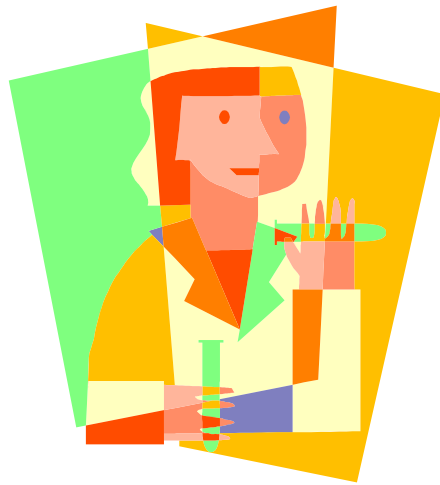


# **2008-2009 SCIENCE FAIR HANDBOOK**



**Grades Kindergarten – Fifth**

**Houston Independent School District**

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The purpose of this publication is to provide teachers, science fair coordinators, and/or science fair committees with suggestions for organizing and promoting a successful school science fair.

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## WHAT IS A SCIENCE PROJECT?

A science project is a planned undertaking by students, calling for problem-based constructive thought and research following the experimental design process.

A helpful resource for working through this process can be found at:

<http://dept.houstonisd.org/curriculum/science/Content/design.pdf>

## EXPERIMENTAL DESIGN PROCESS

1. **Question** - What is the goal? What is tested? (e.g. Does temperature affect the time it takes ice to melt?)
2. **Variables** - There are two variables that need to be identified. An independent variable is the one thing that is purposefully changed to affect the result. (e.g. air temperature) The dependent variable is what is measured. (e.g. Time it takes for the ice to melt.)
3. **Hypothesis** - Make a prediction about how the variable will affect what the answer to the problem will be. The hypothesis must answer the question. This should be stated as an "If...then" statement and be in measurable terms.
4. **Project Plan/Procedure** - Write a step-by-step description of how the experiment will be conducted in order to test the hypothesis. Include repeated (at least 3) trials to increase the reliability of results.
5. **Materials** - List all materials and equipment that were used.
6. **Data Gathering** - Keep a detailed journal including dated entries. Organize observations called data on graphs, charts, and tables using metric measurements. Photographs are appropriate but **cannot show faces** of individuals.
7. **Results** - Summarize the results of the investigation.
8. **Research/Bibliography** - Find more information related to the question. Use print material, electronic media or interview with experts. The bibliography should have a minimum of three (3) sources. These include books, journals (including electronic journals) and magazines. Cite sources using correct format.
9. **Conclusions** - Answer the problem statement. Then analyze the results and write a conclusion explaining whether the hypothesis was proven or not. If you repeated your project what would you change?)
10. **Communicate Findings** - Present the project.

## GETTING STARTED

Getting ready for a science fair requires time and energy. Each school should designate a science fair coordinator.

A Science Fair Committee is recommended. The committee should consist of three to five volunteers who are interested in your science program. The Science Fair Committee may decide to delegate some of the responsibility of the fair by organizing one or more of the following subcommittees:

Registration  
Project Approval/Selection  
Refreshments  
Program/Schedule  
Judging  
*(Parents should not judge school fairs or district fairs)*  
Safety  
Awards  
*(All participants should receive some type of recognition)*

Paramount to the success of a science fair is establishing a timetable so that every necessary function has an adequate time allotment.

**NOTE: In order to participate in the regional fair, it is required that the school science fair coordinator meet personally with the Regional Science Representative. This can be done at a meeting that the Science Representative holds. All HISD Elementary Science Fair rules and guidelines must be followed.**

## ESTABLISHING A TIMETABLE FOR YOUR SCHOOL FAIR

The following is an example of a timetable that the science fair coordinator or committee may follow. Activities may be added or deleted to fit the overall structure of your school science fair. The month that the following activities occur depends upon the dates of the school fair and the district fair.

### Tasks to be completed at least six months before the school fair

- a. Form a Science Fair Committee or select a Science Fair Coordinator.
- b. Form subcommittees.
- c. Set an initial committee(s) meeting date.
- d. Set a date for the fair. Be sure to have this approved and placed on the school calendar.
- e. Select a site for the fair.
- f. Inform students of the science fair.
- g. Distribute information to the students-including a calendar of events, rules & regulations, and student timeline.
- h. Publicize fair via school paper, school bulletins & bulletin boards, letter to parents, newsletters, etc.
- i. Notify parents/guardians of science fair plans/requirements.
- j. Identify Science Fair budget.

Tasks to be completed at least four months before the school fair

- a. Send out information reminding students of the science fair-date, time, location, rules & regulations, deadlines, etc.
- b. Distribute project plan forms to students. Set a date for the return of the forms for approval by the teacher/coordinator.
- c. Obtain judges (high school teachers, college science teachers, high school students, professional scientists, etc.)
- d. Publicize fair.

Tasks to be completed at least one month before the school fair

- a. Collect forms by grade levels and categories.
- b. Compile list of projects. This list is needed for the following reasons:
  - (1) To determine how much space, how many tables, and how many electrical outlets will be needed.
  - (2) To determine how many awards and certificates will be needed.
  - (3) To present final information about the fair to participants (judging criteria, calendar of events, etc.)
  - (4) To decide how many judging teams will be needed.
- c. Finalize fair activities (registration procedures, program, etc.)
- d. Publicize fair.

Tasks to be completed at least three weeks before the school fair

- a. Assemble judging folders and guidelines; reproduce judging forms.
- b. Contact judges (include guidelines, judging form, and other pertinent fair information.)
- c. Plan science fair program.
- d. Order awards and certificates.

**The School Science Fair**

- a. Projects should be judged and awards given.
- b. All participants should receive a Certificate of Participation.
- c. An Open House is suggested.
- d. Family Night for science could be conducted at the same time.
- e. Enter school winners in the Regional Science Fair.

Tasks to be completed after the school fair

Post-Fair Activities:

- 1. Thank you notes for
  - (a) Students
  - (b) Faculty
  - (c) Judges
  - (d) Committee members
  - (e) Volunteers
  - (f) Others
- 2. Publicize fair participants, winners, review, etc.
- 3. Conduct a “debriefing” meeting of committee members and volunteers.

## **K-5 SCIENCE FAIR INFORMATION**

### **Rules/Regulations**

This guide outlines the rules and regulations for school level science fairs. Please share this information with others who are involved with the fair. This information should be shared with students and parents.

### **Exhibit**

It is suggested that exhibits be confined to a space not to exceed 76 cm (30 inches) deep, front to back; 60 cm (24 inches) wide, side to side; and 274 cm (108 inches) high, floor to top. The maximum height for the display itself is 198 cm (80 inches.) However, a school may elect to allow projects with the following dimensions: 122 cm (48 in.) wide by 76 cm (30 in.) deep by 274 cm (9 ft.) high. If the administrative district is having a science fair, be sure to ask about the size requirements for projects.

### **Categories**

It is suggested that the categories listed below be used for school and area competitions:

#### **Physical Science**

(Chemistry, Physics, Properties of Matter)

#### **Earth/Space Science**

(Geology, Astronomy, Geography, etc.)

#### **Life Science**

(Plants and Animals)

## General Guidelines

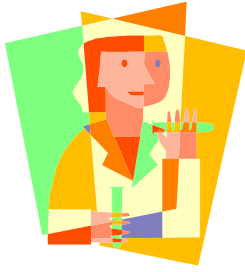
### Type of projects by grade level

Grade Level	Class Project	Group of 3 students	Group of 2 students	Individual
PK – 3 <sup>rd</sup>	X			
4 <sup>th</sup>		X	X	
5 <sup>th</sup>			X	X
6 <sup>th</sup>	Consult the Regional Science Representative to see if the students will follow Elementary or Secondary guidelines. The link to the Secondary guidelines is: <a href="http://hunstem.uhd.edu/SEFH/documents/ruleguid08%20final.pdf">http://hunstem.uhd.edu/SEFH/documents/ruleguid08%20final.pdf</a>			

### Project Requirements

1. Each class/individual/group should develop a project plan **before** the project is started. The plan must be written on the form found on page 10. The completed form must be turned in to the Science Fair Coordinator for prior approval. This same form will be used as an entry form for the school science fair and available for the regional fair.
2. As science fair coordinator consider the following criteria before granting project approval:
  - All projects need to be conducted under adult supervision and follow elementary safety guidelines. TEA Elementary Science Guidelines can be found here:  
[http://www.utdanacenter.org/sciencetoolkit/downloads/safety/texas\\_safety/introduction.pdf](http://www.utdanacenter.org/sciencetoolkit/downloads/safety/texas_safety/introduction.pdf)
  - Materials and equipment should be common elementary science resources such as: aluminum foil, plastic bags, baking soda, salt, potting soil, [sugar](#), [vinegar](#), [coffee cans with lids](#), etc.
  - Projects involving cell cultures, bacteria or mold and those using dangerous chemicals are not appropriate for this age group and should not be permitted. Human surveys do not readily fit into an experimental design and therefore are not accepted.
  - Approval will not be given for projects where the intent is to kill a living organism.
3. The project must be the work of the student(s) registered for the fair.
4. A laboratory notebook, log, or journal is required for each project. This should include raw data, procedures, observations and reflections that were recorded during the experimental process.
5. Age appropriate research should be conducted to increase understanding of science concepts covered in students' projects. A brief summary of the research can be included separately or integrated into the project conclusion.
6. Students must demonstrate through pictures, charts, graphs, diagrams, or tables on the project board or folder evidence of the experiment's completion. **Remember:** Photographs should not show students' faces.
7. All exhibits should have a freestanding backdrop. No commercial models or kits should be allowed as exhibits. A copy of the bibliography should be attached to the backdrop.
8. Only the project board, log and pictures may be exhibited at the fair. The name of the class, student(s), and/or school must **NOT** appear on the project.

**The date of the school science fair must be planned in conjunction with the area-regional fair date, if applicable. The schedule for standardized tests must be taken into account.**

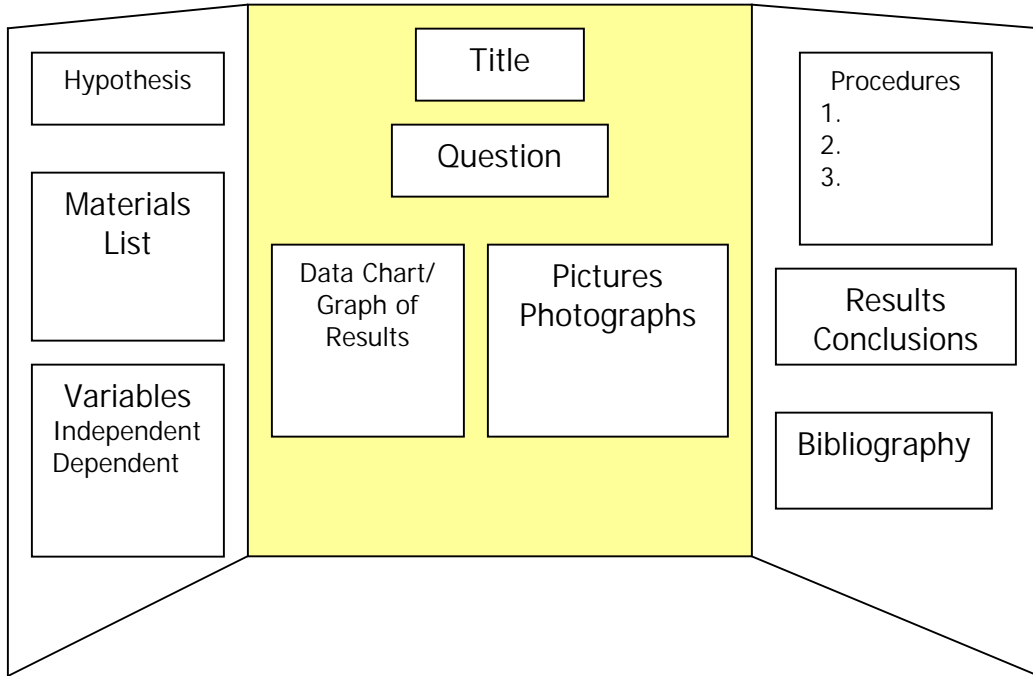


## Science Project Scoring Rubric K – 5

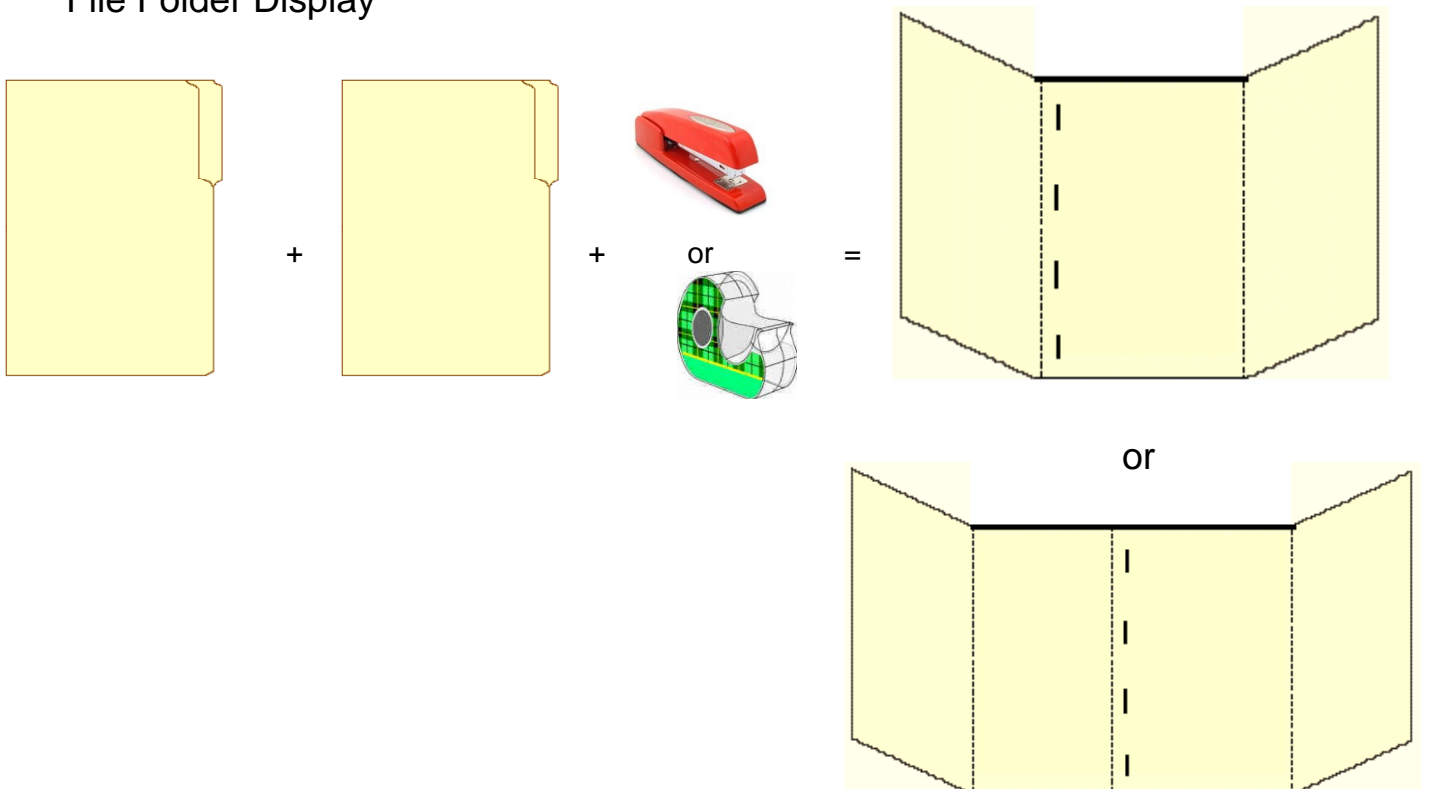
	<b>Points Awarded</b>
<p><b>Content (30)</b></p> <ul style="list-style-type: none"> <li>○ Question is clearly identified</li> <li>○ Hypothesis is clearly stated and directly related to the question</li> <li>○ Procedure clearly tests the hypothesis and includes safety considerations.</li> <li>○ Experiment was replicated for reliability (at least 3 trials)</li> <li>○ All variables were clearly identified.(independent and dependent)</li> <li>○ Materials listed</li> </ul>	
<p><b>Results (30)</b></p> <ul style="list-style-type: none"> <li>○ Science notebook contains dated entries, raw data and description of procedure.</li> <li>○ Results are clearly presented and demonstrated with a table, chart or graph.</li> <li>○ Results relate directly to the question and hypothesis.</li> </ul>	
<p><b>Conclusions (15)</b></p> <ul style="list-style-type: none"> <li>○ Conclusion is clearly stated.</li> <li>○ Conclusion is logical and based on data collected.</li> <li>○ Conclusion includes questions for future research.</li> </ul>	
<p><b>Bibliography (10)</b></p> <ul style="list-style-type: none"> <li>○ Bibliography has at least 3 references written in correct format.</li> <li>○ Clear evidence of appropriate research for project.</li> </ul>	
<p><b>Communicating the Results (15)</b></p> <ul style="list-style-type: none"> <li>○ Project appears well organized and shows depth of study</li> <li>○ All parts of the experimental design process are present.</li> <li>○ Project is neat, presented creatively and is interesting.</li> </ul>	
<b>Total Points (100 possible)</b>	

# Displaying Science Fair Projects

## Tri-fold Board Display



## File Folder Display



## PROJECT PLAN PROPOSAL AND SAFETY FORM

Grade Level: \_\_\_\_\_ Teacher's Name: \_\_\_\_\_

If a **class project**, the number of students in the class: \_\_\_\_\_

If an **individual (1), group (2 or 3)** project, provide the student(s) name(s).

Student's Name: \_\_\_\_\_

Student's Name: \_\_\_\_\_

Student's Name: \_\_\_\_\_

School: \_\_\_\_\_ Region: \_\_\_\_\_

Title of Project: \_\_\_\_\_

(5 words, 50 characters, maximum)

**QUESTION:**

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**HYPOTHESIS (If...Then):**

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**PROCEDURES; (Include, if applicable, safety measures, animal care measures, etc.)**

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**If experimentation is conducted off campus provide the name and address of adult supervisor:**

Name of Adult Supervisor: \_\_\_\_\_ Address: \_\_\_\_\_

**I certify that I have reviewed the project plan prior to the beginning of the experiment and it does comply with the rules and regulations of HISD Science Fairs.**

Classroom Teacher \_\_\_\_\_

Please Print

Classroom Teacher Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## BIBLIOGRAPHY OR LITERATURE CITED

It is important to properly cite the sources used during your project. This includes the books, articles, websites, etc. that you used for researching the project. They are written or typewritten in the following format.

**There is also a free website that will format the sources for the bibliography called EasyBib.**

The URL is: <http://www.easybib.com/>

### **Book with one author:**

Author (last name, first name). Title of the book. City: Publisher, Date of publication.

*EXAMPLE:* Buffa, Liz. Research Paper Smart. New York: Random House, 1997.

### **Book with two authors:**

Author's last name, first name, and second author's full name. Title. Place of publication: Publisher, date of publication.

*EXAMPLE:* Lackey, Mercedes and Larry Dixon. Owlknight. New York: Daw Books, 1999.

### **Book with an editor:**

Editor's last name, first name, ed. Title. Place of publication: Publisher, date of publication.

*EXAMPLE:* Kizer, Carolyn, ed. 100 Great Poems by Women. New Jersey: The Ecco Press, 1995.

### **Encyclopedia article:**

Encyclopedia Title, Edition Date. Volume Number, "Article Title," page numbers.

*EXAMPLE:* The Encyclopedia Britannica, 1997. Volume 7, "Gorillas," pp. 50-51.

### **Journal article:**

Author's last name, first name. "Title of article." Magazine title volume number: issue number (year of publication): page numbers.

*EXAMPLE:* Carlin, David R. Jr. "Why Catholic Liberal Should Settle for Half a Loaf." America 176:2 (1997): 11-15.

### **Magazine article:**

Author's last name, first name. "Article title." Magazine title date of publication: page numbers.

*EXAMPLE:* Jerome, Richard and Margaret Nelson. "Deadly Game?" People Sept 23, 2002: 221-2.

### **Newspaper article:**

Author's last name, first name. "Article title." Newspaper title [city of publication, if not in title] date of publication, edition if necessary: section if necessary: page numbers.

*EXAMPLE:* Martinez, Jose. "Airline: Doomed pilot well trained." Daily News [New York] Oct 31 2002: 26.

### **A person:**

Full name (last name first). Occupation. Date of interview.

*EXAMPLE:* Smeckleburg, Sweets. Bus driver. April 1, 1996.

### **CD-ROM:**

Disc title: Version, Date. "Article title," pages if given. Publisher.

*EXAMPLE:* Compton's Multimedia Encyclopedia: Macintosh version, 1995. "Civil rights movement," p.3. Compton's Newsmedia.

### **Email message:**

Author of message, (Date). Subject of message. Electronic conference or bulletin board (Online).

Available e-mail: LISTSERV@ e-mail address

*EXAMPLE:* Ellen Block, (September 15, 1995). New Winners. Teen Booklist (Online). Helen Smith@wellington.com

### **Website: Site name. Date of last update. Author. Date you accessed the site <URL>**

*EXAMPLE:* U. S. Department of Education (ED) Home Page. 29 Sept. 1999. US Dept. of Education. 1 Oct. 1999 <<http://www.ed.gov/index.html>>.