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QUARTERLY PUBLICATION

GREATER SOUTHERN TIER STEM LEARNING NETWORK

INFORM

ENGAGE

INSPIRE

Business, Education & Community: joining forces to build regional capacity in Science, Technology, Engineering & Math

In this issue...

Campbell-Savona Elementary students have fun learning with STEM program

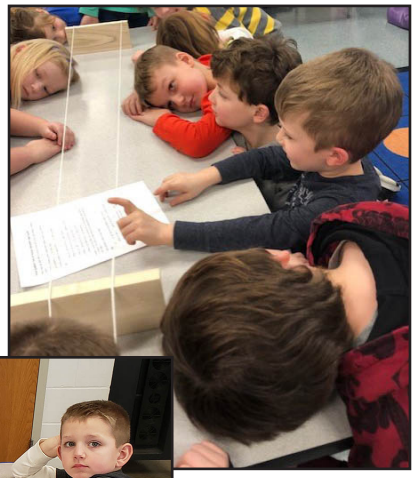
Campbell-Savona Elementary students are exploring and learning every day with the STEM program. Many grade levels are utilizing the new multi-purpose room to work together while exploring new topics and creating projects.

Sixth-grade classes recently worked together on a cross-curricular STEM project on sustainability. Kindergarten classes collaborated to make particle board as part of the Materials and Motion STEM unit. They used wood shavings and cornstarch matrix to create their own piece of particle board. The teachers took it one step further and had all the kids use different cookie cutters to make wood shapes. You could tell by the mess that was left behind that they had a blast.

First-grade classes came together to explore the first investigation in their Sound and Light STEM unit. They chose to hold a STEM Day to provide felllow students with the opportunity to explore many different ways to make sound. Participants rotated to different activities and had fun exploring and learning about sound. Students learned different ways to make vibrations as they created book fiddles, explored making sound with a cup and rubber band, played a table fiddle and explored tone generators. A highlight of the investigation was getting to make rice dance on the tone generators.

STEM Day participants used a tone generator to explore how sounds are made.

(Right) Students listened to the vibrations of a table fiddle at STEM Day.

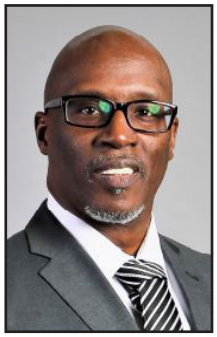


(Left) Kindergartners used wood shavings to create particle board during their Materials and Motion unit.

Introduction to the Greater Southern Tier STEM Learning Network

by Mark D. Vaughn, Ph.D.

The very first meeting of the group that would become the Greater Southern Tier STEM Learning Network was held on September 21, 2005 and kicked off with this opening statement: "Life is a technology-driven enterprise: If so, then an interest in and an understanding of the embedded importance of science, technology, engineering and math to life-long learning and success is 'mission critical'."



Mark D. Vaughn, Ph.D.

Today, the network is an active consortium of leaders and laity from PreK-12 education, higher education, business and industry and science museums on a mission to reenergize, revitalize and refocus attention, interest and understanding of the embedded importance of STEM to life-long learning and success. This mission is informed by our regional priorities as they pertain to STEM education.

The priorities are fidelity of implementation and sustainability, regional assessment, development and/or deployment of STEM curricula at all grade levels, maintenance of research and development databases for data-driven decision making and the creation of systems solutions. Together, these priorities drive the realization of our primary objective: To significantly increase the numbers of STEM-capable GST region graduates in general and, in particular, the numbers of students from GST region schools who enter the workforce in the areas of science, engineering and advanced manufacturing.

Bradford team presents work at Architectural Awareness Final Showcase 2019

On February 5, teams of students from across the region participated in the Architectural Awareness Final Showcase at the Corning Museum of Glass.

The Bradford Central School District presentation and model of Sugar Hill Recreational Area was the culminating activity to the work in their Architectural Awareness class. The class is taught by Becky Schrader and teaches students about the architectural design process. Throughout the course of study, students visited the site that they were working on to get ideas and take measurements, participated in a 3D modeling experience with the assistance of their architect mentor from Hunt Engineers/Architects/Surveyors and designed their own scale models of the properties they wished to transform.

The Bradford team presented its project at the Corning Museum of Glass.

The Architectural Awareness Program, offered by the Career Development Council, pairs middle school teams with local architects for an adaptive re-use project in their community. Students gain a better understanding of their community and develop a variety of STEM-related skills through hands-on learning.

The Bradford team members created a model of their proposal, the Sugar Hill Recreational Area.

CPP implements computer-based testing

In 2017-18, the Corning-Painted Post Area School District piloted computer-based testing at the Middle School. All students in grades 6-8 were tested in ELA and math on their one-to-one devices. The testing went well and as a result, C-PP has moved forward to implement computer-based testing in grades 3-8 for the 2018-19 assessments. This is a big change at the elementary level. To support the change, the technology committee implemented after school and conference day trainings to help staff get their students ready for CBT.

Digital Learning Coordinator June Keuhn oversees CPP's Building Informational Technology Specialists (BITS), who are staffed in each building and provide professional development opportunities in technology throughout the year. Professional development sessions have included topics such as: Typing Club, Google Forms, CBT in your classroom, Google Docs, ReadWorks, MobyMax, Khan Academy and using the math equation editor to help teachers prepare their students for the assessments. Keuhn created a website that teachers can visit to view a presentation she developed with Colin Sinko, fifth-grade teacher at Hugh Gregg Elementary, on ways to support students in preparing to take assessments on a computer.

Check out our resources link at:
https://sites.google.com/cppasd.com/cbt/home

Sinko has been an amazing resource who is full of great ideas to help students feel more comfortable with this new method of testing. His mantra has been, "The more comfortable students are using the Chromebooks, the easier testing will be for them." In addition, Jen Leonberger, CPP's STEM curriculum mentor, has helped the district in this endeavor. At the January staff development day, she presented to second-grade teachers on additional ways to have students work with their one-to-one devices, while simultaneously preparing for future computer-based testing. The skills that have been highlighted are skills students will use for the rest of their lives, not just for the test itself. The district's building informational technology specialists have been essential in providing support, training and resources to help get the district ready for the assessments. Administration and teachers are starting to feel more confident as the assessment window approaches. Everyone is working together to support the CPP mission, "Students are the center of all that we do."

Save the date

The Greater Southern Tier STEM Learning Network will host Summer Academy 2019 on Tuesday, July 23, 2019 from 8:00 a.m. to 3:30 p.m. at Corning Community College. The event is free and will commemorate ten years of Regional STEM work with the theme "From Innovative Idea to Interconnected Ecosystem."

Activities will include a "spare parts" experience, poster competition with cash awards, PM Speed Rounds and the annual State of STEM report.

For more information, go to http://www.gstsln.net/events.

Data corner

The impact of the STEM Learning Network can be seen in recent data. More students are challenging themselves to take extra coursework and earn Regents diplomas with Advanced Designation. Our region was once below the state average, but the 2013 cohort met the state average and the 2014 cohort exceeded the state average by three percent. Thirty-six percent of the 2014 cohort earned a diploma with advanced designation by passing at least three Regents exams beyond the minimum and completing advanced course sequences in a Language Other Than English, a Career and Technical Education Pathway, or the arts.

The GST 2014 cohort exceeded the state average by 3 percent in students earning a Regents diploma with Advanced Designation

Inquiry comes in various forms

Excerpt by Heather Banchi and Randy Bell

Teachers sometimes believe that in order for students to be engaged in inquiry-oriented activities, they need to be designing scientific investigations from scratch and carrying them out on their own. This simply isn't true. In fact, most students, regardless of age, need extensive practice to develop their inquiry abilities and understandings to a point where they can conduct their own investigation from start to finish. Luckily, there are many levels of inquiry that students can progress through as they move toward deeper scientific thinking: confirmation, structured, guided and open.

At the first level, confirmation inquiry, students are provided with the question and procedure (method), and the results are known in advance. Confirmation inquiry is useful when a teacher's goal is to reinforce a previously introduced idea, to introduce students to the experience of conducting investigations or to have students practice a specific inquiry skill, such as collecting and recording data.

At the next level, structured inquiry, the question and procedures are still provided by the teacher; however, students generate an explanation supported by the evidence they have collected. While confirmation and structured inquiry are considered lower-level inquiries, they are important because they enable students to gradually develop their abilities to conduct more open-ended inquiry.

At the third level, guided inquiry, the teacher provides students with only the research question, and students design the procedure (method) to test their question and the resulting explanations. Because this kind of inquiry is more involved than structured inquiry, it is most successful when students have had numerous opportunities to learn and practice different ways to plan experiments and record data.

At the fourth and highest level of inquiry, open inquiry, students have the purest opportunities to act like scientists, deriving questions, designing and carrying out investigations and communicating their results. This level requires the most scientific reasoning and greatest cognitive demand from students. With ample experience at the first three levels of inquiry, students at the fourth- and fifth-grade levels will be able to successfully conduct open inquiries. It is only appropriate to have students conducting open inquiries when they have demonstrated that they can successfully design and carry out investigations when provided with the question.

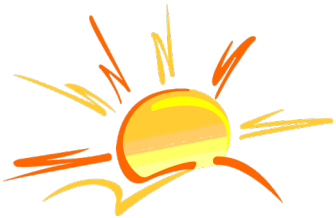
As students experience the multiple levels of inquiry, they will develop the abilities and understandings of scientific inquiry. Students need to experience science through direct experience, consistently practicing the inquiry skills and seeking deeper understanding of science content through their investigations.

UNDERSTAND YOUR DIGITAL FOOTPRINT

Visit the Digital Citizenship Resource Center at http://www.gstric.org/digital-citizenship/

> "What if, instead of avoiding social media in school altogether or focusing solely on the negative aspects, we teach students how to leverage it to connect in positive ways and build a digital footprint that reflects their best selves ..."
>
> Susan M. Bearden @s_bearden

Plans for the Summer of Innovation 2019 are underway. Information on this year's offerings should be available by the end of April. Check www.gstboces.org for details on academies and registration.



GREATER SOUTHERN TIER STEM LEARNING NETWORK

Vision

Our region will be a model in generating math, science and technology interest, excitement and marketable skills.

Mission

Create a regional math, science and technology pipeline that results in the development of a workforce that is rich in M-S-T skills.

Purpose

To re-energize, revitalize and refocus attention, interest and understanding of the embedded importance of math, science and technology to life-long learning and success.