Morningside STEM Fair 2016--5th & 6th Grade Guidelines
Projects Due: Tuesday, January 19, 2016
Judging: Wednesday, January 20, 2016

Welcome to STEM Fair at the 5th and 6th Grade level! At this level, your hard work can pay off with a trip to the District or even the Regional STEM Fair. All kinds of Science, Technology, Engineering, and Math projects are eligible to participate in the Fair. Every year, our judges are amazed at the interesting, creative, curious, independent projects our 5th and 6th graders create. We can't wait to see yours!

Following is a bit of information about the process of the Fair at this level, as well as guidance about topic selection, safety rules, and the difference between experimentation and engineering design projects (also welcome, just follow different guidelines). The Morningside General STEM Fair Handout, available electronically from your teacher, or on the school website, also has useful guidelines about the Scientific Method and suggestions about websites with topic ideas. Still have questions? Just ask!

• The regional science fair is REQUIRING that students get pre-approval for their project BEFORE beginning experimentation. This is a prewrite of your student's project, and will require time and signatures (including from supervising scientists, in some instances) to complete. This blue form was given to your student in class and must be returned to your teacher by **Wednesday, January 6, 2016.**

• The top projects from both Morningside Elementary (up to 20 projects) and Morningside Magnet (up to 20 projects) will submit a VIRTUAL project to the Granite School District for consideration for the District Science Fair on February 10, 2016. The virtual project will be due at the District (electronically) on **February 1, 2016, by 3PM**. Details are included in this packet. I encourage students to prepare their poster using the computer (Powerpoint is the easiest format) so those files can easily be used for the Virtual Fair.

• Virtual projects chosen by the District will participate in the District Science Fair, in person, on February 10, 2016.

• At Morningside, we follow all district and regional Fair safety guidelines. Highlights are included on the following pages of this handout. Projects which do not meet safety guidelines will not be eligible for Morningside judging. Additional rules need to be followed if you are experimenting on humans or animals. You *must* have one human consent form per participant, *with appropriate signatures*, where applicable. This form follows.

• The District is really encouraging originality in projects – see the extensive list of "What NOT to DO" in this packet. This is not meant to discourage you, but rather to encourage you to be innovative and scientifically engaged. If you are interested in a topic on the "What NOT to Do" list, make sure you take a unique angle and have a well-created project with a single variable and many trials.

• Included in this packet are the judging guidelines. We will judge the Morningside projects with the "GSD In Person Fair 2016 Rubric". Review this as you complete your project in order to be sure to address all of the required elements. We are encouraged by Granite School District to only send projects to the Virtual Fair that have a score of 90 or above. I have also included the judging guidelines for the Virtual Projects so you know what to expect from this process.

• The ONLY items which should be brought to school for the Science Fair are the project board (blank boards will be available from Lisa in the office in January) and the project log book. Photos and written/verbal descriptions of experiments are terrific! But NO EXPERIMENTS SHOULD BE BROUGHT TO SCHOOL. This is for safety reasons. Any experimental items that are brought to school will be disposed of immediately.

• All district information is available on the Granite District Science Fair website. Click on the "GSD 2016 STEM Fair Handbook" for more complete information. (Subsequent pages of this handout are from the District Handbook.)
http://www.graniteschools.org/curriculuminstruction/science-k-12/science-fair/

Please don't hesitate to contact me with any questions. We look forward to seeing your projects in January!! Happy Experimenting!!

Shayna Barney
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801-803-9035 (cell)

Is it OK to do a project about…?

For the safety of the students as well as following all the guidelines at the Regional and International Fairs, here is a quick guide to avoiding problems with your projects.

1. I want to have PEOPLE be a part of my project.

No-Skip to #2

Yes-You will need to have every person fill out a consent/permission form if you are having them (pg 24):

Eating/drinking something

Asking them survey questions

Doing something physical like running, jumping, walking

2. I want to have ANIMALS be a part of my project

No-Skip to #3

Yes-To avoid animal cruelty, any project with animals other than observing behaviors of pets needs a vet's signature before beginning. See page 13 and 15

3. I want to have BACTERIA/MICROBES/FUNGUS be part of my project

No-Skip to #4

Yes-You CANNOT grow bacteria at home or at elementary school. See page 13 and 15 of this handbook. Stephanie Wood can help you find a lab to grow bacteria. swood@graniteschools.org

4. I want to have WEAPONS/HAZARDOUS CHEMICALS/FIRE be part of my project.

No-Skip to #5

Yes-You will need to check with your teacher, school STEM Fair coordinator and Stephanie Wood for pre-approval. If you aren't sure if it's a hazardous chemical, call Stephanie Wood

5. My project idea is on the "Not Recommended" list on pg 21-is that ok?

Those projects are usually not competitive enough to make it to District or Regional fairs but yes, you may do one.

Rules for Experiments Involving Animals

Student projects that use living organisms (excluding plants) must follow these guidelines:

1. Behavior observation studies or supplemental nutritional studies involving pets may be done at home. Any other experiments involving laboratory animals (rats, mice, hamsters, gerbils, rabbits, etc) cannot be conducted in a student's home. Proper animal care must be provided daily, including weekends, holidays and vacations. Experimental procedures that cause unnecessary pain or discomfort are prohibited. Experiments designed to kill vertebrate animals are not permitted. Experiments with a death rate of 30 percent or higher are not permitted.
2. A veterinarian's signature is required of all projects with vertebrate animals (except behavior observations of pets).

Rules for Experiments Involving People

1. Experimentation on humans must conform to the same regulations as other animals. Human studies (including surveys, taste testing, and physical exertion) **must have prior approva**l from the mentor teacher or district science specialist **and permission slips signed** by the participant and the parent/guardian.

Rules for Experiments Involving Pathogens (including bacteria cultures)

Culturing Bacteria: Bacteria/Fungus may NOT be grown at home or at an elementary classroom. Pathogenic bacteria experimentation is prohibited. Other bacteria experiments must have sealed Petri dishes. As part of the project, the student should have a plan for disposal. Must be done in a BSL 1 or 2 lab (the GTI offers its lab as a location for growing bacteria). Projects not following this guideline will be disqualified.

Projects Not Recommended

Projects should be experiments or engineering design projects, NOT demonstrations and should reflect the student's own work and ideas. The following list outlines topics that are commonly seen at STEM Fairs and *are not generally competitive enough to win awards*. Chances are if you got the project in a book or on a "Science Fair project website" it may not be competitive to make it. Use caution in using a project online for inspiration—there is a difference in getting an idea from another project and just copying someone else's work! (If you use an online project, consider asking a different question, or adding a layer of experimentation.)

- Effect of music/talking/colored light/different liquids on plants
- Effect of cola, coffee, etc. on teeth; tooth decay, coloring, etc.
- Effect of running, jumping, music, video games, movies, etc. on blood pressure
- "Which brand is best?" -- (which popcorn pops better, which soap, fertilizer, which paper towel, battery, laundry soap etc.)
- Basic maze running
- Any project which boils down to simple preference; what do girls/boys/cats/dogs like better...
- Effect of color on memory, emotion, mood, how food tastes etc.
- Optical illusions (including stroop effect)
- Reaction times in general and distractions effecting reaction speed
- Many male/female comparisons, especially if bias shows
- Basic solar collectors, or "build a kit models"
- Music/video games/sleep amount affecting learning
- Taste/color or paw-preferences of cats, dogs, fish etc.
- Ball bounce tests with poor measurement techniques
- Magnet demonstrations (or hot/cold magnets)
- Fingerprints and heredity
- Hovercraft design
- Growing bacteria from doorknobs, student's hands, places around the school, etc (also hand sanitizer tests).
- Memory Tests
- Types of Insulation effectiveness
- Coke & Mentos/volcanoes

Projects we DO need more of:

Computer science

Mathematical applications

Engineering

The Process for an Engineering Project

Select a Topic
Read magazines, make observations, ask people about challenges or problems that they have to gather ideas for an engineering project.

Purpose
Define the need or the problem that you want to address in the project. What or who will benefit from your project?

Research
After you have chosen a problem or a need research more about your topic. Come up with some questions related to your topic and search for the answers. Then write a paragraph about what you learned. Why is your idea needed? Why is your version better than others you researched?

Design Goal
Use what you learned from research to develop a possible solution to your need or problem. Describe your design idea in detail, including materials you will need and costs.

Build, Test, Revise
Start by following your design goal, then make adjustments to your prototype after you have tested it. You will probably have to go through several cycles of building, testing, and redesigning. Be sure to record all of this process.

Design Solution
Once you have a prototype that addresses your need or problem, you need to develop a materials list and procedures for creating the final prototype.

Conclusion
Share what you learned from your experiment in your conclusion. Be sure to explain how your design effectively solves the problem, or meets the need.

Informed Consent Form

Grades 5-12: for projects testing/surveying people

This form must be signed by the parents or guardians of all subjects who are under 18. Form kept by STUDENT in Project Data Book

Student Researcher's Name_____

Title of Project _____

Adult Sponsor _____ Phone _____

Your child has been asked to participate as a subject in a STEM Fair project. The purpose of this form is to notify you of any possible risks and obtain your permission for him/her to participate. The student researcher will be supervised and any surveys or questionnaires should be attached to this page. (This project has been reviewed and approved by an Institutional Review Board. If you have any questions, please contact the Adult Sponsor listed above)

To be completed by the student researcher:

1. What will you ask the subjects to do?

2. Will your subjects be eating or drinking anything? No _____ Yes _____

If yes, what will they eat or drink? _____

3. Will your subjects be doing any kind of exercise? No _____ Yes _____

If yes, what will they do? _____

4. Will your subjects be answering questions or completing a survey? No _____ Yes _____

If yes, please attach a copy of the questions to this page.

To be completed by the subject prior to the experiment:

_____ _____ _____

Subject's Name Signature Date

For subjects under 18 years old, a parent/guardian must give permission for participation:

I understand what my child will be doing and am aware of any possible risks.

_____ _____ _____

Subject's Name Signature Date

_____

Project's Adult Sponsor (Most likely the classroom teacher)

2016 GSD Virtual STEM Fair Judging Rubric

The Question (up to 10 points) An excellent question will be interesting, creative, worded scientifically and relevant to the world today. You should also include your thought process and preliminary research on why you selected the question. (250 Word max, no pictures on this slide)	
Hypothesis (up to 10 points) An excellent hypothesis will lead on from the question, be tightly focused and build on existing knowledge and be testable. (An Engineering/Invention project will have a design goal instead of hypothesis). A hypothesis should be a concise sentence or two (no pictures on this slide/page).	
Research (up to 10 points) Excellent students will undertake research to help them shape their question and hypothesis and to put their work into a relevant, real-world context. (Engineering/Invention show research how new product will meet a need better than an existing product, how it fills a need). (500 Word max, no pictures on this slide/page)	
Experiment (up to 30 points) Excellent students will demonstrate that they have used good experimental techniques and describe their experiment clearly and in detail. Multiple trials are an expectation of good experimentation. (Engineering/Invention should show schematics, assembly information, refining of design, prototyping) (summary explaining the procedures, variables, materials, & testing/experimental trials. Pictures are very appropriate on this slide/page-multiple slides/pages OK).	
Data/Observations (up to 20 points) -Excellent data will be relevant, sufficient to support a conclusion and should be recorded accurately and precisely, and be presented clearly. -Excellent observations will describe patterns or trends supported by the data. (Engineering/Invention project show evidence of testing, applications of invention) (multiple slides/pages OK to record data, charts, graphs, and lists are appropriate).	
Conclusion (up to 15 points) An excellent conclusion will explain how the experiment answers the question or why it fails to do so and whether or not it supports the hypothesis. (500 Word Max, no pictures on this slide/page).	
Works Cited (up to 5 points) Excellent students will acknowledge and provide clear references for sources of information that they have consulted and/or referenced and acknowledge any assistance received. Proper citation is in APA format-use Citationmachine.net (e.g. to find equipment and materials, to stay safe or to use unfamiliar equipment or techniques).	
Total	

GSD 2016 District STEM Fair Rubric

(This is the form Morningside judges use to evaluate projects)

Interview & Display (up to 15 points) An excellent student will be able to explain in detail their research and experiment designs as well as interpret charts and graphs. Students should be able to explain the significance of their findings, usefulness and new questions/experiments that may arise from their research.	
The Question (up to 10 points) An excellent question will be interesting, creative, worded scientifically and relevant to the world today. You should also include your thought process and preliminary research on why you selected the question.	
Hypothesis (up to 10 points) An excellent hypothesis will lead on from the question, be tightly focused and build on existing knowledge and be testable. (An Engineering/Invention project will have a design goal instead of hypothesis). A hypothesis should be a concise statement.	
Research (up to 10 points) Excellent students will undertake research to help them shape their question and hypothesis and to put their work into a relevant, real-world context. (Engineering/Invention show research how new product will meet a need better than an existing product, how it fills a need	
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Conclusion (up to 5 points) An excellent conclusion will explain how the experiment answers the question or why it fails to do so and whether or not it supports the hypothesis.	
Total	