2015 RSVA Report

Retirees' School Volunteer Association

Inside this issue:

President's Message

Please mark your calendars and accept my personal invitation to join us at our **ANNUAL MEETING**
Thursday October 15th
1:00 - 4:30PM
Raytheon Global HQ
870 Winter Street, Waltham

Email JonLongley@Verizon.net
You must be on security's guest list.

We are excited to hear presentations from Provost & Dean of Faculty Vincent P. Manno, Sc.D. (Olin College), Vice-President of Engineering Michael Del Checcolo (Raytheon Integrated Defense Systems) and learn from Lexington High School's Parity Bits how they are applying STEM principles. We welcome all future retirees! We also welcome new members Dr. Harold Edelstein, Walter Caughey, Colmon Wong, Dr. Ryn Miake-Lye and Dr. Bruce Porter.

PROJECT-BASED LEARNING

America is reinventing itself in the arena of Science, Technology, Engineering and Mathematics (STEM) education, following the lead of Dean Kamen who founded FIRST robotics 25 years ago (For Inspiration and Recognition of Science & Technology).

RSVA's theme for 2015 is **Project-Based Learning**, which increases student engagement and involvement in the application of STEM principles to hands-on projects with real-world results. Simple project-based learning takes place in grade-school classrooms, while teams of middle-school and high-school students are exposed to building robots for problem-solving through after-school clubs. Project-based learning bodes well for the future of this industry and others of progress.

RSVA stays abreast of STEM initiatives to enhance education in our local communities. We volunteer about one to a dozen hours a month mentoring appreciative students who benefit from our experienced perspectives. Often we serve educators, too, by condensing years of professional experience to just a few minutes of informal technical advice in class or during after-school activities (see http://rsva.org) Through our volunteering with students, RSVA members become connected with community at many levels: government and business, observatories to school boards, parents and teachers. We are as fulfilled by these associations and activities as we are grateful for the leadership of the principals and faculty at the remarkable schools where we volunteer. RSVA has many vignettes and photos herein to share about our STEM successes.

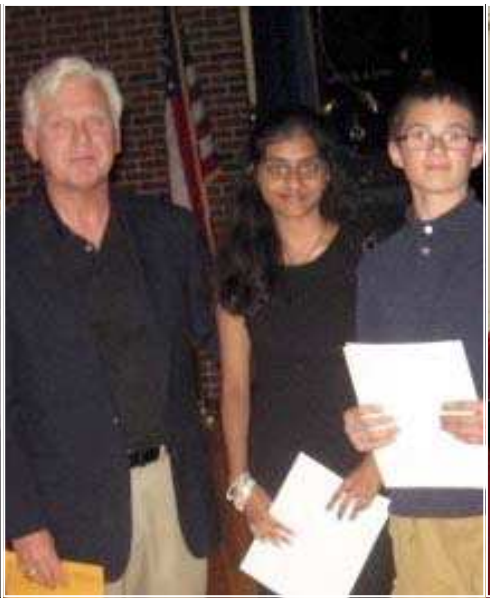
Jonathan T Longley
RSVA President

ABOUT RSVA STEM AWARDS

RSVA is a 501(c)(3) not-for-profit organization whose purpose is to enhance the science and math education of students in our local communities (see www.rsva.org). Founded in 1993 prompted by the passage of the Massachusetts Education Reform Act, our members are mostly retired engineers who continue the Raytheon Company's use of volunteerism to cultivate young engineers and scientists to replenish and sustain the technical workforce. We mentor students in class and in after-school science clubs, robotics competitions, math clubs, science fairs and homework help sessions in over 20 school districts in eastern Massachusetts.

RSVA STEM Awards

In support of education in Science, Technology, Engineering and Math (STEM) with generous sponsorship from Raytheon, we created the RSVA STEM Award. This award is granted to one male and one female student who have shown the highest performance in STEM subjects and activities during the school year. Selected by the school faculty and administration and presented at the school's Awards Ceremony, the award consists of a recognition certificate and a gift certificate to Barnes and Noble. RSVA members are responsible for nominating local middle or high schools and obtaining the awardees' names in a letter from the school principal that describes why those students were chosen. Each school receives a plaque with provisions to mount leafs each year engraved with the awardees' names, as well as an annual grant to support the school's STEM activities. In 2012 RSVA made awards to the three Framingham Middle Schools: Cameron, Fuller and Walsh. In 2013 new awards were granted to Leominster High School, Natick's Kennedy and Wilson Middle Schools. 2014 saw the addition of Banneker Charter Public School in Cambridge. In 2015 we continued our awards to all these schools.



FRAMINGHAM-NATICK TOWN CAPTAIN'S REPORT

SUMMARY

Nine volunteers worked in Framingham, Natick and Boston public schools for 834 hrs reaching 452 students. RSVA members served as math tutors and advisors to after-school clubs, providing both remedial and enrichment support to elementary, middle and high school students. Several supported after-school Robotics Clubs. One club earned regional and national recognition by competing in robotics world championships in Louisville, Kentucky. Our organization also presented STEM awards to 8th grade students at five middle schools. In addition, each of the schools received $1000 awards as well for their promotion of STEM subjects.

RSVA provided sustainment funding of $500 each to 6 Middle and High School robotics clubs in the MetroWest area including Natick, Framingham and Marlboro. The funds made it possible to purchase additional robotics materials and competition registration fees.

MEMBERS' VOLUNTEER ACTIVITIES

Marc Barnett volunteered at the Cameron Middle School (Framingham). He met weekly with 2 students from each of the three grades for 30 minute sessions for each grade level. He went over their "blast from the past" assignments, checked their work and helped to respond to any questions they had. Unfortunately there were fewer sessions than last year owing to harsh winter weather as much as standardized testing schedules within the school. Marc volunteered 16 days for 24 hours with 8 students.

Gerry Brody attended the 2014 STEM Summit where he participated in morning and afternoon Out-of-School Time (OST) break-out sessions. As a member of the Advisory Council of the MetroWest STEM Education Network (MWSEN), he participated in the Executive Committee meetings and the quarterly Council meetings.

Gerry was elected Treasurer of RSVA at the January Board Meeting, taking over from long-time volunteer Jim Ross. On behalf of the RSVA Board of Directors, Gerry presented the annual $1000 RSVA STEM Awards to Fuller and Cameron Middle Schools (Framingham) to a boy and a girl selected by their faculty for outstanding STEM performance. The students are awarded a gift certificate; the schools add a leaf to the plaques previously presented to them. Gerry made a presentation to the Framingham School Committee on a special $1000 STEM grant by RSVA to Framingham High School and Walsh Middle School toward their expenses for participating in the International VEX Robotics Championship in Louisville, Kentucky (see photos). Gerry expended 51.5 hours in support of RSVA-related activities during the 2014-2015 school year.

Daniel Carson provided in-class tutoring services to the 7th grade math classes at Timilty Middle School in Roxbury. This entailed assisting students with understanding of Math topics taught by the teacher. As needed, the teacher would have Mr. Carson assist an individual student requesting help or a small group of students he had identified as needing help. Mr. Carson's involvement consisted of 1 day per week for approximately 7 hours per day. He served 60 students and volunteered 30 days for 210 hours

Walter Caughey volunteered with the Walsh Middle School Robotics Club, along with Rich Serwetman and Mel Weinzimer. He supported Club Advisor, Pascal Chesnais, by helping the club's many teams assemble their robotics kits and prepare for inter-club competitions. Walter volunteered a total of 39 hours, spending 17 days with the club.

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FRAMINGHAM-NATICK TOWN CAPTAIN'S REPORT (CON'T)

Sorin Rosenberg tutored at the Cameron Middle School in Framingham, where he provided math tutoring to two students in each of Grades 6, 7, and 8. The tutoring took place under the supervision and guidance of Mrs. Megan Maguire, Math Head. The material used for tutoring consisted of Blast from the Past (BFP) work given by teachers to the students. Sorin worked at the school 18 days, completing 47 tutoring sessions for a total of 44 hours. Sorin has enjoyed working at Cameron, and is looking forward to the next year of tutoring.

Paul Rosenzweig has been tutoring in Framingham at Cameron Middle School on Tuesday mornings and Wednesday afternoons. He also tutors at the Walsh Middle School on Thursday afternoons. Paul also volunteers with Jewish Family Service of Metrowest (JFSMW), serving as a Tutor/Mentor in the fourth grade Math Academy program at the Wilson Elementary School in Framingham on Tuesday afternoons. He is also a volunteer tutor for the Homework Center at the Framingham Library, where he has tutored students of all grade levels in math and reading. Paul is a Learning Partner with SOAR55 (Service Opportunities After Reaching 55). Paul has found tutoring to be an enjoyable retirement experience. He has taken education courses at Framingham State University and considers working as a volunteer educator to be his second career.

Rich Serwetman assisted an after-school Robotics Club at the Walsh Middle School in Framingham. This is the second year for the Walsh Robotics club, and membership has doubled from last year to 35 students. Rich provided advice and guidance to the 6th, 7th and 8th grade student members and provided assistance to the club's faculty advisor, Pascal Chesnais. The club met after school once or twice weekly. Rich also developed a portable battery charging system for use by the students during their robotics competitions. Rich accompanied the students to the VEX Robotics competitions at the State and Regional levels. One team qualified to compete in the VEX Robotics World Championship in Louisville, Kentucky where they were one of 150 middle school clubs from around the world that competed. Rich volunteered a total of 48 days for a total of 124 hours.

Tom Toomey volunteered at the John F. Kennedy Middle School in Natick by assisting the Technology teacher in after-school Robotics activities, including the Robotics Club and the Robotics Teams. The Robotics Club consisted of more than 60 students who constructed robots using LEGO NEXT programmable modules and sensors. The Robotics Teams consisted of three groups of 10 students each – a novice team, an all-female team and an experienced team. Each team designed and constructed robots to compete in the FIRST LEGO League's Regional Competition. Tom volunteered over 150 hours in 65 days.

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FRAMINGHAM-NATICK TOWN CAPTAIN'S REPORT (CON'T)

Mel Weinzimer volunteered at the Walsh Middle School Robotics club in Framingham. The club has thirty-five members spanning 6th, 7th and 8th grades. The RSVA and Raytheon helped launch the club last year by providing funding to purchase a number of VEX robotics kits and spares. This year with the club size doubling, the RSVA and Raytheon renewed their sponsorship with the purchase of additional robotics kits to meet the needs of the growing club. The club met twice a week to learn about building and operating the robots. They also participated in competitions sponsored by Quinsigamond Community College in Worcester and by VEX Robotics. The club's successes included winning numerous competitions. As a result, for the second year in a row, the Walsh Middle School Robotics Club qualified to compete in national championships held in Louisville, Kentucky in April, 2015. The RSVA provided additional funding for the club to help defray travel expenses. There, the team experienced the John Wooden quote "Together Everyone Achieves More": they had a terrific, one-of-a-kind experience meeting students from all over the world.

Mel also served as a judge for the Broward County STEM Olympiad in Florida. In that role he evaluated and scored over 35 reports from middle and high school teams that competed in a challenge to propose a mouse-trap car.

Mel presented annual RSVA STEM Awards on behalf of the RSVA Board of Directors to a male and female student selected by the Walsh faculty for outstanding performance and interest in STEM activities during the year. The awards, presented at the end-of-year awards ceremony at Walsh middle school, consist of award certificates to each student and a $1000 grant to the school. Mel volunteered a total of 9 days, for a total of 21 hours and impacting 200 students.

LEXINGTON TOWN CAPTAIN'S REPORT

Michel Adler again judged at the Medford High School Science Fair. Some projects were quite impressive and original.

Along with **Jon Longley** and John Rudy, Mike supported the Lexington First Robotics "Two Bits and a Byte" team and also the all-girls "The Parity Bits" team, a first for this year. "Two Bits and a Byte" again advanced to the World Championships, although they didn't fare as well as last year. The all-girls team also participated at the World Championships by demonstrating next year's robotic control, which requires the use of an Android smartphone for the programming function. Jon gave a talk to the teams for various options of lifting balls into a canister. Mike provided a presentation showing wiring techniques that contrasted daisy chaining versus parallel control, running twisted pairs to minimize interference, and grounding options. "Two Bits and a Byte" has 47 participants and "The Parity Bits" 22 girls. To manage the great number of participants, sub-teams supported software, mechanical design, build, documentation, and community outreach.

RSVA supported the robotics clubs with an annual donation plus an additional donation for travel expenses to St. Louis for the First Robotics competition. The students are truly gifted, dedicated and eager to go at it again next year.

RSVA Volunteers Enhance Science

ANDOVER TOWN CAPTAIN'S REPORT

MEMBERS' VOLUNTEER ACTIVITIES

Al Del Checcolo volunteered, as in previous years, as a Math Mentor 1 hr/week at West Elementary School. Al worked with Mrs. Tracey Galat and small groups of her first grade class. Using a combination of games and puzzles, he stressed the importance of math in the everyday aspects of life regardless of final employment decisions. This activity was personally very rewarding but, ultimately, maintaining the students' attention was challenging.

For a third consecutive year, Al volunteered as a Mentor for the Andover Robotics Club (ARC) at Andover High School. The club's sponsor is Mrs. Minda Reidy, a Science teacher who has presented at our RSVA Annual Meeting. The club met after school hours 3 days/week. As competition dates approached, teams extended the meeting times and, on occasion, the number of days to meet. One team comprised newer, less experienced members while the other team was more experienced juniors and seniors. Co-operation between teams demonstrated the best aspects of academic competition. Forming a third team consisting of all girls is being actively supported for the upcoming school year. A year-end celebration was held at the Andover Country Club, at which new club officers, the teams, Mrs. Reidy, mentors and many supporters were all recognized.

With **Colmon Wong**, Al prepared and conducted a 2-week Electrical Engineering (EE) course as part of an overall Engineering Technology initiative sponsored by Mrs. Minda Reidy and Mrs. Cynthia Givens. Classroom lectures were prepared and presented by Colmon and Al, as well as laboratory experiments that reinforced the lecture material. Based on our presentation experience and the excellent comments of Mrs. Reidy and Mrs. Givens, the presentations are being revised for the upcoming year, where the program will again be offered. This initiative is expressly designed to encourage juniors and seniors to explore college-level STEM curricula and follow-on careers.

Newly introduced this year by Mrs. Minda Reidy, an Externship was offered to 8 outstanding seniors. Each Externship student proposed a STEM -related project, subject to approval, to be completed over a 14-week period. Ninety-minute meetings were conducted each school day. Weekly progress reports and a final project presentation, as well as mentor evaluations, were the basis for the final course grade. Al was a mentor to a student who developed and produced a photo booth for his growing DJ initiative. Al's assistance was mostly comments and suggestions related to the design effort to faciltate the actual building of the project. In total, the above items represent 250 volunteer hours.

During the past school year Al was also honored to be elected Vice President of RSVA.

Colmon Wong joined RSVA in October 2014, a year after he retired from Raytheon. Since then, he has volunteered in a number of activities at Andover High School.

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ANDOVER TOWN CAPTAIN'S REPORT (CON'T)

The highlight was his participation in two Exploring Engineering courses, one for each semester. He taught much of the basic introduction to electrical engineering. The first topics included the nature of the electric charge, currents, voltages, resistors, and Ohm's law. The material progressed into other common elements found in electrical circuits, such as capacitors, inductors, diodes and transistors. He also spent some class time on more general science/ engineering topics, such as scientific notations and standard measurement units. A kit was provided to students to connect up and measure simple and some progressively more elaborate circuits. The lectures, labs and a project ran for about 3 weeks, one and a half hours per day.

To a lesser extent, Colmon also supported the high school Robotics Club activities. All the design and implementation work was done by students. However, mentors provided assistance and advice when asked. The robotics teams competed very successfully in statewide competitions. Lastly, Colmon adjudicated two regional robotics events. The total amount of time spent was approximately 100 hrs, all very enjoyable.

Jon Longley volunteered for a third consecutive year as a mentor for Andover High School STEM activities: 3 Exploring Engineering (EE) courses, Externship for senior projects, and 2 FTC teams of the after-school Andover Robotics Club. Last fall, Jonathan met with Mrs. Minda Reidy, who guides science- and math-oriented students toward STEM college studies with strong support from volunteers. She is exemplary with project-based learning activities; her students explore big tech questions by collecting data, analyzing and weighing evidence, interpreting and presenting findings. RSVA and Mrs. Reidy planned presentation materials to complement the Exploring Engineering (EE) textbook chapters. RSVA mentors had a few hours "on stage" where we all interacted successfully. RSVA members also consulted on the EE student design/build projects and subsequently judged them. Jon primarily supported the regularly scheduled EE courses. He had Q&A sessions with the students during the introductory and Mechanical Engineering chapters. Using props Jon taught 4 lectures on hydraulics/brakes/actuators, wedges, cranks, cams, gears, screws, levers, pulleys, inclines, fulcrum/bearings/axles, pantograph/ linkages and energy conversion. This included an understanding of machines, transmissions, power plants, and basic calculations of force/work/power. Jon also discussed important technical inventors, analyzed technical current events and general problem solving. Jon showed how an engineering mindset and problem analyses build student confidence and help broadly with any career. Jon also supported the Material Engineering and Civil Engineering chapters of EE by presenting tension, compression and bending loaded members of a simple truss bridge, in preparation for student teams building a simple truss bridge for load testing. Jon helped with hydraulics theory (a backhoe demonstration of principles and operation of linear actuators), as well as design-build-modify-test activities associated with Rube Goldberg mousetrap projects. The self-learn PowerPoint presentations delivered by EE student teams on energy, hydroelectric dams, and various bridges were rewarding to witness.

Jon is honored to be elected President of RSVA, and attended a MassTec (Massachusetts Technology Education/Engineering Collaborative) annual conference at Fitchburg State University.

Jon supported the Andover Robotics Club and judged a US Army sponsored Ten80 car race. Through RSVA, Jon prepared an ME presentation and brainstorming session for a newly formed all-girl Robotics team at Lexington High School. The objective was lifting objects by various means, even an unconventional bellows. Later this team built a successful robot for the First Tech Challenge (FTC) and were invited guests to the FTC World Championships conference in St Louis, Missouri in mid April.

RSVA helped to arrange mentors for each

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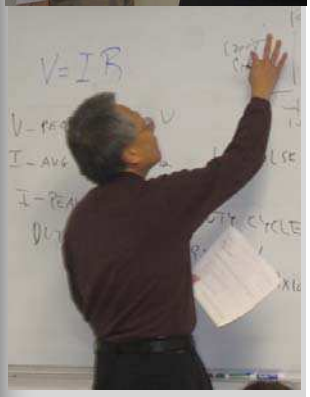
ANDOVER TOWN CAPTAIN'S REPORT (CON'T)



Externship project. Jon mentored two seniors: one built a safe testable solid-propellant rocket engine scaled down to 1 foot; another demonstrate the balance of forces on a powered model airplane in flight.

Jon also supported the spring semester of the Exploring Engineering course taught by Ms. Cynthia Givens. He held Q&A sessions with the students and taught the lectures in Mechanical Engineering described above. In addition, Jon prepared Material Engineering and Civil Engineering presentations about material properties, tension testing, and bridge construction. He helped with student design-build team projects, for which students fabricated scale model bridges of 8 different types (suspension, arch, beam, truss, cantilevered, cable stayed, Bascule Bridge etc.) The students learned experientially the properties of strength, stiffness, and density of basic materials through a collaborative discussion of the typical and best applications for each material. For example, a price/pound comparison was conducted of aluminum, ash, pine, steel, concrete, basic plastics, carbon-graphite, and lobster meat.

In total, Jon volunteered 220 hours, including discussions about future STEM awards at other Andover public schools.

CAMBRIDGE TOWN CAPTAIN'S REPORT

David Carey volunteers at the Banneker Charter Public School, an urban K1-6 STEM School that has achieved the top level in MCAS testing for 3 years in a row. David assists with their after-school astronomy club. On behalf of the RSVA Board, he presented an RSVA STEM Award. Acknowledgment from the school follows:

Good Morning David,

Thank you again for doing such a great job speaking/presenting yesterday at Banneker's Spring 2015 Graduation RSVA STEM Award presentation.

It was really well done; I loved that you even added some current astronomy news into the speech.

Thank you again for being such a great volunteer/support/role model for the students. We are lucky to have you! Enjoy your summer and we'll see you in the fall!

Sincerely,

Barbara Brothers

After School Program Director

"There is no limit to the amount of growth and development that the mind can sustain. The mind does not stop growing at any particular age."

-- Mortimer J. Adler

MARLBOROUGH TOWN CAPTAIN'S REPORT

Bruce Porter became a member in March. The next month, he and long-standing member **Milton Jones** introduced the RVSA to Marlborough High School (MHS) and established a long-term partnership of RSVA with their STEM program. For the 2015-2016 academic year RSVA will support students in roundtable career development discussions, project-based learning, tutoring, and a STEM EXPO.

In the limited time remaining in the 2014-2015 school year, Bruce and Milton met the STEM program leaders and student members, who provided us a tour of their project-based learning laboratories. The students discussed the rewards and challenges of a career in a technical field with Bruce, an Optical Physicist from Corning and MIT Draper Laboratory, and Milton, an Electrical Engineer from Raytheon. Bruce and Milton touched on the need for continuous learning to keep up with advances, the importance of developing strong oral and written communication skills, and the role of human problem solver.

Rodney Girard and **Neil Kaufman** joined Bruce and Milton as judges in MHS's annual STEM EXPO on June 12, 2015. In the fall of 2015, the MHS STEM director will get in touch with Bruce to plan RSVA's activities in support of the MHS STEM program for the 2015-2016 academic year.

In a separate activity, Bruce was an evaluator of STEM Olympiad project plans for the Broward County Schools in Florida.

VISIT TO MAST CONFERENCE

The Massachusetts Association of Science Teachers (MAST) is a collective group of school teachers, who teach engineering, science and math. They have formed a state association to promote STEM in after school projects for students in grades 6-12 (see http://www.massscienceteach.org).
They have an annual large conference in which they recognize both outstanding students who have shown in competition excellence in STEM exhibits and outstanding STEM teachers. In their conference, they encourage sponsors to attend at a fee of $75 for a booth. Many supportive organizations also attend to encourage and promote the students. RSVA could cooperate with their program and perhaps their president could meet with Jon Longley to explore interactions.

—Harold Edelstein

RSVA

Retirees School Volunteer
Association, Inc.
P.O. Box 921
Framingham, MA 01701-0921

Website: http://rsva.org
E-mail: JonLongley@verizon.net

PURPOSE/MISSION:
To enhance the science and math education of students in our local communities

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OR CURRENT RESIDENT

2015 RSVA Key Facts

Retirees' School Volunteer Association

ANNUAL MEETING — **Thursday, October 15, 2015**
1-4:30pm
Raytheon Global HQ
870 Winter Street, Waltham

BOARD MEETINGS — **3rd Fridays at 9:00am**
open to all members — Raytheon Global HQ

1417 hours volunteered

700 students mentored