



**SEPTEMBER 2017**

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*Photo by A. Sue Weisler*



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## Rochester Already has Incredible Experience in STEM Delivery

by Jon Kriegel

Immediate Past President, and RES Volunteer Coordinator



### Early Efforts . . . .

Starting in 1987 and lasting ten years, Eastman Kodak delivered nearly a million man-hours of classroom-based STEM support, here in Rochester. Our focus was on Rochester City Schools, Grades 3-12, and we visited more than 700 classrooms, for two hours each visit, twice a week for those ten years. Most volunteer teams consisted of two Kodakers; I worked with School #25 (Bay at Goodman), and was part of a relatively rare, threesome of Kodak volunteers. This was years before the STEM acronym existed, but we helped a fifth grade teacher (Donna) turn whatever Science, Engineering or Math topic she was presenting, into a hands-on, (four-person), team effort.

Given the ten years of this program, the result was the delivery of truckloads of (STEM) hardware to take measurements, log data, demonstrate applications and derive actual results, now referred to as *Project Based Learning*, in hundreds of classrooms. Perhaps most importantly, we brought personal details about using the technical topics being taught, in actual applications, via examples that were based upon our combined personal-career-histories.



I doubt that there has been a STEM Initiative since, which approaches that magnitude, whether your metric is man-hours invested, tonnage of hardware developed, or educational adrenaline.

The fact that Kodak is no longer a 54,000 employee company, (that's what we were in Monroe County alone), doesn't mean that this **21<sup>st</sup> Century Learning Challenge** STEM Initiative, was anything less than a great idea, way ahead of its time!

### Let's move 40 years ahead . . .

The *Rochester Engineering Society* has access to more than 3,000 Engineers in upstate New York, many of whom were the actual Kodak volunteers who "worked" this initiative in the 1990's. In fact, four of the TCLC veterans have returned to "work," by joining the current RES STEM Initiative. Shouldn't we be continuing this STEM Initiative, with not only with engineers, but include machinists and doctors etc. (actually, anyone with a technical background)?

Maybe it makes sense to broaden our new program to include any school wishing to have STEM support, and surely we should be recruiting anyone with a STEM background (not just engineers), to become our Volunteer STEM Coaches. (I see a retired MD in an AP Biology Class, offering significant support.) By matching the volunteer's skill-set to the teachers STEM objectives, coaches are ready to contribute immediately.



This RES Initiative is called



Last year we had 11 coaches working in four schools, and as this school year starts, we have 9 additional openings, from a family of schools, helping teachers deliver hands-on STEM at many grade levels.

Below is a Volunteer contact form excerpted from our webpage:

## STEM Bridges Contact Form for Volunteers

Dear Volunteer STEM Coach: Thank you for your interest in bringing your professional expertise into collaboration with a classroom teacher. After you fill out and submit section one of this form you will be contacted by the **STEM Bridges** Coordinator to discuss your interest, availability, and the current opportunities seeking a STEM professional's connection. Please note that classroom opportunities occur Mon-Fri during the school day (before 3pm).

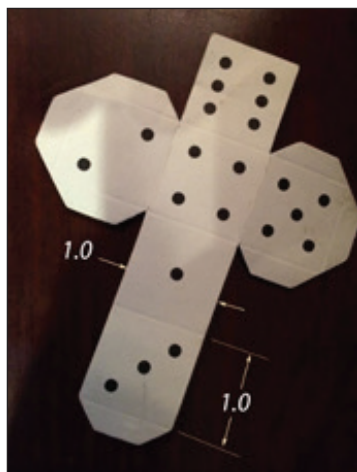
Your Last Name *	<input type="text"/>
Your First Name *	<input type="text"/>
STEM field *	<input type="text" value="Science/Medicine"/> ▼
Your email Address *	<input type="text"/>

We have a similar page for teachers who are looking for Volunteer STEM Coaches.

### So what does a Volunteer STEM Coach actually do while supporting a STEM Teacher?

One of the topics in my 5<sup>th</sup> grade class was buoyancy, and along the way, Donna tackled density, and eventually wrote the units  $lbs/in^3$  on the board. I suggest that we could have justifiably spent the next three classes developing how mankind got to those units. Perhaps it is also true that unless we invest the time to get the students to understand those units intimately, no further learning about “density” will occur. So on the way home the day of that class, I stopped at a print shop

and asked them to build a steel-rule die that would stamp the stretch-out of a cubic inch, with all the tabs for gluing, and (to make it actually a print job), the dots to make it a gaming die. At the next class we gave each student a flat-pattern and a glue-stick. (This was 1991, and the glue-stick itself was a new idea.) When we gave the materials to the kids, we suggested that if they folded them backwards (with the dots on the inside), they would be making a cubic inch, instead of a die. About half the students took the bait. *Continued on page 14*



*Continued from page 13...* This hands-on exposure was just the first step in a series of hands-on projects that drove home what “density” meant, and later, density’s role in “*buoyancy*.”

With 1500 of us working, it might be safe to say that the TCLC inadvertently built some level of hardware for every conceivable technical topic.

### More History . . .

Xerox, B&L and RF Communications (now Harris) all began STEM delivery on the same timeline as the Kodak TCLC. Xerox is celebrating more than 40 years of supplying STEM Kits, created for their initiative, to support Webster area schools, and has added an annual *Science Exploration Day* which involves middle school students in building 3D structures based on tetrahedrons.

STANYS (Science Teachers Association) has run *Science Exploration Days* at St. John Fisher College for 46 years! This program includes technical presentations for high school students, on par with any of our RES Affiliate’s Annual Professional Development Conferences.

The RES has kept the books and supplied the manpower for the exhibits at the *E3 Fair* every year since its inception in 1991. Sixth, seventh and eighth graders get exposed to more than a dozen professional organizations and the associated career-path options.

The RES also has an Explorer Troop, which takes STEM interested high school students on typically 11 laboratory/industry tours every winter, with the goal of exposing them to STEM-related career possibilities. This effort also dates back to the 1980’s.

My bachelor’s degree at RIT included six, ten-week trimesters of co-op employment. I feel comfortable calling that STEM in higher-ed.

### Where do we go from here . . .

I see the government’s creation of the STEM acronym as recognizing that, as a Country, the only way to sustain world-class status is to educate its citizenry in STEM. Maybe your company has the foresight all of the companies mentioned here have shown, and sees such volunteering as necessary to keep even their own employee-pipe-line filled.

Rochester just keeps coming with STEM Initiatives, and I hope you will consider joining the fray by visiting STEM Bridges, ([stem-bridges.org](http://stem-bridges.org)) and signing up to become an *RES Volunteer STEM Coach*.

A *STEM Bridges* volunteer needs to be available during school hours, so retirees are high on our list, but maybe you are self-employed, and can arrange visitation times, or perhaps you can promote the employee pipeline path to STEM-capable future employees.

### In closing . . .

I am a member of the Board of the *Finger Lakes STEM Hub*, the *E3 Fair* and the *Boy Scouts Seneca Waterways Council*, and find Rochester to have an incredible network of people and organizations who are focused on STEM delivery. The RES *STEM Bridges* effort is being integrated with the efforts of these and other upstate STEM partners. Please visit <http://www.wxnews.org/post/stem-coaches-volunteer-their-time-help-kids> for a current example of *STEM Bridges* at work in an 8<sup>th</sup> grade class.

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Also, please feel free to contact me directly if you have questions or are interested in *STEM Bridges*.

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