EXHIBITOR'S HANDBOOK
Middle School

66th ANNUAL
PRINCE GEORGE'S AREA SCIENCE FAIR

Charles Carroll Middle School

February 21st, 2014

General Information

Science fairs teach about more than students learning more about their favorite science content. Science fair projects allow students to practice scientific thinking and problem-solving, improvise when a procedure doesn't work out as predicted, present science findings to others, and constructively critique each other's work. If the presentation is being judged, it sharpens their skills in communicating science process and content.

Students strengthen math skills through analyzing and graphing data; reading comprehension skills by doing complicated background research; and creative problem-solving skills throughout the process.

Science fairs involve self-directed learning. A word of advice from Science Fair Central: don't wait until the science fair project starts to make this the first self-directed science investigation that your students do. From the start of the year, give them opportunities to problem-solve, make decisions and design and conduct their own tests as part of your regular curriculum, and they will be ready for the science fair project.

While students learn important lessons in the classroom and lab, science concepts become relevant as students see practical applications all around them and delve into scientific investigation of their own. When students control the hands-on exploration, they gain a deeper level of understanding than could ever be possible from a textbook or from following canned directions in a lab.

Science fairs are an especially motivating way to learn. When students are charged with choosing their own topics and designing their own procedures, they are more likely to take ownership of their work and become personally invested in learning. If you think about what really stays with students, the science fair project is something they always remember.

Many students choose topics they're already passionate about; others discover new interests along the way. Reluctant learners who show little enthusiasm in the classroom may suddenly find themselves driven to find the solution to a scientific problem. Sometimes a science fair project can spark a lifelong interest in a subject and lead to an important career in a science-related field.

Charles Carroll Middle School Evaluation Criteria for Category Judging - 2014

Category and Grand Awards Judging is conducted using a 100-point scale with points assigned to creative ability, scientific thought or engineering goals, thoroughness, skill, and clarity. Team projects will be graded based on the same. Following is a list of questions for each criteria that can assist you in interviewing the finalists and aid in your evaluation of the finalists' projects.

Creative Ability (15 points)

- Does the project show creative ability and originality in the questions asked?

  The approach to solving the problem, the analysis of the data, the interpretation of the data?

  The use of equipment, the construction or design of new equipment?
- Creative research should support an investigation and help answer a question in an original way.
- A creative contribution promotes an efficient and reliable method for solving a problem. When evaluating projects, it is important to distinguish between gadgeteering and ingenuity.

Scientific Thought/Engineering Goals (50 points)

- If an engineering project, the more appropriate questions are those found in IIb. Engineering Goals.
  - Scientific Thought
    - Is the problem stated clearly and unambiguously?
    - Was the problem sufficiently limited to allow a plausible approach? Good scientists can identify important problems capable of solutions.
    - Was there a procedural plan for obtaining a solution?
    - Are the variables clearly recognized and defined?
    - If controls were necessary, did the student recognize their need and were they correctly used?
    - Are there adequate data to support the conclusions?
    - Does the finalist or team recognize the data's limitations?
    - Does the finalist/team understand the project's ties to related research?
    - Does the finalist/team have an idea of what further research is warranted?
    - Did the finalist/team cite scientific literature, or only popular literature (local newspapers, Reader's Digest)?

- Engineering Goals
    - Does the project have a clear objective?
    - Is the objective relevant to the potential user's needs?
    - Is the solution workable, acceptable to the potential user, economically feasible?
    - Could the solution be utilized successfully in design or construction of an end product?
    - Is the solution a significant improvement over previous alternatives?
    - Has the solution been tested for performance under the conditions of use?

Thoroughness (15 points)

- Was the purpose carried out to completion within the scope of the original intent?
- How completely was the problem covered?
- Are the conclusions based on a single experiment or replication?
- How complete are the project notes?
- Is the finalist/team aware of other approaches or theories?
- How much time did the finalist or team spend on the project?
- Is the finalist/team familiar with scientific literature in the studied field?

Clarity (20 points)

- How clearly does the finalist discuss the project and explain the purpose, procedure, and conclusions? Watch out for memorized speeches that reflect little understanding of principles.
- Does the written material reflect the finalist or team's understanding of the research?
- Are the important phases of the project presented in an orderly manner?
- How clearly is the data presented?
- How clearly are the results presented?
- How well does the project display explain the project?
- Was the presentation done in a forthright manner, without tricks or gadgets?
- Did the finalist/team perform all the project work, or did someone help?

THE DECISION OF THE JUDGES IS FINAL.