2009 Science Fair

Purpose:

- To focus attention on science experiences in school.
- To stimulate greater interest in science by all students.
- To recognize and commend youthful scientific talent and hobby pursuits.
- To stimulate interest in scientific investigation over and above routine class work.
- To offer an opportunity for display of scientific talent through exhibit and demonstration.
- To provide constructive suggestions for teachers and students of science.
- To arouse interest of the public in science abilities of students and teachers.

Planning:

- Study the Judging Criteria in order to make the best possible showing of your exhibit.
- Study the Rules for Exhibits to be certain you understand what is expected of you.
- Since many of the interested visitors will know little about science, remember:
    - Keep your exhibit clear.
    - Develop explanatory labels (test them on your parents and friends to determine if their meanings are clear).
- Simple, clear-cut and dramatic presentation of an idea does more to show what you know than a large, exceedingly complex exhibit.
- 1st, 2nd, and 3rd place winners will be exhibited in the TWU Area Science Fair.

Safety and Other Information to Know Before Entering:

- No dangerous chemical substances, such as caustics, acids, highly combustible solids, fluids, or gases in pressurized tanks may be displayed.
- Any electrical apparatus must be constructed according to standard electrical laws. If in doubt consult a competent electrician or your electrical inspector.
- No live disease-causing organisms that are pathogenic to man or other live vertebrates.
- No microbial cultures, alive or dead, including unknown specimens.
- No live vertebrate animals.
- No food, neither human nor animal.
- No syringes, pipettes, and similar devices.

The Science Fair committee reserves the right of refusal of an exhibit it considers unsafe.

General Rules:

- An individual exhibit is constructed by one person only.
- All exhibits must be constructed by students.
- Each student may enter only one exhibit.
- Group projects will be eligible in the elementary division only, but each group member must pay the entry fee. Only one form per group needs to be submitted.
- Teachers or other technically trained people may give information and advice.
- All equipment and other necessary material must be furnished by exhibitor, 110 volt outlets will be available.
- If electricity is needed, exhibitor must furnish an extension cord at least 15 feet in length.
- Posters must be self-supporting.
- No exhibitor or sponsor will be allowed in the exhibit room during judging.
- Size of exhibit is limited to 30 inches in depth, 48 inches in width, and 108 inches in height from the floor to the top of the exhibit.
- Safety precautions must be strictly observed.
- No student's name or school may be displayed on exhibit.
- Judges have authority to reclassify a project if they feel it has been entered in the wrong category.
- If the above rules are not followed, the project will be disqualified and not allowed to be displayed.

Rules for Live Vertebrate Animal Projects:

- If students choose to conduct experiments using live vertebrate animals, the proper forms must be completed and must accompany the project.
- The student's project will not be judged if the proper forms are not displayed with the exhibit at the TWU Area Science Fair.
- **No live vertebrate animals are allowed to accompany the project.**

Procedure:

Each entry will be judged separately on its own merit. The judges will use the criteria as listed and will give consideration to the degree to which standards are met. Each entry will be evaluated on a point basis. Group projects will be judged with other group projects and not against individual projects.

Judging Criteria, Which We Might Want to Use Throughout:

Clarity	6 points	Judging will be based on how well an average person can understand an exhibit. Neat, brief guide marks, labels, and descriptions will be helpful. How well a spectator's attention follows through an exhibit will be important.
Skill	7 points	Good workmanship and how much an exhibit needs repairs, under normal working conditions, will be considered. In collections, skill in handling, preparing, mounting, or other treatments will be important.
Thoroughness	7 points	An exhibit will be judged on how completely the story is told. Details or working model's construction in explicit form are not necessary.
Creative Ability	10 points	Exhibits should show originality of approach or handling, regardless of the expense of the materials bought or borrowed. Weight will be given to ingenious use of materials. Collections will be considered creative if they seem to serve a purpose.
Scientific Thought	10 points	An exhibit will be judged on how well it discloses classification, accurate observation, and whether or not controls were used. It should show a verification of laws, or cause and effect, or present by models or other methods, a better understanding of scientific facts or theories. Consideration will be given to probable amounts of real study and effort which is represented. What might have been added or improved will not be considered.
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TOTAL	40 Points	

Science Fair Information

The following are the categories that you will need on your science board to explain your project. The bold printed words that are titles for the categories should be on your science board with your information.

Title
It can be your question you are trying to prove or simply an interesting or "catchy" title for your project.

Question, Problem, or Purpose
What is it you want to learn or do? You will want to call it the question if you are stating your guiding question. You will want to call it the problem if you are stating the problem you intend to investigate. You will want to call it the purpose if you are stating the purpose for your investigation.

Hypothesis
What do you think will happen when you perform the experiment or complete the project? This is your answer to your question or what you think will happen based on your problem or purpose. This is stated before you do any tests, experiments, or research.

Materials
What materials do I need in order to complete my project? List all the items you will need to do the project or to do the experiments. A person reading your materials list should be able to clearly understand what is needed in order to do your project. Don't forget to give the number or amount needed.

Procedure
This is your step-by-step way of testing your hypothesis or doing your experiment. It has to be very clear so others can read your procedure and follow what you say without being confused.

Data or Results
What actually happened when I performed my experiment or completed my project? You need to write down or make charts, tables, or graphs to show exactly what happened when you did your experiment. You can take pictures while you work, but you need to have pictures without you in them. Show what you have done by way of work and not your wonderful face.

Conclusion
What did I find out? Your conclusion is the answer to your question. It may be the same as your hypothesis, but it might be different. Your conclusion is based on what happens by following your procedure and what you learn from the data from your experiment.

Research
If you had to find information in a book, newspaper, or magazine to help explain part of your project, you will need a research category. Simply explain what information may be helpful to others who are looking at your project so they can clearly understand what you have done.

How to Prepare a Science Project

Choosing a Project

1. Deciding what to do may be the most difficult part. Start by listing subjects you are interested in.
2. From each general idea on your list, list questions that you think might be interesting to answer.
3. Choose one that you think you can answer. Before choosing it, do some preliminary research and consider three questions.
    a. Will it be interesting and safe?
    b. Can I get the necessary equipment or materials to do it?
    c. Will I have enough time to complete it?

Project Proposal

Once you have chosen your problem, question, or purpose, write out your project proposal. In your proposal, you will list your problem as well as the materials, and procedure you plan to use.

Demonstrating a Scientific Principle

1. If you plan to do a demonstration, you will be explaining how something works or why something happens the way it does.
    a. When you do a demonstration, be sure that you understand it thoroughly and can explain it to others. If possible, put together a working model.

The Experiment

If you choose to do an experiment, use the guidelines listed below.

1. Research
    a. First, find out as much as you can about your topic. Look up information in science books, newspapers, magazines, and online or interview a scientist or specialist in the area you are studying.
2. State your hypothesis.
    a. Sometimes people call this an "educated guess." What do you think you will discover once your experiment is finished? Your hypothesis does not have to be correct. You are doing the experiment to see if you are correct. You don't want to do something you already know the answer to.
3. Begin the experiment.
    a. Make measurements and record your data.
    b. Use a control when applicable.
    c. Manage your variables. Everything must stay the same except the one thing you are testing.
    d. Perform your experiment more than once. If you do the same experiment 10 times, will the results be similar?
    e. Collect and present your results. Tables, graphs, and charts are helpful in evaluating data. You may have to do some averages, etc., to be evaluate your results.
    f. From your results, form your conclusion. Was your original hypothesis correct? Can you do additional experiments to verify your results? Remember that your results and your conclusion are a product of your experiment. Someone else could do your same experiment and get different results.

How Parents May Help with Science Fair

Choosing a topic is perhaps the most important step in a science project. Together you and your children can think, imagine, dream, and wonder about the world around you. Try to remember some of the questions they have asked in the past. Trips to the museum, industries, or down to the creek may spark some curiosity. Write down several topics to think about over the next few days. Discuss with your child the difficulty of the project, whether it will require technical knowledge and equipment, and the expenses involved, but please let the choice be the child's. Let this be his or her project.

Maintain your enthusiasm. Your excitement over the project is contagious and will keep your child going. Let your child know that you think the project has value. Be positive.

Help locate materials and resources.

Provide transportation to such places as libraries, nature centers, colleges or universities where they can find project information.

One idea sparks another, and it is easy to get off track. Gently remind your child to stick with the exact question that needs answering.

Back away and let him/her do the project themselves. The more you interject your ideas, the more the child will withdraw, and you will be left with the entire project to do yourself.

Plan the Display
The display should tell the project in a neat, well-organized, and appealing manner. The presentation should reflect the scientific method.
Size: limited to 30 inches in depth, 48 inches in width, and 108 inches in height from the floor to the top of the exhibit.
Backboard: durable, portable, and self-supporting
Written or Visual Information: should include the steps of the scientific method. Daily logs, charts, graphs, photographs (do not show the presenter's face), models, drawings, and/or bibliography may be included.

Types of Projects

The purpose of encouraging students to enter a project in the science Fair is so they may acquire hands-on experience through the practical application of the scientific process. Therefore, all projects should be one of the following:

An experiment
An experiment is a test of a cause-effect relationship. An experiment occurs when one variable is changed and another variable is watched for any response. All other variables remained the same throughout the experiment.

An observation
After formulating a question, specific movement, behaviors, or actions in nature are observed over a period of time. Once the observations are gathered, they are studied for patterns that will answer the question. One example of an observation project is the study of an ant's eating habits.

A model
A model is a way to display the parts of something and show what each part does to carry out a particular function. A model study can provide answers to questions like: "How does it work?" or "What does it look like?" An example of a functional model is building an electromagnet, identifying the parts of the electromagnet, and evaluating which parts are essential or non-essential to its functioning.

An invention
Can be one of two things. It could be something or some process that has never been made or done before (a new item) or an object or process is modified in some way (creating a better brake system for a car or bike).

A collection
The question "What is it?" requires a collection design. A collection study involves collecting objects, describing them, grouping them, an identifying them by their proper name. Descriptions are used to sort objects into like groups. The five senses are used to describe the objects, and these descriptions then compared to photographs of the identified objects. When a match is made, the collected object has its proper name.

Students Information and Due Dates
(see 5th Grade Science Fair Information link for more details)

Step One—Pick a Problem
Begin reading and researching topics that interest you. Look through your science book, other books available, newspapers, or magazines. Take notes as you read about things that interest you. Also you will need to write down the title of the resource, the author's name, the publication information, and the date of publication. This will be used to create your bibliography. When you are finished reading, write five questions about what you have read. Then stop and think . . . If you had all the time you needed and could spend time with the world's top expert in the area that interests you, what five questions would you ask? These questions help you determine what you want to learn and do for your project. Think about ways to learn more and go about finding answers to your question. Start collecting all the information you can about this topic.

Step Two—Statement of Question, Purpose, or Problem
You will write up the problem and defend your decision to investigate this problem. Why do you want to do this project? In order for it to be accepted for grading, it must be free of grammar, punctuation, or spelling errors. It must be clear, concise, and scientifically accurate. The problem will be looked at and given back as many times as necessary until it is acceptable. Remember to never ever copy information word for word from a book, magazine, newspaper, or internet.

Your Statement of Question, Purpose, or Problem is due **February 5th, 2010.**

Step Three—Statement of Hypothesis
Once the problem is accepted, you may start working on the hypothesis. Tell what you think the answer is and then explain why you think your answer is correct. This should also be free of grammar, punctuation, or spelling errors. It must be clear, concise, and scientifically accurate. The hypothesis will be looked at and given back as many times as necessary until it is acceptable.

Your Statement of Hypothesis is due **February 12th, 2010.**

Step Four—Materials and Procedure
Materials-List the materials that are needed to do your project.
Procedure—Explain the steps it takes to carry out your project. Be detailed with your steps. Decide what data and information you will be collecting. As you are doing your project, you need to keep a log, journal, or notes about what you do, how or if you change anything, and what is happening. Be thinking about how you will make charts or tables to show your data. These should also be free of grammar, punctuation, or spelling errors.

Your Materials and Procedure are due **February 19th, 2010.**

Step Five—Conduct the Project and Collect Data
You have your materials, know what you want to do, have your steps to follow, and are ready to collect data. Follow your steps to do your project. Be sure to take notes along the way and write what happens. Don't erase anything along the way. Just put a single mark through the thought or answer you want to change. Scientists do not erase.

Step Six—Analysis and Conclusion
Once you have finished your project, you need to start finding ways to analyze your data and draw conclusions. You need to create charts or tables to show your data, but you also need to write a paragraph or more explaining what happened or what you learned. Does what happened support or contradict your hypothesis? Explain what you now know or believe. What have you learned? In order for it to be accepted for grading, it must be free of grammar, punctuation, or spelling errors. It must be clear, concise, and scientifically accurate. The conclusion will be looked at and given back as many times as necessary until it is acceptable.

Your Analysis and Conclusion are due **March 5th, 2010.**

Step Seven—Display Board—Entire Project
Your board needs to be neat, colorful, and eye-catching. You may have hand-written pieces on your board, but typing looks better.

Your Display Board—Entire Project is due **March 23rd, 2010.**

Display Board Rubric

Items on Display	Point Possibility	Points Earned	Comments
Title Large, eye-catching. Spelling, capitalization, or punctuation errors?	5		
Question, Purpose, or Problem Subheading provided? Spelling, capitalization, or punctuation errors?	14		
Hypothesis Subheading provided? Written in complete sentences or thoughts? Spelling, capitalization, or punctuation errors?	14		
Materials Subheading provided? Amounts and numbers provide? Spelling, capitalization, or punctuation errors?	14		
Procedure Subheading provided? Written in complete sentences or thoughts? Easily understood? Spelling, capitalization, or punctuation errors?	14		
Data or Results Subheading provided Charts, tables, and/or data log provided? Spelling, capitalization, or punctuation errors?	14		
Conclusion Subheading provided? Written in complete sentences or thoughts? Spelling, capitalization, or punctuation errors?	14		
Neatness Overall appearance is eye-catching, fun, well put together?	11		
Grade	100		