

2009-  
2010

Gaston Christian School  
Science Fair Handbook



Gaston Christian School  
2009-2010



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**I. Introduction:**

Here at Gaston Christian School we have many goals and ambitions, but no goal is more important than the integration of the Bible into all of our curriculum. “Integrating the Bible with the school’s science curriculum goes deeper than the use of scientific facts to illustrate spiritual truth, though such use is clearly scriptural. It also goes deeper than merely quoting Bible verses that refer to scientific subjects. It involves finding the scientific facts and principles that are taught in the Bible and incorporating them into teaching where they are relevant to the subject at hand, thus consolidating truth gained from Bible study and from observations of men. All truth is God’s truth” (ACSI, 2008). So how do we accomplish such a lofty goal? We have determined that one way to accomplish this goal is to initiate a school-wide science fair.

Goals and Objectives for the Science Fair

1. Encourage students to develop and apply creativity, skill, and logical thinking to the solutions of science, engineering, and mathematical problems, and to be challenged to further scientific study.
2. Encourage students to increase in knowledge, interest, and understanding of God’s universe and all His creation.
3. Provide opportunities for students to display their science projects and observe the work of other Gaston Christian school students in the field of science.

Students involved	Voluntary or Required
Grades 4-6	Voluntary (most of the project is done at home)
Grades 7-8	Required (most of the project is done at home and some is required to be turned in)



## II. General Information

### Experimental vs. Nonexperimental projects

If entering as a 4- 6<sup>th</sup> grader, you must do a nonexperimental project. If entering as a 7<sup>th</sup> – 8<sup>th</sup> grader, you must do an experimental project. The basis for this decision is to encourage students to learn about the area of study for the first couple of projects (4<sup>th</sup> -6<sup>th</sup> grade projects), and then, consequently, to encourage students to create a workable experiment or hypothesis to perform in the 7<sup>th</sup> and 8<sup>th</sup> grade years.

Example –

4<sup>th</sup> grade –What are the differences between the grass family and other plants?

5<sup>th</sup> grade – How does a grass leaf grow? (Using maybe phototropism)

6<sup>th</sup> grade -Demonstrate photosynthesis in grass

7<sup>th</sup> grade -Experiment with whether grass grows better with organic fertilizer or non-organic fertilizer.

8<sup>th</sup> grade -Experiment with your own chemicals to see if you can get grass to grow faster.

*Note : This process will also allow students to study areas in which they are interested in, as well as new ones. The projects do not have to be in succession! This is just a template. Example – Explored the ear in 5<sup>th</sup> grade and decided to study the eye in 6<sup>th</sup> grade – this is perfectly fine!*

### Where / Rounds (dates are later in the handbook)

- Class room round -There will be a 1<sup>st</sup> round that takes place in the classroom (No parents are allowed to attend this portion due to lack of space). The top 3



projects from each class in 4<sup>th</sup> and 5<sup>th</sup> grade will make it to the final round. The top 10 from each grade in 6<sup>th</sup> – 8<sup>th</sup> will make it to the next round. (This is not per class, but per grade in Middle School) The judge for the 1<sup>st</sup> round will be the teacher.

- Final round – The Final round will take place in the Gymnasium. (Parents are allowed to view the projects at the appropriate time listed later in the handbook) The contestants that make it to this round need to have the written report ready, as well as be prepared for questions from the judges. The judges will be faculty and members of the community.

### Reward / Prizes

1<sup>st</sup> place - Each grade's 1<sup>st</sup> place winner will receive a \$20 reward.  
2<sup>nd</sup> and 3<sup>rd</sup> place winners will receive a ribbon.

### Classroom / Home

This project is to be done at home with “help” from the parents involved. The requirement is for students to do 90% of the work while the parents help with 10% of the work. This is a Student science fair. We know that this is impossible to judge, but we expect every parent and student to be as honest as possible.

The project timeline should be followed by the student on his/her own time. This is not a class project. **Projects will not receive academic grades for Voluntary grades (4-6<sup>th</sup>), but in 7<sup>th</sup> and 8<sup>th</sup> grades projects will receive academic grades as discussed in class.**

### Questions

Questions regarding science projects should be directed to the teacher. If help is needed, the teacher will contact the Science Fair Chair.

### Honor statement

Before beginning the science project, the student must sign the honor statement at the back of this handbook. By signing the handbook, the student and the parent agree to have read fully the Science Fair Handbook. If this signed statement is not returned, the project will not count!



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### III. Rules and Regulations

#### **Grades 4- 6 (nonexperimental projects only): Categories for experiments**

- “Model – An entry that shows how various parts work together to accomplish the purpose for which they are designed. It includes projects that explain how a manufactured item, such as the internal combustion engine, works. Another option is to show how a created item, such as a leaf, functions
- Collection – An entry that classifies and displays items gathered from nature. It includes fossil, flower, and rock collections.
- Demonstration – An entry that explains a principle or law found in physical creation or in mathematical realms, such as why objects appear to lose weight when placed under water.” (ACSI)

#### **Grades 7-8 (experimental projects only): Categories for experiments**

A project is experimental if it meets **all** of the following criteria:

- A hypothesis is posed (a statement, not a question)
- A student experiment is conducted
- Data/record are collected and analyzed
- The solution to a problem is sought
- Note : Models and demonstrations may be used in the experimental project but are not required.



#### IV. Safety Standards

Because of the current medical situation in our school systems today, there are a number of precautions that need to be followed during the presentation of the project.

*Note: The following rules only apply to what is included in the actual display. The following items can be used for the project. However, they are not allowed to be present at the presentation unless photographed or drawn.*

##### **Items not allowed in the project display**

- No living organisms, including plants
- No taxidermy specimens or parts
- No preserved vertebrate or invertebrate animals
- No human or animal food
- No human/animal parts or bodily fluids (ex. Blood, urine)
- No plant materials (living, dead, or preserved) that are in their raw, unprocessed, nonmanufactured state (exception : manufactured construction materials used in building the project or display)
- No laboratory/household chemicals
- No poisons, drugs, hazardous substances or devices(ex. firearms, ammunition, weapons)
- No dry ice or other sublimating solids
- No sharp items (ex. syringes, needles, knives)
- No flames or highly flammable materials
- No batteries with open-top cells
- No glass or glass objects unless deemed as a necessary safe option
- No pressurized tanks
- No lasers

##### **Items allowed in the project display, *but with restrictions***

- *Rockets*- Rockets may be used at home under strict warning that they are dangerous and need parental supervision – rockets may be brought as a display, but not for use at the school.



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## V. Project Requirements

### A. Display overview

#### 4-6<sup>th</sup> grade project display (nonexperimental)

- Title
- Conclusion or summary (including Biblical application)
- Examples, drawings, models, photographs, tables, graphs, other items to demonstrate subject
- (not required) background information on your project (ex, research of topic)

#### 7<sup>th</sup>-8<sup>th</sup> grade project display (experimental)

- Title
- Conclusion or summary (including Biblical application)
- Examples, drawings, models, photographs, tables, graphs, other items to demonstrate project
- (not required) background information on your project (ex, research of topic)
- Results – including tables and graphs of data
- Experimental design (materials and procedures used)
- Logbook
- Equipment, samples, or other items that pass safety standards (if student has questions, h/she should ask the teacher)

### B. Display Board Criteria

*Note: projects must be free standing for table display*

- Maximum size – May not exceed 48” by 30” deep by 72” high from the tabletop. Those exceeding the limit will be penalized, and some may not be admitted.
- Materials for display board
  - Plywood
  - Pegboard



- Pressed wood/ or wood
- Foam core
- Cardboard

### C. Display information

- Title/topic (experimental and nonexperimental)
  - “Since a good project is one that is chosen to fit the student’s interests and abilities, so the time spent selecting a topic is very important for success. *The student may be working with this project a long time.*
  - The student should not choose a topic that he/she will be unable to complete, or a topic that requires equipment that is too costly to obtain.
  - The student must handle topics encompassing sensitive issues from an appropriate Christian perspective.
  - Suggestions
    - The student may look through magazines for good topics or look at the suggested websites at the end of this handbook.
  - Use a hypothesis format. (required for experimental projects)
  - Students must try to make the topic short and descriptive.” (ACSI)
- Summary and conclusions
  - 4<sup>th</sup>-6<sup>th</sup> grade (nonexperimental projects) – The student must summarize the importance of the model or design
  - 7<sup>th</sup>-8<sup>th</sup> grade (experimental projects) - The student must specifically state whether or not the hypothesis was correct. If not, the student must state the changes that are needed to attain desired results.
- For winners of class room round only – written report
  - “The written report is a one-page summary of the project that includes purpose of the experiment, procedures used, data, background information, and conclusions. The written report must include what further experimentation is necessary to broaden the scope of the question.” (ACSI)
  - 250 words for 7<sup>th</sup> -8<sup>th</sup> grade
  - 150 words for 4<sup>th</sup>-6<sup>th</sup> grade
- Experimental projects only: Results including graphs and tables
  - Students must use these graphs and tables to explain your results.



- Experimental projects only: Logbook
  - The student must write down every procedure used. It is a virtual diary of your project. It should start with the first day the student receives the assignment through the day the students turn in the project. The student needs to include failures because sometimes the greatest scientific accomplishments started as a failed idea.

**VI. Science Fair Deadlines / Completion Checklist : 2009-2010**

Assignment	Assignment Description	Deadline or Due Date (The phase of the project should be completed by ...)	Persons involved
Meeting of Teachers	Science Fair Chair will introduce the science fair handbook and schedule.	September 9 <sup>th</sup>	Teachers only
Discuss projects	Science Fair Chair will introduce the experiments in chapel. Teachers to take a very short time in class to discuss topics and perimeters for projects. (Demonstrate projects)	September 24 <sup>th</sup> in chapel	4 <sup>th</sup> -8 <sup>th</sup> grade - in each grade level chapel
Memo to Parents	Introducing Science Fair to the parents	September 29 <sup>th</sup>	Science Fair Chair
Topic Selection	Narrow down an "area" of interest for a science fair project. (not required - this is a guideline) Example - I know I'm going to do something with plants.	October 9 <sup>th</sup>	4 <sup>th</sup> - 8 <sup>th</sup> grade



<p>Question or model decided</p>	<p>This is the specific question or model the student will be investigating in the project. Example – Photosynthesis (4<sup>th</sup>-6<sup>th</sup> grade) Example – Will plants grow closer to light or water? (7<sup>th</sup> – 8<sup>th</sup> grade)</p>	<p>October 23<sup>rd</sup></p>	<p>4<sup>th</sup> – 6<sup>th</sup> grade -this is a guideline, no official due date</p> <p>7<sup>th</sup>-8<sup>th</sup> grade – required</p>
<p>Project started</p>	<p>Successful experiments require a minimum of three trial runs. If plants are used, at least three plants for each variable should be tested. (Log book started) Turn in handbook honor statement before starting the project. (Turn in to your teacher)</p>	<p>October 23<sup>rd</sup> –January 25<sup>th</sup></p>	<p>4<sup>th</sup>-6<sup>th</sup> grade - no log books are required</p> <p>7<sup>th</sup>-8<sup>th</sup> grade – log books are required</p>
<p>Materials and Procedure</p>	<p>Create a detailed list of the materials that will be used to conduct the experiment and the detailed steps that will be followed while conducting the experiment. (provide list of materials to the teacher)</p>	<p>January 8<sup>th</sup></p>	<p>4<sup>th</sup> – 6<sup>th</sup> grade -this is a guideline, no official due date</p> <p>7<sup>th</sup>-8<sup>th</sup> grade – required</p>
<p>Data Analysis and Graphs</p>	<p>The analysis of the <u>experimental</u> plan. Visual representations of data are recommended.</p>	<p>January 22<sup>nd</sup></p>	<p>7<sup>th</sup> and 8<sup>th</sup> grade only</p>
<p>Summaries, Conclusions, and Applications</p>	<p>An explanation of the results of the experiment. Needs to be no more than 1-2 paragraphs. One of the paragraphs should explain the Biblical application of your topic.</p>	<p>February 5<sup>th</sup></p>	<p>4<sup>th</sup>-8<sup>th</sup> grade</p>



Display Board	A good display board includes a good title, is well-organized, eye-catching and adheres to the rules and guidelines for size and safety.	February 24-25 <sup>th</sup> , 2010	4 <sup>th</sup> -8 <sup>th</sup> grade
Display Board in front of Science Teacher	The final project board that will be displayed at the science fair.	February 24-25 <sup>th</sup> , 2010	4 <sup>th</sup> -8 <sup>th</sup> grade
Written report	The written report is a one page summary of the project that includes purpose of the experiment, procedures used, data, background information, and conclusions. Also include what further experimentation could be done to broaden the scope of the question.	March 24, 2010	7 <sup>th</sup> – 8 <sup>th</sup> grade winners only – 250 words  4-6 <sup>th</sup> grade winners only - 150 words
Display Board in front of judges	The final project board that will be displayed at the science fair. A good display board includes a good title, is well-organized, eye-catching and adheres to the rules and guidelines for size and safety.	March 24, 2010	4-8 <sup>th</sup> grade winners and judges

### VII. “Tentative” Science Day Schedule (Final Round)

March 24, 2010

<b>Student sets up project</b>	7:20-7:50
<b>Judging of projects</b>	9:00-10:30
<b>Parental viewing</b>	10:30-2:00
<b>Students take project home</b>	2:00-3:00

### VIII. Project Topic Ideas

#### A. Nonexperimental Project Ideas

- “Identify and label a collection (such as shells, leaves, rocks, and insects).
- Research and label parts of a plant (or a computer, a car engine...).



- Research and label parts of an animal or insect.
- Make a model of the solar system.
- Make an electromagnet and explain the operational principles.
- Root a plant and explain the process involved.
- Record cloud formations (or rainfall) in a chart over a period of time.” (ACSI)

### **B. Experimental Project Ideas**

- “Which is dirtier, tap water or water in a bottle?
- What material produces the most static cling to a balloon?
- How does sunlight affect the growth of a plant?
- Which paper towel is most absorbent?
- Do fingernails grow faster than toe nails?” (ACSI)

### **C. Books for additional resources**

- *The Know how Book of Experiments* by Heather Amery
- *Ideas for Science Fair Projects* by Robert Gardner
- *Research Adventures for Young Scientists* by George Barr
- *Mr. Wizard’s Experiments for Young Scientists* by Don Herbert

### **D. Websites Resources**

- [www.billnye.com](http://www.billnye.com)
- [www.cdli.ca/sciencefairs](http://www.cdli.ca/sciencefairs)
- <http://homeworkspot.com/sciencefair>
- [www.super-science-fair-projects.com](http://www.super-science-fair-projects.com)
- [www.all-science-fair-projects.com](http://www.all-science-fair-projects.com)
- <http://scienceclub.org//kidproj1.html>
- [www.ars.usda.gov/is/kids/fair/ideas.htm](http://www.ars.usda.gov/is/kids/fair/ideas.htm)
- [www.scienceproject.com](http://www.scienceproject.com)
- [www.neiu.edu/~pjdolan/chemistry.htm](http://www.neiu.edu/~pjdolan/chemistry.htm)
- [www.rossarts.org/naples/ideas.htm](http://www.rossarts.org/naples/ideas.htm)
- [www.top-science-fair-projects.com](http://www.top-science-fair-projects.com)
- [www.scifair.org](http://www.scifair.org)
- [www.exploratorium.edu](http://www.exploratorium.edu)
- <http://school.discovery.com/sciencefaircentral/scifairstudio/ideas.html>
- [www.pbskids.org](http://www.pbskids.org)



IX. Grading Rubrics for Classroom and Final Rounds

**Judging Form : 7<sup>th</sup> -8<sup>th</sup> grade experimental Projects**

Student's Name \_\_\_\_\_ Grade \_\_\_\_\_

Project Title \_\_\_\_\_

Name of Category	Points Possible	Points Earned	Cumulative points
1. Visual Display (10%)			
Overall display presentation is effective	5		
Includes: Title, Hypothesis, Conclusion, Results, Graphs...	5		
2. Knowledge (30%)			
Student understands principle behind the project	10		
Student understands the when/why/how of the project	10		
Student understands the functions of the various parts	10		
3. Scientific Method (30%)			
The experiment was controlled	10		
Student used appropriate variables	10		
Hypothesis stated properly (as a statement)	10		
4. Summaries and conclusions (30%)			
Report and logbook explains the project well	10		
Conclusions are supported by data	10		
Biblical application is relevant	10		
5. Point deductions (up to 5 points)			
Oversized display (Larger than 48" w, 30" d, 72" h)	-5		
Report too short (for winners only)	-5		
Not following handbook guidelines / Lack of logbook	-5/-5		
		Total Score	

Judge's Comments:

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X. Grading Rubrics for Classroom and Final Rounds

**Judging Form : 4<sup>th</sup> -6<sup>th</sup> grade Nonexperimental Projects**

Student's Name \_\_\_\_\_ Grade \_\_\_\_\_

Project Title \_\_\_\_\_

Name of Category	Points Possible	Points Earned	Cumulative points
1. Visual Display (18%)			
Overall display presentation is effective	6		
Includes: Title, Conclusion, Models, and Examples....	6		
All items labeled and Identified	6		
2. Knowledge (30%)			
Student understands principle behind the project	10		
Student understands the when/why/how of the project	10		
Student understands the functions of the various parts	10		
3. Verbal explanation (22%)			
Student can explain the project in knowledgeable terms	11		
Student can identify parts in scientific or layman's terms	11		
4. Summaries and conclusions (30%)			
Report explains the project well	10		
A Biblical application is displayed	10		
Biblical application is relevant	10		
5. Point deductions (up to 5 points)			
Oversized display (Larger than 48"w, 30"d, 72"h)	-5		
Report too short (for winners only)	-5		
Not following handbook guidelines	-5		
		Total Score	

Judge's Comments:

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**XI. Honor statement**

*Note: This page must be signed and returned to your teacher before beginning your science fair project. By turning this in the teacher knows you have started your project.*

**I have read the entire Gaston Christian School Science Fair Handbook. I have agreed to follow all rules that apply to my project. I have agreed that I will do 90% of the work and my guardian(s) will do 10% of the work. I acknowledge that any problems that may occur while conducting these experiments will be my responsibility, not Gaston Christian School. I relinquish GCS from any and all liability for personal accident and/or injury that may occur while I am in the process of creating and executing my science project.**

**Student Signature**

\_\_\_\_\_

**Date**\_\_\_\_\_

**Parent Signature**

\_\_\_\_\_

**Date**\_\_\_\_\_



**Handbook References:**

*ACSI Activities Coordinator Manual 2008*