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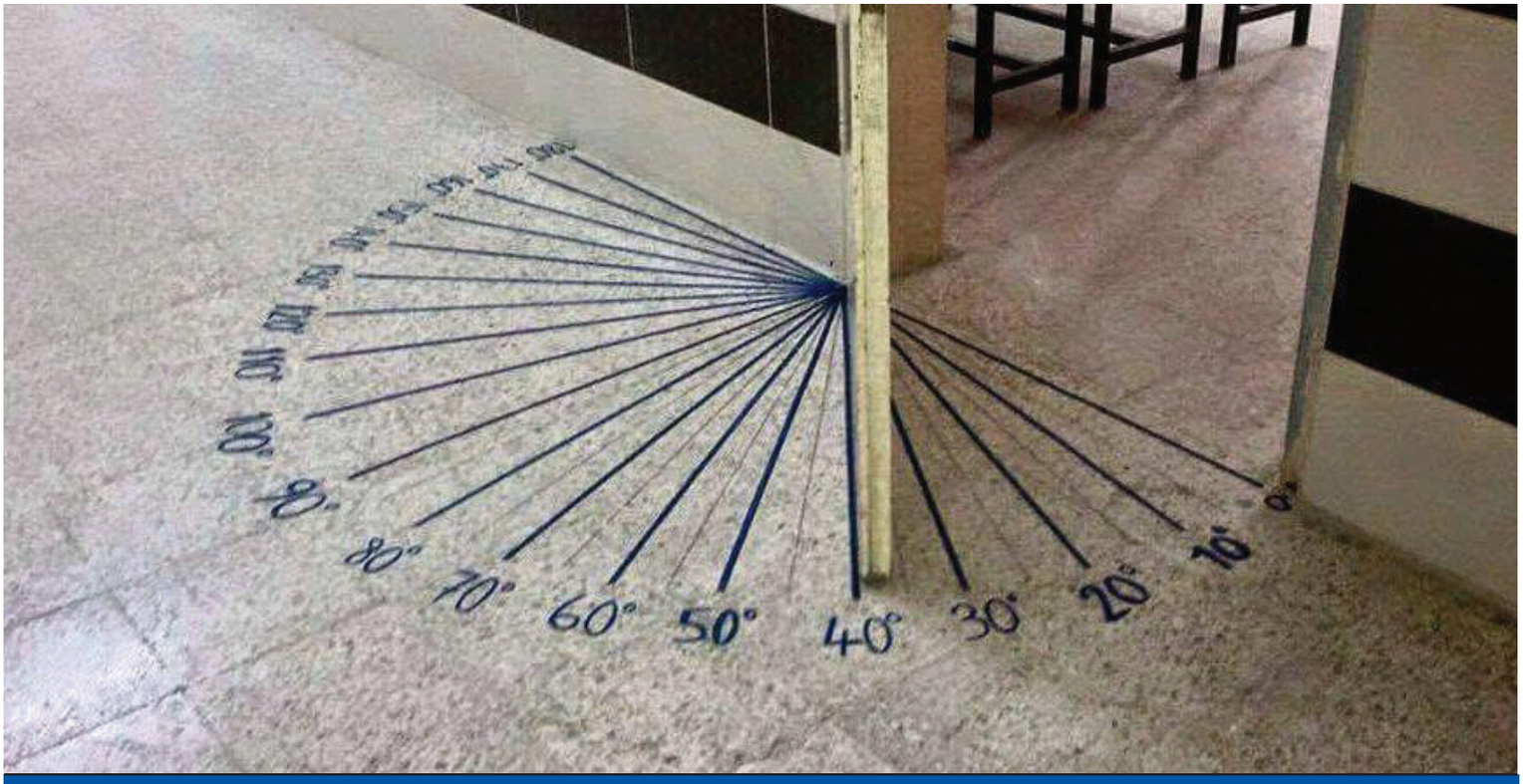
Technical? Retired? - Maybe you could be a Volunteer STEM Coach! |6



Also in this issue:

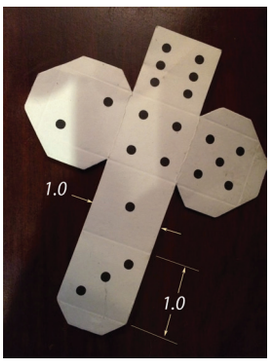
Technical? Retired? - Maybe you could be a Volunteer STEM Coach!

Administrative Director, Lynne Irwin, interviews RES President and Volunteer Coordinator Jon Kriegel, and Eileen, a 4th Grade Teacher and Donna, a 5th Grade Teacher; on the RES STEM Initiative to put technical people in classrooms as STEM support for teachers.

Ms. Irwin: **Donna, I understand Jon was one of three volunteers who visited your class twice a week for 2 hours each visit. Given that this went on for six years, can you give me a specific example of how these visits helped you and or your students?**

Donna: I used to teach Simple Machines/Pulleys with chalk on the blackboard. We spent several classes talking about the relationship between the number of pulleys and the resulting mechanical-advantage. The STEM volunteers brought in a block and tackle with 3 pulleys at one end and two at the other. We set up a mock tug-of-war in the school parking lot, and the smallest girl in class could wind-in the strongest four boys. If a picture is worth a thousand words, just imagine what this hardware-demonstration was worth. The kids not only got a better feel for the physics principals, they also saw and used, the real-world hardware.

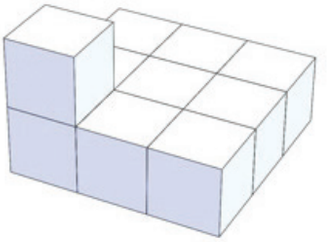
(Picture from another STEM class)



Ms. Irwin: **Eileen?**

Eileen: I was working on Buoyancy and Density. The units for Density are lbs/in^3. Jon was worried that the kids had no image in their head of what those units meant, so to make at least the *volume* part of this concept more tangible, he had 150 paper stretch-outs of a cubic inch made. Each student got the flat-pattern and a glue stick, and made their own cubic inch.

One of the Coaches had a foam die that was 3 inches on each side. We calculated that there should be $3^3 = 27$ of our paper cubic inches in the big foam one, but nobody believed it. So he borrowed the class's paper cubes and started building the larger one. When he set the 10th block in place we all gasped; it was clear that it was really going to take 27 to match the foam die.



Ms.Irwin: **How many Volunteer STEM Coaches are involved in this Initiative?**

Jon: We have 44 Volunteers at this time. Coaches have been working the 2015/16 school year at *School #3 (RCSD STEM Magnet), Honeoye Falls Primary School* and at *Edison Tech*. A dozen school districts have asked for Volunteers for next year.

Ms. Irwin: **What training does a Volunteer need to participate?**

Jon: Our experience is that Pre-K through Six, your technical background and career-related experience make you a valuable resource for any teacher working on STEM topics. Help comes in the form of either bringing or building hardware to help make tangible and real, the topics the teacher wants to work on, and perhaps more importantly, we bring the real world application examples that justify teaching this material in the first place.

At higher grades and for High School classes, we try to stay on specific areas-of-expertise that agree with the volunteer's career history. If an AP Biology teacher wants help, we will connect her with someone strong in that area.

This practice means that no new training is required. Instead, the goal is to match the Coaches' existing skill-set with the teacher's objectives.

Just as an aside, the coaches found themselves competing to be the first to "design" (or find), that "cheap and dirty" hardware that would best demonstrate whatever technical concept the teacher was pursuing. (*The Cubic Inch* was a win on my imaginary score sheet.) Think about bringing a volt meter to a 5th Grade class and measuring the potential you can get from a potato.

Ms. Irwin: **I understand that this initiative is related to efforts Eastman Kodak and other Rochester employers made in the 1980s and '90s.**

Jon: Yes, in fact the Xerox (sister) Initiative, started in 1987, is actually still running. I can speak best about the *"Kodak 21st Century Learning Challenge"* which put 1500 of us (engineers and technicians) into more than 700 RCSD classrooms from 1987-1996. This program started six years before the Federal Government coined the STEM acronym! The Kodak initiative consisted of three prongs; *Classroom Visitation, 1-on-1 Mentoring, and a Worker/Teacher Job Exchange.* One hundred and fifty Teachers came to Kodak every day for five weeks during the summer, and took over the job of his or her Kodak counterpart. "**Today Ms. Johnson (a teacher from School #4), will be running the jobs queued up for the electron-beam microscope at the EK Research Labs in Building 83.**" The premise was that such hands-on, real-world experience can only help to enable teachers regarding the realities of STEM delivery.

Ms. Irwin: **Since you are the president of the Rochester Engineering Society, should we conclude that you are seeking only "Engineers" as Volunteer STEM Coaches?**

Jon: No, we want anybody with a technical background that is available during school hours. Retirees may be our largest demographic, but if you are self-employed, or you work for a company which sees STEM support as helping to fill their employee pipe-line, we've got work for you. We also get a lot of college students who are satisfying community-service needs. Candidates with any technical background are eligible, not just engineers. Classroom Visitation is my focus, but we have also been helping to staff *Project Lead the Way, First Robotics,* and organizations like *BSA Explorer Troops*, (the RES runs *Troop 801*), and other STEM groups which meet after school and weekends.

Ms. Irwin: **Eileen, was there any fear that this visitor was competing with you as a second teacher?**

Eileen: Absolutely not. I worked with the same three coaches for six years. By the end of the second week, is was clear that this partnership was providing three extremely valuable plusses:
1. The coaches could take the class (and me) to technical depths where I could not have gone. (Which is, by the way, also empowering me for future classes.)
2. No matter how good a teacher I am, how was I also going to accumulate all the actual application examples these "techies" brought to my class?
3. The students got exposure to "engineers" and to technical Career-Path opportunities. (Somehow this career exposure used to be limited to Firemen and Policemen.)

Jon: Let me interrupt to say that Kodak was very "hands-off" with the *Classroom Visitation* arm of this Initiative. There was complete trust that working relationships would develop between coaches and teachers. Better yet, there was almost no attrition; everyone who joined, found it to be so rewarding, no one left. Four of our new RES Recruits are actually Veterans from the Kodak initiative. One actually left Kodak to pursue education as a full-time career. We also found an RCSD Teacher who was, as a 4th grader, tutored by Kodak volunteers. How is that for Career-path influence?

Ms. Irwin: **How many hours per week are your Volunteers committing?**

Jon: We have been making two visits per week, but it turns out, even a Coach who can only visit once a month, can make a difference. That just means you need a lot of them, to keep up with the need. Each teacher might see three different Volunteers in a given week. It is also possible to have more than one Coach in any given class.

Ms. Irwin: **Were you also part of the Kodak Mentoring Program?**

Jon: Yes, I mentored a 5th grader named Louis, who wanted to be a Paleontologist. I gave him a 13 inch wooden Pteronodon model for his birthday. The kit included one sheet with the outline of all the parts, and suggested that an adult grew to have a 21 foot wing span. You don't dare give an engineer the plans unless you are willing to have him help his student build this Pterosauria (technically not a dinosaur), life-size.

Ms. Irwin: **How does an interested person with a technical background become an RES Volunteer STEM Coach?**

Jon: Visit the RES web page: **Roceng.org/Volunteer**
Or contact Jon Kriegel
585 281-5216 (cell) or **jkriegel@rochester.rr.com**.