

# Science Fair Guidelines

- Grades 3 - 5 (Non-Experimental Only)
- Grades 6 - 12 (Experimental Life or Physical Sciences)

The LCS Festival Science Fair is a competition designed to encourage students from elementary through high school levels to refine and put into action scientific principles found in creation. The purpose is to allow the students to exercise their critical reasoning and ability of expression of their thoughts filtered through the Holy Scriptures. Moreover, the students are not in competition with each other but rather are competing against standards set to measure each participant's work and ability to present a project with poise and articulate oral presentation.

## Types of Science Projects and Categories

### 1. Types of Projects

#### a. Non-Experimental - Elementary ONLY (grades 3-5):

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

#### b. Experimental - Middle School/High School:

##### i. All MS/HS projects must follow the scientific method:

- Identify the Problem.
- Form a Hypothesis (a possible solution, “what if...”)
- Do background research (books, periodicals, magazines, pamphlets, etc).
- Conduct an experiment (procedure to test the hypothesis).
- Observe
- Analyze the procedure (how was it done; what materials were used).
- Record data (logbook)
- Formulate a conclusion from the experiment answering the hypothesis.

### 2. Categories

#### a. Life Science:

- Behavioral;
- Botany;
- Microbiology;
- Zoology;
- Physiology;
- General Biology

#### b. Physical Science:

- Physics;
- Chemistry;
- Earth Space Science;
- Math and Computers;
- Engineering;
- General Science

## Science Project Requirements

### 1. Project Design

- a. Start by making several rough sketches, evaluating the arrangement of materials, lettering, etc., until you have your proposed plan for the display.
- b. Make the design eye-catching and attractive to tell the story of your problem and to get the viewer's attention. However, avoid gaudy, splashy approaches to the design.
- c. Make an easy-to-follow design to "shout" the message in a few seconds.
- d. Lettering should be large and attractive (avoid hand lettering unless the student is talented/ artistic in that area).
- e. Titles should be short and descriptive.
- f. Use pictures, diagrams, graphs, and photographs when possible.
- g. Color generalizations:
  - i. green and yellow shades suggest natural sciences.
  - ii. red and blues, the technical and applied sciences.
  - iii. blues and white suggest medicine.
  - iv. Unique and creative display arrangements often enhance a project.
  - v. Do not "overdo" the design and take away from the message of the project.

### 2. Material:

- a. Standard Science Fair boards are available in various colors and are recommended.
- b. Other materials for backboard displays are foam board, pegboard, and cardboard.  
All displays must be free standing.
- c. The project display should be attractive, creative, eye catching, neat and informative.

### 3. Size:

- a. The exhibit display may not exceed 4 feet wide, 2 feet deep & 5 feet high.
- b. Those exceeding the limit will be penalized in points.

### 4. Board Requirements:

- a. Experimental projects must include all of the following  
**(Non-Experimental projects require #1, #4, #7, #9, #11, and #12)**
  - i. **Title:** The student may use his/her creative abilities to come up with a catchy title.  
The title tells what the project is going to solve; it may be stated in the form of a question.
  - ii. Abstract
  - iii. Project: A statement of the problem to be solved.
  - iv. **Hypothesis:** An educated guess based on information gathered about the particular topic.  
It can be written using an 'if-then' statement such as: "if" magnets attract iron, "then" only those objects that contain iron will be attracted by the magnet.
  - v. Method of Testing Hypothesis: It should explain the procedure you will use to test your hypothesis.
  - vi. Results: A brief explanation of the results obtained by the experiment.
  - vii. **Conclusion:** A brief explanation of how the hypothesis was proven, or not, by the procedures followed by the experiment.
  - viii. Experimental Design: This can be a drawing of different steps of the procedures, models of the experiment done, sample or collection of specimens, etc.
  - ix. **Background Information:** The student will need to research the chosen topic.  
Credible internet sources, books, encyclopedias, computers, newspapers, magazines, interviews, and information obtained from organizations are resources that the student can use.

x. Results: It relates to the total amount of information obtained during the experiment. The way in which data is recorded is very important. Record the data using charts, graphs, tables, pictographs, logs, photographs, written observations, or anecdotal records. The more data there is, the more accurate the conclusion will probably be. Doing an experiment just one time does not give sufficient information to draw a conclusion.

xi. Conclusion: Once the information and data have been analyzed a conclusion can be written. In the conclusion the project is summarized, and evidence is given to support the original hypothesis and the Biblical principle or illustration. The conclusion should include a statement as to whether the hypothesis was verified or nullified. It should also include statements of what further experimentation could be done to broaden the scope of the problem considered, or why results are inconclusive.

xii. Written Report: Reports for elementary students can be written by hand; the Upper Division grade reports must be typed (due to length).

1. Elementary:

- a. Each exhibit must include a written report.
- b. 150-200 words for 3rd
- c. 200-250 words for 4th
- d. 250-350 words for 5th

2. Middle School:

- a. Each exhibit must include a detailed report, fully footnoted, with bibliography. This report should give detail of literary research done on the hypothesis.
- b. 350-500 words for 6th
- c. 500-800 words for 7th
- d. 800-1000 words for 8th

3. High School:

- a. Same requirements as Middle School.
- b. 800 – 1200 words for grades 9-12

## 5. Logbook

- a. Chronological record of the project's development should include who, what, when, where, why and how of each day's work.
- b. The logbook must be a part of the project display (on the board or the table).
- c. The logbook is a journal of your experiment. As you begin your experiment record procedure in detail and write it out, step-by-step, drawing and labeling any apparatus you use, and explaining how all the variables are controlled.
- d. Results are first formulated in your logbook.
- e. Everything you do on your project goes in your logbook! From start to finish it must be in your logbook. Keep the book neat and clean. It will be displayed with your project at any fair you attend.

## 6. Biblical Reference

- a. All exhibits must include a scripture reference. Some ideas are not specifically mentioned in the Bible, but there are verses that develop principles which can be related to the project. The intent is to relate all areas of science to the Creator of the universe. Moreover, the exhibit and the information provided must have Biblical application or illustration.
- b. Application
  - i. Information that is usable in everyday life and relevant to the problem being considered.
- c. Illustration
  - i. Explanatory example from Scripture that parallels the problem.

## 7. Equipment

- a. All exhibits requiring electricity must be designed for 110 volts. The ground plug (3-prong) must be used. Exhibitors must provide their own extension cords.
- b. Gas/Water: No gas or water outlets will be provided.
- c. Suitability for Exhibition: Dangerous/unsafe exhibits will not be permitted.

The Fair officials reserve the right to remove any project deemed objectionable or hazardous.

## 8. Credit

- a. Your name, school and grade must be in the lower right-hand corner on the back of your display. Acknowledge all help there.

## 9. Oral Presentation

- a. Student must be able to explain the project in technical terms to the judges and non-technical language to the layman.
- b. Student must be able to answer a number of general and specific questions.

## 10. Project Assistance

- a. Project is to be the product of one student's work- NO team projects.
- b. Students may seek help with typing and board construction.
- c. Someone may also critique the student's methods.
- d. Backboard design/layout must be the student's own work.
- e. At all grade levels, students must do 90% of the total work.
- f. All help must be acknowledged in written form on the exhibit.

## 11. Safety and Concerns

- a. Live animals or plants are not permitted at the Science Fair. Animal and plant experiments may still be done but must be photographed step by step. The photographs, not the animals, are included in the project display. When using animals for experimentation, students must not perform unnecessary or indiscriminate experiments on live animals. Photographs of inhumane treatment will be rejected by the Fair officials, and not permitted as part of the display.
- b. Rockets: Fair officials will reject unsafe experimentation with rockets. The American Rocket Society has advised that because of the dangers involved, experiments with rockets should be discouraged.
- c. Projects involving temperatures in excess of 100 degrees C. (212F) must be adequately insulated from flammable surroundings by suitable insulation.
- d. Electrical safety must be observed. No exposed switches, wire or metal parts permitted. All wiring and connections should conform to safety standards as approved by electrical safety engineers/codes.
- e. Any project that may constitute a hazard to the public will be rejected.

## 12. Science Fair Judging

- a. Non-experimental projects will be judged according to visual display, knowledge, verbal explanation, written report, and Biblical application.
- b. Experimental projects will be evaluated according to creativity, scientific method, thoroughness, technical skill, level of difficulty, neatness and appearance.
- c. Naturally, a more in-depth project, written report and oral presentation is expected of students at each additional grade level.
- d. The judging criteria are as close to the public system as possible, so those students may enter other Science Fairs.
- e. Students will be required to be with their projects during the time of judging.
- f. The LCS Festival Science Fair is to be considered a public presentation and students are asked to dress neatly and appropriately for the occasion.