Emerson Science Fair 2016-2017

The Science Fair is on again with awards, trophies, and prizes for the best projects!

We emphasize the following for all Science Fair projects:

Originality – We encourage original projects that the student thinks up on their own, even if it ends up being found later on the Internet or in a science-project book.

Ownership – Each student who submits a project will be presenting it in front of judges, so if they did not initiate and lead the work, it will be obvious during the presentation. Getting help is encouraged, but each student must do the majority of the work themselves. Remember to acknowledge any help.

Personal Interest - We encourage students to devise projects that spring from their personal interests**.** Even if it is not a traditional science topic, ANYTHING can be researched using scientific methods!

Use of the Scientific Method – Did the project reflect the logic and methods of science so that questions raised were answered confidently? Is there one[1] clear *dependent measure* that reflects the outcome measure you are looking for? Is there one[2] well-defined *independent variable*? Did you make sure no other variables could be responsible for chances in your outcome (dependent measure)?

Additional consideration in the judging will be given to clarity of the project question, description of how the question was tested, and presentation of data. Also important are appropriate use of measurements, honesty in acknowledgements, and citing of references.

There are three keys to a great project:

1. Do the science! Follow your interests to a scientific question that you can answer with an experiment and document your project clearly on a display board.
2. Be able to explain your project and findings clearly in 5 minutes to the judges.
3. **Know your project!** Do most of the work **yourself**, as you alone will be answering judges' questions.

Science Fair Rules

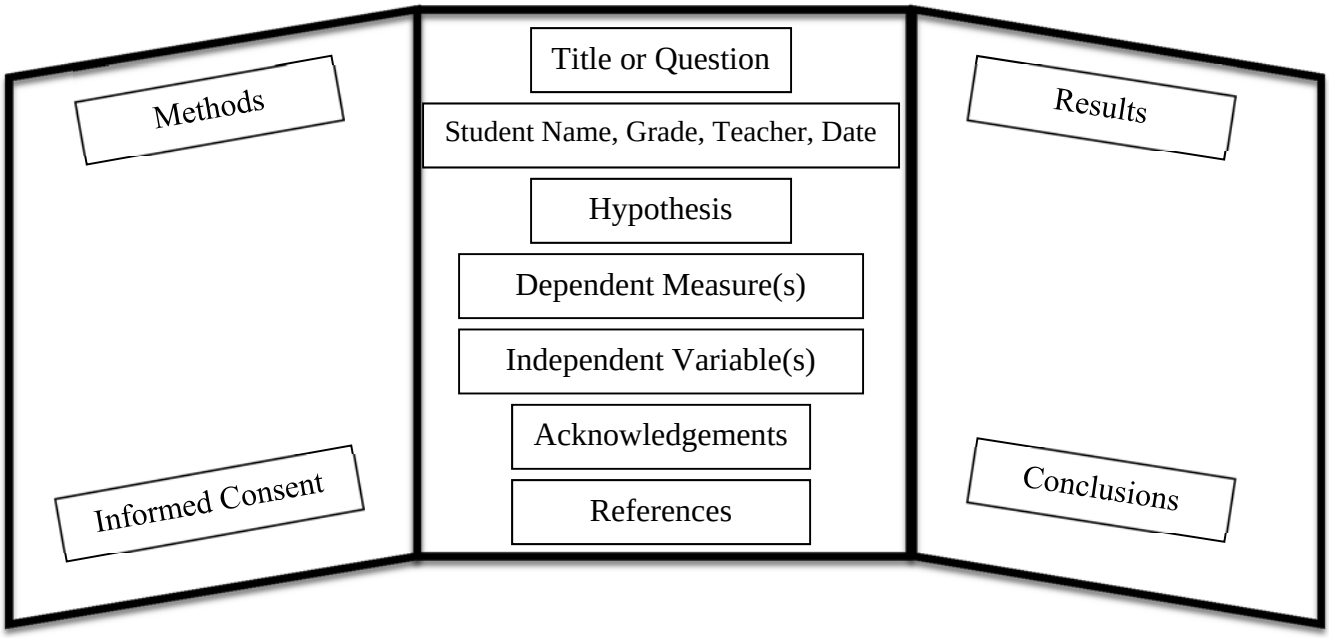
1. ALL EXPERIMENTS MUST BE SAFE! Experiments with explosives, dangerous chemicals, or drugs will not be allowed. All electrical equipment must conform to electrical safety laws.
2. Animals may be used in experiments. However, ABSOLUTELY NO HARM, DANGER, or DISCOMFORT may be done to them.
3. Experiments involving humans are permitted, but there can be ABSOLUTELY NO HARM, DANGER, or DISCOMFORT to the human. You must get written signed permission from each human subject before you perform the experiment. If the human subject is a minor (under 18 years old), you must get their parent's written permission for them to participate. The originals of the permission forms must be attached to the display board.
4. Demonstration projects are not allowed (e.g., a "volcano"). Also, projects that have been over-represented in science fairs (e.g., Mentos in Diet Coke) will not be approved.

[1] Experiments can, and often do, have MORE than one Dependent Measure (DM), but focusing on one DM helps simplify the initial experimental design; after the initial design, additional Dependent Measures can be considered.

[2] Experiments can have MORE than one Independent Variable, but a proper design of the experiment becomes complex and analysis of data collected can be far more challenging.

What Your Display Board Should Include

There are many ways to clearly present your project on a display board and you are free to choose the way that you feel accomplishes this best. However, there are a few things that you should include on your display board to save time explaining your project to the judges and to make it clear to everyone who sees your display board what you wanted to find out, how you did it, and what you learned. Here's what most project display boards should include:



Question – The question your project was trying to answer. This also makes a great Title. (If you use it as your Title, you do not need to also have a "Question" section on your poster.)

Student Name, Grade, Teacher, Date – This is the first year where all of this information MUST be on the board. Please ALSO put this information on the center back of the board.

Hypothesis – Describe what you thought would happen before you did the experiment.

Dependent Measure(s) – The dependent measure is the thing you are trying to affect by your experiment. It is what you are most interested in changing. It is what you measure to see if your experiment was successful. For example, if my experiment was to see what kind of oil makes my toy car go fastest down a ramp, my dependent measure would be the speed of my toy car (or the time it takes my toy car to go down the ramp).

Independent Variable(s) – The independent variable is the thing you vary (change) to see how it affects your dependent measure. If my experiment was to see what kind of oil makes my toy car go fastest down a ramp, my independent variable would be "kind of oil." (The dependent measure is *dependent* on the independent *variable*.)

Methods – Describe exactly how you did this experiment. Tell what equipment, materials, and procedures you used. This is like a recipe for your experiment. Be detailed enough so that another person could repeat your experiment. Use lists and photos to help make it clear how you did your experiment.

Results – Describe what you found out from your experiment. Present the data you collected from your experiment in photos, graphs, and/or tables that will help people understand your results.

Conclusions – Tell what the answer to your question was. Was your hypothesis proved or disproved? If your hypothesis was not correct, why do you think you got a different answer than you expected? If your hypothesis was correct, why do you think it was correct? This is a good place to make a brief comment about what you learned.

Acknowledgements – List all the people who helped you with the project, and thank them.

References – List any books, articles, or websites that you used to help you with your project.

I**nformed Consent** – If you used human subjects, attach a written signed consent form from each participant (and/or parent). These forms should be placed in an envelope attached to the back of the board.

Additional Important Information

- 5th grade students are **REQUIRED** to turn in a Science Fair project. Some 4th grade teachers may require or give extra credit for turning in a Science Fair project- talk to your teacher. Any Emerson student may participate! Awards will be given for 1st, 2nd, and 3rd place for each grade.
- Projects may be done in pairs (maximum of two students), but workload must be shared equally.
- Students will present their project display boards to judges. Check the presentation dates in the **Timeline**, below, for your child's class.
- Investigation projects (summarizing facts about a particular topic) **will only be allowed for grades K-4!** They will be eligible for Honorable Mention, but not "Place" awards. Investigation is only the 1st step in experimental science (to obtain background knowledge to conduct an experiment).
- Students may bring in apparatus used during the project on presentation day ***if it has been approved by their teacher.***
- Included in this packet is an exercise ("Turning Curiosity into Science") for students (and parents) to brainstorm ideas for science projects. The following website is also extremely helpful. It can guide you through the entire Science Fair process, from project idea to presentation.
  https://dl.dropboxusercontent.com/u/28183747/ScienceFairGuide%202013.pdf

- **Parent volunteers for the Fair will be greatly appreciated!** In interested, please contact George Brogmus (818-517-7997) or GBrogmus@UCLA.edu.

Timeline

November 18, 2016, Friday: Science Fair APPLICATIONS are due (online: http://www.emersonstarspta.org/event_sciencefair.html).

December 15, 2016, Thursday: Any requested changes to applications must be completed **AND APPROVED** by this date to be accepted into Science Fair judging.

February 3, 2017, Friday: Completed DISPLAY BOARDS are due in classroom.

February 6, 2017, Monday (10a - 2:50p): Preliminary Judging/Presentation day for K-4th grades.

February 7, 2017, Tuesday (11a - 2:00p): Preliminary Judging/Presentation day for 5th Grade (Green Rotation)

February 8, 2017, Wednesday (12 - 2:50p): Preliminary Judging/Presentation day for 5th Grade (Blue Rotation)

February 9, 2017, Thursday (12- 2:50p): Preliminary Judging/Presentation day for 5th Grade (Yellow Rotation)

February 14, 2017, Tuesday (10a - 2:50p): Final Judging - all grades honorable mention projects Presented and Judged, by a panel of outside (non-Emerson) judges.

February 21-23, 2017, Tu-Th: Science Fair Project Boards displayed in Room 304.

February 24, 2017, Friday (10a - 12p): Awards Assembly for Science Fair Participants. Parents of all participants are invited.

Turning Curiosity into Science

Science is often stereotyped as limited to certain topics, but **any** interest can lead to scientific inquiry. Students are strongly encouraged to pursue a Science Fair project that emerges from the things they find personally relevant. Below are steps that may help to guide the student from their interests to a "cool and interesting" science project.

Step 1:

List the things you think are the most cool and interesting. These might be things, hobbies, ideas, or topics you like; things you like doing; things you'd like to do or see; or things you want to know more about. Often the most cool and interesting things are things that make us ***wonder***. ***Example:*** *Sunsets*

Step 2:

Think about what you know about these cool and interesting things. List the things you DON'T know about them and/or things that could make the cool and interesting thing better. You may want to *investigate* by looking at a book or article about your topic for more ideas. Https://scholar.google.com/ is a great search engine for finding recent scientific research on a topic. If the full text of an article is not available online, contact a local library for assistance obtaining the full text version. ***Example:*** *What is it about some sunsets that make them seem more beautiful?*

Step 3:

Narrow your focus to a question or improvement that interests you most. ***Example:*** *Which colors make a sunset seem more beautiful?*

Step 4:

Refine your question to a project that you could reasonably investigate. ***Example:*** *Does more red in a sunset make it look more beautiful?* Some of the most recognized, award-winning science projects involve the creation of something new – an invention, a program, or a product. This may not seem like something you could turn into a question, but it's really quite easy. All you have to do is to form your question in terms of a COMPARISON of your invention to something else. ***Example:*** *Will wearing red-tinted glasses result in students rating pictures of a sunset more beautiful than without the glasses?* Check your question to make sure it includes at least one Dependent Measure (the outcome your care about) and an Independent Variable. In our example, the Dependent Measure would be some kind of rating of beauty and our Independent Variable would be "redness" (by way of wearing or not wearing red-tinted glasses). Finally, control for any other variables that might affect your results. In our example, we may want to have two pairs of glasses (one with just clear glass and one with red-tinted glass) or three glasses "conditions" (clear, red-tinted, and no glasses). This way we could find out if the red-tinting made the difference or if any difference had something to do with just putting glasses on.

Additional resources:

Sample Human Subject (Participant) Consent Form:
http://www.lascifair.org/wp-content/uploads/2014/09/Jr-Div-Human-Consent-Form.doc

Helpful Sites:
http://www.jpl.nasa.gov/edu/teach/activity/how-to-do-a-science-fair-project/
http://www.usc.edu/CSSF/FAQ/WhatJudgesWant.html
https://www.googlesciencefair.com/en/

Questions? Contact George Brogmus at 818-517-7997 or at GBrogmus@UCLA.edu