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Science fair advice: If you show that you care about what you're doing, it will make a lasting impression

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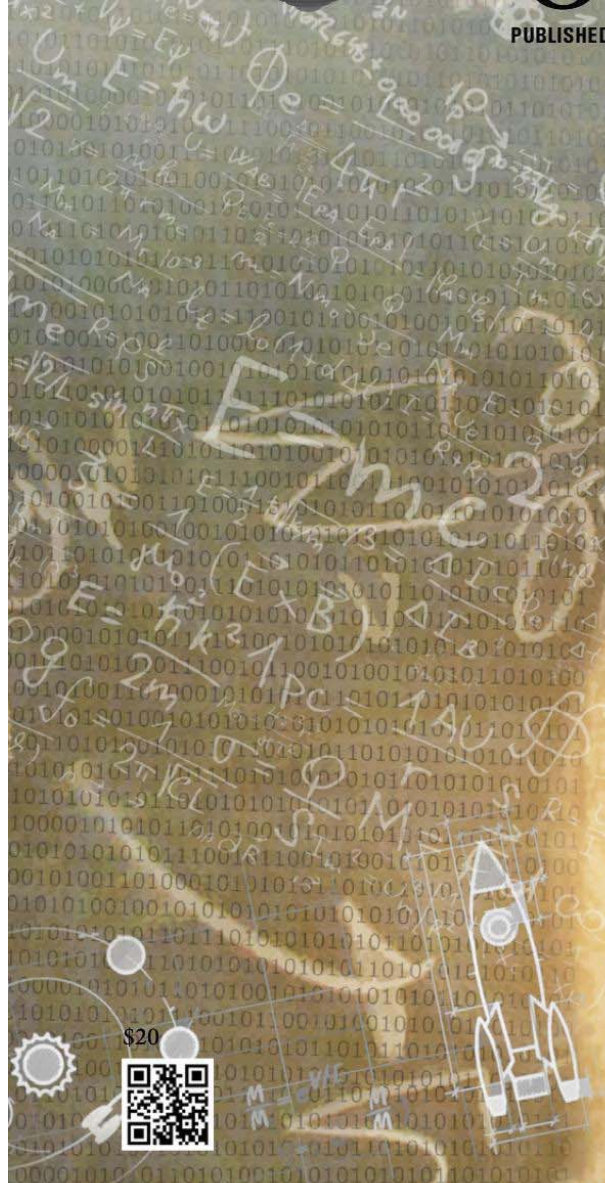
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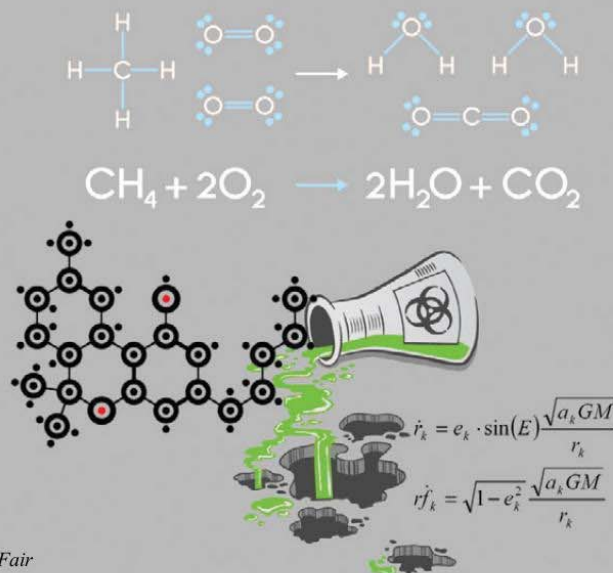
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ADVICE

If you Show that you Care About What you're Doing— You will Make a Lasting Impression

Dr. Tonya D Jeffery, Coastal Bend Regional Science Fair



STEM to Open up Opportunity

Research has demonstrated the need for more graduates with science, technology, engineering, and mathematics (STEM) degrees to fill jobs within the Coastal Bend. It is with great priority that students are introduced and encouraged to pursue STEM majors and studies, creating a pipeline that begins in primary and secondary levels of education. Increasing science fair participation among secondary students, specifically high school students can greatly benefit them when applying for college and ultimately in deciding their career path. Participating in science fair requires students to make observations, ask questions about particular phenomena or situations, formulate ideas/predictions about the solution to a problem, develop and carefully conduct experiments or investigations to arrive at answers or solutions to a problem, and effectively present and communicate his or her work to society. Students utilize their creativity and innovative skills on a topic that engages them and piques their curiosity. Students must also be required to complete many science fair forms and that would simulate the many forms necessary to complete when applying for admissions to college. In addition, participating in

the science fair is an added talent, students can add to their resumes. Students who compete in the science fair for consecutive years improve and refine their scientific skills. Exposure to STEM prior to college increases the likelihood that students will follow related majors once admitted, thus contributing to the future sustainability of STEM careers in the Coastal Bend area. Finally, at many regional and state fairs various universities and national organizations provide scholarships for students who participate in the science fair and plan to pursue majors in STEM.

Projects with Real-time Relevance to Stand out in the Crowd

I strongly urge students to participate in a science fair—it will be an experience of a lifetime. Students should select a topic they are genuinely interested in, curious about and wish to know more about; also, topics that addresses real world problems and have a greater chance of impacting a large population. We all strive to make our world a better, safer place to live and thrive. Projects that focus on issues directly related and relevant to their community and society are also well received.

If your school does not have a mentoring program, contact your regional science fair director for guidance and support. In addition, students should contact faculty at a local community college or university in the discipline related to their science fair topic. For example, our regional science fair is sponsored by our university and supported by the local community college. For example, as a fair director, I serve as the liaison for the student-faculty mentoring process by connecting students to faculty in a way that they closely matches their science fair topic and research. Many times scientists and researchers at universities have participated in science fair as a K-12 student themselves, or serve as judges for the regional science fair. So they look for opportunities to mentor the next generation of STEM experts. This ultimately bridges a gap between university and community in fostering STEM engagement, support to the local community, and future sustainability of STEM careers in the Coastal Bend area.

Another avenue to go about finding a mentor for science fair is for students to ask their parents about colleagues, friends, or family members who may be working in the field or discipline the student is seeking support. Many times parents can network and connect their child to an expert or specialist in the field of study to assist with their science fair project. Finally, depending on the topic, students may have their parents assist them in contacting specialists at a local business, museum, nature center, pet clinic, hospital, etc.

In order to prepare for judges questions, practice communicating and explaining your research in four to five sentences: what is the motivation for your topic, why does it matter to you and society, what did you do, what are the results/ findings, and what are your next steps. Also you should be able to communicate your research to judges in understandable terms for those who may be in non-science fields. If you are able to translate the technical and scientific language of your research in an easy to understandable manner so that non-science people can understand what you did and how you did it, then you have a greater chance of scoring well on the judging rubric. Also, be prepared to share what the take-home message is. Remember, you only have a limited amount of time to get your message across so practice your presentation. Put your heart and soul into your presentation so that the judges see the passion you have for your topic and research. If you show that you really care about what you're doing, you will make a lasting impression.

Parents to Play an Incremental Role

Parental support needed varies from student to student and depends on the nature of the science fair project. Parent's role in the community may be an untapped treasure to the teacher. Parents are very willing to help and can assist in the following ways:

1. Resource Person: Provide expertise on the topic, help find resource information, or provide contact with experts.

2. Supplies: Furnish or locate needed equipment.

3. Transportation: Take students to library, to meet with resource people, or to gather supplies

4. Place: Provide a garage, plant nursery, or laboratory.

Each school should write a letter to the parents as early as possible explaining them about Science Fair and how they can help.

However, it is important to note that some students may only need minimal support only or no support at all. It all depends on the topic, space needed to conduct the science fair (school, home, or lab), and the resources available.

Degrees and Achievements

My background is in health and community education, which is what my undergraduate and masters' degrees are in, with an emphasis in biology. During a community presentation to cancer patients, I found my love and passion for teaching, so I switched careers and became a certified 4-8 science teacher, teaching middle school science in the largest school district in Texas. During that time I served as a science department chair, science fair coordinator for my middle school campus, mentor to novice teachers, as well as, provide professional development to pre-service and in-service teachers. For my love of science and teaching, I decided to further my professional development and pursued a doctorate in Curriculum & Instruction, with a special emphasis in science education from the University of Houston—in December 2012. During my doctoral studies I was a clinical associate professor at the University of Houston for three years, where I taught elementary and secondary school methods to math and science undergraduate and postbac majors.

I am currently the Director of the Coastal Bend Regional Science Fair and assistant professor of science education at Texas A&M University-Corpus Christi (TAMUCC). I started working with the science fair in 2013. More outreach is needed in the coastal bend region to encourage

participation in science fair among secondary students. Therefore, this fall in October 2015, we have implemented a Science Fair Outreach Day for teachers, parents and students in the community. The event began with an overview about our regional fair's history, stats from last year, and goals for the current year. Information about required science fair forms were also discussed and provided to participants in a packet. We decided to host panel speakers: one panel consisted of teachers who actively participate in science fair; parents who regularly support their students in science fair; and the most compelling panel was of the high school students who were Intel ISEF finalists the past two years plus students who had advanced and won at the state fair. The students served on a student panel and passionately shared details about their projects and experiences at the state and national fairs with the participants. A common theme from all students was that "they selected their science fair topics based on an idea they were truly interested in and passionate about." It was a well-attended event and we hope to host more outreach events for the community in the future!



Dr. Tonya D Jeffery

My research focuses on the recruitment and retention of beginning secondary science teachers, conceptions of nature of science, teachers' self-efficacy in math and science, and pre-service and in-service teacher professional development in STEM.

Participating in Science Fair

By first participating in their school, district, or regional

science fair! A student will never know if their project will make it to the state or national science fair, however, they first have to enter the fair and participate! If they place in the regional fair, chances are their project is sophisticated enough for Intel ISEF. Students who place in 1st, 2nd, or 3rd place in the regional fair usually advance on to the state science fair. If the student's project places in the state fair and/or receives special recognition or an award by a national organization, chances are that the project may be sophisticated enough for Intel ISEF. Feedback from the judges at both the regional and state fairs can also inform the student as to whether their project is competitive for Intel ISEF. But, students will only find out if they participate in the science fair!

Valued Educational Experience

Participating in a science fair will provide a valued educational experience to students through the development and presentation of STEM research. Students get the opportunity to share their innovative ideas and research with other curious, like-minded individuals who are as passionate about science. Students also get to receive critical feedback from experts in their field of research on how to enhance and hone their innovative research ideas so that their projects are even more competitive in future competitions. It is an amazing experience for students. Many times students get to meet notable science innovators and other aspiring scientists from around the region (regional fair), state (state fair), or world (Intel ISEF).

Science Fairs to Infuse Curiosity

Yes, as a kid my parents strongly encouraged me to read lots of books and to participate in the annual science fair. My first school fair was in fifth grade. I had an amazing 5th grade teacher who loved science and she instilled her passion for science in us. I measured the length of time (in days) it took various fresh fruits and vegetables to spoil. I can remember science fair being a family affair in which everyone contributed to some extent: my parents took me to the local library to do some research on my topic, purchased the fruit and vegetables, supplied the camera for photos of my investigation, and purchased my notebook for data collection and science fair board for display. I made the observations, data tables, took lots of pictures, wrote my report, and decorated and organized my display board. It was a memorable experience that I thoroughly enjoyed and it made a great and lasting impression on me. My teachers' enthusiasm and interest in science sparked my curiosity and I've had the science bug in me ever since. I am happy to share this opportunity with students in my current role today! ●