General Outline for a 4.5-day ASRT workshop

If one or more of these “Top 10 mistakes teachers make” have impacted you when guiding your students through planning, working on, and presenting STEM Research projects, consider applying for the customized, in-person, **FREE (thanks to funding from Regeneron and ZEISS)**, Advancing STEM Research Teaching Professional Development Program

Top 10 mistakes teachers make when providing STEM Research opportunities for their students

1. I think I need to be the mentor for every (or most) student.
2. I limit the types of projects that students can work on based on my knowledge base and comfort level.
3. I limit the scope of student projects based on the available equipment.
4. I limit the depth of student projects based on the time allotted for in-class projects during 1 school year.
5. I consider each new school year as a year to start a new project and not continue to the next phase of the current project.
6. I limit my students’ opportunities and/or success because I am not familiar with the different and ever-changing science fair/competition deadlines and restrictions.
7. I allow students to get off track/fall behind, because I do not schedule regular and required "check-ins" to check on progress and set new goals.
8. I underestimate the impact of students presenting with confidence and enthusiasm while also being well versed on all related and semi-related topics when presenting at science fairs.
9. I do not use our more experienced students as student mentors/student teachers for the younger, less-experienced students.
10. I underestimate the positive impact of students wanting to belong to a group with similar interests who can also understand and appreciate the challenges of carrying out a long-term, advanced STEM research project.
Possible Topics for the ASRT workshop
www.ASRTprogram.com

** The following is ONLY a starting point. The ASRT workshop can be customized daily to address the specific short-term and long-term goals of all involved.

** Though some items and activities may be labeled “for 1st year” or “for 2nd year” or “for 3rd year” students, all activities can be customized to fit in any type of student STEM research project opportunity, club, class, or program.

1. **Building a Science Research Program/Elective/Club**
   - Increasing the quantity and quality of incoming students.
   - Building parent support.
   - Building school district support.
   - Making the program a "thing".
   - Spirit building merchandise.
   - Spirit building social media ideas.

2. **1st year Science Research student activities**
   - Class structure and rules.
   - Goals and grading.
   - Online searching skills.
   - Finding general and advanced (journal) articles related to the chosen area of research.
   - PowerPoint/Google Slides basic skills.
   - Selecting research topics that are appropriate based on the available time, resources, etc.
   - Understanding and explaining Basic info. in the chosen area of research.
   - Deciphering, understanding, and explaining advanced info. in the chosen area of research.
   - Designing a small project and writing up a research plan.
   - Identifying and memorizing key vocabulary terms in the chosen area of research.
   - Presenting general research topic via PowerPoint/Google Slides.
   - Creating a general research topic via poster.
   - Presenting an advanced, journal article in the chosen area of research.
   - Anticipating general and challenging questions in the chosen area of research.
   - Creating the first section of the research poster.
   - Writing the first section of the research paper including introduction, review of literature, problem statements, objectives, and hypotheses.
   - Creating the first section of the research poster.
   - Writing the second section of the research paper including methodology.
   - Creating the second section of the research poster.
   - Writing the third section of the research paper including results, analysis, discussion, application, conclusion, and future research.
   - Creating the third section of the research poster.
   - Practicing the poster presentation to peers, teachers, parents, and community members.
   - Presenting phase 1 of the research project in local competitions.
   - Planning for phase 2 of a long-term, summer-based research project or designing phase 1 of a new project.
   - Starting the personal essays and application for the senior year competition – the Regeneron Science Talent Search.
   - Presenting at the end-of-year symposium/showcase via poster.

3. **2nd year Science Research student activities**
   - Class structure and rules.
   - Goals and grading.
   - Analyzing winning vs non-winning student research papers.
   - Writing the first section of the research paper including introduction, review of literature, problem statements, objectives, and hypotheses.
   - Creating the first section of the research poster.
   - Writing the second section of the research paper including methodology.
   - Creating the second section of the research poster.
   - Writing the third section of the research paper including results, analysis, discussion, application, conclusion, and future research.
   - Creating the third section of the research poster.
   - Practicing the poster presentation to peers, teachers, parents, and community members.
   - Presenting phase 1 of the research project in local competitions.
   - Planning for phase 2 of a long-term, summer-based research project or designing phase 1 of a new project.
   - Starting the personal essays and application for the senior year competition – the Regeneron Science Talent Search.
   - Presenting at the end-of-year symposium/showcase via poster.
4. **3rd year Science Research student activities**
   - Writing the full paper to enter all competitions including Regeneron Science Talent Search (STS), Junior Science and Humanities Symposium (JSHS), Regional Science Fair affiliated with the Regeneron International Science and Engineering Fair (ISEF) and the International Genius Olympiad.
   - Creating a PowerPoint/Google Slides presentation to present in the JSHS competition.
   - Creating a poster to present in the regional ISEF-affiliated science fair and the International Genius Olympiad.
   - Creating a brochure to share the research project with a broader audience.
   - Presenting at the end-of-year symposium/showcase via PowerPoint/Google Slides.

5. **Competitions**
   - Understanding the different competitions.
   - Formats, deadlines, and limitations/restrictions.

6. **Mentors**
   - How to help students find a mentor to help guide them with their research project.
   - How to reach out to a potential mentor as a teacher and as a student.
   - Resources to find potential mentors for almost any area of research in rural, suburban, and urban settings.

7. **Community outreach**
   - Public presentations/practice sessions at the school.
   - Public presentations in the community.

8. **Behavioral (Survey) Projects**
   - Creating a school-based Institutional Review Board (IRB).
   - Deciding on a topic.
   - Creating a survey that can be distributed online, locally, or nationally.
   - Reaching out to potential mentors and organizations locally or nationally to help distribute the online survey.
   - Quantifying the results to be statistically analyzed.
   - Analyzing what the results show.

9. **Statistical analysis and graphing resources**
   - Benefits and drawbacks of different statistical analysis/graphing programs (apps).
   - Choosing the correct graph type to represent the data appropriately and clearly.

10. **Poster presentations**
    - Technology tips to help with poster design.
    - Poster review and critique.
    - Poster printing and display supplies and ideas.
    - Presentation timing and tips.

11. **PowerPoint/Google Slide presentations**
    - PowerPoint/Google Slides design and tech. tips.
    - PowerPoint/Google Slides review and critique.
    - Presentation timing and tips.

12. **Paper writing**
    - Paper design and structure based on different competitions.
    - Paper review and critique.

13. **Building and growing a science fair**
    - Organizing the numerous components.
    - Awards and Sponsors.
    - Facility/Staff/Volunteer requirements.