Harmony Science Academy – Austin

School-Wide Science Fair

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Harmony Science Academy - Austin Science Fair

Calendar of Events

Sep. 2010-Oct. 2010

- HSA Science Fair Handbook will be given the parents and students. **(Sept. 10th, 2010)**
- **Deadline:** HSA Science Fair Handbook Release form and Safety Forms should be returned to science teachers. **(Sept. 17th, 2010)**
- **Deadline:** HSA Science Fair Entry Forms should be submitted by students to teachers **(Sept. 24th, 2010)**. Students **cannot** change title of the project after they submitted the forms.
- **Deadline:** HSA Hypothesis form should be submitted by students to teachers. **(Oct. 1st, 2010)**
- **Deadline:** Procedure should be submitted by students to teachers. **(Oct. 15th, 2010)**

November 2010

- **Deadline:** HSA Science Fair Rough Draft of Research Paper submitted to their respective science teachers via email, USB, or printed. **(Nov. 22nd, 2010) (Must be typed and double spaced)**
- Judging Information will be mailed out for Judges.

December 2010

- **Deadline:** HSA Science Fair Final Research Paper submitted to their respective science teachers via email, USB, or printed **(Dec. 17th, 2010) (Must be typed and double spaced)**

January 2011

- **Deadline:** Display Boards submitted to students' respective science teachers **(Jan. 7th, 2011)**
- In-class presentations **(Jan. 10-12th, 2011)**
- Preliminary Grading and Judging by Science Fair Committee **(Jan. 10-12th, 2011)**
- Qualified projects will be announced. **(Jan. 13th, 2011)**
- Set up Science Fair **(Jan. 14th, 2011 – 3:00 till finished)**
- **HSA-Austin School Wide Science Fair (Jan. 15th, 2011)**

LETTER TO PARENTS

Dear Parents,

As you know, science, technology and engineering are basic skills expected by employers. As Twenty First Century citizens, these students will also have to make some of the toughest decisions of any generation, based on their understanding of emerging science and technology.

Science fairs involve students in the practices of science and engineering, requiring them to apply those skills to a topic of interest to them. Doing science is key to understanding science.

Our school is holding a science fair on January 15th, 2011, and all students in grades 4-8 have been invited to participate. Hands-on scientific investigation and invention are the focus at our particular fair. Over a 12 week period, your child will design, test, analyze, and present a project that uses scientific methods to solve a problem. The sky's the limit!

Please note that the bulk of the work will be done at home. Students will be given project guidelines and timelines at school, and teachers will check in with them periodically. However, much of the work will be self-directed. Parents are encouraged to offer emotional support and reminders, but to allow children to do the projects by themselves.

Don't hesitate to call or email with any questions. Thank you very much in advance for your support!

Sincerely,

Ryan Gwizdala
Science Fair Coordinator
Grades 4, 5, 7

Ayse Tunc
Science Fair Coordinator
Grades 6 and 8

SCIENCE FAIR GOALS

Science teachers have many reasons why we believe the Science Fair is an invaluable experience for our students. Some of the top reasons or goals that we hope our students achieve are:

1. to stimulate interest, curiosity, and desire to explore the mysteries of the world.
2. to learn, understand, and apply the scientific method.
3. to provide real experiences and methods by which all scientific knowledge has been and is still being gathered.
4. to help develop skills in communicating both verbally and in writing.
5. to help develop skills of interpretation and analysis of data.
6. to learn how to complete long range projects.
7. to acquire skills of research using a variety of resources such as the Internet, interviews, books, magazines, etc.
8. to show a connection between what is learned in the class and what happens in real life.
9. to promote unique opportunities for us (teachers) to work individually with you (the student) in an interdisciplinary project.
10. to foster independence in the student by providing the opportunity for you to take initiative and responsibility in studying a topic for your own learning.

THREE MAJOR COMPONENTS

The science fair project can be divided into four major components or parts.

1. The Experiment:
    1. choosing a topic
    2. performing an experiment
2. The Visual Display
    1. prepare a backboard that illustrates the complete science project
    2. display equipment and materials needed to explain the project
3. The Oral Presentation
    1. present orally a summary of the project to your teacher, classmates, or judges
    2. share and explain all phases of the project in an open setting

HSA - Austin SCIENCE FAIR RULES

General Rules and Regulations

1. All students in HSA are required to complete and submit a research project.
2. Students will receive project grades for each deadline on their exhibits/projects which will determine the majority of 2nd and 3rd Report Card grades in Science class.

3. All students are encouraged to do individual projects, however group projects are allowed in all divisions, including the Senior Division. Maximum two students may be involved in a group project.
4. All exhibits will be turned in on the due date. See the calendar of events. **No** late exhibit is **accepted!**
5. All exhibits should be taken home the day of or no later than two days after school-wide science fair. Exhibits not taken home will be discarded. Harmony Science Academy does not take the responsibility for loss or damage to any of the exhibits.
6. Exhibits will have a limited access to electrical power. If your project will need power, request one week in advance to due date.
7. Fair rules will be distributed to the students before school-wide science fair. Failure to follow these rules may result in disqualification from the fair.
8. If a student wins a trophy or medal in the city-wide or state-wide science fair, or in any other competition/contest in which he/she represents the school, then the school owns the trophy or medal and displays it. A copy will be made for the student. (Student handbook , pg.18)

SAFETY GUIDELINES

Harmony School of Science - Austin follows all rules and requirements specified by Austin science and engineering fair competition. Students should obtain approval for the projects include biological cultures, chemicals, fire, and radiation. All students should return Science Fair Safety Form.

The exhibits **must not** include any of the following:

1. Microbial cultures or fungi, live or dead (no rotten or moldy stuff either!) Try photographs instead.
2. Displays of live animals.
3. Preserved vertebrate animals, whether whole or their parts (this includes humans).Teeth, hair, nails, and histological sections are permissible if properly acquired and form is filed.
4. Photographs showing vertebrate animals in any non-normal condition.
5. Open or concealed flames, matches, or lighters.
6. Dangerous chemicals, including caustics, acids, and many household chemicals.
7. Highly combustible solids, fluids, or gases. (No rocket engines!)
8. Controlled substances.
9. Radioactive materials.
10. Operating lasers.
11. Anything potentially hazardous to the public.

Special care must be given to the following:

12. High temperature.
13. Batteries. (Open top cells are not permitted.)
14. High voltage equipment must be shielded with a grounded metal box or cage to prevent accidental contact. Wiring, switches, and metal parts must be located out of reach.

15. Electric circuits for 110 volts AC must have an underwriters laboratories approved card equipped with a grounded (3 pronged) plug. Exhibits are limited to 300 watts.
16. All wiring must be properly insulated.
17. Bare wire and exposed knife switches are permissible only in low voltage, low current circuit of 12 volts or less.
18. Electrical connections in 110 volt circuits must be soldered or fixed with approved connectors.
19. Devices emitting ultraviolet light must be equipped with the proper filters for eye protection

DIVISONS & CATEGORIES

Experimental exhibits will be divided into three categories:

Life Sciences	**Physical Sciences**	**Engineering/Computer/Math**
Agriculture	Chemistry	Engineering
Behavior/psychology	Physics	Electronics/computer
Environmental sciences	Astronomy	Mathematics
Geology/geography		
Medicine health/Microbiology		
Botany/Zoology		

A SAMPLE PROJECT

The Effect of Salt on the Boiling Temperature of Water

INITIAL OBSERVATION

Cooking instructions tell you to add salt to water before boiling it.

PROJECT TITLE

The Effect of Salt on the Boiling Temperature of Water

PURPOSE OF THE PROJECT

To find out how table salt affects the boiling temperature of water.

VARIABLES

Dependent variable: amount of table salt added to water
Independent variable: temperature at which the water boils
Controlled variable: the amount of water, the heating element, and cooking pot

HYPOTHESIS

Adding table salt to boiling water will cause the water to boil at a higher temperature.

MATERIALS AND EQUIPMENT

- Table Salt
- Distilled Water
- 2 Quart Cooking Pot
- Pint measuring cup
- Teaspoon and tablespoon measuring spoons
- Thermometer
- Stirring spoon

EXPERIMENTAL PROCEDURE

1. Boil one quart of distilled water on a stove.
2. Measure the temperature of the boiling water. Record the highest temperature reading. This is the **control** to compare with.
3. Measure out table salt using a kitchen measuring spoon. Level the spoonful.
4. Add the measured salt to the boiling water and stir.
5. Measure the temperature of the boiling water with the salt in it. Record the highest temperature reading.
6. Repeat for other amounts of salt.

DATA

Data Obtained: 2/25/07, Mankato, MN

Amount of boiling water	2 Cups
Temperature of boiling water **(Control)**	212.9° F
Amount of table salt added to boiling water: Run #1	1 Tbl.
Temperature of boiling water after adding salt: Run #1	215.6° F
Additional amount of table salt added to boiling water: Run #2	1 Tbl.
Temperature of boiling water after adding salt: Run #2	218.3° F

EXPERIMENTAL OBSERVATIONS

When the salt was added to boiling water it bubbled up more, and then stopped boiling. Shortly afterwards, it boiled again.

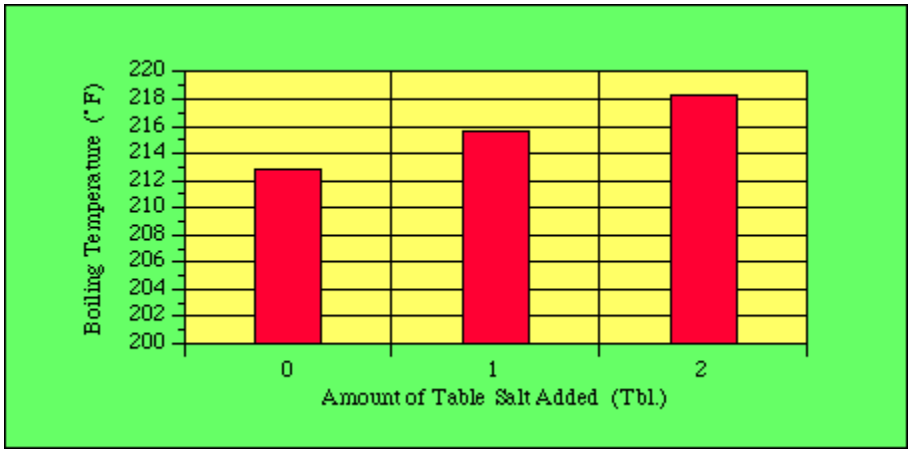
If the thermometer extends beyond the outside of the pot it reads a higher temperature. Heat from the stove burner makes the thermometer read higher. Keep the thermometer over the pot when making temperature measurements.

CALCULATIONS

- Total amount of table salt added for Run #1: 0 + 1 = 1 Tbl.
- Total amount of table salt added for Run #2: 1 + 1 = 2 Tbl.

RESULTS

Temperature of boiling water **(Control)**	212.9° F
Amount of table salt added to boiling water: Run #1	1 Tbl.
Temperature of boiling water after adding salt: Run #1	215.6° F
Total amount of table salt added to boiling water: Run #2	2 Tbl.
Temperature of boiling water after adding salt: Run #2	218.3° F



Amount of Table Salt Added Versus
Water Boiling Temperature

CONCLUSIONS

- Is the hypothesis correct?
  Yes. Adding table salt to water causes the water to boil at a higher temperature.

- Problems with doing the experiments.

The temperature readings were hard to make. Gloves had to be worn to keep my hands from getting too hot. Had to be careful that the stove heat was not hitting the thermometer.

- Other things learned: Be careful when adding salt to boiling water.

DISPLAY BOARD

Your science fair display represents all the work that you have done. It should consist of a backboard, the project report, and anything that represents your project, such as models made, items studied, photographs, surveys, and the like. It must tell the story of the project in such a way that it attracts and holds the interest of the viewer. It has to be thorough, but not too crowded, so keep it simple. The allowable size and shape of the display backboard can vary, so you will have to check the rules for your science fair**. Most exhibits are allowed to be 48 inches (122 cm) wide, 30 inches (76 cm) deep, and 108 inches (274 cm) high (including the table it stands on).** These are maximum measurements, so your display may be smaller than this. A three-sided backboard is usually the best way to display your work. Sturdy cardboard or other heavy material is easier to work with and is less likely to be damaged during transportation to the fair. Some office supply stores sell inexpensive premade backboards such as Hobby Lobby, Office Depot. Purchased backboards generally come in three colors, black, blue, and white. You may use one of these colors. The title and other headings should be neat and large enough to be read at a distance of about 3 feet (1 m). A short title is often eye-catching. Self-sticking letters, of various sizes and colors, for the title and headings can be purchased at office supply stores and stuck to the backboard. You can cut your own letters out of construction paper or stencil the letters for all the titles directly onto the backboard. You can also use a word processor to print the title and other headings.

Some teachers have set rules about the position of the information on the backboard.

The following headings are examples: Problem, Hypothesis, Experiment (materials and procedure), Data, Results, Conclusion. The project title should go at the top of the center panel, and the remaining material needs to be placed neatly in some order.

You want a display that the judges will remember positively. So before you glue everything down, lay the board on a flat surface and arrange the materials a few different ways. This will help you decide on the most suitable and attractive presentation. The figure below shows what a good display might look like.

JUDGING CRITERIA

CRITERIA	INDV	TEAM	EXPLANATION
Creativity	30	25	Originality of the problem, uniqueness of approach and the handling and interpretation of data should be commensurate with the grade level of the student. Ingenious use of equipment and materials is considered regardless of the expense of the items involved.
Scientific Thought or Engineering Goals	30	25	SCIENTIFIC THOUGHT The project shows evidence of depth of study and effort in employing scientific procedures in the solution of a clearly defined problem including study of background, sampling, orderly recording and analysis of data, and the formulation of logical conclusions. or ENGINEERING GOALS The project has a clear objective relevant to the needs of the potential user. The product or process has been tested and is workable and feasible economically and ecologically.
Thoroughness	15	12	The study is complete within the scope of the problem. Scientific literature has been searched, experiments have been repeated and careful records have been kept.
Skill	15	12	Credit is given for special skills needed for the construction or use of equipment and for mathematical, computational, and observational and design skills.
Clarity	10	10	The purpose, procedures and conclusions are clearly explained orally and through the display. The project notebook is well organized, and neat and accurate. Sources of ideas, data and assistance are clearly identified.
Team Work	NA	16	The tasks and contributions of each team member is outlined and reflected in the final work.

REQUIRED FORMAT FOR THE SCIENTIFIC RESEARCH PAPER

PLACE EACH SECTION ON A SEPARATE SHEET OF PAPER

Page 1: TITLE PAGE

Center your title several inches below the top of the page. Directly below your title should be your category (life science, physical science, or engineering/math/computer). In the lower right hand corner, list your name, grade, and date.

Page 2: INVESTIGATIVE QUESTION, PURPOSE, AND HYPOTHESIS

State them in one sentence each!

Page 3: INTRODUCTION

Explain how and why you chose this project. Include any pertinent background information that relates to your topic. In other words, **research on your topic** belongs in this section. The Introduction should be no more than one page.

Page 4: MATERIALS, VARIABLES, AND PROCEDURE

List materials vertically and be specific. Explain your procedure step by step. Drawings/Sketches/Pictures help make your method clearer: include them. If you constructed any materials or equipment, explain here. Identify your independent, dependent and controlled variables. List your procedure step by step.

Page 5: RESULTS

Present your results neatly in tables and graphs. Graphs must be on graph paper or done on a computer. Include a detailed explanation on how you interpreted your data, so that the reader will be able to follow your conclusions.

Page 6: CONCLUSIONS

Write this section after you have finished preparing your results. Briefly summarize your results in the past tense. Restate your hypothesis in the present tense and tell how your data supported or did not support your hypothesis. Give your interpretation of your results and discuss their significance. Don't hesitate to mention difficulties you had or mistakes you made. Include other information that relates to your project that you obtained through research. Give one or two suggestions for what the next experiment might be (related to your experiment) based on your results.

Page 7: ACKNOWLEDGEMENTS

Thank the people who helped you with your project, telling what they did for you.

Page 8: BIBLIOGRAPHY

List any books, articles, etc. that you used for information. Use the following format:

BOOK:
Last name of author, Author's first initial(s). Title of source. Place where published: Publisher, publishing date (year).

For example:
Lane, R. How To Wield A Sword. San Francisco: Nueva Press, 1990.

ARTICLE:

Last name of author, Author's first initial(s). "Name of article." Journal name. Month, Year, pages.

For example:
Smuin, S. K. "My Life in Middle School." Life. November, 1990, p. 13.

CD-ROM:

Title, publisher, publishing date (year)
For example: Encarta Encyclopedia, Grollier's Publishing, 1995.

INTERNET:

Title of site, Author of site, date (year) or URL address.

For example: Burlingame Intermediate School Home Page, Burlingame Intermediate School, 1996 OR http://www.smcoe.k12.ca.us/besd/bis/BIS.html.

5th HSS - AUSTIN SCIENCE FAIR

HANDBOOK RELEASE FORM

(This form is necessary for all students)

My signature below indicates that I have read and understand HSS Science Fair Handbook Guidelines and have been given a copy of my own to keep.

Please tear off this entire page and return to your respective Science Teacher.

_____ _____

Student Signature Date

_____ _____

Parent Signature Date

_____ _____

Email Address Phone Number

SCIENCE PROJECT SAFETY FORM

(This form is necessary for all students)

- If a science project involves vertebrate animals, human subjects (including surveys), controlled substances and pathogens, recombinant DNA, tissues including blood, cell

cultures, microorganisms, environmental sampling, or potentially dangerous chemicals or equipment; you need approval from the Science Fair Board.

- All bacteria, fungi, etc. should be considered potentially pathogenic.
- Air, water, mud and soil samples may contain pathogens or hazardous materials.
- Learn about animal safety measures if working with animals. Pet store animals may not be used for any type of research.
- Surveys should not involve violation of privacy act or potential risk.
- Consumable alcohol and tobacco products and drugs must be obtained by and used by adult project supervisor.
- If using equipment that has voltage greater than 220 volts, firearms, radioactive substances and radiation, you need to review the proper safety standards before experimentation.
- The starting date of project is when approved. No student can begin until they receive approval from their parents.

Student Acknowledgement:
I understand the risks and possible dangers to me of the project I will be working on. I will adhere to all HSS Science Fair rules when conducting my research and project.

_____ _____ _____
(Student's Printed Name) (Signature) (Date)

Parent/Guardian Approval:
I have read and understand the risks and possible dangers involved in a science fair project. I consent to my child participating in a research project.

_____ _____ _____
(Parent/Guardian's Printed Name) (Signature) (Date)

HSS - Austin Science Fair 2010

Project Entry Form
(This form is necessary for all students)

EXHIBITOR:
Exhibitor's Last Name: _____ First Name: _____ MI ___ Grade ____

TITLE:
_____
(maximum of 50 letters/characters)

BRIEF EXPLANATION OF PROJECT:
_____
_____

VARIABLES:
Dependent:
_____
Independent:
_____
Controlled:
_____

HYPOTHESIS (stated in the form of: "If _____, then _____.)
_____
_____

DIVISION (circle one of the following)
4th Grade 5th Grade 6th Grade 7th Grade 8th Grade

CATEGORY (check **ONE** of the following)
Life Sciences Physical Sciences Engineering/Computer/Mathematics

If this project involves vertebrate animals, human subjects (including surveys), recombinant DNA, tissues, cell cultures, microorganisms, environmental sampling, or potentially dangerous chemicals or equipment, were the safety forms approved/signed by the HSS Science Fair Committee. Yes No

Will project require access to 110-120V electricity? Yes No
If yes, student must provide a 9 ft. UL-listed, good quality grounded extension cord.

NAME OF TEACHER: Last Name _____ First Name _____
(Giving the most assistance)

ENTRY AGREEMENT: I enter this project at my own risk and will not hold anybody responsible for loss or damage to the exhibit, or harm to myself. I agree submit display board on December 6, 2010 and to remove my exhibit AFTER to the close of the Awards Ceremony on Saturday, December 11, 2010.

_____ _____
Exhibitor's Signature Parent or Guardian Signature

Certification for entry by school science teacher:

_____
Name/Title Signature