Teacher Science Fair Resources (T-SFR)

(Teacher Information and Student Helps)

Dear 3rd and 4th Grade Teachers,

The 3rd and 4th Grades District Science Fairs will be held at South Jordan Elementary Thursday, April 19, 2012 from 4:30 P.M. to 7:30 P.M.

Student Registration for the 3rd and 4th Grades District Science Fairs will be Wednesday, April 18, 2012 from 4:30 P.M. to 6:30 P.M. at South Jordan Elementary School.

3rd and 4th grade teachers who are sending students to the 3rd/4th Grades District Science Fair must send their names to Paul Nance no later than Friday, April 13th. A reminder will be sent to you.

This section contains teacher science fair resources. It has information about school science fairs and how teachers can help students for science fair project preparation.

3rd/4th Grades Teacher Check-off List
In Preparation For The School Science Fair

- Hand out "How Does a Student Do a Meaningful Science Fair Project?" packet.
- Go over important parts of the student packet:
    - Inform students that they can do a project using the Scientific Method, the Engineering Design, or the Computer Design.
    - Students need to submit to their teachers the 2011-12 3rd and 4th grades Jordan Schools and District Science Fairs Registration Form before students start the school science fair project.
    - Go over each part of the registration form.
        - Student and Project Information (page A)
        - Science Fair Project Rules (Page B)
            - Humans
            - Animals
            - Control substances
            - Hazardous substance or devices
            - Growing potentially hazardous biological agents
        - Science Fair Project Research Plan (Page C)
        - Safety Rules and Required Signatures (Page D)
    - Parent permission slips are required if students use subjects under the age of 18. (Signatures must be placed in student's journal)
- Give the students their respective science fair timeline (Scientific Method, Engineering Design, or Computer Design) sheet to get certain things done in a timely manner.
- Inform parents early about the school science fair and dates.
- Try to get a committee together to find psychologists, nurses, doctors, biochemists, teachers, and school administrators to sign the lines of the Special Signature Page.
- Start the preparations for the school science fair.

Things NOT To Do!

A List of Things That Will Get a Project Disqualified or Not Judged

Because CUSEF and SLVSEF are affiliated with the Intel ISEF, the rules and regulations used by CUSEF and SLVSEF must match those established for ISEF. Though they may seem pesky, these rules help ensure student safety and compliance with applicable international, federal and state laws. The complete ISEF rules can be found here: http://www.societyforscience.org/isef/document/completerules2011.pdf

The ISEF website has a very handy Rules Wizard, which asks a series of questions about your project and then tells you what, if any, additional forms you will need to fill out in addition to the ones that CUSEF and SLVSEF require. The Wizard can be found here:
http://www.societyforscience.org/isef/students/wizard/index.asp

I. The following is a list of things, based on the ISEF, CUSEF, and SLVSEF rules that are not allowed. These *will* get your project disqualified. So, do not do them? Bolded items are the most frequent offenders.

- **Growing any microorganisms at home.**
- Working with a BSL 2 organism in a BSL 1 lab.
- Working with any BSL 3 or 4 organisms.
- Doing a project designed to engineer bacteria that are resistant to multiple antibiotics.
- **Failing to complete and submit the required forms.** Make sure that you have all the required signatures and be certain that your dates are correct. For example, if your form says you started your project on November 1st, but you didn't get SRC approval until November 15th, then we have a problem.
- Failing to get SRC pre-approval *if* your project requires it.
- Do a project involving human subjects without getting IRB pre-approval.
- Doing a project with hazardous chemicals, activities, or devices without a Designated Supervisor (or a Qualified Scientist, if using a DEA-controlled substance).
- A demonstration project. (If your project is simply showing how something works, it is probably a demonstration. Change it into an experiment by selecting and manipulating a variable.)
- Plagiarism, fabrication of data, or any other form of ethical misconduct.
- Doing a project designed to kill vertebrate animals.
- Senior division forms are looked at VERY closely.

II. The following things are not allowed with the project. If they are not removed the project will not be judged.

- The entire project display, including notebooks, pictures, gadgets, and papers, must fit within the required dimensions of 30" deep, 48" wide, and 108" tall (from floor to top).
- No living organisms, taxidermy specimens, preserved animals; human/animal body parts or body fluids are permitted.
- No pictures showing vertebrate animals during laboratory procedures are allowed.
- **No food is permitted at the display.**
- No raw plant materials, living, dead, or preserved are permitted.
- **No chemicals (including water), no hazardous substances or devices, highly flammable material, sharp items, or glass are allowed at the display.**

Resolving problems with the project display is usually possible, but it is best to avoid violating any of the display and safety rules. Use pictures to show items not allowed at the project display; it ***will not*** negatively affect the judging scores and it ***will*** make life much easier. The required items at the project in addition to the display board are a lab notebook. The student should bring their research report if they have one.

Why Do a Science Fair Project?

- Doing a science fair project integrates all the skills and arts that are usually taught separately in school. At the end of a finished product, the student will have used many of the following skills: reading, writing, spelling, grammar, math, statistics, ethics, logic, critical thinking, graphic arts, computer, planning, methodology, self-learning, and presentation skills.

- Doing a science fair project can be self-validating and exciting because it is not just practice. It involves real discovery of little known information of the student to the development of exciting, factual information connected to the world. The project is usually based on a scientific question or a designing interest to allow the student to use a process method to find an answer or develop a new product. Finding answers or learning of an outcome can be a powerful moment of discovery for the student. Participation in a science fair can improve self-esteem and self-confidence. A science fair project excites those who enjoy a challenge to instill an incredible feeling of independent achievement.

What a Science Fair Project Is and Is Not

A Science Fair Project Is Not:

- Just an experiment, just building a product, or doing something on the computer
- A report about a science, engineering, or computer topic
- A simulation or demonstration to show how something works
- A survey of what people think or feel about something
- An experiment that shows common knowledge that everyone knows
- An experiment that is copied from of a book or off the Internet
- Gathering statistics from a news source and reporting on the daily changes

A Science Fair Project is:

- Thinking of a question or problem to investigate and solving it by means of:
    - the scientific method
    - the engineering design method
    - or the computer design method
- Planning:
    - an investigation to answer a science question using strategies
    - by design to construct a prototype
    - by design to write a computer program
- Follow through with:
    - conducting an experiment and gathering measurable data
    - constructing something that works
    - programming a code for a computer
- Analyzing data to gain knowledge
- Using the knowledge learned to make a connection to higher-level ideas and to understand those new ideas to see how to apply them to the real world

Teacher Timeline for the Class/Grade Science Fair

Several months before the science class/grade fair

1. Set up science discovery centers in your classroom.
2. Work through several class projects and experiments with your class. Emphasize the scientific process (and engineering method if applicable).
3. Encourage your media specialist to locate books and other reference materials that relate to science topics.
4. Make sure the school custodian is notified of the date and told what furniture is needed.

Six to eight weeks before the class/grade fair

1. Inform the students of the fair.
    a. Explain and give to them the scientific method/engineering design write-up.
    b. Tell them the date.
    c. Give them a timeline when each part of the scientific method/engineering design is due so the students will work on it at a constant rate.
    d. Pass out the "Science Fair Research Plan" and "Special Signature Project Sheet" and to be turned back to the teacher after week three weeks (see "Student Timeline" sheet) for teacher approval.
2. Generate interest by talking about last year's fair or a fair you have attended.
3. Generate ideas of science fair projects.
4. Send home a note to make parents to make them aware of the dates of the class/grade fair and what is to be expected from the students.
5. Set up "help sessions" for the students who are participating.
6. Begin finding judges.

One to two weeks before the class/grade fair

1. Send home a confirmation letter to parents restated the schedule of events.
2. Students should be about completed with their projects.
3. Students should begin working on their display boards.
4. Make a class list of participants and project titles.
5. Remind the judges and send out the judging sheet to become acquainted with it.

Day before or morning of the fair

1. Set up tables needed for the fair.
2. Help students display their projects.
3. Have a "judges' area" ready with refreshments, clipboards, judges' tags, pencils, and judging sheets.

Fair day

1. Be supportive and encouraging.
2. Visit the fair and discuss the projects.
3. Take pictures of the projects with the students for a later discussion and an attention-getter for next year.

Who, What, When, Where & How?

Tips for organizing a school science fair.

WHO: Who will participate?

- As a teacher, team, grade department or school, decide which students will be doing science projects this year. Will a science project be required? If so, for who? The entire school? An entire grade level? One or two classes? Only the chemistry students? Only the honor students?

WHO: Who will you recruit as judges?

- Recruit the help of you PTA. Start by asking for volunteers within your school community. Local science organizations, clubs and universities are also helpful.

WHO: Who will serve on your Scientific Review Committee?

- A scientific review committee consists of a science teacher, a school administrator and a biomedical scientist (medical doctor, psychologist, veterinarian, microbiologist, etc) depending on the nature of the student's project. These individuals are important for approving research plans at the school level.

WHAT: What are your goals for your student's science projects and for your school fair?

- It is important to outline your goals and secure the support of your school administration. Science projects easily align with the Utah science Core and Intended Learning Outcomes.

WHEN: When will your school fair be held?

- Pick a date and time and outline a timeline for students to complete their projects. Most science projects will take a **MINIMUM** of six weeks to complete.
- Alert your parents and kids early. Don't assign the project right before Christmas break and expect them to have it completed when they return back to school.
- Coordinate the dates of your school fair to allow students the opportunity to advance to the district and regional science fairs.
- Consider if you will have judges interview students at the fair. This will help you determine the length of your fair and the number of judges you will need. Most interviews will take at least 10 minutes.

WHERE: Where will your fair be held?

- Maximum size dimensions for projects advancing onto the Intel ISEF are 48 inches wide, 30 inches deep and 108 inches tall. Determine how much space you will need by the number of students and project display boards. Many schools host their fairs in their media centers, auditoriums or lunchrooms.

HOW: How will you make this happen?

- **START EARLY!** Organize a core group of individuals to help you! Don't be afraid to ask for help.
- Refer to the Science Buddies website http://sciencebuddies.org often or call your local district folks or regional science fair reps.
- Guide students through the scientific method by modeling and teaching each step through examples in class. Become familiar with the experimental rules and help your students understand them as well.
- Make sure your students complete a research plan and fill out the appropriate paperwork with approval signatures **BEFORE** they start experimenting.

School Science Fair Solutions
Creativity is Key

PROBLEM:

The participating students at our fair have completed a science fair project but we don't have enough space for all the projects.

POSSIBLE SOLUTIONS:

Hold small classroom science fairs where the teacher or students select the winners. The teacher could select a small percentage to advance to the school fair or the students can act as judges to advance projects to the next level. Students should know the requirements already or can be given a grading rubric. Le the students present to each other.

PROBLEM:

We don't have enough judges to interview all of the students.

POSSIBLE SOLUTIONS:

Narrow down the number of students participating in the school science fair.

Judges within a community are often willing to come to more than one fair. Combine forces with the other schools in your area to recruit judges.

Swap judging with other schools. Coordinate with the other schools in your area and rotate judging – teachers from one school can judge at another school.

Identify the top projects and have the judges interview those students or have the judges look at all of the display boards and call down the students they wish to interview.

PROBLEM:

I'm the only teacher at our school that has students complete a science project and I still want my students to have a "science fair" experience.

POSSIBLE SOLUTIONS:

Hold a classroom science fair or combine with another teacher/school to hold a larger fair.

PROBLEM:

I want my students to have the experience of doing a science project but I don't want all of the extra work of holding a science fair.

POSSIBLE SOLUTIONS:

Hold classroom presentations. The students don't have to put together a display board but they will need to present their ideas to the class and to you. Have the students judge each other.

Have the students complete a portfolio rather than a display board.

Student Science Fair Resources

http://cusef.byu/edu

www.sciencebuddies.org

http://www.stevespanglerscience.com/content/experiment/science-fair survival

www.sciencebob.com

OSW Publications

The following documents are available from EPA's toll-free Hotline (800 424-9346) at no charge; reference the following publication numbers when ordering:

- *The Quest for Less: A Teacher's Guide to Reducing, Reusing, and Recycling.* EPA530-R-00-008.
- *Planet Protectors Club Kit* (workbooks, certificate, badge, board game). EPA530-E-98-002.
- *A Resource Guide of Solid Waste Educational Materials: Second Edition.* EPA530-B-99-018.
- *Adventures of the Garbage Gremlin: Recycle and Combat a Life of Grime* (comic book). EPA530-SW-90-024.
- *Ride the Wave of the Future: Recycle Today!* (poster). EPA530-SW-90-010.
- *Service-Learning: Education Beyond the Classroom* (brochure). EPA530-K-99-001.
- *Let's Reduce, Reuse, and Recycle!* (CD-ROM). EPA530-C-00-001

OSW Online Resources

- http://www.epa.gov/epaoswer/osw/careers/

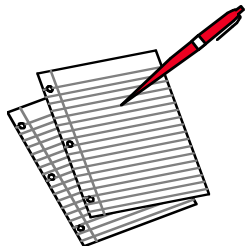
Online Resources for Environmental Science Projects

- http://www.isd77.k12.mn.us/resources/cf/SciProjIntro.html
- www.isd77.k12.mn.us/resources/cf/SciProjIntro.html
- www.detroit.lib.mi.us/is/science_fair.htm
- http://faculty.washington.edu/chudler/fair.html

Other Resources for Teachers

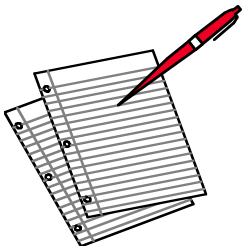
- *The Environmental Education Collection: A Review of Resources for Educators, Volume 1*, North American Association for Environmental Education (1997).
- *The Environmental Education Collection: A Review of Resources for Educators, Volume 2*, North American Association for Environmental Education (1998).

STUDENT SCIENCE FAIR PROJECT
SUGGESTED TIMELINE
USING THE SCIENTIFIC METHOD



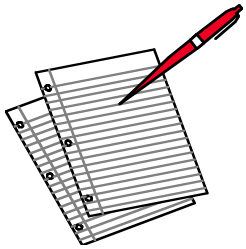
Week	What is going to be accomplished?	Done
Week 1	Student becomes familiar with the scientific or design method. Student gets science fair journal ready. Student comes up with a topic and purpose (question) for his/her science fair project and writes it in the journal.	
Week 2	Student researches the topic by finding at least three sources and reading about them. He/she writes detailed paragraphs in the journal of specific details of what was learned.	
Week 3	Student writes his/her hypothesis in the journal. Student writes an explanation of why he/she thinks this will happen. Student writes up a list the materials needed and the step-by-step procedure of the project in the journal.	
Week 4	Student identifies the controlled variables and the experimental variable and writes them in the journal. Student begins to acquire the materials.	
Weeks 5-6 (or longer if needed)	Student does the experiment. He/she gathers data and writes the data in the journal. The student organizes the data into a table in the journal.	
Week 7	Student analyzes the data and makes a line, circle, or bar graph in the journal. Student interprets the graph and writes what the data means according to the graph. A conclusion is written in the journal. The student also writes what was learned and makes a connection to the world.	
Week 8	Student makes a creative display board using colors, decorative paper, different font size, pictures, and designs. It displays all parts of the scientific method (except the research). Student writes a brief explanation under each method step on the board. Student practices what he/she is going to say about each step for the interview.	

STUDENT SCIENCE FAIR PROJECT
SUGGESTED TIMELINE
USING THE ENGINERING DESIGN



Week	What is going to be accomplished?	Done
Week 1	Student becomes familiar with the engineering design. Student gets science fair journal ready. Student comes up with a topic and purpose for his/her science project design and writes it in the journal.	
Week 2	Student researches the topic by finding at least three sources and reading about them. He/she writes detailed paragraphs in the journal of specific details of what was learned.	
Week 3	Student writes his/her design requirements in the journal. Student begins the preliminary designs and narrows it down to the design desired. Student writes up a list of the materials needed.	
Week 4	Student writes up the final step-by-step procedure of the prototype in the journal. Student acquires the materials needed to build the prototype.	
Weeks 5-6 (or longer if needed)	Student builds the prototype according to the design requirements. Sets up a plan on how to test it. Student tests the prototype. He/she gathers data and writes the data in the journal. Student analyzes the data if it worked or not according to the design requirements.	
Week 7	If the prototype doesn't work according to the design requirements, then redesigning and retesting is necessary. Data is gathered and analyzed again. A conclusion is written up.	
Week 8	Student makes a creative display board using colors, decorative paper, different font size, pictures, and designs. It displays all parts of the engineering design (except the research). Student writes a brief explanation under each design step on the board. Student practices what he/she is going to say about each step for the interview.	

STUDENT SCIENCE FAIR PROJECT
SUGGESTED TIMELINE
USING THE COMPUTER DESIGN



Week	What is going to be accomplished?	Done
Week 1	Student becomes familiar with the computer design. Student gets science fair journal ready. Student comes up with a topic and purpose for his/her science project design and writes it in the journal.	
Week 2	Student researches the topic by finding at least three sources and reading about them. He/she writes detailed paragraphs in the journal of specific details of what was learned.	
Week 3	Student writes his/her design requirements in the journal. Student begins the preliminary designs and narrows it to the type of design desired.	
Week 4	Student writes up the final step-by-step procedure of the program code in the journal. Student writes in the program code according to the design requirements.	
Weeks 5-6 (or longer if needed)	Student sets up a plan on how to test it. Student tests the program code. He/she gathers data and writes the data in the journal. Student analyzes the data if it worked or not according to the design requirements.	
Week 7	If the program code doesn't work according to the design requirements, then redesigning and retesting is necessary. Data is gathered and analyzed again. A conclusion is written up.	
Week 8	Student makes a creative display board using colors, decorative paper, different font size, pictures, and designs. It displays all parts of the computer design (except the research). Student writes a brief explanation under each design step on the board. Student practices what he/she is going to say about each step for the interview.	

Science Fair Project IDEAS
Tips for selecting a topic

For most students, the hardest part of the science fair project is coming up with an idea and then narrowing down their question. The following list outlines ways that most students follow to select their own project.

Interests & Hobbies

All science projects should be something that the student is interest in and finds exciting. Many really good projects relate to student interests and hobbies.
Science Buddies has an excellent topic wizard that helps students sort through their interests and then offers suggestions and project examples based on their answers.

Current Events

Current events and problems facing our society are really hot project ideas each year.

Teaching Method Idea: Current Event File and Science in the News logs
Research and debate in class how as a class or a student they could set up an experiment and test a problem or find a solution.

Observations

A lot of good projects come from student observing and questioning the things they see around them.

Teaching Method Idea: Observation Log

News Articles, Books and Television Shows

All students will have to do an extensive amount of research regardless of their topic - reading helps students come up with ideas.

Teaching Method: Science in the News, Files, Current Event Discussions, etc.

Class Projects:

There are a lot of class projects and experiments that can be taken further.

Teaching Method: Do a lot of class projects and experiments, use examples from Science Buddies to expand projects.

Parent or Mentor Suggestions:

Use the research of others to start another project. Many parents have great ideas - some professors are willing to work with kids and allow them a small part of a larger project.

Teaching Method: Read abstracts and journal articles relevant to studies in class, have scientists come and talk with students in class.

Display Board Tips

Your display board is important. It's not nearly as important as your judging interviews—they count much, much, much, more than your display board. But, first impressions matter, and the first impression judges get about your project is what they see on your display board, read in your abstract, and find in your lab notebook.

What should by display board say?

Your display board should do two things: First, it should tell a story about what you did, why you did it, how you did it, what you find out, and why people should care. That's the process, the scientific method, engineering design process, or mathematical proof process. Second, your board should highlight the end result of your project: your conclusion and its importance, the useful tool you engineered, or the exciting proof that you solve. That's the product, the final result of your project. Your board should convey both process and product because it's the combination of the two that make an excellent project.

How can I make my board look good?

Here are a few suggestions about the mechanics of board layout and design. See www.sciencebuddies.org for more information.

- Make your text readable. Font size >100 for your title, 32-48 for headers, 16-18 for body text, and 12-14 for captions. Remember that the person reading your board is standing a few feet away from it, not reading it like a paper. These larger font sizes also help limit the amount of text on your board. Putting too much information on the display board is a common mistake.

- Figures are awesome. Use graphs, flowcharts, diagrams, and pictures whenever possible. Make sure they are large enough to be read from a distance, and be sure that your figures have captions. Number your figures and refer to them by number elsewhere on your board (e.g., "See figure 1.").

- Use a paper cutter or paper trimmer to cut your paper; it makes nice, straight edges.

- Use matte photo paper instead of regular printer paper for printing your text and figures. It's a bit more expensive, but makes text and images look crisper and cleaner. You can use glossy photo paper, too, but sometimes glossy paper creates a harsh glare.

- Photo paper is thicker than regular paper, so instead of overlapping sheets of paper when your text doesn't fit on one page; cut the paper and make the edges flush. If done well and with straight edges, the seam is almost invisible.

- If you have an ink jet printer, you might be able to cut a piece of poster board to the width your printer's paper feeder and then print on that piece of poster board. This is great for printing titles because it lets you print things with dimensions like 8.5" x 20". Your title then fits on one page, and you don't have to worry about lining things up perfectly.

Projects Often Done by Students

Projects should be experiments, NOT demonstrations and should reflect the student's own work and ideas. As an experiment the project is a collection and analysis of data. The following list outlines topics that are commonly seen at science fairs and are not necessarily unique ideas or projects. If your student does a similar project make sure it is well thought out with a lot of data and multiple trials (more than 2 or 3) and a creative twist.

1. Effect of music on plants
2. Effect of talking to plants
3. Effect of dark vs. light on plants or colored lights, etc.
4. Effect of liquids on plants other than water, e.g. milk, soda, salt water, etc.
5. Effect of cola, coffee, etc. on teeth; tooth decay, coloring, etc.
6. Effect of running, jumping, music, video games, movies, etc. on blood pressure
7. Balanced diets (data usually unreliable)
8. Strength/absorbency of paper towels (and other products)
9. "Which is best?" – Approach generally without scientific merit (which popcorn pops better, which soap, fertilizer, etc.)
10. Basic maze running
11. Any project that boils down to simple preference; what do girls/boys/cats/dogs like better…
12. Effect of color on memory, emotion, mood, etc.
13. Effect of color on food taste, e.g. changing the color of Jell-O to affect the taste.
14. Optical illusions
15. Reaction times in general and distractions effecting reaction speed
16. Many male/female comparisons, especially if bias shows
17. Basic planarian regeneration
18. Detergents vs. stains
19. Basic solar collectors
20. Acid rain projects (Important: to be considered, thorough research into the composition of acid rain and a scientifically accurate simulation of it would be necessary.)
21. Basic flight tests, e.g., planes, rockets
22. Battery life (plug in and run down)
23. Basic popcorn volume tests
24. Taste comparison, e.g., Coke vs. Pepsi can you tell the difference?
25. Sleep learning
26. Music affecting learning
27. Taste or paw-preferences of cats, dogs, etc.
28. Color choices of goldfish, etc.
29. Basic chromatography
30. Wing or in shape comparison with mass, surface area, etc. not considered
31. Ball bounce tests with poor measurement techniques
32. Fingerprints and heredity
33. Hovercraft design
34. Colonizing bacteria from doorknobs, student's hands, places around the school, etc.
35. Memory Tests
36. Penny polishing; what cleans pennies the best
37. Insulation effectiveness
38. Coke & Mentos
39. Hand sanitizers and bacteria; which sanitizer is best?

What Are Requirements for a BSL1 Lab?

Biosafety Level 1 is suitable for well-characterized agents that are not known to consistently cause disease in health adults, and present minimal potential hazard to lab personnel and the environment. Work in a BSL1 lab is typically conducted on an open bench top, using standard microbiological practices (listed below). Special containment equipment or facility design is not required, but may be used as determined by appropriate risk assessment. Supervisors/Teachers must be trained in procedures conducted in the laboratory as well as microbiology or a related science.

Standard Microbiological Practices

1. The supervisor must enforce policies that control lab access.
2. Hands must be washed after working with potentially hazardous material AND before leaving the lab.
3. Eating, drinking, handling contact lenses, putting on makeup, storing food for human consumption is NOT permitted in the lab area at any time. Food should be stored outside of the lab area and in designated cabinets/refrigerator specifically for food use.
4. Mouth pipetting is prohibited; mechanical pipetting is acceptable.
5. Safe handling of sharps i.e. needles, scalpels, glass pipettes, as well as broken glassware must be implemented. Supervisors should have practices implemented that reduce the risk of injuries. NEVER dispose of any sharps in the trashcan.
   a. Needles: must NOT be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated before disposal.
   b. USED needles and syringes must be placed in a **puncture-resistant** sharps container for disposal.
   c. Non-disposable sharps must be placed in a hard walled container to be transported for decontamination; i.e. scalpels with non-removable blades.
   d. BROKEN glassware must not be handled directly; use a brush, dustpan, tongs or forceps. Place broken glassware into the sharps container (a plastic 5 gallon bucket works great for this).
6. Splashing and/or aerosol (any airborne substance) should be avoided, make sure all procedures are performed to minimize the occurrence.
7. Use the appropriate disinfectant after the experiment to decontaminate the work surfaces, especially after a spill or splash.
8. All cultures, stocks, and other potentially infectious matters should be decontaminated **before** disposal.
   a. Materials to be decontaminated outside of the lab must be placed into a durable, leak proof container and secured for transport.

b. Materials to be removed from the facility for decontamination must be packed in accordance with applicable local, state, and federal laws and regulations.

9. While using an infectious agent a biohazard symbol must be posted on the entrance to the lab. The sign must include: the name of the agent(s) in use, and the name and phone number of the supervisor or responsible personnel. As well the infectious agent's information should be posted in accordance with the institutional policy.
10. Pests should be kept to a minimum (insects, rodents, etc.)
11. Supervisor must ensure that lab personnel have received training on their duties in the lab and any precautions to prevent exposures, and exposure evaluation procedures.

Safety Equipment

1. Protective lab coats are recommended to prevent contamination of personal clothing.
2. Goggles should be worn to prevent slashes of microorganisms and/or other hazardous materials into the eyes. Those who wear contacts should also wear eye protection.
3. Gloves MUST be worn.
a. If gloves are contaminated, dispose of and put on a new pair.
b. Remove gloves and wash hands after working with the hazardous material AND before leaving the lab.
c. Do NOT wash or reuse disposable gloves. Dispose of used gloves WITH other contaminated waste.

Room Requirements

1. Must have doors for access control to the lab.
2. Must have a sink for hand washing.
3. Must be easily cleanable; carpets and rugs are NOT appropriate.
4. Lab furniture must be able to support loads and users. All spaces should be accessible for cleaning.
a. Bench tops MUST be impervious to water and heat resistant, as well as resistant to organic solvents, acids, alkalis, and other chemicals.
b. Chairs used MUST be covered with a non-porous material that can be easily cleaned and decontaminated with an appropriate disinfectant.
5. Lab windows that open to exterior should be fitted with screens.

For further reference please visit:
http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl5toc.htm

3RD AND 4TH GRADES SCHOOL SCIENCE FAIR SCIENTIFIC JUDGING SHEET

Name(s)_____ School _____

Project Title_____

Category	Comments	Excellent 5	Good 3-4	Fair 1-2
I. Journal/Log (Scientific Thought)				
Title Page/Table of Contents: Title, name, school, date, and the table of contents				
Purpose: Problem stated clearly and as a question				
Research: Three different sources cited with well-written notes				
Hypothesis: Well thought out, educated guess with explanation of why				
Experiment: o List of materials and step-by-step instructions clearly written				
o Controlled and Experimental Variables clearly identified				
o Sufficient data gathered and organized				
Analysis: Graph accurately made showing the data and comparisons with a written explanation				
Conclusion: Reveals evidence of learning				
II. Display				
o Neat, edited, and physically sound				
o Scientific method displayed, easy to follow, and self- explanatory				
o Journal and display showed a close relationship				
o Creative Board Design				
III. Interview				
o Student shows a basic knowledge of field studied and able to elaborate				
o Student is able to explain how the scientific method was used				
o Student shows interest, enthusiasm, and a passion toward the project and could tell how it was personalized				
IV. Project Design				
o Creative, procedural approach with ingenious use of materials and equipment to solve the problem				
o Project shows in-depth thought and work to solve the problem				
o Results show a well, thought out, reasonable conclusion showing a useful connection to the world				
o Overall great follow through from the purpose to the conclusion				

Score Ex. 5 Gd. 3-4 Fair 1-2

Sub scores				**Total Score**	**/100**

3RD AND 4TH GRADES SCHOOL SCIENCE FAIR ENGINEERING JUDGING SHEET

Name(s)_____ School _____

Project Title_____

Category	Comments	Excellent 5	Good 3-4	Fair 1-2
I. Journal/Log (Engineering Design)				
Title Page/Table of Contents: Title, name, school, date, and the table of contents				
Need: A need for the project is defined				
Research: Three different sources cited with well-written notes				
Design Requirements: Clear statement of the requirements for prototype development				
Preliminary and Final Designs: o Beginning and final designs drawn and labeled showing a variety of ways to meet the design requirements and achieving a final design				
o Materials' list and step-by-step instructions clearly written				
Building and Testing the Prototype o Prototype built according to the design requirements				
o Sufficient data gathered during the first testing. Data is analyzed if redesigning is necessary.				
Redesigning and Retesting: Redesigning and retesting done showing gathered data and analyzing				
Conclusion: Reveals evidence of learning				
II. Display				
Neat, edited, and physically sound				
Engineering method displayed, easy to follow, and self explanatory				
Journal and display showed a close relationship				
Creative Board Design				
III. Interview				
o Student shows a basic knowledge of field studied and able to elaborate				
o Student is able to explain how the engineering method was used				
o Student shows interest, enthusiasm, and a passion toward the project and could tell how it was personalized				
IV. Project Design				
o Creative, procedural approach with ingenious use of materials and equipment to solve the problem				
o Project shows in-depth thought and work to solve the problem				
o Results show a well, thought out, reasonable conclusion showing a useful connection to the world				

Score Ex. 5 Gd. 3-4 Fair 1-2

Sub scores				**Total Score**	**/100**

3RD AND 4TH GRADES SCHOOL SCIENCE FAIR COMPUTER JUDGING SHEET

Name(s)_____ School _____

Project Title_____

Category	Comments	Excellent 5	Good 3-4	Fair 1-2
I. Journal/Log (Computer Design)				
Title Page/Table of Contents: Title, name, school, date, and the table of contents				
Need: A need for the project is defined				
Research: Three different sources cited with well-written notes				
Design Requirements: Clear statement of the requirements for the program code				
Preliminary and Final Designs: o Beginning program codes written showing a variety of ways to meet the design requirements				
o Final focus on one set of program codes written showing changes and progress to meet the design requirements				
Programming and Testing of the Code: o Computer coded according to the design requirements				
o Sufficient data gathered during the first testing. Data is analyzed if designing is necessary.				
Redesigning and Retesting: Redesigning and retesting done showing gathered data and analysis.				
Conclusion: Reveals evidence of learning				
II. Display				
Neat, edited, and physically sound				
Computer method displayed, easy to follow, and self explanatory				
Journal and display showed a close relationship				
Creative Board Design				
III. Interview				
o Student shows a basic knowledge of field studied and able to elaborate				
o Student is able to explain how the computer method was used				
o Student shows interest, enthusiasm, and a passion toward the project and could tell how it was personalized				
IV. Project Design				
o Creative, procedural approach with ingenious use of materials and equipment to solve the problem				
o Project shows in-depth thought and work to solve the problem				
o Results show a well, thought out, reasonable conclusion showing a useful connection to the world				

Score Ex. 5 Gd. 3-4 Fair 1-2

Sub scores				Total Score	/100

Directions for Filling out the 2011-2012 3rd and 4th Grades Jordan Schools and Jordan District Science Fairs Registration Form

All 3rd and 4th grade students entering their respective school science fairs in Jordan District must fill out the 2011-2012 Jordan Schools and District Science Fair Registration Form for 3rd and 4th Grades to give to their teachers prior to beginning their science fair projects. There are certain rules that students must follow in doing a science fair project. If these rules are not followed the project can be disqualified at the district and regional levels. Filling out this form correctly and completely will guarantee admittance to all levels of competition.

After you have chosen a topic and prior to beginning your project, the next step is to fill out **completely** the Jordan District Science Fair Registration Form for 3rd and 4th Grades. Your teacher will give you the Jordan District Science Fair Registration Form when you receive this student packet. Below are the directions on how to fill out the registration form. Completion of this form does not guarantee advancement to the Jordan District Science Fair, but it will show that you have followed all the science fair rules for all competition levels.

Once you have filled out the registration form, give it to your teacher for approval. If it is not complete he/she will give it back for you to complete. If you change your science fair research plan, then you must submit a new plan to your teacher. **If you are doing this project as a group (maximum of three students per project) you will only need to fill out one form.**

Directions To Filling Out the Four-Page Jordan Schools and District Science Fair Registration Form

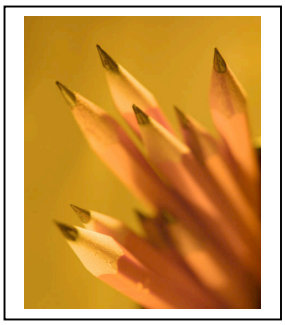
Page A—Student and Project Information

1. **Student Information**
   - This is to be filled out by you and anyone else who are doing this project with you. You can have up to three students per project.
   - All the information needs to be filled in just in case you need to be contacted either by phone or mail.

2. **Project Information**
   - Fill out all information including teacher's name and his/her email. Your teacher's email will be the first and last name with a period between the first and last names ending with "@jordan.k12.ut.us".
   - Mark the box of which category your project is under. If you have problems knowing, look on "Page 2" of the student packet, ask your teacher, or call Paul Nance at 801-244-6479 or email him at paul.nance@jordan.k12.ut.us**.**
   - Mark the boxes on the right if you are going to be experimenting on any of the things listed. If you are, you need to get some signatures before starting your experimentation found on Page B of the registration form. If not, mark "I am not testing any of the above in my experiments."
   - Answer the "yes" or "no" questions at the bottom.

Page B—Science Fair Project Rules*

(This page is for the those projects that need Special Signatures)



Some projects require special signatures from professionals before you can begin them. These experiments may cause harm to humans and vertebrate animals without being screened. U. S. laws have been set up to protect humans and animals from being hurt, disgraced, or diseased.

The following projects need special signatures from certain professional people listed below with the date they signed it.

- **If you are working with humans as subjects,** you must get **prior approval** from your science teacher and a school administrator within your school. Have each sign on the lines provided on the form. **Also, if any of your subjects are under 18, you need to get written permission from a parent/guardian of each child.**
- **If you are working with non-human vertebrate animals as subjects,** you must get **prior approval** from your science teacher and a school administrator within your school. Have each sign on the lines provided on the form. Proper animal care must be provided daily and there cannot be any pain or discomfort.
- **If you are working with controlled substances,** you must get **prior approval** from your science teacher and a school administrator within your school. Have each sign on the lines provided on the form. All laws in handing the controlled substances must be followed. An adult must be present and supervise the experiment.
- **If you are working with hazardous substance or devices,** you must get **prior approval** from your science teacher and a school administrator within your school. Have each sign on the lines provided on the form. Students must follow the laws in handling these substances or devices. An adult must be present and supervise the experiment.
- **If you are working with potentially hazardous biological agents (bacteria, mold, fungi, viruses, parasites, fresh human or animal tissues),** you must get **prior approval** from your science teacher and a school administrator within your school. Have each sign on the lines provided on the form. Growing of unknown microorganisms must be grown in a sealed, unbreakable container such as a Petri dish and stayed sealed during the whole experiment. **The containers must be kept in a lab for observation and not in the home. If this experiment is done at home the project will be disqualified.**

If you have questions about these signatures ask your teacher or call Paul Nance at 801-244-6479 or email him at paul.nance@jordan.k12.ut.us.

***It is important to get these signatures before the experimentation begins. Otherwise, it may cause the project to be disqualified for further competition.**

Page C—The Science Fair Project Research Plan

After you have chosen a topic, the next step is to write up the research plan for your teacher. There are a couple of reasons a research plan needs to be written.

- **There is pre-work that needs to be done before the actual experimentation. Knowing the steps you need to take to complete a science fair project will help you do a completed project.**
- **Your teacher can look at it and know that your project will be a safe and meaningful project.**

Filling out the Science Fair Project Research Plan includes the following:

1. Write your question of what you want to discover through experimentation.
2. Write to books/articles you used or plan to read about your topic.
3. Write a hypothesis using the **"If….then"** phrase using background knowledge acquired during the research.
4. Write a list of supplies needed for the experimentation.
5. Tell where your experiment will be conducted.
6. Write the name and phone number of your adult supervisor.
7. Write up the actual procedure, in detail, how you plan to do your experiment.

- **Be sure to be complete when you write up your plan so you, your teacher, parents, supervisor and those who may need to sign it know exactly what you will be doing.**
- **If you change your science fair research plan, then you must submit a new plan to your teacher.**

Page D—Display and Safety Rules and Student and Parent/Guardian Signatures

1. Display and Safety Rules

- Be sure to read and know all the display and safety rules. They must be followed when displaying your project.

2. Student, Parent, and Teacher Signatures

Please read the statement above the signature lines so you know what are signing.

- All students must sign this page showing that they have read the rules and guidelines of the school and district fairs that their projects comply with the rules and guidelines of the school and district science fairs.
- A parent/guardian must sign this page showing that their child's project complies with rules and guidelines of the school and district fairs. There is also a place for parent signatures for the child and project information can be appropriately used for publicity purposes.
- Your teacher also needs to sign and date that your project complies with the rules and guidelines of the school and district fairs.