



**DR. NELSON YING
TRI REGION SCIENCE
AND ENGINEERING FAIR**

MEMO

TO: Advocates for real science and engineering experience for pre-collegiate students
FR: Mary Eileen Wood
DT: November, 2010
RE: Fair in a Box

This will provide an overview of options and existing online resources available to individuals, districts or organizations exploring how to launch a local science fair. The most important thing you can do is to give them opportunities locally to try on their wings.

**Our focus is STEM – Science, Technology, Engineering and Mathematics –
and our approach is that students will work individually or in teams of two or three.**

Who may sponsor a science fair?

An individual classroom teacher or department, the school's PTO/PTA or a club, a local company, the public library, a community group such as Rotary or Lions ... anyone who wants to give students a chance to discover their talents and passion in the STEM fields.

What sort of fair might we operate?

1. **Poster Fair** in which students do rather simple topic posters. These work well for an Open House activity, and start them thinking "What do I like to do? What interests me?"
2. **Noncompetitive Science Fair** with parents talking with students, so youth have the chance to present to people other than their parents and teachers about a topic that interests them. Each student receives a ribbon or certificate of participation.
3. **Semi-competitive Science Fair**, again with parents interviewing students other than their own children, this time with a simple rubric or guide. Everyone receives some token to document participation. Certain projects would go on to represent the school at the regional level – the top 10 or 20%, the upper half. (Note: The Ying TRSEF does not have to restrict advancement at this point, so a fair in our territory may choose its own numbers. Verify the preferences of your affiliated fair.)
4. **Competitive Science Fair**, with parents *and local community folk such as retired teachers, union members, other industry and business people, college faculty and staff, lawyers and clergy, Kiwanis or Grange members*. This rubric will gather more information, in order to inform decisions about level of Honors and special awards as well as advancement.

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Where can we find help to plan our science fair?

Science Buddies is the first stop place for teachers and parents. www.sciencebuddies.org

The screenshot shows the Science Buddies website homepage. At the top, there is a navigation menu with tabs for Home, Project Ideas, Project Guide, Ask an Expert, Blog, Teachers, Parents, Students, and Science Careers. Below the menu is a search bar with the text "Google Custom Search" and a "Search" button. The main content area is divided into four columns:

- Science Fair Project Ideas:** Includes a list of project ideas to choose from, a Topic Selection Wizard, and a Science Fair Project Ideas Directory.
- Science Buddies News:** Features a "SCIENCE BUDDIES in Action" section with news items such as "Steven Vogt, member of the Science Buddies Advisory Board, leads team that discovered the Gliese 581g exoplanet" and "High school volunteer awarded 2010 Craig Sander Outstanding Mentor award".
- Student Resources:** Includes a "Science Fair Project Guide" and "Ask an Expert" section.
- Teacher & Parent Resources:** Includes "Teacher Resources" and "Parent Resources" sections.

On the right side, there is a sidebar with sections for "Information You Want to Know" and "Scientific Method Poster!".

For fair planners:

Whoever is planning the fair will find fair development guidelines at the Teachers tab, but every section is rich with real-world advice and tools. The Ying TRSEF suggests you review this material, then contact us with any further questions or “fine tunings.” Adults not involved in fair planning can use the suggestions at the “Parents” tab to encourage students to take the best advantage of this opportunity.

For students:

While the Archimedes Initiative (see next page) is the ideal starting point for student online exposure to science fairs, once their interest is sparked, the wizard at **Project Ideas** will help them select a project that fits their skill level, available time, and budget. **Project Guide** walks them through the project process ... without nagging from you! At **Science Careers**, students hear directly from scientists and engineers what their work entails, how they prepared for it, why they enjoy it so much. The **Blog** gives students exposure to the newest achievements ... and questions ... in STEM fields across the board. **Ask an Expert** features volunteer STEM specialists who will post answers to student questions submitted at the site!

For everyone:

For the whole picture, be sure to visit the **Intel International Science and Engineering Fair** site. Your fair will be part of the crucial, powerful base of this penultimate fair. If you sign up for their newsletter, you'll get the “big picture” of how fairs serve as launch points for students.

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501(c)3 nonprofit association – Affiliate / Intel International Science & Engineering Fair (ISEF)

The Archimedes Initiative www.archimedesinitiative.org is the most recent addition to science fair resources, and without a doubt one of the most powerful. Dr. Jeffrey Seeman and Tom Lawrence created video-based, self-directed learning (SDL) to offer a “transformative experience populated almost entirely by students speaking to other students – not adults telling students how to solve their problems. Dudley Herschbach, 1986 Nobel prize winner in chemistry, is the only adult voice.”

Your students hear firsthand about why to do a science fair project, how to choose, plan, and conduct their experiments, how to prepare for judges. They can follow a student through his/her project from beginning to end, track a topic from the POV of many peers, or follow their curiosity through the videos searching for inspiration! Experience thus far by the site’s developers suggests that the best way to use this extraordinary new tool is to turn the students loose and have them explore it themselves.

The screenshot shows the website for The Archimedes Initiative. At the top, there is a navigation bar with links: THEME VIDEOS, PROJECTS, TOPICS, RESOURCES, ABOUT THE INITIATIVE, and JOIN THE INITIATIVE. Below the navigation bar is the logo for The Archimedes Initiative, which includes a stylized atom symbol and a leaf. The main content area is titled "Topics" and contains a paragraph explaining that the site features commentary from project participants. Below this, there is a prompt: "Choose a topic below to start your exploration!". The topics are presented in a 4x4 grid of video thumbnails, each with a title below it:

- Advice to Parents
- Advice to Students
- Best of Science Fair
- Choosing Your Experiment
- Conclusions
- Conquering Fears
- Designing Your Experiment
- Help from Parents
- Judges
- Literature Search
- Making a Difference
- Mentors
- Preparing for the Future
- School Requirement
- Solving Problems
- Teamwork

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