



2019 STEM Research Institute for Teachers of: Science, Engineering, Mathematics, Technology

Introduction

- Questar III sponsors the STEM Research Institute for Teachers of Science, Engineering, Mathematics, and Technology.
- During the summer of 2013, Questar III piloted the Summer Research Institute for Science Teachers.
- The Institute for Science Teachers was modeled after a highly successful, twenty-nine- year program founded by Dr. Sam Silverstein at Columbia University.
- The Research Institute is now entering its sixth year and has expanded to include all areas of STEM.

Program Overview

- Secondary school teachers will be partnered with research laboratories, engineering, technology or mathematics professionals working in Capitol District firms/businesses for **two consecutive summers**. For 7 weeks, the teachers work four days a week, participating in projects and/or research under the mentorship of a professional mentor in their field.
- The 5th day of the week teachers attend professional development workshops at Questar III writing lessons and developing curriculum to be used in their classrooms.
- The teachers receive a stipend (\$10,000.00) each summer as well as \$1000.00 (ea. summer) for classroom materials and equipment.
- Teachers become part of a cohort of teachers sharing ideas and working together to promote STEM for students in the Capitol Region.

Program's Results

- Research shows that the Columbia Summer Science Research Program has significantly enhanced the interest and proficiency of students in the classrooms of participating teachers.
- Students whose teachers have participated in the program have increased interest and proficiency in science, as indicated by greater participation in science competitions and after-school science programs, and a higher success rate on the Regents Exams in science. (*Reference Science Magazine Article: Oct 2009*)
- Questar III teachers (STEM Fellows) who have completed this program consistently report the experience has significantly impacted their classrooms in multiple ways including changes in instructional practices, increased student engagement and higher levels of academic achievement.
- STEM Fellows report a tremendous gain in their understanding of how to make content and skills relevant to the STEM world outside of school.



Why is this program worth implementing in the Questar III Region?

- Practicing professionals working with teachers, will increase our teachers' knowledge of **how** science, engineering, mathematics and technology are used in careers, which results in new and improved lessons in the classroom. Science teachers who attend attest to the fact that their practice has changed: "Before I entered this program I taught **about** chemistry. Now I teach chemistry."
- Increased student interest and participation in STEM fields in the future.
- High school graduates better prepared for the jobs and/or continued education in STEM related fields
- Long- term impact on meeting the needs of the Capital Region workforce in STEM related high-tech jobs.

In Their Own Words

Deb Mabey, Hoosick Falls Central School- Science

"I would recommend this program to any and all teachers that want to infuse cutting edge 'real-life' science experiences into their classroom to help inspire their students to pursue STEM careers."

Sean Higgins, Cairo-Durham High School Science

"This experience has had a profound impact on me as both a scientist and as a teacher. The experience and information learned will directly impact my students as I now have real world experience that I can bring back to my classroom, as well as labs that will develop the skills in my students needed to succeed in STEM."

Nicole Mantas, Mohonasen High School Science

"I learned how success, as a result of struggle and hard work, builds confidence and a willingness to continue. I found that mistakes are often more informative than being correct and that in real science you are wrong much more than you are right- BUT- that is okay. It is real science."

Kyle Crawford, Coxsackie-Athens High School Technology

"Learning from and working alongside the Centrothern Eco Systems employees really helped me grasp the manufacturing process as a whole. There is no doubt that I will be able to better communicate real world concepts about manufacturing processes as a result of this experience. It was the most valuable professional development I have ever had."

Ryan DeBrosky, Rensselaer Junior/Senior High School Mathematics

"These two summers have shown me so many ways I can relate mathematics to the real world. I came away knowing I needed to transform my classroom and it gave me so many ideas of how to increase active learning and embed problem-solving strategies with my students. The employees I worked with use these skills alongside mathematics every day."