World Wide IDEA/ICATT

2007
Cyber Science Fair Handbook (WWICSF)

V1.2ww
March 2, 2007

Contents

Introduction

You are invited to participate in World Wide IDEA's Cyber Science Fair (WWICSF). The WWICSF is intended to encourage "Project Based" education in the home and to provide an opportunity for students to display their work in science and technology, via the Internet. The format will be one in which students enter a "science fair" competition. Ribbons will be awarded and all project teams or individual entrants. The WWICSF will differ from most typical "science fairs", in that it will include FIVE categories of projects. **Any home-schooled student may enter this year's WWIDEA Cyber Science Fair.** WW IDEA encourages any military, State Department or contracting home-schoolers to join us. We hope to see you

Category List

We will offer five entry categories. (I have found in past fairs that the first three categories below work very well with younger students.)

WWICSF Categories:

- **Scientific Collection**
- **Inventions or Innovations**
- **Demonstration of Scientific Principle**
- **Scientific Investigation ("Typical Science Project"; solves a problem using the Scientific Method.)**
- **Illustrated Science Report**

Age Groupings and Partnerships

WWICSF Groups:
Students will compete within the following age groups:

Group I - K-3
Group II - 4-8
Group III - 9-12

If a project has **multiple partners**, they may enter together. The project will be entered into the age category of the oldest participant. One ribbon will be awarded for each project regardless of the number of partners.

NOTE for Group K-3: Student originality and participation is critical to all projects and will be looked for by the judges. Please photograph student writing when possible. Students should be quoted "exactly" if parent is transposing student input, via dictation. This is totally acceptable for students in this group.

Project Awards

Each grade category will have different requirements and they will be judged separately. There will be a First, Second, Third Place and Participants ribbon, for each category, IN EACH AGE GROUP. One ribbon will be awarded for each project regardless of the number of partners.

Why "Project Based" Science?

- Creates purposeful, student-centered learning
- Promote interdisciplinary learning
- Promote creativity
- Involve the parent as learning partner / mentor
- Provides excellent opportunities for "On Demand" direct instruction
- It is fun.
- Helps develop life-long learners by facilitating student-directed learning
- Provides opportunities to teach attitudes and value
-

Time line requirements

Registration Due…… **~~March 1, 2007~~ Extended to March 9, 2007**
Projects Submissions Due……**May 1, 2007**
Project Posting to Web site ….**May 7, 2007**
Judging Completed ……**May 24, 2007**
Awards Posted to Web……**May 31, 2007**
Awards Mailed……**May 31, 2007**

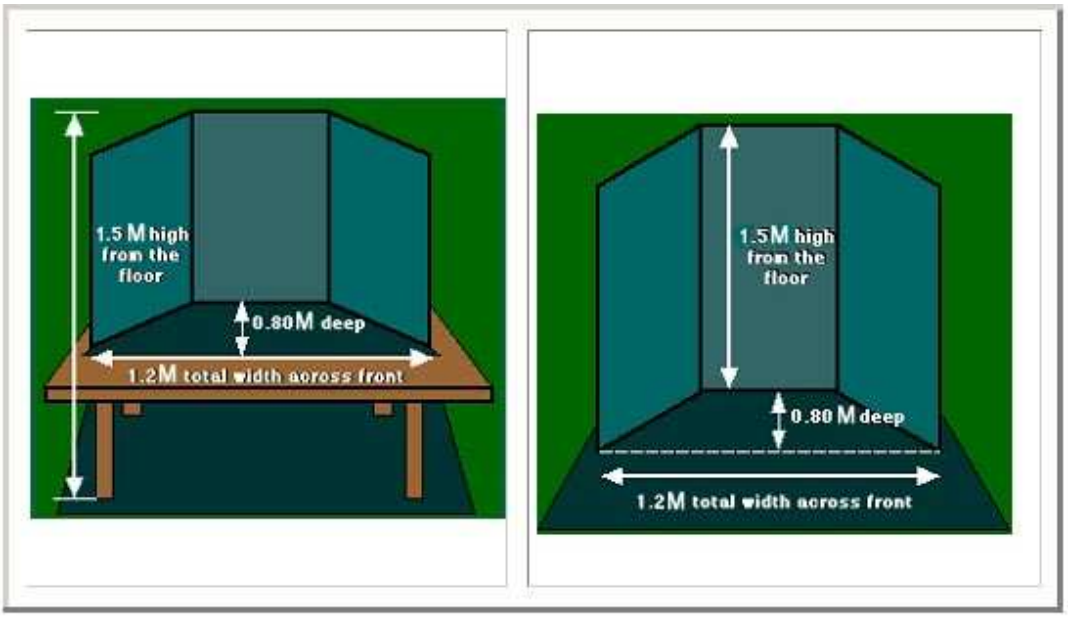
Project Constraints

PowerPoint File size Limit -

Your PowerPoint file, containing your project may be no larger than 5MB (or 5,000K).

Display Board size Limits -

This is the display that you will photograph and include in your PowerPoint Presentation.
The vertical, back ground display board may fold or not fold.
It must not exceed the following dimensions. (Measurements are in Meters (M)



Labeling of Deliverables:

Send in only one PowerPoint presentation, attached to an e-mail to:

mpope@wwidea.org

Write “WWICSF ENTRY” in the subject window of your e-Mail.
Use the following naming format. For your PowerPoint attachment:
<Student’s Last Name>. < Student’s First Name>.WWICSF07.ppt

Example: Smith.Bill.WWICSF07.ppt

Scientific Collection

Scientists often begin their work by making collections of things from nature: rocks, minerals, fossils, plants, flowers, insects, fur, skulls, etc. To be useful, a scientific collection should be well organized and the specimens correctly identified. Be sure to label each specimen with the name of the item; labels should also include where and when the item was collected and who collected it if this information is different for each item. Photos or drawings may accompany the specimens to provide more information; for example, you may want to include a photo of the tree from which a particular leaf was collected. The objects may be presented with backgrounds that reconstruct their natural setting. More detailed information the student wishes to include can be presented in a logbook or journal. Interpretation of the importance, meanings, and relationships of the specimens is encouraged, especially for older students. For example, the student might discuss how rocks or minerals are used in construction or manufacturing, the role of plants in medicine or food, or how fossils help us to understand the past.

Your display for a Scientific Collection should include the following elements:

Title-- Be creative!
Theme-- What is the main classifying theme of your collection (examples: leaves, leaves from trees in Fairbanks, or leaves collected in Vermont). Your theme can be your title if it is not too long.
Method-- General description of how you obtained your specimens.
Collection (with Pictures)--Specimens, labels, additional information about the specimens, if available, including photos, drawings, logbook, etc. The collection should be arranged in some logical order (leaves from hardwood trees and leaves from softwood trees; deciduous leaves and evergreen leaves; spring leaves, summer leaves, and fall leaves).
Interpretation-- Importance, meaning, or relationships of the collection or, for younger children, "what I learned from my collection."
Sources of Information-- List the resources you used to obtain information for your project including books, magazines, museums, people, etc.
Acknowledgements-- List the people who helped you on your project and state what they did. If you have already listed them as a source of information, you do not need to list them again.
Pictures of Display
No limits

Judging criteria for Scientific Collections:

1. (5 points) The collection is focused on one clearly defined theme.
2. (5 points) The collection is based on thorough research.
3. (5 points) The display is in logical order, easy to understand, and appealing to the eye.
4. (5 points) The display uses more than one good method to convey information, such as the labels, journal, photos, etc.
5. (10 points) The display includes some interpretation of the collection.
6. (5 points) Sources are complete.
7. (5 points) Display is complete.
8. (10 points) Written explanations are well presented.(6-Trait Writing Model will be used to score written explanations.)
9. (20 points) Project shows evidence of originality and independent work.

Inventions or Innovations

An invention is a useful object which has never been made before. An innovation is a new service or process (way of doing or making something) or an improvement of an object, service or process. All inventions begin with a "need" or a "problem." Once you have decided on a problem to solve or a product to improve, it is time to search for an appropriate solution.
All inventors are expected to keep an Inventor's Notebook: a log of your progress towards your invention. Your notebook will be your record of the ideas you had for solving your problem; ideas may come from radio or TV, newspapers, conversations with friends and family, professionals, etc. Put these ideas in your notebook with the source and date of the idea. Even if an idea seems silly at the time, write it down; it could be the key to your invention. Your notebook will also contain all your design work and any materials you used to try out your solutions. Be sure to write down what worked-and what didn't work. Every time you work on your invention, record the work in your notebook.
Your invention will be examined for its usefulness, practicality, and originality. The project should include an explanation of the need for the item, step-by-step instructions on how to build and use it, and a working model. Don't forget to name your invention.

Your display of your Invention or Innovation should contain the following elements:

Name of the Invention or Innovation-- Catch the attention of the viewer.
Problem or Need--The purpose of your invention or innovation.
Inventor's Notebook-- A record of ideas for a solution, possible designs for the invention, outcomes of trial runs by you or your friends.
Explanation-- How to build and use the invention; include a list of materials used.
Working Model -- Your invention or innovation.
Evaluation-- Do you think your invention is a success or not? Why? Would you change it in any way?
Sources of Information-- List the resources you used to obtain information for your project including books, magazines, museums, people, etc.
Acknowledgements-- List the people who helped you on your project and state what they did. If you have already listed them as a source of information, you do not need to list them again.
Pictures of Display
No limits

Judging Criteria for Inventions or Innovations:

1. (5 points) The problem or need presented is clear.
2. (5 points) How to build and work the invention is clear.
3. (5 points) The list of materials is complete.
4. (5 points) The Inventor's Notebook is complete.
5. (5 points) Written explanations show understanding of the project.
6. (5 points) The display is easy to understand and appealing to the eye.
7. (5 points) The name for the invention is intriguing.
8. (5 points) The model of the product is well constructed.
9. (5 points) Sources are complete.
10. (5 points) Display is complete.
11. (10 points) Written explanations are well presented.(6-Trait Writing Model will be used to score written explanations.)
12. (20 points) Project shows evidence of originality and independent work.

Demonstration of a Scientific or Mathematical Principle

This type of project encourages students to mess around with a scientific principle (gravity, magnetism, genetic inheritance, electrolysis, osmosis, etc.) and then share their knowledge with others. Good demonstrations focus on only one scientific principle and use a variety of means to illustrate that principle: drawings, photos, models, and other visual aides. The best demonstrations involve multiple senses and allow the viewer to interact with the scientific principle directly--work pulleys, look in different kind of mirrors, spin a color wheel, change a magnetic field--so be sure your interactive demonstration is sturdy. Your exhibit should attract visitors with an eye-catching display, engage them in learning, and send them on their way with a better understanding of the scientific principle.

Your Demonstration display should contain the following elements:

Title--An intriguing title will capture the viewer's attention.
Objective--Clearly identify the scientific principle you wish to demonstrate.
Explanation--A general statement of how the scientific principle works; you can include a history of how the principle was first discovered to add human interest to your demonstration.
Demonstration—Play-by-play explanation of your demo, Models, drawings, charts, graphs, photographs, and "hands-on" materials that will help the viewer understand the principle. Each visual aide should be accompanied by an explanation of what it shows or directions for using it.
Application-- Give some examples of how the scientific principle impacts the world around us.
Sources of Information--List the resources you used to obtain information for your project including books, magazines, museums, people, etc. **Acknowledgements**---List the people who helped you on your project and state what they did. If you have already listed them as a source of information, you do not need to list them again.
Pictures of Display

Judging criteria for Demonstrations:

1. (5 points) The demonstration is focused on one clearly defined scientific principle.
2. (5 points) The demonstration is based upon thorough research.
3. (5 points) The demonstration uses more than one good method to convey information.
4. (5 points) Application of the principle is explained.
5. (5 points) Sources are complete.
6. (5 points) Display is complete.
7. (10 points) Written explanations are well presented. (6-Trait Writing Model will be used to score written explanations.)
8. (20 points) Project shows evidence of originality and independent work.

Scientific Investigation

A scientific investigation is a way of answering a question using the "scientific method."

The scientific method:

- State the problem
- Gather information
- Make hypothesis
- Test hypothesis (Experiment)
- State conclusion

Experiments must ask questions that can be answered by a series of objective tests. If repeated, the tests should yield the same basic answer.

For example, "Which cats are most beautiful?" requires a highly subjective, value-laden response. The response would vary from person to person. This would not make a good science experiment. On the other hand, "What diet produces the shiniest fur in cats?" would make a fine project, assuming there is some objective way to measure shininess.

To build a really good experiment, the student needs to identify factors that might affect the outcome of the experiment (these are called **variables**) and change only one at a time.

For example, would it be appropriate to experiment with the effect of the amount of light on plant growth if you used different types of plants, gave them different amounts of water, and kept the plants in different places? It would be difficult to know which of the factors actually affected plant growth. To remedy this, **vary one factor at a time and keep everything else exactly the same.**

What if you used only one plant in each amount of light, would that be a good test? What would happen to your experiment if one plant gets sick, or is attacked by insects, or accidentally breaks a stem? You're out of luck. Therefore, you should use several plants in each light condition or do the project several times (these are called **replicates**). Having a number of replicates is essential for a good science experiment.

What if your experiment doesn't turn out the way you thought it should? Try it again!

Your conclusions should rely upon the information you collected and tell what you actually found out. There is nothing wrong with saying, "My data did not support my hypothesis." Please DO NOT rewrite your hypothesis to retrofit your data.

Your display for a Scientific Experiment Should contain the following elements:

Title-- Catchy titles grab the viewer's attention, but be sure they are relevant to your experiment. The question you are asking can also make a good tide.

Problem-- Be sure to state clearly and concisely the question you hope to answer with your experiment; be sure your experiment is designed to answer this question.

Hypothesis-- This is your guess at the answer to your question or what you expect to be the result of your experiment. Stating a hypothesis determines how you design your experiment. For example, the hypothesis that "temperature affects the way a ball bounces" might be tested differently than the hypothesis that "warm balls bounce higher than cold balls." (This is a good place to identify variables.)

Experiment-- Describe what you did to test your hypothesis. Your description should include enough detail that someone else could read it and repeat your experiment.

- Material list
- Procedure - Step-by-step description of how you performed your experiment
- Data or Results - A written record of your observations
  Raw Data-- These are your measurements, counts, survey statistics, or other results gathered during the experiment.
  Data Analysis Graphs, charts, photos, drawings, etc. are a good way to organize data so that it can be understood more easily. Some written text may be desirable to summarize your results, but do not discuss the meaning of the results in this section.

Conclusions-- This is where you discuss your results, tell what you think your results mean, and describe what you learned. Did your results support your hypothesis? In other words, do you think your guess was right? Why or why not?

Sources of Information-- List the resources you used to obtain information for your project including books, magazines, museums, people, etc.

Acknowledgements-- List the people who helped you on your project and state what they did. If you have already listed them as a source of information, you do not need to list them again.

Pictures of Display
No limit

Judging Criteria for Scientific Investigations:

1. (5 points) The question the project seeks to answer is clear.
2. (5 points) The hypothesis or prediction is clear.
3. (5 points) Procedures are clear, complete, and address the hypothesis.
4. (5 points) Data or observation records are clear, complete, and well illustrated.
5. (5 points) The experiment has replicates (for example, several plants in each light condition, several flights of the paper airplane, etc.)
6. (5 points) Conclusions are consistent with the data and clearly refer to the initial hypothesis.
7. (5 points) Written explanations show understanding of the project.
8. (5 points) The display is easy to understand and appealing to the eye.
9. (5 points) Sources of information are complete.
10. (5 points) Display is complete.
11. (10 points) Written explanations are well presented. (6-Trait Writing Model will be used to score written explanations.)
12. (20 points) Project shows evidence of originality and independent work.

Illustrated Science Report

Sometimes a student has a keen interest in a science subject that does not readily fit into any of the other five categories. Usually this is a subject that is not easy to study where a person lives (for example, coral reefs, from Alaska) or is difficult to demonstrate (for example, nuclear power). **To prepare an Illustrated Science Report, the student learns as much as possible about the subject using such sources as books, interviews, lectures, museums, and personal observations. Notes are kept on what was learned and where the information was obtained. The student then organizes the information and writes a report on what she/he has discovered in his/her own words.** The subject of the report should have a unifying theme. We encourage students to show how their subject has or could have relevance to the world we live in (leave your reader with some food for thought). The student must use visual aides to illustrate the report such as models, drawings, photographs, charts, etc. The Illustrated Scientific Report will require a display board on which the student should mount a rifle, an introduction, and a summary of the report. We encourage at least some illustrations be mounted on the display board; others may be more appropriately incorporated into the written report.

An Illustrated Science Report differs from a Demonstration of a Scientific Principle in one major aspect: **it does not demonstrate a scientific principle.** For example, a student may want to learn about deep-sea fishes. That would make a fine Scientific Report. One aspect of deep-sea fishes is the great pressure they are able to withstand. An exhibit could be built to examine, and allow others to explore, the effects of water pressure. This would be a fine Demonstration of a Scientific Principle.

One of the objectives of a Science Fair is to encourage students to do science, not just to learn or write about it. We encourage students to enjoy science in all forms. **We feel there is a growing need for good science writers who can bring scientific information to the public in an easy-to-understand format.**

Your display of an Illustrated Science Report should have the following elements:

Title-- The title of your report should be on the report as well as on the display board.

Introduction or Background--This is where you explain how you became interested in the topic, what your objective is in writing the paper, and who you intend your readers to be (your targeted audience); the introduction should be on the display board.

Illustrated Report-- This is your written report; visual aides can be incorporated into the report as illustrations and can accompany the display as models, mounted photos, etc.; if the written text is short enough, it can be mounted on the display board.

Visual Aides--Your report must contain visual aides to help the reader understand your subject; some visuals may be in the written report and some in the display; visuals should be relevant to your subject and accompanied by written text that highlights the point you wish to make with the visual; visual aides should also be used to attract the reader's attention to your project.

Summary-- brief summary highlighting the main points should be provided at the end of your report and on the display board; readers who do not have time to read your entire report should be able to read the summary and come away with a good idea of what the report contains.

Sources of Information--List the resources you used to obtain information for your project including books, magazines, museums, people, etc.

Acknowledgements---List the people who helped you on your project and state what they did. If you have already listed them as a source of information, you do not need to list them again.

Pictures of Display

No limits

Judging criteria for Illustrated Science Reports:

1. (5 points) The report is focused on one clearly identified theme.
2. (5 points) The report is based upon thorough research.
3. (5 points) The report is easy to understand and neat.
4. (5 points) Visual aides who are relevant, self-explanatory, and eye appealing accompany the written report.
5. (5 points) Sources are complete.
6. (5 points) Display is complete.
7. (20 points) Written explanations are well presented. (6-Trait Writing Model will be used to score written explanations.)
8. (20 points) Project shows evidence of originality and independent work.

Tips and Frequently Asked Questions (FAQs)

Tips for Submitting Project Presentations:

- **You will be submitting your project as a Microsoft, PowerPoint presentation. Your file may not be larger than 5 MB.** This will be more that enough room for your project if graphics are optimized and sound and animation is used sparingly. Contact Mark Pope if you need assistance trimming-down a corpulent file.

- **Use animation sparingly** and only when needed. It is the content of your project that will be judged, not how fancy your transitions are.

- **A large picture file (over 40Kb) can be optimized** using most picture editing software. Pictures saved in JPEG format work best. Contact me if you have questions about optimizing your pictures. Most pictures should be no larger than 40K. If they are, people will most likely, not want to wait for your project to load. Please keep pictures to less than 40K; under 20K is best.

Why a homes-school science fair?

Children of all ages can benefit in many ways from putting together a science fair project. Science projects give students a chance to do hand-on science and be real scientists. The process of designing, implementing, and presenting a science experiment results in a much deeper understanding of the specific science topic and of the scientific process in general. Students also learn broader skills such as time management, report writing, graphic/artistic display, and oral presentation, which have applications in many areas of life.

Who may enter the Home-school Science Fair?

Any home-schooled student may enter this year's WWIDEA Cyber Science Fair. WW IDEA encourages any military, State department or Contracting home-schoolers to join us. Students must currently be in grades K through 12. Each student may enter only one project, which covers research done during the school year. In addition, students must have been home-schooled for the duration of the project. Projects entered in another science fair during past school years are ineligible. Continuation of a project from a previous year is permitted, as long as the entered project presents new research conducted during the current school year.

Why should I register for the Cyber Science Fair?

Registration helps us plan.

Must my child do an investigation, or may we simply display a project we have worked on?

Scientific Investigations use the "Scientific Method" to answer a question. As such, scientific investigations represent a complete and original problem solving process. We encourage all students to conduct scientific investigations at some point, during home-schooling. We have included four other science fair categories because they involve processes that are important to scientists. They are ways of "doing science" that help make it possible for us to continually learn new things, and ultimately, solve new problems.

Do you have other questions? If so, please Contact Mark Pope, WWICSF Coordinator .

2007 WWICSF Registration

(Please copy and paste to an E-Mail and send to Mark Pope)

Name of Entrant:

Age:

Grade:

Address:

Phone:

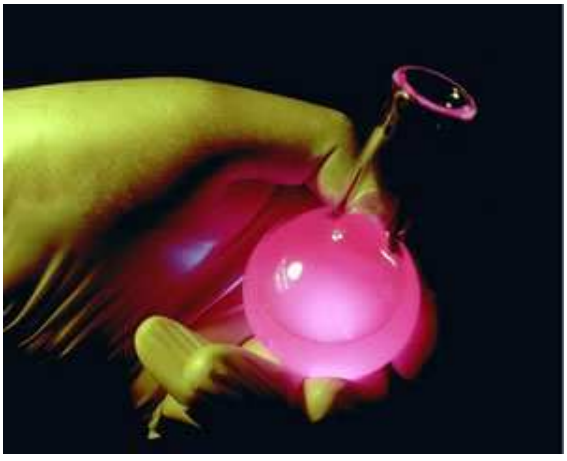
Email:

Project Category:

Title of Project:

Parent:

NOTE:
Please be sure to fill in all blanks. If you are working with a partner, be sure your partner includes their name.



Remember. . . "The important thing is not to stop questioning." - A. Einstein