

SCIENCE PROJECTS & SCIENCE FAIRS



Stepping Stones For Our Future Scientists

BRAZORIA COUNTY SCIENCE FAIR
February 18-20, 2010

*Brazoria County Fairground
901 South Downing Road
Angleton, TX*





2010 Brazoria County Science Fair

Information Booklet

Rules and Guidelines



February 18-20, 2010
Brazoria County Fairground



2010 BRAZORIA COUNTY SCIENCE FAIR

Registration for the *2010 Brazoria County Science Fair* (BCSF) will be open **between 12/7 and 1/20**.

Follow these steps:

1. The student will need to read the “**BCSF Registration Instruction Sheet**” (elementary/secondary) BEFORE completing the registration form.
Elementary students (PreK – Grade 6)
<http://www.bcfa.org/sciencefair.htm>
Secondary Students (Grades 7 – 8)
<http://www.bcfa.org/sciencefair.htm>
2. After the student has all the information listed on the “**BCSF Registration Instruction Sheet**”, the student will input the information onto the “**BCSF Registration Form**”. This form can be found as a hard copy in the appendix or on line at the following URL:

Elementary students (PreK – Grade 6)
<http://www.bcfa.org/sciencefair.htm>
Secondary Students (Grades 7 – 8)
<http://www.bcfa.org/sciencefair.htm>
3. The student will need **TWO** copies of the completed form. One copy is to keep for their records and the other copy is to turn into their science teacher.
4. A completed and signed “BCSF Registration Form” will be turned into their science teacher, along with a \$2.00 entry fee by **Wednesday, January 20th**. If student has not already typed in the procedure, including equipment/materials needed and safety precautions for the BCSF registration form, a copy of this information will need to be stapled to the back of the “BCSF Registration Form”.
5. Students will receive back from the “**Science Fair Committee**” one of two forms:
 - a) Approval Form
 - b) Revision Form
6. All projects requiring revisions will need to be resubmitted on line to the “Science Fair Committee” **no later than noon Thursday, February 11th**. A decision on the final revisions will be emailed out to the teacher and student on **Friday, February 12th**.
7. **Approval Forms** will be required of all projects to enter the Brazoria County Science Fair and will be taped to the back of the display board.

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Science Teacher Information Page

The URL listed below has been provided in order to keep the science teachers of students participating in the science fair informed of schedule of events, status of their students, and current information needing to be communicated.

URL: <http://www.bcfa.org/sciencefair.htm>

2010 BRAZORIA COUNTY SCIENCE FAIR

Changes in Brazoria County Science Fair

Project Numbers must be displayed on the front of the project boards.
All approved projects will be assigned a project number and category.

Please remember to not include pictures or names as part of the project display.

2010 BRAZORIA COUNTY SCIENCE FAIR

Schedule of Events

Thursday, February 18 4:30 PM – 7:30 PM - Project Set Up

Approval Form required of all projects and will be taped to the back of the display board.

If a student is unable to set up their own project, a parent or another student can set it up for them, but the project's **Approval Form** will still be required.

Friday, February 19 5:00 PM – 8:00 PM - Judging of Projects

Pre K – 6th Grade Projects are judged **without** the student present.

7^h – 8th Grade Projects – The judging includes interviewing the student or group of students involved. Students must be with their project between 5:00 PM and 8:00 PM. **Any project without a participant present will be passed over by the judges and will NOT be scored.**

For **Security and Safety Issues**, the students will not be able to leave the exhibit building once their project is set up.

Parents are **not** allowed in the exhibit area while the judges are interviewing the students.

Saturday, February 20 Science Fair Projects Displayed and Awarded

| | |
|---------------------|---|
| 9:00 AM – 10:00 AM | Public Views Projects |
| 10:00 AM – 11:30 AM | Award Ceremony (Commercial Exhibit Building) |
| 11:30 AM - 12:30 PM | Project Pick Up |

(Any student who is unable to pick up their own project may have a parent pick it up or give **written permission** for another student to pick up their project. Projects not picked up by 1:30 PM will be discarded.)

2010 BRAZORIA COUNTY SCIENCE FAIR

Grade Division & Types of Projects

Elementary Division

PreK – Grade 6

Model Project – MOD (Grades PreK – 3)

Individual or Team (3 people max)

Observation & Investigation Projects – OB (Grades PreK – 2)

Individual or Team (3 people max)

Experimental Project (Grades PreK – 6)

Individual or Team (3 people max)

Categories of Experimental Projects

- Physical Science- PS
- Earth Science -ES
- Life Science -LS

Junior Division

Grades 7 – 8

Experimental Project

Individual Project (Grades 7 – 8)

Chemistry - CH

Computers - COM

Earth /Space Science - ESS

Engineering - ENG

Mathematics - MATH

Physics - PHY

Behavioral/Social Sciences - BSS

Biochemistry/Microbiology - BCMC

Botany - BOT

Environmental Science - ENV

Medicine/Health - MH

Zoology – ZOO

Team Project (Grades 7 – 8)

Three people max

Engineering/Computers/Mathematics – ECM

Physical Sciences - PS

Botany/Environmental/Zoology - BEZ

Behavioral/Biochemistry/Medicine & Health - BBMH

Junior Division – qualifying for the SEFH

The Brazoria County Science Fair is the qualifying event for the **Science Engineering Fair of Houston, March 12 - 14**. Therefore, all students with an experimental project participating in the Junior Division who are considering competing must follow the **Safety Rules and Regulations** of the Science Engineering Fair of Houston.

A student is required to file protocol forms, if they choose to involve any of the following:

- a) **Human Subjects (including surveys)**
- b) **Vertebrate Animals**
- c) **Hazardous chemicals and or equipment**
- d) **Environmental Collections**
- e) **Human Tissue or Recombinant DNA**
- f) **Microorganisms**

If a student is interested in competing in the Houston fair, they first must medal in their division at the Brazoria County Science Fair and have the proper SEFH paper work or protocol forms filed. They will need to complete the required protocol forms for approval and submit the forms to the Scientific Review Committee (SRC) of the Science Engineering Fair of Houston

The website and the forms are located at URL:

<http://hunstem.uhd.edu/SEFH/>

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GENERAL RULES for All Projects

It is highly recommended that Pre-K through 8th Grade Projects
DO NOT INVOLVE THE FOLLOWING:

- g) Human Subjects (unless it is a survey)
- h) Vertebrate Animals (unless it is for OBSERVATION only)
- i) Hazardous chemicals and or equipment
- j) Environmental Collections
- k) Human Tissue or DNA
- l) Molds or fungi, Bacteria

If a student in grades 7-8 is considering competing in the Science Engineering Fair of Houston, then they must have SRC approval forms for the above project types. The SRC Application deadline is **November 28, 2008.**

- 1 All science projects must have a **BCSF Approval Form**. In addition, teacher guidance and adult supervision is necessary to help ensure the safety of the student during the project.
2. The **Procedure and Safety Protocol** on the online “**BCSF Registration Form**” must be completed to submit the form.
3. A student doing an individual project may enter only one project/exhibit, and it must be his/her own work. Groups of 2 to 3 students of the same grade level may enter a single project in Pre-K– 8th grades. The group project requires one fee for the project, not a fee for each member.
4. Project/exhibit size will be limited to 76 cm front to back, 122 cm side to side and 274 cm from floor to top of project. Tables are approximately 76 cm high. Project size requirements of the Science Engineering Fair of Houston will be used. The display must be freestanding.(e.g. tri-fold of cardboard or foam board)
5. Elementary students will not be present during the judging process.
6. Students in grades 7-8 are required to be present to be interviewed. The oral presentation counts a maximum of 10 points toward the final judging score of the project. An unattended project **WILL NOT** be scored. Parents are **not** permitted in the judging area during judging.
7. **Student will not be allowed to display the name(s) of exhibitor(s) nor identifiable photos on their project display. A judge must not be able to identify the project with a student name.**
8. Once a project has received an approval form from the Science Fair Committee, the project’s purpose and basic procedure can not be changed. Projects that are restructured or completely new will not be judged.
9. No commercial projects, such as kits, will be allowed.

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PreK – Grade 8: Experimental Projects Rules and Regulations

The following rules and regulations have been developed to help insure the safety of all participants in the Brazoria County Science Fair. Please, read and follow these rules and regulations carefully. Naturally, all situations cannot be foreseen; therefore, the BCFA Science Fair retains the right to disqualify any project or exhibit that it judges to be potentially hazardous or inappropriate in any way. Entries not conforming will not be judged and may be removed.

Project Experimentation Rules and Regulations:

1. All science projects must have a **BCSF Approval Form**. In addition, teacher guidance and adult supervision is necessary to help ensure the safety of the student during the project.
2. The **Procedure and Safety Protocol** on the online “**BCSF Registration Form**” must be completed to submit the form.
3. The **identical repetition of a previous year’s work is not permitted**. A student may again exhibit research on a continuing program, provided the research shows significant progress when compared with the previous year’s project.
4. Projects entered in the **Experimental Category** are **required** to follow the steps of the **Scientific Method**.
5. Students will need a **Project Logbook** with their display. A logbook is a written record of all work and research done on the project. It should be in the student’s own handwriting
6. **Students in grades 7-8 are required to be present** to be interviewed. The oral presentation counts a maximum of 10 points toward the final judging score of the project. An unattended project **WILL NOT** be scored. Parents are **not** permitted in the judging area during judging.

Project Display Rules and Regulations:

Anything, which could be hazardous when on public display, is strictly prohibited. This includes, but not limited to:



- live potentially pathogenic organisms.
- microbial cultures and fungi (including yeast), living or dead.
- any open or concealed flames
- dangerous chemicals
- combustible solids, liquids or gases
- any tanks or containers which have previously held combustible solids, liquids, or gases
- any type of drug or medicine.
- any exhibit producing temperatures above 212 degrees F must be adequately insulated from its surroundings.
- open cell batteries are not permitted.
- lasers are not permitted
- environmental samples such as dirt, mud, and water should be in a sealed container.
- all wiring must be located out of reach of observers and properly insulated and designed with an adequate overload factor.
- photographs of dissections or surgeries are prohibited

2010 Brazoria County Science Fair

Experimental Project Judging Form

Pre-K through 6th Grade

Project Title: _____ Project ID #: _____

| <u>Criteria</u> | <u>Point Value</u> | | |
|---|---|------|---------|
| | Very Strong | Weak | Missing |
| <u>Project Objective:</u> | | | |
| Clear statement of problem or question | 6 | 5 | 3 |
| Creative and original | 4 | 3 | 2 |
| <u>Background Knowledge</u> | | | |
| Research of key scientific concepts | 5 | 4 | 3 |
| Use of relevant resources in background | 5 | 4 | 3 |
| <u>Experimental Design</u> | | | |
| Hypothesis: stated as a prediction & testable | 6 | 5 | 3 |
| Variables: Identification and description of all relevant | 6 | 5 | 3 |
| Control or controls: are present and used as a standard for comparison | 6 | 5 | 3 |
| Repeated trials: experiment was repeated or large number of experimental subjects were tested | 5 | 4 | 3 |
| Materials and Equipment: suitable for experiment and described clearly | 5 | 4 | 3 |
| Procedure: Clear and detailed | 5 | 4 | 3 |
| Laboratory Notebook: accurate, dated record of project | 8 | 6 | 3 |
| Safety: procedures for safety are discussed and followed | 5 | 4 | 3 |
| <u>Results:</u> | | | |
| Graphs and Tables: correct type used, labeled, clear, quantitative measurements, label units | 5 | 4 | 3 |
| Summary: explains the data on the graphs/tables | 5 | 4 | 3 |
| <u>Conclusion:</u> | | | |
| Discussion of major findings | 5 | 4 | 3 |
| Statement of how data supports hypothesis | 6 | 5 | 3 |
| Suggestions for further study | 4 | 3 | 2 |
| <u>Display:</u> | | | |
| Attractive, clear and creative | 4 | 3 | 2 |
| Displays all steps of project and follows Fair rules | 5 | 4 | 3 |
| Sub-total of All Points |  | | |
| Participation Points | +10 | | |
| Project Grade Total Points |  | | |

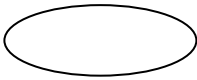

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Experimental Project Judging Form

Grade 7 - 8

Project Title: _____

Project ID #: _____

| <u>Criteria</u> | <u>Point Value</u> | | |
|--|---|------|---------|
| | Strong | Weak | Missing |
| Project Objective: | | | |
| Clear statement of problem or question | 6 | 5 | 3 |
| Creative and original | 4 | 3 | 2 |
| Background Knowledge | | | |
| Research of key scientific concepts | 5 | 4 | 3 |
| Use of relevant resources in background | 5 | 4 | 3 |
| Experimental Design | | | |
| Hypothesis: stated as a prediction & testable | 6 | 5 | 3 |
| Variables: Identified and description of all relevant | 6 | 5 | 3 |
| Control or controls: are present and used as a standard for comparison | 6 | 5 | 3 |
| Repeated trials: experiment was repeated or large number of experimental subjects were tested | 5 | 4 | 3 |
| Materials and Equipment: suitable for experiment and described clearly | 5 | 4 | 3 |
| Procedure: Clear and detailed | 5 | 4 | 3 |
| Lab Notebook: accurate, dated record of project | 8 | 6 | 3 |
| Safety procedures are discussed and followed | 5 | 4 | 3 |
| Results: | | | |
| Graphs and Tables: correct type, labeled, clear, quantitative measurements, label units | 5 | 4 | 3 |
| Summary: explains the data on the graphs/tables | 5 | 4 | 3 |
| Conclusion: | | | |
| Discussion of major findings | 5 | 4 | 3 |
| Statement of how data supports hypothesis | 6 | 5 | 3 |
| Suggestions for further study | 4 | 3 | 2 |
| Display: | | | |
| Attractive, clear and creative | 4 | 3 | 2 |
| Displays all steps of project and follows rules | 5 | 4 | 3 |
| Presentation of Project | | | |
| Student was articulate in the presentation; showed knowledge and thoroughness of research and experimentation. | 10 | 8 | 6 |
| Sub-total of All Points |  | | |
| Participation Points | +10 | | |
| Project Grade Total Points |  | | |

2010 Brazoria County Science Fair

Model Project Rules and Regulation

(Pre-K through 3rd Grade)

The purpose of this project category is to give more opportunity for age appropriate projects that the students can do themselves. This project will provide the young student the introductory skills of the Scientific Method. The TEKS for K-3 Science requires the students to be able to do the following:

- Ask questions about organisms, objects and events;
- Gather information using simple equipment;
- Make decisions using information;
- Communicate those decisions with explanations about their investigations.
- Use age appropriate tools and models to verify that organisms and objects can be observed, described, and measured.

The student will select a science concept to model and plan their design in a student notebook. The student will be judged on the knowledge and understanding shown through the design of the model. Other students should be able to learn from the model's representation.

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Model Project Judging Form

(Pre-K through 3rd Grade)

Project Title _____ Project No. _____

Assign a maximum score of 10 points in each category below:

| Criteria # | Project Notebook | Points Awarded |
|-----------------------------|---|----------------|
| 1. | Clear statement of the purpose of the model. | 6 8 10 |
| 2. | Selection of the science concept to model is appropriate to age level. | 6 8 10 |
| 3. | Student notebook shows that planning and thought went into the development of the model. (Drawings, descriptions, etc.) | 6 8 10 |
| Project Design | | |
| 4. | Creativity and originality shown in the selection of materials used to build the model. | 6 8 10 |
| 5. | Knowledge and Understanding of the science concept is evident in the constructed model. | 6 8 10 |
| 6. | Project design is neat and well constructed. | 6 8 10 |
| 7. | Conservation of materials to build the model is evident. | 6 8 10 |
| Project Presentation | | |
| 8. | Others would learn from the model representation. | 6 8 10 |
| 9. | There is clarity of the display, including the organization and presentation of information. | 6 8 10 |
| 10. | Presentation shows a development of knowledge and understanding throughout the process. | 6 8 10 |
| | Sub-total of Points | |
| | Participation Points | +10 |
| | PROJECT POINT TOTAL | |

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Observation & Investigation Project – General Rules

Pre-K through 2nd Grade

The purpose of this project category is to get more projects that look age-appropriate because the students can do the work. When going through the TEKS for K-2 Science, one sees that this age group child should be able to do the following:

- Ask questions about organisms, objects and events;
- Explain a problem in her/his own words and identify a task and solution related to the problem;
- Plan and conduct simple descriptive investigations;
- Gather information using simple equipment;
- Make decisions using information;
- Communicate those decisions with explanations about their investigations.

Examples of what this type of project would look like:

Patterns in Nature: child finds a mathematical shape that is duplicated in nature. (S)he asks questions about the patterns and wonders how often (s)he can find that pattern in nature.

Student uses an inexpensive camera to take pictures of the patterns. (S)he generates a list of questions concerning the patterns found. (S)he develops answers to the questions.

Rulers as measurement tools, construction paper shapes can be placed in the pictures to compare and contrast what is found.

The Child's Display:

- Student pictures with written explanations/descriptions
- List of student-generated questions
- List of answers
- Tools used for measurement
- Statement of what was learned

Changes Over Time: child picks something they are interested in that changes over time (such as salt or sugar crystals, seeds, puppies, kittens or other very young animal)

NOTE: Projects with young animals would have to be started at least 2-3 months before the fair.

Child would take notes and pictures of the changes that are observed. Child generates a list of questions about the changes taking place. Child develops a list of appropriate answers to her/his questions. Child can make a timeline with this information and the pictures. Child makes a statement of what was learned from observing the changes that take place.

The Child's Display:

- Student pictures with written explanations/descriptions. Pictures could be displayed in a photo album or on a timeline.
- List of student-generated questions
- List of answers (cont'd on next page)
- Tools used for measurement
- Statement of what was learned

Compare and Contrast: Student finds organisms, objects and events to compare and contrast. (S)he takes pictures of the chosen things and writes descriptive investigations concerning the likenesses and the differences. List of questions with appropriate answers are developed. Measurement tools can be included in the pictures if there are size differences or likenesses. Student states what was learned about the likenesses and differences observed.

The Child's Display:

- Student pictures with written explanations/descriptions. Pictures could be displayed in a photo album or on a timeline.
- List of student-generated questions
- List of answers (cont'd on next page)
- Tools used for measurement
- Statement of what was learned

There are many possibilities for this age group to put together a science project that is age-appropriate and does not require the skills needed for a display board and going through all of the steps of the scientific methods.

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Observation & Investigation Project - Judging Form

(Pre-K through 2nd Grade)

Project Title: _____ **Project ID#** _____

12 points for very strong

10 points for moderately strong

7 points for weak or non-existent.

| Criteria | Points Awarded | | |
|--|----------------|----|---|
| Display <i>appears age appropriate</i> <i>Demonstrates age appropriate skills</i> | 12 | 10 | 7 |
| Required Components <i>Pictures drawn or photos taken</i> <i>Measuring tools displayed</i> <i>List of questions</i> <i>List of answers</i> <i>Communication about what was learned</i> | 12 | 10 | 7 |
| Problem/Purpose of Project <i>Stated and Age-appropriate</i> | 12 | 10 | 7 |
| Measuring Tools <i>Used in pictures/project showing creativity</i> <i>Used appropriately</i> | 12 | 10 | 7 |
| Questions <i>Show originality and thought</i> <i>Aligns with problem and project</i> | 12 | 10 | 7 |
| Answers <i>Shows thought and degree of accuracy</i> <i>Creative thinking observed</i> | 12 | 10 | 7 |
| Communication of What Was Learned <i>On Target as to what should have been learned</i> <i>Appropriate for problem/project</i> | 12 | 10 | 7 |
| Safety <i>Safety Precautions were listed</i> <i>Evidence that safety was a part of the project</i> | 12 | 10 | 7 |

Criteria Point Value Total: _____

Student Participation: +14

Project Overall Score _____

2010 Brazoria County Fair Association
Informational Booklet
Appendix

Sterile Technique

to be used with Bacteria & Mold Cultures

1. Wash hand, wear goggles & gloves (you may borrow goggles from BISD if necessary)
2. Turn off AC/ vent system, close door, this circulates dust in air, mold spores are sometimes attached to dust particles.
3. Wipe working surface down with alcohol or 10% ammonia/water
4. Sterilize (dip in alcohol) any utensils that may touch the object you're testing
5. If you are testing if a certain food object will mold, it must be in a container: Petri dish or ziplock bag. Once the object is placed in the container, it should be sealed (tape Petri dish/ snap ziplock shut). You should not open the container through out the experiment. When viewing the object, do not hold it close to your face or smell it.
Observation must be made in the container.
7. When experiment is over, throw the container away without opening it.
8. Wash hands; wipe down work area with 10% ammonia/water mixture or alcohol