

St. Paul's Preparatory Academy

Science Fair Parent/Student Packet

Dear Parents,

As you know, science, technology, and engineering are basic skills expected by employers. As Twenty-First Century citizens, our 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 the week of March 8 through March 12 and all students in grades 4 to 8 are required to participate. Over an 8-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 email with any questions. You may email your child's teacher or me. My email address is grockwell@stpaulsprep.com. Thank you very much in advance for your support!

Sincerely,

Mrs. Gayla Rockwell

How to Help as a Parent

It is up to the student to decide what to study. You can help by motivating your child and listening to his or her ideas. However, it is crucial to remember that it is up to your child to design and execute the entire project. Judges at the science fair take particular care to note that the work is the student's and that the student understands the topic, the research, the experiment, the analysis of data, and the conclusion. The judges expect that the student has received some help from another person, such as a parent or teacher, and that such help will be credited in the display.

It is very easy to take control of a student's project, especially if you think it should be done differently. Remember that the project is a learning experience for your child, and he or she will not benefit from a project done by you. Your job is to supervise. If our child asks for help, appears to be struggling, or is disregarding safety measures, then you may wish to offer assistance. An excellent resource to guide your child through the processes is below.

Science Project Overview

Four Parts of the Science Fair Project

1. The Experiment (Scientific Method Approach)
2. The Logbook
3. The Display Board
4. The Oral Presentation

1. The Experiment

A project is experimental if it meets the following criteria:

- A hypothesis is posed (a statement, not a question)
- A student experiment is conducted, using the scientific method
- Data/records are collected and analyzed (the experiment results in data that can be measured)
- The solution to a problem is sought

Steps in the Scientific Method

1. Select a topic – The topic should be interesting, original, allow for completion by the due date, not be too expensive, and it should have data that is measurable.
2. Research and planning – The research should help the student in planning the experiment and developing the hypothesis statement. The hypothesis is an educated guess, based on the research, about the answer to the investigative question (title). Don't forget – professionals are also a good resource.
3. Experiment – Plan the experiment. What materials will you need, and what steps will you take in testing your hypothesis? Record these steps in your logbook. Test the hypothesis at least three times. There should only be ONE variable in the experiment. The more times you repeat the experiment, the more reliable your results will be. Be sure to collect data for all trials. You can take photos to document your work as you go.
4. Observe, record, and analyze data – Write down the steps that were followed and the data results in the logbook. Organize data from the research and experiment, looking for patterns.
5. Draw a conclusion – Determine if the hypothesis is supported or disproved by the experimental results.
6. Display – Although it is tempting for students to use all computer graphics – or for younger students to have parents develop computer graphics, the best display boards are not always the “prettiest” boards. Guide the students as they prepare and layout the requirements on the display board.
7. Oral Presentation – Each student will give an oral presentation describing how they did their experiment, what they learned, what they would do differently, etc. to the teachers. Students should be comfortable explaining their project to the teachers. Teachers may also ask questions to clarify the student's understanding of the project.

2. The Logbook

Everything you do on your project is recorded in your logbook! That includes history and record of progression of the project (begin the day of assignment, end on the day turned in).

- A diary of the science project – every time you work on your project record in logbook.
- When experimentation begins, include the procedure in detail and write it out step-by-step.
- Include drawings and labels.
- Explain how all variables are controlled. (Teachers can help with this.)

Include the following:

- Title Page – This includes title of the project, name of student researcher, and name of student's school.
- Second Page (and those following) – Question being investigated; list of materials, and method for conducting the experiment (plan); please include notations of safety precautions.
- St. Paul's Project Approval Form and any additional forms (to be determined by the teacher).
- Subsequent pages – Record experimental procedures and actual data, writing it down as you go (not scribbled on scraps of paper and entered later; dated pages).

The logbook should be with you at all times while you are working on your experiment.

Think About This

An experiment can support or not support the hypothesis. Thomas Edison failed more times than he succeeded in his lifetime, but is still considered one of the greatest inventors of all times. The important thing is that the student uses the data in analyzing what happened and draws a conclusion as to why it happened.

3. The Display Board

The display may not exceed 48' wide by 30" deep by 72" high from the tabletop. Science display boards may be purchased from local stores such as Michael's, Mardel's, Wal-Mart, or Staples to name a few. ***Do not write the student's name the front of the display board. Please write the student's name on the back, bottom right of the board.**

Title – Use the Question Format *Use on the board and in the logbook (example: Which Brand of Paper Towel Will Hold the Most Water?).

Biblical Application/Illustration – Each project must include a Scripture/ Biblical illustration to be displayed on the board.

Abstract – Brief summary description of what was done. *Use on the board and in the logbook.

Project Information (including problem, hypothesis, variables, control)
Teachers can help with what the variables and control are.

Experimental Design – You may include a drawing or diagram of the project.

Results – This is description of the data; tables and graphs of data may be used.
*Use on the board and in the logbook.

Conclusion – State whether hypothesis was correct; if the hypothesis is not correct, state possible needed changes. State what could be done to broaden scope of the problem. *Use on the board and in the logbook.

Logbook – You must include the required approval forms as directed by the teacher.
*Include with the display and NOT on the display.

Equipment, samples, or other items from experiment should be included – do NOT include dangerous items such as glass, chemicals, etc.

Photographs and/or Diagrams – You may include photographs on the display board and/or logbook to demonstrate the experimental process. Origins must be credited if not part of student's experimental process. Photographs of human subjects (other than student) must be accompanied by consent form (received from the teacher).

4. The Oral Presentation

Each student will have several minutes to present his/her project with the teacher/class. Teachers are interested in knowing if the student is knowledgeable about the topic. Can the student explain the project in knowledgeable/scientific terms and explain background information? Can the student accurately interpret the results of the experiment? Has a Biblical application/illustration been integrated into the presentation? Remember to practice out loud, at home, several times.

Science Project Timeline

- January 6-10 – Research what you would like to propose as your project.
- January 11-13 - Get a logbook
- January 14 – **The Science Project Approval Form is due. **QUIZ GRADE****
Turn in the signed Science Project Approval Form to your teacher; receive any additional forms from you teacher that you may need. (Teachers will help student determine if any additional forms are necessary.)
- Once you receive the approval for your Science Project, begin to record in your logbook everything you do in detail for your project.
- January 15-18 – Gather materials and plan the steps for your experiment.
- January 20-22 – Determine what are the variables and control. (Teachers will help with this if necessary.)
- January 23–February 26 – Work on the experiment recording all work and observations in your logbook.
- February 9 – **Biblical Illustration Form is due. **QUIZ GRADE****
- March 1-2 – Draw your conclusion; collect data, make charts and/or graphs.
- **March 3 – The Abstract is due. **QUIZ GRADE****
- March 3-5 - Assemble the display board. (See attached checklist to ensure your board is complete.)
- March 5-7 – Prepare your Oral Presentation. (See attached checklist.)
- March 8 – Pack up your board, logbook, and materials to bring to school on Monday, March 8.
- March 8 – **Bring your Science Project to school **TEST GRADE****
- Be prepared to give you Oral Presentation in class. (Teachers will give the students instruction on where to put their projects.)
- March 11 – Assemble your project in the display area. (Teachers will give students instructions on the display area.)
- March 12 – **Take your project home.**

**Final judging will take place on Thursday, March 11.
Boards will be on display March 11-12.**

The Display Board Checklist

- Board dimensions – The display area may not exceed 48” wide by 30” deep by 72” high from the tabletop; science display boards should be purchased from local stores such as Michael’s, Mardel’s, Wal-Mart, or Staples to name a few.
- Title – A question format is recommended; make it short, yet descriptive, conveying specific information about your project.
- Biblical Application/Illustration – Each project must include a Scripture/Biblical illustration to be displayed on the board.
- Abstract – Brief summary description of what was done (no longer than 250 words). Note : The abstract also appears in the logbook. Example : “Three brands of tennis balls were tested to determine which one retained its bounce over the longest period of time. The balls were regularly bounced over a five-week period. Of the three brands tested – Brand A, Brand B, and Brand C – Brand B retained its bounce best.” *Use on the board and in the Logbook.
- Project Information – State the problem and hypothesis separately (The hypothesis is your prediction of what you believe will happen); identify the variables and control.
- Results – Include tables and graphs of the data *Use on the board and in the logbook.
- Conclusion – State whether hypothesis was correct; if not state needed changes; state what could be done to broaden scope of problem *Use on the board and in the logbook.
- Logbook – Include required approval forms as directed by the teacher. *Include with the display and NOT on the display.
- Equipment, samples, or other items from experiment may be included – do NOT include prohibited items such as glass, chemicals, etc.
- Photographs and/or Diagrams – Included on display board and/or logbook to demonstrate the experimental process; resources must be credited if not part of student’s experimental process; photographs of human subjects (other than student) must be accompanied by a consent form (received from the teacher).

St. Paul's Preparatory Science Fair Approval Form
Due Thursday, January 14

Student Name _____

Brief Research Plan (this form must be included in the Logbook)

Question being addressed

Hypothesis

Description of materials being used

Parent/Guardian

I have reviewed the Science Project plan and I approve of the project my child has chosen.

Parent/Guardian Signature

Date

Teacher

I have reviewed the student's Science project plan and I approve of the project that the student has chosen.

Teacher Signature

Date

**Additional forms necessary for this project
(Teacher will provide the forms if needed)**

- Human Subject Form
- Vertebrate Animal Form
- Human and Vertebrate Animal Tissue Form

Scripture/Biblical Illustration Form
Due Tuesday, February 16

The Bible Verse

How It Relates to My Project

Student Name _____ Date _____

St. Paul's Preparatory Science Fair Abstract Form
Due Friday, February 26

Student Name _____

Please complete in paragraph form.

Why I chose this project:

Please complete in paragraph form.

What was the procedure of the projects and the results:

Oral Presentation Checklist

The oral presentation will be given in class, and students will have the display board to use as they discuss the following:

- State the title of your project.
- State your hypothesis.
- Explain how you used the materials to do the experiment. Include variables and controls.
- Explain the results of the experiment.
- State the Conclusion – Was the hypothesis correct or incorrect?
- Explain the scripture and Biblical application.
- Explain what you learned by doing the experiment.
- Answer any questions the teacher may ask.

It is important that students practice the Oral Presentation at home with parents.