must be contained within the allotted space. No projects may be place upon the floor.

Live animals, plants, bacteria, or fungi will not be permitted in any display. This includes potted plants, mold, spoiled food, etc. The use of photograph and graphing is encouraged.

All wiring switches, and metal parts that carry potentials of 100 volts or higher, such as in radio and electronic apparatus, must be located out of reach of observes and properly insulated. This rule is essential to prevent serious electric shock.

If batteries are used, they must be sufficient to maintain operation throughout the time of the fair, at least four hours.

No open fires will be allowed.

ANY PROJECT THAT DOES NOT ABIDE BY THESE RULES WILL DISQUALIFIED.

CATEGORY DESCRIPTIONS

Your STEM fair project must fall within one of these five categories.

Biological Science:

Projects with plants, animals, fungi, bacteria, or protozoan as subjects. Topics include ecological relationships and environmental problems related to organisms.

NO LIVE ORGANISMS ARE ALLOWED AT THE STEM FAIR! This includes live plants, mold, spoiled food, etc. Your project may involve a live organism; however, the organism cannot be brought into the stem fair.

Consumer Science:

Projects with consumer products as subjects. Topics include comparison testing, consumer psychology, environmental impact, and waste management.

Health and Behavioral Science:

Projects involving the health or behavior of humans or the behavior of other organisms. Topics include, but are not limited to, hygiene, mental health, learning, social interactions, environmental health problems, and the behavior of organisms.

Physical Science:

Projects dealing largely with non living, materials. Topics include, but are not limited to physical and chemical changes of matter, geology, astronomy, energy, electricity, magnetism, heat, light, and sound

Engineering Design:

ANY ENGINEERING PROJECT WILL FALL INTO THIS CATEGORY

Projects that create a solution to a problem or need. Topics include designing, building, analyzing, modeling or improving a device. Testing and creating materials is also engineering design.

** Electrical Access: If your project requires electrical access, you will need to bring your own extension cords and duct tape.

Project Requirements

You may choose to do a project following the scientific process or by following the Engineering Design Process. For either, follow the basic steps that are provided in this information packet and document your work in a science notebook. Keep a timeline of your work. This is your daily journal of events as you study and learn about your project. Plan ahead. Don't wait until the last minute. Provide your notebook as part of your project display and use it as a resource during your interviews. The notebook is a requirement on the judging rubric.

Scientific Process:

1. Ask and Select a testable question. This a a question yet to be answered.
2. Learn about the testable question. Do research at the library, online, or talk to a professional. Record your research and data in your science notebook.
3. Develop a hypothesis. Use what is learned from the research to predict and answer the question
4. Identify and state the variables
5. Design an experiment. Carefully plan a test of the hypothesis. It must use comparisons and measurements with the correct units.
6. Collect data. Do the experiment! Take the measurements. Draw and label the graphs and complete summary tables. Identify the units for each axis.
7. Draw a conclusion. Compare the results of the data collection with the hypothesis. Was the hypothesis supported?Can what happened be explained? What was learned? Upon reflection, did your thoughts change? What would you change the next time?
8. Construct a display. (trifold)
9. Practice your presentations. Do not just memorize it. Be able to talk about your project. Look the judges in the eye. Practice in the mirror or with people who know nothing about the project. Refer to your science notebook and explain the process, data and results to the judges.

Engineering Design process:

1. Define the problem. After narrowing down your interests to one problem, explain the problem.
2. Learn about the problem. Do background research about the problem, gathering possible solutions and existing solutions to similar problems.
3. Specify requirements. Your problem's solution must do or perform certain ways. List these as performance items. How well will your solution work?

4. Create alternate solutions. There has to be a least three ways to solve your problem. You Will choose one based on your capability, costs, time and knowledge.
5. Build a prototype. Choose a solution from Step 4. And build your model to show how your solution solves your problem.
6. Test and redesign as necessary. While building your prototype, or after you've evaluated your prototype, change and retest to get a better result. Keep in mind your requirements from STep 3; these should not change very much.
7. Construct a display. You need to communicate your results.
8. Practice your presentation. Do Not memorize it. Be able to talk about your project. Look the judges in the eye. Practice in the mirror or with people who know nothing about the project. Refer to science notebook and explain the process,data and results to the judges

Displays

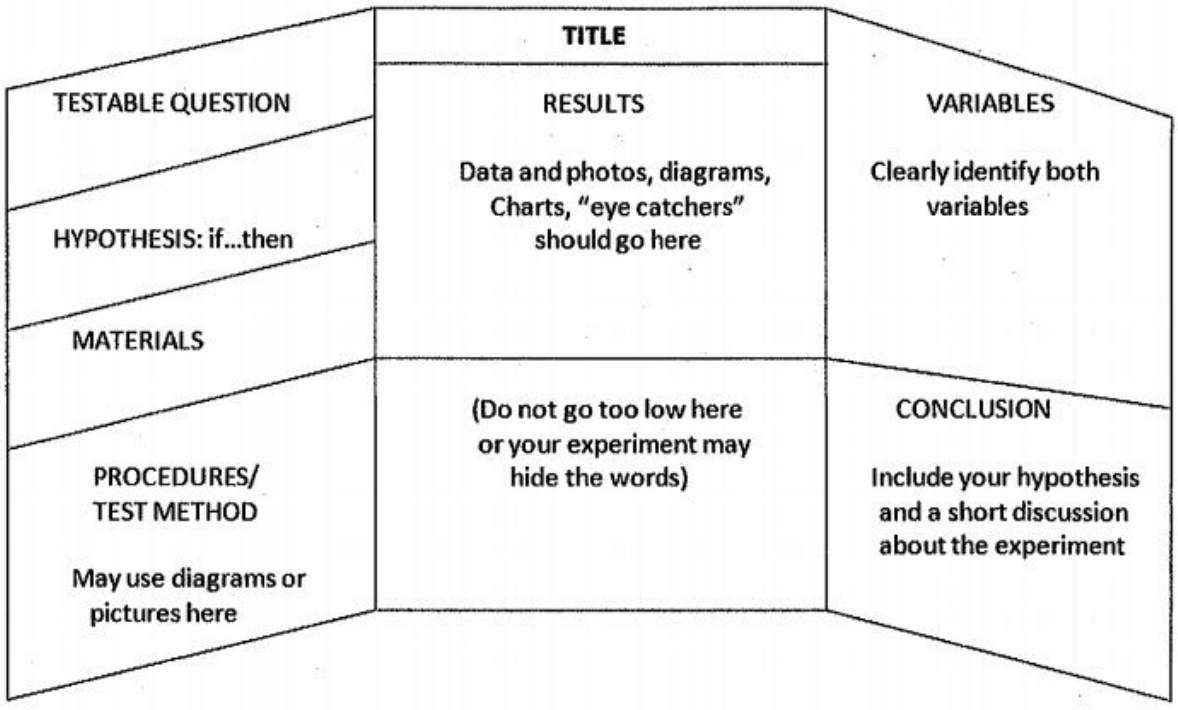
Scientific Process Criteria

This criterion should be documented on the exhibit and in your notebook.

Scientific Process:

- Title
- Testable question
- Background research
- Hypothesis (use an "If...then" statement)
- Variables. Clearly identify the **independent** (manipulated) and the **dependent** (responding) variables.
- Materials
- Procedures including measurements and comparisons
- Results (data in a table, chart, and/or graph form with corresponding units)
- Conclusion (supported or not supported)

Scientific Process- Display Board Template

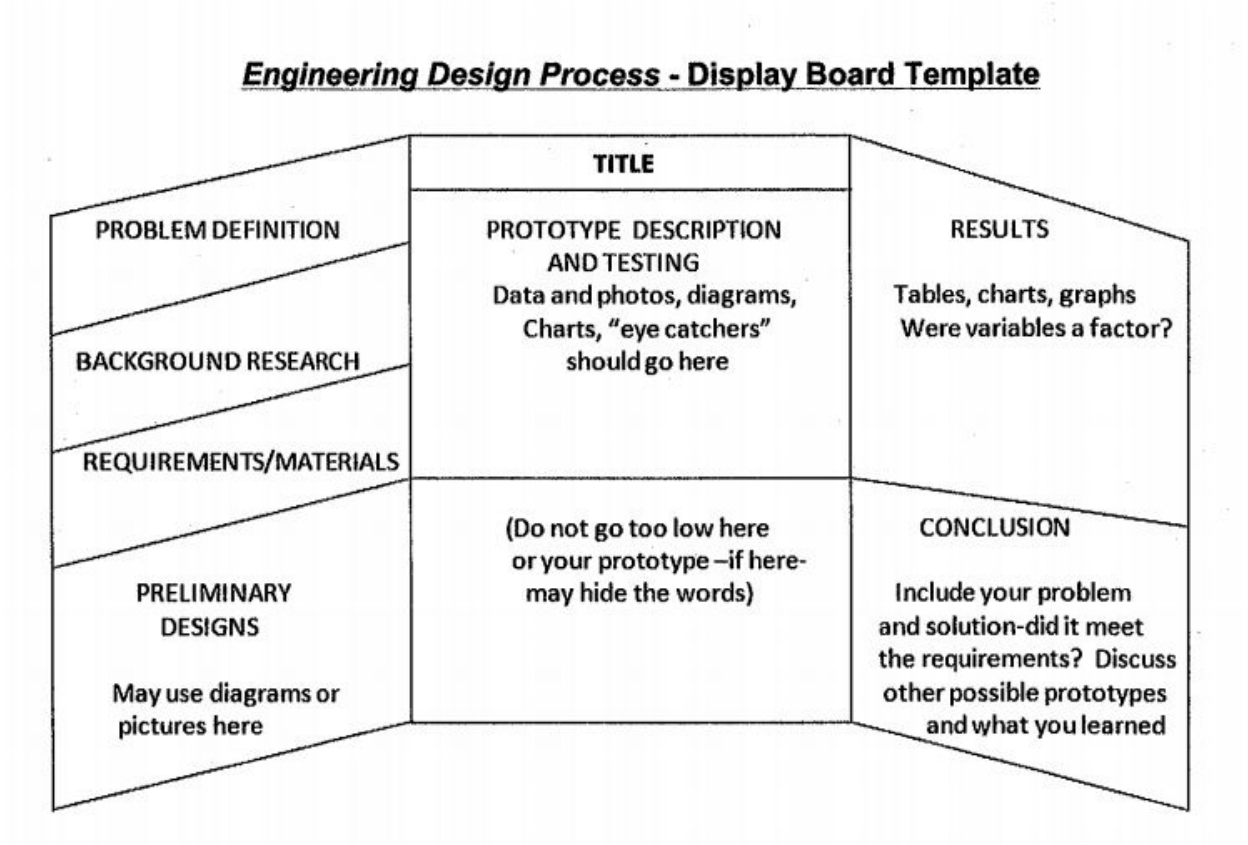


Independent Variable: What I change

Dependent Variables: What I observe

Controlled Variables: What I keep the same

Engineering Design Displays



Engineering Design Process Criteria

This criterion should be documented on the exhibit and in your notebook.

Engineering Design Process:

- Title
- Problem Definition
- Background Research
- Requirements/Materials
- Preliminary Designs
- Prototype Description and Development (redesign, test methods)
- Results (tables/charts/graphs)
- Conclusion (Did the solution meet the requirements?)