2015

Science Fair Teacher Handbook

Updated November

http://www.graniteschools.org/curriculuminstruction/science-k-12/science-fair/

Time Line Checklist

☐ **Pre Approval-Students plan their projects and get approval before they begin. See pages 15-17.**

☐ Local School Fairs .....completed by
February 2, 2015

☐ Virtual Fair, projects must be uploaded by
February 6, 2015 3:00 pm MST

☐ Semi Finalists selected and notified by **February 11, 2015**

☐ District In Person Fair for Semi Finalists **February 19, 2015**

☐ U of U Regional Fair (Grades 5 – 12)……..
(For winners of the GSD In Person Science Fair).

Registration Deadline **February 27, 2015**
Fair **March 24-27, 2015**

Which Fairs? What if I win?

Round 1-School Fair: Each school can choose how to run their own fair. Some schools go class by class, others invite the entire school. Check with your school principal to find out who is in charge of the fair at your school. Schools may select up to 20 projects to send along to Round 2-Virtual Fair.

Round 2-Virtual Fair: This is the qualifying round for the District Science Fair. School Fairs narrow down the projects to only the very top quality, most competitive projects. Up to 20 projects per school may be registered for the Virtual Fair (if a school does not have 20 competitive projects, they should register fewer projects). Students will upload their online project to the folder on the District Server. Judges select the top 100+projects to move on to Round 3, the District Fair.

Round 3- District Fair: Participants of the District Science Fair are the Semi Finalists selected from the entries of the Virtual Fair by the judging committee. Approximately 100 projects (up to 40 elementary, up to 40 junior and between 20-30 senior) will advance from the Virtual Fair to the District Science Fair. Winners at the District Fair are eligible to participate in Round 4, the Regional Fair.

Round 4-Regional Fair: The top projects from the GSD District Science Fair will be sent to the U of U Regional Fair.

NOTE: GTI students. If a student attends the GTI, they must choose if they are registering from the GTI or from their home school, not both.

How to select winners to send to the Virtual Fair: Please use the same rubric as the district. Projects that are submitted to the Virtual Fair should be scoring between 90-100 points on the rubric. Discourage students from doing projects on the "Not Recommended" list on page 20 of this manual-they are generally not contenders for moving on to the District and Regional Fairs.

How do I get to the District and Regional Fairs?

1. You must get pre-Approval of your project BEFORE you start
Grades 5-8: Fill out the form on pg 15-16 and give it to your teacher. You must get approval and fill out the online form BEFORE you start your project.

Grades 9-12: You must get Regional Fair approval and fill out the form BEFORE you start your project. http://isef.slvsef.org

2. Win at your school fair and be one of the up to 20 projects from your school to be able to participate in the District Virtual Fair

3. Create Multimedia presentation that showcases/summarizes your project. You may use any software you choose, however the final product must be readable on a Granite District Computer. PowerPoint is an example of a software that every school has access to. Follow these page guidelines for each of the sections on the Rubric:

- Question –First page
- Hypothesis-Second page
- Research-(may use more than 1 page, word limit 500)
- Experiment-(may use more than 1 page, word limit 500)
- Data/Observations -(may use more than 1 page, word limit 500)
- Conclusion – (may use more than 1 page, word limit 500)
- Works Cited – (may use more than 1 page)

4. **Check that your file will run on a computer other than the one you designed it on.** Upload your complete presentation to the School Server. You cannot upload files from home; it must be done at school (you do not have access to the shared drive at home).

Save your project with this file name structure:

School Project Name.pptx

Example: Skyline UV Light and Self Healing Polymers.pptx

Your school fair coordinator will receive instructions on how to upload your project to the server. Work with your teacher or school technology specialist to make this easy. Do NOT wait until the last moment…

How your project gets to the Regional Fair

Round 1: I'm one of the up to 20 winners at my School Science Fair.

NO
Thanks for participating. Talk to your teacher about how you can improve things for next year.

YES
Great job! You need to get ready for the Virtual Fair. Create your Multimedia presentation. You need to save your project to district server by February 6, 3pm.

Round 2-Virtual Fair: After February 6, judges will review the projects submitted to the server. Approximately 100 projects will be selected as Semi Finalists.

My project was listed on the District Webpage on February 11 as a Semi Finalist at the Virtual Fair

NO
There were 100's of projects in the Virtual Fair and the competition was stiff. Review your project with your teacher to see if there were things missing from your project required on the judging rubric or areas that could have been strengthened. Refine your project and try again next year!

YES
Round 3-Great job! You are moving on to the District Fair! You need to get a display board ready for February 19th. Check with your teacher or school science fair coordinator for the time and address. Practice your presentation since you will have judges come interview you.

I won a Grand Award at the District In Person Science Fair on Feb 19th.

NO
Take a look at other projects for ideas, refine yours, try entering in some other contests as practice and try again next year.

YES
You are moving on to the **Salt Lake Regional Science Fair** at the U of U on March 24-27. You will be given a certificate with registration instructions.

What to do on the day of the Science Fair?

Virtual Fair-Round 2. This is entirely online. If you are selected by your school to participate, you will upload your work by February 6. If your project is a winner at the Virtual Fair, you may advance to Round 3, the In-Person Fair. Winning projects will be posted on the district website February 11.

http://www.graniteschools.org/curriculuminstruction/science-k-12/science-fair/

Virtual Fair winners: Award Certificates are emailed to school to print and distribute.

District Fair-Round 3. February 19, 2015. Held at the Granite District Office in the lobby of the 5-story building, 2500 S. State Street, Salt Lake City, UT 84115 (enter from State St. or Main St.)

Fair Schedule: Be set up and ready by the start of your session-5 minutes early is PLENTY. The room will be in use by the previous session, so you can't get in too early.

8:45 am 5th grade
10:30 am 6th grade
12:00 pm 7th and 8th grades
1:30 pm 9th – 12th grades

NOTE: Students only have to be at the fair for about 1½ hours; they should return to school after their projects have been judged.

Winners of District Fair posted online by 6:00pm on webpage
http://www.graniteschools.org/curriculuminstruction/science-k-12/science-fair/

District Fair Winners: *Award Ribbons will be sent to student's school, but will be available for pick up at the District Office on Feb 20th for those who would like them right away.*

Details about what happens on Science Fair Day, Feb 19th, 2015

Judging: Students will need to stay with their projects and be prepared to present / explain their projects in about 7 minutes to the judges. Each project will be reviewed by at least 2 judges. School mentors, students and parents should study the fair rules and criteria clearly so each are understood by all.

Students: They should plan on being with their project for about 1 ½ hours (plus or minus). They may want to bring a book or something to work on while they wait.

Parents: A waiting area will be set up near the fair; families are welcome to wait, but should not be in the project area during judging.

Awards: Winners at the District Fair will be designated as Grand Award Winners and eligible to participate in the Regional Science Fair. Ribbons for the Grand Award winners will be sent to the school or may be picked up at the District Office.

Removal of Projects: Students should take their project with them when the leave.

Damage or Loss: Neither the district science fair committee, the school mentoring teacher, or school sponsors assumes the responsibility for loss or damage to any exhibit, display or part thereof.

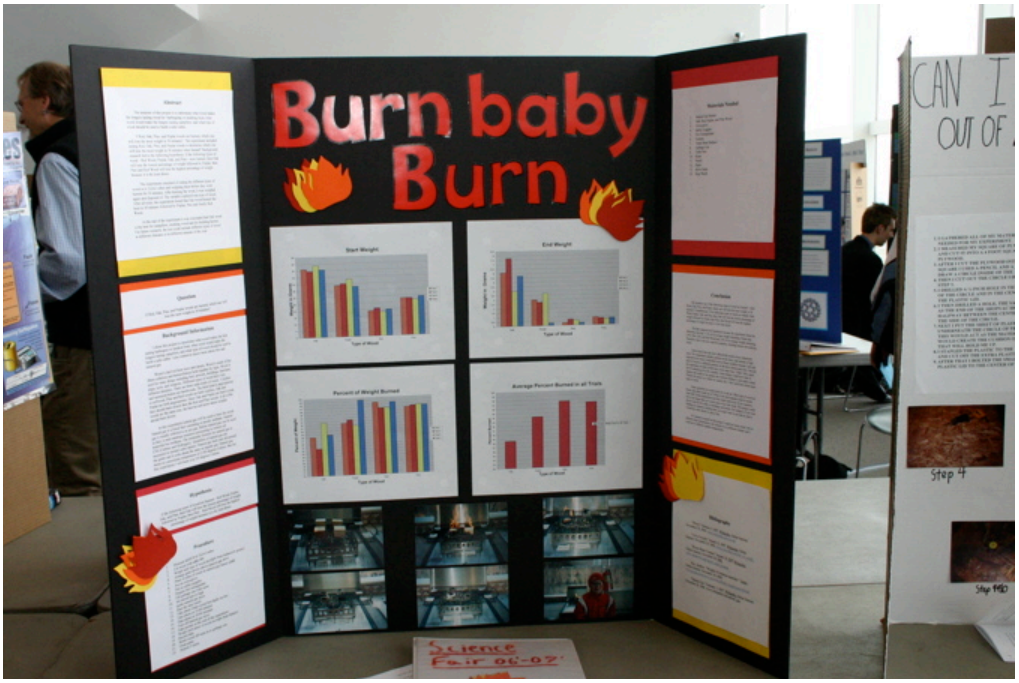
Transportation: Participants will arrange their own transportation to and from the fair (see GSD memo on transportation).

District Fair - What to Bring?

What is allowed in the display booth?

Bring the student, the display board and a project data book. Leave all the other stuff at home (bottles, samples, machines, plants etc…) Take lots of good pictures and place them on the board and in the project data book instead. Winning projects don't need props!

Example:



Choosing a Project

Staying Safe
Getting Pre-Approval

Planning Your Project

The rest of this manual are documents for students as they design and plan their projects.

Project Categories

Projects must fit within one of the following 9 categories:

- Behavioral & Social Sciences
- Biology & Biochemistry
- Chemistry
- Energy & Transportation
- Engineering & Computer Science
- Environmental Sciences
- Medicine & Health Sciences
- Physics, Astronomy & Math
- Plant & Earth Sciences

For more detailed information about categories visit
http://slvsef.org/resource-center/research-categories

Team Projects

Yes, team projects are allowed. Teams may consist of up to 3 students in the same division (elementary 5th-6th, junior 7th–8th or senior, 9th–12th). Projects that had more than 3 students at the school level may NOT just send part of the team to represent them. Teams cannot mix divisions, so an elementary student can't be on a team with a junior high student.

Project Data Book

Keep track of data during the experiment phase of the project. Each project at the *District Science Fair* MUST have its **project data book** in the display. The project data book will contain detailed notes about the process of the project. Data tables, information collected and observed will be recorded here. Make sure that entries in the data book are dated! This can be a handwritten section of a notebook. There should be lots of information in this project data book (ideas, amounts, steps, errors, results, dates, drawings, formulas etc…) This is also where students should place Informed Consent Forms for human test subjects.

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, you can't experiment on vertebrate animals (except as noted on pg 13 of this handbook).

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

No-Skip to #4

Yes-You CANNOT grow bacteria at home or at elementary school. See pg 13 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 science fair coordinator and Stephanie Wood for pre-approval.

5. My project idea is on the "Not Recommended" list on pg 20-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. Experimentation on living organisms will only be conducted on lower-order life forms, such as bacteria, fungi, protozoans and insects.
2. Vertebrate animals are NOT to be used in a science fair project with the following exceptions:
    a. Observation of normal living patterns of pets, fish or domesticated animals. Normal behavioral studies may be carried out, but project must be carefully selected so neither physiological of psychological harm result
    b. Observation of normal living patterns of wild animals in a free-living state or in zoological parks, gardens or aquariums
    c. Living vertebrate animals will not be allowed in the display of the project.
    d. Cells, tissues, or organs may be purchased from a biological supply company or research facility.

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

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.

TEACHER NOTE: The following 2 pages should be printed back-to-back and given to every project in 5th-8th grades.

They need to be pre-approved by the school before they begin.

Schools will collect these forms and send them as a **bundle** to Stephanie Wood to keep on file. These must be filled out for every single project that competes in the school fair, not just the ones advancing to District/Regionals.

Once a student's project is approved, they cannot switch projects (unless you fill this form out again)

I've simplified the elementary and junior high versions as much as possible.

The 9th-12th grade is very extensive and has to be done online. The director of the regional fair is happy to come to your school to model how this works or to sit with students who need help.

Pre Approval: Grades 5-8 School Common Sense Safety Approval-Page 1

All projects must be PRE-approved by the **school** before any project can get started. See the back of this sheet for ALL the details.

Students-fill the top out and give to your teacher. PRINT CLEARLY.

Name(s):
School:

My project uses:

- ☐ Animals
- ☐ People
- ☐ Bacteria/Pathogens
- ☐ Hazardous materials (weapons, fire, chemicals etc…)
- ☐ None of these

This is what my project is about:

- -

Teacher/Fair Coordinator

- ☐ Approved: I have reviewed the project and talked with the student (and parents if needed) and feel that it is safe and reasonable for the student to do. Steps are in place to get permission from participants, keep animals safe, avoid creating a pandemic of super-bacteria or burning down the school. I checked with the District or Regional Fair in case I wasn't sure. Signatures on back of document.

- ☐ Denied: I have reviewed the project and DO NOT approve it due to safety concerns. I checked with the District and Regional Fair and they concur that this project is going to get a student disqualified or worse, hurt. Pick another idea.

_____

Printed Name of School Fair Coordinator
(Coordinator: Send your entire school's forms to Stephanie Wood in a bundle)

My Experiment will Involve the Following (check all that apply):

☐ Human Subjects

All human research projects must be **reviewed** and **approved** by a science teacher, a school administrator and one of the following: a psychologist, psychiatrist, medical doctor, physician's assistant or registered nurse **before the student begins experimentation**. If they determine that there is more than minimal psychological or physical risk to the human subjects involved in the project, the student must receive written consent from each of the participants and written parental consent for students under 18 years old. If they determine that there are unacceptable risks involved the student must revise his or her project. *Please attach a copy of the surveys or tests* you intend to use with your research plan. Students may not publish or display information that identifies the human subjects.

☐ Non-Human Vertebrate Animals

All projects involving non-human vertebrate animals must be **reviewed** and **approved** by two science teachers and a biomedical scientist (ex. a local veterinarian) **before the student begins experimentation.** Alternatives to the use of vertebrate animals must be explored and included in the student's research plan. Experiments involving laboratory animals (rats, mice, hamsters, gerbils, rabbits, etc) cannot be conducted in a student's home except for behavior studies on pets. 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. Students may not perform euthanasia, except in emergency situations. Alcohol, acid rain, insecticide, herbicide and heavy metal toxicity studies are prohibited. Experiments with a death rate of 30 percent or higher are not permitted. Behavioral studies or supplemental nutritional studies involving pets or livestock may be done at home.

☐ Controlled Substances (Prescription Drugs, Tobacco, Alcohol, etc)

All projects involving controlled substances must be **reviewed** and **approved** by two science teachers and a school administrator or biomedical scientist **before the student begins experimentation**. Students must adhere to all federal, state and local laws when acquiring and handling controlled substances. Only under the direction of a qualified scientist or designated supervisor may a student use federally controlled or experimental substances for therapy or experimentation. Students under 21 may not handle or purchase smokeless powder or black powder for science projects.

☐ Hazardous Substances or Devices (Chemicals, Firearms, Welders, Lasers, Radioactive Substances, Radiation)

Students must adhere to federal and state regulations governing hazardous substances or devices. An adult must directly supervise experiments. Students working with hazardous substances or devices must follow proper safety procedures for each chemical or device used in the research.

☐ Potentially Hazardous Biological Agents

(Bacteria, Mold, Fungi, Viruses, Parasites, Recombinant DNA (rDNA), Human or Animal fresh tissues, blood or body fluids, etc)
All projects involving potentially hazardous biological agents must be **reviewed** and **approved** by two science teachers and a biomedical scientist **before the student begins experimentation**. It is the responsibility of the student and the adults involved with the project to conduct a risk assessment. Risk assessment defines the potential level of harm, injury or disease to plants, animals and humans that may occur when working with biological agents. Risk assessment involves:

1. Assignment of the biological agent to a biosafety level risk group. **Students in grades 5-8 may only conduct research with biological agents determined to be at Biosafety Level 1 (BSL-1).** BSL-1 agents pose low risk to students or the environment and are highly unlikely to cause disease in healthy people, animals or plants. Examples of BSL-1 Microorganisms include: *Agrobacterium radiobacter, Aspergillus niger, Bacillus thuringiensis, Escherichia coli strain K12, Lactobacillus acidophilus, Micrococcus leuteus, Neurospora crassa, Pseudomonas fluorescens, and Serratia marcescens.* **Studies involving unknown microorganisms can be determined BSL-1 if the organism is collected in a plastic Petri dish or other non-breakable container and is sealed and remains sealed during the entire experiment.** Examples of BSL-1 rDNA studies include: Cloning of DNA in *E. coli K12, S. cerevesiae*, and *B. subtilis* host vector systems. Examples of BSL-1 Tissue studies involve the collection of non-infectious fresh tissues (not including blood or blood products) with little likelihood of microorganisms present. Projects involving blood or blood products are considered Biosafey Level 2. Plant tissues, established cell lines and cultures, meat from food stores or restaurants or packing houses, hair, teeth that have been sterilized, and fossilized tissue do not need to be treated as potentially hazardous biological agents.

2. Determine the level of biological containment available to the student researcher. **Biosafety Level 1 projects can be performed in a school laboratory but are prohibited in the home environment.** Standard microbiological practices must be used and all hazardous agents must be properly disposed of at the end of experimentation. The experiment must be supervised by a qualified scientist or a trained designated supervisor.

***For a complete list of rules regarding all of the subjects listed above please visit the following website:**
http://www.societyforscience.org/page.aspx?pid=312
If your project will include any of the subjects listed above, you must get all these signatures before you begin.

_____	_____	_____
Science Teacher Date	**School Fair Coordinator Date**	**Other professional (i.e. doctor, vet, scientist)**

Senior High (9-12) Safety Pre Approval:

http://isef.slvsef.org

All the 9th-12th grade projects have to approve directly through the **Regional Fair**. Your pre-approval is done online. Every project needs to do this BEFORE they begin. This is NOT just for school winners, but every project that will be participating at any level in any fair.

For Granite 9th-12th grade projects wishing to be eligible to win awards at the Regional Fair, all **pre-approvals must be COMPLETE by January 9th at the latest.** Remember, you can't start until after the pre-approvals are done, so the earlier you do this the better.

Contact the Regional Science Fair if you need help filling out the ONLINE forms. http://slvsef.org/

Probably not going to get approved:

Things we've denied in the past when the school wasn't sure if it was ok.

- Feeding energy drinks to kindergartners
- Blowing up "stuff" just for fun
- Burning "stuff" just for the sake of burning
- Putting fish in substances other than water
- Setting up an X-ray machine for use on kids (no doctor supervision)
- Homemade explosive devices
- Surveys about extremely personal information—that were not done anonymously
- Mice euthanization

The long and short of it—
We want kids exploring and learning and having fun. We don't want to end up in a lawsuit because the adult in the room said it was OK for a 12 year old to empty out shotgun shells and light up the contents. If you wouldn't want your own child doing it, better check with the District or Regional Fair for extra guidelines.

Want to see ALL the rules (in all their legal-ese finest?)
http://www.societyforscience.org/page.aspx?pid=312

Student Check List

- ☐ Ask the “big question”
- ☐ Research the topic
- ☐ Make the hypothesis
- ☐ Organize and Plan the experiment
- ☐ Get approval from teacher, fill out the forms *(see pg 15-17 in this handbook for how to access the forms online)*
- ☐ Conduct the experiment
- ☐ Keep track of data
- ☐ Do more than one trial/build or refine prototype
- ☐ Analyze the results
- ☐ Make conclusions

If you are a Semi Finalist from the Virtual Fair:

- ☐ Get the Project Data Book ready
- ☐ Write up summary report (optional)
- ☐ Create Display board
- ☐ Practice your presentation
- ☐ Bring to Fair: Display, Project Data Book, Summary report

Projects Not Recommended

Projects should be experiments, NOT demonstrations and should reflect the student's own work and ideas. The following list outlines topics that are commonly seen at science fairs and are not generally competitive enough to win awards. Students should avoid these projects. 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!

- 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 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"
- Taste comparisons, e.g., Coke vs. Pepsi can you tell the difference?
- 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 of a Research Experiment

1. What is it that the experiment is about? What are you investigating and why (what are your goals for the research experiment?)
2. Explain how you went about investigating it
    a. Discuss the steps you followed in designing and conducting the experiment, including your setup, the equipment and tools you used and how you used them.
    b. Use drawings or pictures as well as words to illustrate your work
3. List the data you collected
    a. Use tables, graphs, or any other charts that help organize and present your data.
4. Analyze the data you collected
    a. Does the data address your goals?
    b. Justify your results using the data
5. Conclusions
    a. What exactly did you do?
    b. What observations did you make and what are your findings?
    c. How do they meet or not meet your goals?
    d. Are the findings what you expected?
    e. Discuss the strategies you attempted in setting and carrying out your work (and how successful they were), your analysis, any unexpected results, errors, possible alternative findings, and explanation.
    f. Discuss any revisions that you think may be necessary in regard to your methods and findings.
6. Reflections
    a. What did you think of this experience?
    b. What did you learn?
    c. How did this activity help you (or not?)
    d. What were some of the issues and how did you address them?
7. Suggestions
    a. How could your results help someone (what group might be interested in knowing more about your results or could benefit from your research?)
    b. What will you try next?

Adapted from NSTA Science Scope Magazine, “Tried and True: Teaching the practice of science, unteaching the scientific method”, Summer, Volume 33, 2010.

Hints for Keeping a Project Data Book

A project data book is your most important piece of work. Accurate and detailed notes make a logical and winning project. Good notes show consistency and thoroughness to the judges and will help you when writing your research paper.

- Don't remove any pages. Simply put a line through errors.
- All pages should be numbered before any data is entered.
- All entries should be dated.
- Each new entry should begin on a separate page.
- Use more than one notebook if necessary.
- Don't put rough drafts of the research paper in the notebook.
- All entries must be legibly printed or typed.

Contents of the Project Data Book

- List of potential science fair projects
- Project title
- Experimental design. Identification of variables etc.
- Data Tables (Raw and Summary Data)
- Regular observations (similar to a diary)
- Calculations
- Graphs
- Reading notes from literature pertaining to the project, including references and citations

Documentation: The proof that the experiment was completed

- Date all entries in the Project Data Book.
- Photograph whenever possible. Photograph the progress in various stages when possible.
- If scientific equipment is used (Spectrometer, HPLC, IR, NMR,) save all print outs from the machine.
- If the project is to be a continuation from past years you must have all your old notebooks.
- The burden of proof that the project was completed is on the student. To avoid any questions as to the validity of your experiment you should document everything.

Special Forms to Fill Out

These special forms should be kept by the STUDENT and put in the Project Data Book.

Special Forms Include:

- Informed Consent Form (for any project using people for anything)

Grades 9-12: You may have additional forms fill out online at:
http://isef.slvsef.org

IRB—Institutional Review Board. This is the committee of adults in your building that determines if a project is reasonable and safe for a student to do. If a project involves humans or animals or bacteria, you should include a professional such as physician, vet or microbiologist to sign off on the project. In most cases, the IRB will be the science fair coordinator, the classroom teacher and perhaps an administrator. If a project seems to have potential for danger, consult a professional just to be on the safe side. You can always contact Stephanie Wood or Megan Black at the District Office if you have questions.

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 science 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)

Rubrics:

There are two rubrics, one for the Virtual Fair and one for the District Fair. They both look for the same high quality research, experimentation and data collection. The main difference is that the Rubric for the District Fair has a section based on your interview with the judges.

It is recommended that you use the *District Science Fair Rubric* at your school fairs.

2015 GSD Virtual Science Fair Judging Rubric

The Question (up to 15 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 15 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 15 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 20 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) (500 Word Max; 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 15 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) (500 Word Max, record data, charts, graphs, and lists are appropriate on this slide/page-multiple slides/pages OK).	
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 (e.g. to find equipment and materials, to stay safe or to use unfamiliar equipment or techniques).	
Total	

Student Explanation to the Virtual Fair Rubric

In addition to the judging criteria, these are suggestions for students to think about or address as they plan and do their project (in bold face type).

The Question

Find a question that interests you about something that you have observed, noticed or wondered about.

Hypothesis

What is your hypothesis? Try to address something that you believe is challenging which you are able to answer in a single experiment.

Research

Figure out what others have found out about your subject area or question. How has your research helped you to refine your question and ask something that may not be unique, but is relevant and interesting and not already answered?

Experiment

Design and execute an experiment that tests your hypothesis. Include descriptions of the materials, equipment, and methods/techniques you used. Explain the variables and how they will be controlled, manipulated and measured. Also detail any key steps to avoid errors, risks and safety.

Data/Observations

Report on all of the data, numbers, outputs or outcomes from your experiment. Show an understanding of what you saw happening during your experiment. Describe the patterns and trends you saw emerge as you worked.

Conclusion

How did your experiment support or contradict your original hypothesis? How could you improve your experiment? Did everything go as planned or were there unexpected results? Does what you learned lead to a new question to ask or experiment that would answer it? If so, why would it be important, interesting, or useful to do?

Works Cited

Use a bibliography generator such as citationmachine.net to document articles you read, people you interviewed etc…

GSD 2015 District Science Fair Rubric

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 12 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 12 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 12 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	
Experiment (up to 20 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 in good experimentation. (Engineering/Invention should show schematics, assembly information, refining of design, prototyping)	
Data/Observations (up to 12 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)	
Conclusion (up to 12 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.	
Works Cited Document (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 (e.g. to find equipment and materials, to stay safe or to use unfamiliar equipment or techniques). *This is a separate document that should be placed in the science notebook, NOT on the display board.*	
Total	

FAQ s

Who can I call at Granite? Stephanie Wood 385-646-4239 swood@graniteschools.org or Megan Black, msblack@graniteschools.org

Can my school fair happen after the February 2nd deadline? No.

Can there be team projects? Sure. Up to 3 kids per team—in the same division (elementary 5th-6th, junior 7th-8th or senior 9th-12th). Sorry, no cross-division projects (can't mix an elementary with a junior high for example)

Do we really need to have consent forms? Yes. It provides a level of safety for students and reduces liability for the school. Also, for students who make it to the regional level, they will be disqualified if they don't have all these special forms.

What is an IRB? See page 23 of the 2015 Handbook. It is the group of adults in your building that approve projects.

What about K-4 students? There is no competition at district or regional levels, but schools are welcome to have younger students participate in their school fairs.

Can a 10th-12th grader participate? Yes. Contact Stephanie Wood for information. There are scholarships for high school students at the regional level, but you must participate in the district fair ($80,000 scholarship to Westminster)!

How much does it cost? NO fee at the District! If a student wins at the District Fair and needs help with the Regional Fair entry fee, please contact swood@graniteschools.org

What if my school doesn't hold a science fair? If a school doesn't have a formal fair, individual students may still participate. Have your parent, teacher or principal contact Stephanie Wood for information.