

Superintendent's Corner

## Developing a mindset that empowers learning

DR. JOSEPH M. SAWYER  
SUPERINTENDENT

Our school district's mission statement, which has been in place for twenty years, concludes with the aspiration that we will provide our students with "the desire to continue to learn throughout life." Obviously this is not something measured through standardized tests, and it is difficult to ascertain whether Shrewsbury alumni are motivated to keep learning years after their experiences in our schools. While we rightfully measure how well our current students are attaining important knowledge and developing key skills in the here and now, so that they are well prepared for higher education and an increasingly complex world of work, we also know that the attitudes about learning our students develop now will greatly influence their futures. It has become increasingly clear that "knowing how

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Technology education • Next steps for Beal project • After school STEM learning • "Google Expedition" experience

inside • pages 5, 6 & 7

Innovative math at all levels • Updates from the office of Finance & Operations • Road Scholars 5K Race and 1 Mile Fun Run news • Shrewsbury Education Foundation awards



In the photo above, Sherwood students are standing in front of a green screen showing a scene from Venice. Litza Rivera, Instructional Technology Support Specialist at Sherwood, created this to illustrate how students recently experienced virtual reality travel. See the article on page 3 regarding this unique experience where students used special cardboard viewers made and supplied by Google to "travel" to select locations around the world and learn about them!

“An investment in knowledge pays the best interest.”

~ Benjamin Franklin ~

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Pictured above are students taking part in the After School Activities Program (ASAP) at Spring Street School. From left to right are Ryan Pergola, Riley Hunt, Enzo Garrastegui and Tysan Dang. The group is experimenting with the concept of drag by racing toy cars using a ramp made with books.

## Fiscal Year 2017 Budget update

MR. JOHN R. SAMIA  
SCHOOL COMMITTEE CHAIR

In October 2015, the Shrewsbury School Committee adopted fiscal guidelines and priorities for the Fiscal Year 2017 School Department Budget, charging Dr. Sawyer and his team with developing a budget to accomplish the following goals:

- 1) Maintaining current personnel and programming;
- 2) To make investments in programs and other resources to meet mandates in cost effective ways; and
- 3) Advance School Committee strategic priorities.

At the School Committee's January 20, 2016 meeting, Dr. Sawyer presented the fiscal year 2017 school department budget recommendation of \$62,446,298, which represents an increase of \$3,990,779, or 6.83%, over fiscal year 2016.

Dr. Sawyer's budget recommendation meets the School Committee's fiscal year 2017 goals outlined above. This budget reflects the costs necessary to carry the existing program forward and to comply with

legal mandates, as well as the cost of funding modest employee compensation adjustments based on actual and projected contractual agreements. This budget recommendation does not include any new academic programs or classroom teaching positions.

The School Committee acknowledges that the town's financial resources will not be able to support Dr. Sawyer's initial recommendation. However, the School Committee feels that it is important for the community to understand the cost of carrying the existing program forward. As Dr. Sawyer aptly states in his introduction to the budget materials presented to the School Committee: "I also understand the financial limitations connected to revenue growth within our town government system, and the reality that state government is unlikely to provide much in the way of additional funding for local government, including public schools. Therefore, I believe that our community will not have sufficient financial resources to fund this budget plan."

On January 29, 2016, Town Manager Daniel Morgado released his Fiscal Projection #1 for the town's Fiscal Year 2017 budget. Mr. Morgado's initial recommendation for the school

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## Superintendent's Corner

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to learn” will be a critical skill for our students to possess in the coming decades, in order to adapt to the rapid changes inherent in a globally connected, hyper-fast, technology-driven society. It also is more apparent than ever that the mindsets our students develop now regarding their ability to learn will play a crucial role in their futures.

In recent years, the work of psychologist Dr. Carolyn Dweck of Stanford University has become very influential in both education and business. Her studies, summarized in her book *Mindset: The New Psychology of Success*, illustrate the importance of having a “growth mindset,” which is the belief that dedication, hard work, and perseverance are

**The mindsets our students develop now regarding their ability to learn will play a crucial role in their futures.**

necessary to develop your talents and are the most important factors in your success. This is the opposite of a “fixed mindset,” the belief that how much intelligence and talent you have is predetermined and doesn’t change. Dweck’s research in education is compelling, in that it shows that students who develop a growth mindset, where they hold the belief that intelligence can be developed, are more likely to embrace challenges; persist despite obstacles; see effort as a path to mastery; learn from criticism; and are inspired by others’ success. Conversely, those who have a fixed mindset, where they believe that intelligence is static, tend to avoid challenges; give up easily when faced with obstacles; see effort as fruitless; ignore feedback; and are threatened by others’ success. Given the differences, it is not difficult to see why we would want to help our students develop a growth mindset.

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## Shrewsbury School Journal

The non-profit Shrewsbury School Journal is published three times a year and reaches every household in the diverse and growing town of Shrewsbury. It is published by the central office of the Shrewsbury Public Schools with the help and expertise of many individuals. The mission of the Shrewsbury School Journal is to provide an accurate source of information about our school system and the town in which we live. We hope to foster a community of continuous learners.

**Dr. Joseph M. Sawyer**  
Superintendent

**Kimberlee Cantin**  
Project Coordinator/Designer

# Providing inspiration & innovation

BRADY McCUE  
GRADE 8 STUDENT  
OAK MIDDLE SCHOOL

## Technology Education Providing Inspiration & Innovation

In the iPad-fueled environment present in the majority of classes at Oak Middle School, a class where drills and hammers line the walls may seem out of place. This is Mr. Allen Beer’s Technology Education classroom at Oak Middle School – an open industrial space where students gather around large wooden workbenches, tools in hand.

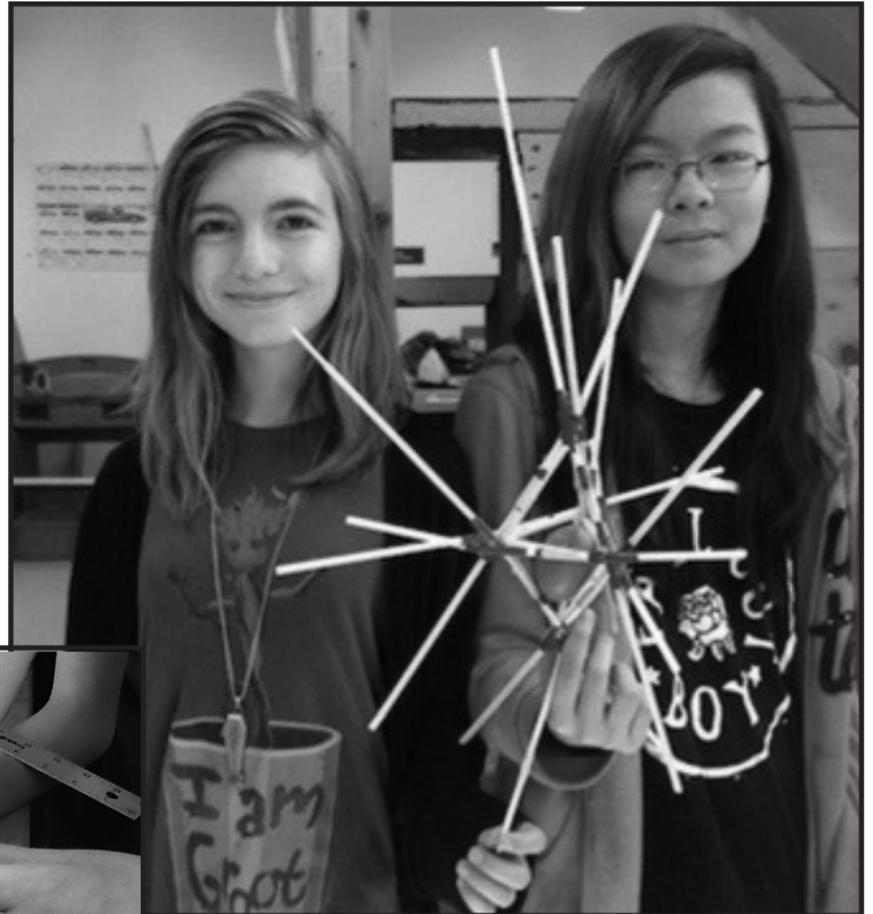
The goal of the class is to teach students about engineering through the design process. As defined by Mr. Beer, the design process is defined as follows: “the methodical procedure starts with identification of a problem,

researching solutions, picking a solution, building a prototype, testing and refining the prototype, recording data, and then presenting the solution.”

## Teaching 21st Century Skills

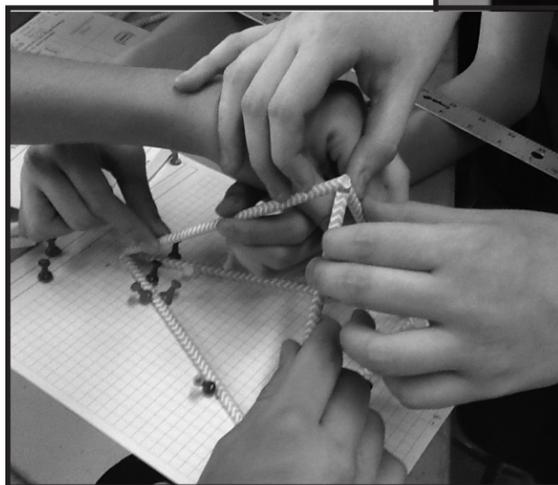
Lying at the heart of Technology Education are the concepts of critical thinking and creativity. While

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Pictured in the photo above are Stacey Allen, on the left, and Kathleen Wang on the right. They are holding an egg-drop vehicle prototype.

The photo to the left shows a wind powered vehicle prototype that has just been hot-glued. A perfect example of teamwork as students are holding it securely until the glue joints are solid.



## New after school STEM learning

KAREN ISAACSON  
DIRECTOR OF  
EXTENDED LEARNING

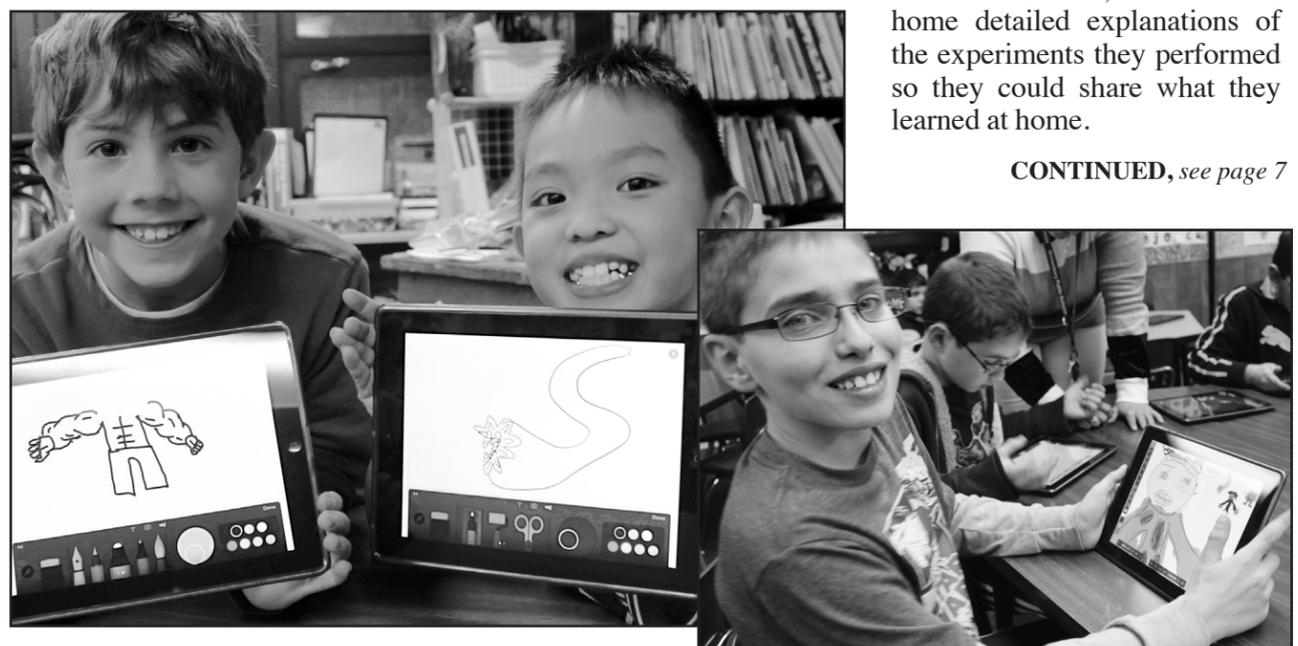
Shrewsbury’s elementary school students have new opportunities for learning outside of school hours thanks to the recently launched Elementary After School Activities Program (ASAP). These after school

clubs are developed and taught by SPS professionals and meet once a week, after school, for five weeks. The winter session featured some fantastic opportunities for students to gain hands-on experience in the areas of Science, Technology, Engineering and Mathematics. The program is funded by course registration fees.

At Coolidge, Blake Jarvi, In-

structional Aide, offered a “Mad Scientists Club.” Students used common household supplies to conduct experiments involving chemical reactions, surface tension and many other scientific principals. “It was very exciting to hear the hypotheses of the students and to see their faces light up with excitement when performing the experiments,” said Ms. Jarvi. At the end of each class, students took home detailed explanations of the experiments they performed so they could share what they learned at home.

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Pictured above are Alexander Ewick on the left and Kaden Truong on the right. The photo on the right shows brothers Domenico and Giuseppe Villani, 4th and 3rd grade students, respectively. All students attend Spring Street School. Both photos show students in the “Comic Strips in the 21st century” class taught by Tara Gauthier, Instructional Technology Specialist at Shrewsbury High, which utilized the district’s iPads. She teaches other classes such as “Introduction to Broadcasting,” and “Digital App-smashed News”.

# Beal project moves ahead

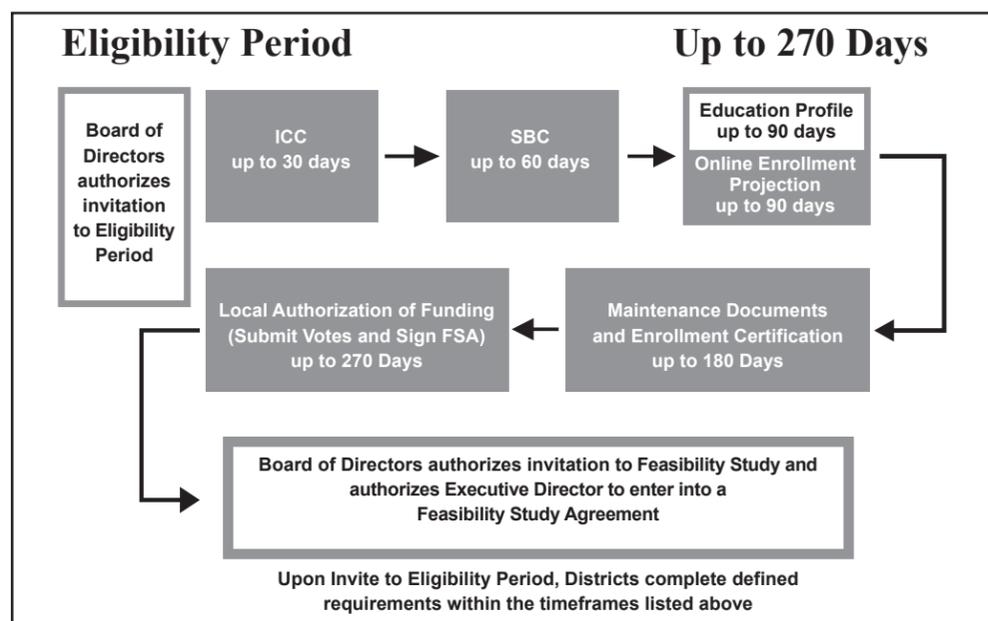
**PATRICK C. COLLINS**  
ASSISTANT SUPERINTENDENT  
FOR FINANCE & OPERATIONS

On January 27th the Board of Directors of the Massachusetts School Building Authority [MSBA] unanimously voted to invite the Town of Shrewsbury into the Eligibility Phase for potential replacement of the Beal Early Childhood Center.

The Beal Early Childhood Center project was one of 26 school projects selected from the 97 applications in the 2015 Statement of Interest process. The MSBA made it clear that the 26 selected represented the most “urgent and pressing” school building needs from the applicant pool. The table below depicts the number of applications to its Core Program and the number of projects selected in each respective year.

Due to the larger number of projects selected in the 2015 cycle, the MSBA will be phasing the official “start time” for each project moving into the Eligibility Phase. They have conveyed to us that Shrewsbury’s start time will be in March 2016. This will commence a 270 day time period in which a number of requirements must be fulfilled which are detailed in the “Eligibility Period” illustration below.

Application Year	Core Program Applications	Selected
2013	141	14
2014	108	15
2015	97	26



The table above depicts the number of Core Program applications and the number of selected applications in each respective year.

The graphic to the left illustrates the various requirements that the district must fulfilled during the “Eligibility Period”.

**Requirement 1. Initial Compliance Certification [ICC]:** This is an agreement between the town and the MSBA that we agree to move into the Eligibility Phase with the understanding we must comply with all state laws and MSBA regulations in order to proceed in this process and remain eligible for grant funding.

**Requirement 2. School Building Committee [SBC]:** The community must form a School Building Committee that meets the requirements of MSBA in terms of its composition.

**Requirement 3. Enrollment Projection and Educational Profile:** A long-term enrollment projection must be submitted that includes the entire preschool through grade 12

population. The MSBA must concur with the projection and wants to be sure that any proposed project will serve the long-term enrollment and educational needs of the district.

**Requirement 4. Maintenance Documents:** The town must demonstrate good stewardship of capital investments by detailing the preventive and corrective maintenance plans and budgets via annual operating budgets and capital improvement planning and budgeting.

**Requirement 5. Local Authorization of Funding for a Feasibility Study:** Town meeting must appropriate adequate funds to conduct the required Feasibility Study. This study develops and evaluates various building options and results in a recommen-

ation that best fits the community’s enrollment and educational needs. Costs for the Feasibility Study are eligible for MSBA grant reimbursement at the same rate as a building project.

Grant reimbursement rates are established by law and range between 31% and 80%. In essence, socioeconomic factors are used to measure a community’s relative wealth and develop a reimbursement percentage. Additional “incentive points” may be added to the reimbursement rate when a community adopts specific building best practices or environmentally friendly building strategies. The Sherwood Middle School received 54.16% reimbursement from MSBA.

We are eager to begin this process with MSBA and the community to resolve a significant space and facility need for the district.

## Superintendent’s Corner

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As with most things, this is easier said than done. There are deep-seated cultural norms that can get in the way of developing a growth mindset (just think of how many people will casually say “I’m just not a math person,” as if math competence is something that is inherent and unchangeable). We want to send our students the message that they can develop their knowledge and skills through effective effort and practice. This, of course, doesn’t

**We want our students to be engaged in critical thinking in order to solve complex problems, and we want them to be able to adapt and improve their performance in response to feedback.**

mean that everyone starts with the same level of talent, or that all can achieve the same levels of success in every domain. Rather, it means helping students understand their innate ability is the floor, not the ceiling, and that through hard work they can achieve significant improvement and meet high expectations.

Developing a growth mindset is a key reason why we are working to enhance our curriculum, instruction, and assessment in ways that require students to become active learners. We want our students to be engaged in critical thinking in order to solve complex problems, and we want them to be able to adapt and improve their performance in response to feedback. Our graduates will not be well served if their educational experience were to consist of passively absorbing information, regurgitating it, and viewing feedback as merely a judgment of whether they are good at a subject or not. Instead, we need to ensure that our students are able to analyze challenging, messy problems that don’t have a clear right answer; ask good questions in order to determine how to frame the problems; devise thoughtful, creative solutions and communicate them clearly; and respond to critical feedback by improving upon their initial work. Which type of person would you rather have on your team at work? Which one would you rather hire?

Helping students become “lifelong learners” has become a cliché that many schools espouse; the question is whether schools are helping students develop the skills and mindset that enable them to effectively continue their learning. Like a boat against the current, if you stop learning you go backwards. By helping our students to develop a growth mindset that motivates them to learn continuously, we empower them with the skills to paddle upstream to reach their goals, rather than drift along passively as perceived victims of their circumstances. As legendary coach John Wooden said, “When you’re through learning, you’re through.”

# Global travel without the jetlag



Ms. Carol Virzi, 5th grade ELA/Social Studies teacher at Sherwood Middle School, applied for the opportunity to have students at Sherwood take part in a global travel experience. On March 3, 2016, through Google’s Expeditions Pioneer Program, students experienced the opportunity to try “Expeditions”, a new product that allows teachers to take their classes on virtual field trips, immersing students in experiences that bring abstract concepts to life and giving students a deeper understanding of the world beyond the classroom. The photo at left shows how teachers use iPads that are preloaded with panoramic images of numerous field trip locations and instructional talking

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# Fiscal Year 2017

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department includes an increase of \$656,626, or 1.12%, and represents a \$3,334,153 gap from Dr. Sawyer's initial budget recommendation.

But, didn't the June 2014 override fix the school funding problem? There is no doubt that the Shrewsbury Public Schools are reaping significant rewards from the Shrewsbury community's investment of an additional \$4.2M (of which \$500K was to cover employee benefits) provided by the passage of the operational override in June 2014. The School Department has utilized the override funds exactly as promised, with the majority of funds invested in much needed staffing to reduce and maintain appropriate class size and provide mandated services. The remainder of the funds procured much needed curriculum materials and technology infrastructure. We are truly thankful for this additional investment by the Shrewsbury community.

These investments to reduce class size, update curriculum and technology and to provide mandated services are providing more robust learning experiences and 21st century skills requisite to succeed in a truly global economy for all of our students. Our students are thriving and excelling, and continue to earn many awards and championships in academics, the visual arts, music, drama, speech and debate, robotics, mathematics, science and engineering, and athletics.

However, while the override provided critical resources to the Shrewsbury Public Schools, it did not fully resolve the cost pressures placed on our budget from inconsistent and inadequate federal and state funding and complying with resource-intensive legal mandates. Rather, the override provided much needed funding to restore teaching positions, curriculum material purchases and technology that had been eliminated or reduced over the past decade.

To be clear, the cost pressures that the Shrewsbury Public Schools face are not unique. Virtually all communities in the Commonwealth face the same annual budget dilemma, namely the inability to raise revenues necessary to cover rising educational costs. Shrewsbury has been better able to withstand these cost pressures due to a longstanding track record of extraordinary financial management and innovation.

Over the next month, Dr. Sawyer and his team will be determining a cost reduction plan, which will most likely be presented to the School Committee at our regularly scheduled meeting on April 6th. During the same time, Shrewsbury's Fiscal Year 2017 budget picture will become clearer. Our hope is that additional resources will become available to close as much of the \$3.34M gap as possible, thereby limiting the damage to our academic program.

We will continue to keep you informed as the budget process evolves.

# Do you have a problem?

BY LISA PAPIAZIAN AND  
SUSAN CONLEY  
ELEMENTARY LEVEL  
CURRICULUM COORDINATORS/  
INSTRUCTIONAL COACHES

*You're planning a vacation and would like to stay three nights in a hotel. The hotel will cost \$185 per night. You've saved \$1,400 for this vacation. How much will you have left for the rest of your trip after paying for your hotel stay?*

Welcome to third grade math! This problem, which many adults have faced when planning a vacation, is actually a third grade math problem. When we walk into the classroom there is a buzz in the air as students are working together to understand, represent, solve, and critique solutions. This is real-world problem solving at its finest!

Elementary teachers across the district are finding ways to embed this type of mathematical thinking, creating mathematicians starting as young as kindergarten. As we all realize, mathematics is the pillar of numerous decisions we make in everyday life. We use math

as we filter information from the news - election coverage, sports statistics, and world health warnings. Math is the center of decisions we make in our own personal finances, whether planning a vacation

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Pictured above are Coolidge students and parents at a recent Math Night. Seated in the foreground at the table are students Declan McMahon, front and center, Lilly Ruggieri on the right. In the back row, from left to right, are Akshaj Aineni, and sisters Jaya and Divya Singh working together to solve math problems.

# Effective math communication

MELISSA McCANN  
MIDDLE LEVEL MATHEMATICS COORDINATOR

Students continue to build their problem solving and communication skills as they progress through the middle grades. As the math content gets more complex, students' capacity to make sense of problems and express their reasoning must be expanded. The middle school math teachers have developed explicit lessons and rubrics to help students improve their written communication in math. The resources and strategies utilized in the math classrooms promote rigor and consistency across the grade levels.

At Oak Middle School, one of the report card standards is designed to assess how well a student:

*"Communicates mathematical thinking clearly and concisely."*

Teachers and students refer to the term "SO C<sup>4</sup>" to represent the criteria of an appropriately communicated solution to a problem. Sharon Freedman, the OMS advanced math coach, and the grade 7 math teachers introduce this set of expectations to students. The grade 8 math teachers then maintain these expectations for communication in math.

Jennifer Dufault, a veteran math teacher on the 8 Green teacher team, explained, "The SO C<sup>4</sup> method has helped my students organize their thoughts and provide support and evidence for their answers. The approach doesn't remove the messiness that sometimes comes along with problem solving, but instead forces the students to go back and make sense of what they did to

arrive at a particular answer. The students are then able to organize their thoughts and provide mathematical support from one step to the next."

With the SO C<sup>4</sup> guidelines in place, students are poised to demonstrate their understanding in a way that is understood by others. Nihal Chaudhary, a student in one of Ms. Dufault's honors math classes confirmed, "SO C<sup>4</sup> helps me to include all of the details and information I need to fully answer the prompt, and it helps me to do it a neat and organized manner. I am

SO C <sup>4</sup>		
S	Supported	✓
O	Organized	✓
C	Correct	✓
C	Complete	✓
C	Clear	✓
C	Concise	✓

able to clearly explain my work with the SO C<sup>4</sup> checklist; it's quick, easy, and fun to remember!"

"The growth my students have shown this year has been tremendous," said Ms. Dufault. "They look at their own work from September and compare it to work they are doing now and amaze themselves. The support the students are providing for their answers is showing up on various types of assignments, tests, quizzes, and problems of the week."

Shrewsbury's students are learning and applying the communication skills and problem solving strategies they will need to tackle future mathematical challenges.

**Turn to page 6 for an article on a unique new math class offered at the high school level!**

# An evening of awards & recognition



The Shrewsbury Education Foundation (SEF), hosted its Annual Awards and Recognition Dinner which was held on January 23rd, and true to form, it was a very snowy night. Still, in spite of the weather, the SEF welcomed a full house. SEF co-president Melanie Petrucci says, "It's a testament to the dedication of the community and the Shrewsbury Public School faculty to celebrating achievement in education. My SEF colleagues Sandy Fryc and Chris Juetten always coordinate a lovely evening."

Without the generosity of contributors (Shrewsbury florist Danielson Flowers who donated gorgeous rose and hydrangea centerpieces and local musician, Andrew Clark, who once again, set the tone with his acoustic guitar and vocals) and sponsors (Presenting Sponsor, Howard Grossman from Grossman Development Group, Central One Federal Credit Union and Staples Foundation), the SEF would not be able to do the work they each year which is to promote and provide "Innovation in the Classroom."

Since its inception in 1992, SEF has awarded well over \$250,000 in grants to Shrewsbury Public Schools for innovative programs reaching students at every level, from preschool to high. SEF is an all-volunteer organization that raises money to fund grants which put resources and programs directly into the classroom. Annually, Shrewsbury Public School teachers write grant applications seeking funding for unique learning experiences and resources that will directly benefit students.

Prior to selection, the committee evaluates and ranks grant applications using the following metrics:

- Creativity and Innovation
- Clarity of Goals and Objectives
- Quality and Longevity of Impact
- Evaluation Plan
- Realistic Budget
- Collaborative Effort (is encouraged and recognized but not required)
- Quality of Presentation

In addition, projects should meet as many of the following criteria as appropriate:

- Involve as many students as possible
- Stimulate creativity in or out of the classroom
- Meet students' needs and increase motivation to learn
- Encourage unique ideas
- Enhance or enrich the curriculum

**Purposes of the program are to:**

- Develop new resources for schools
- Encourage extraordinary curricula

The following thirteen grants have been awarded for the 2015-2016 school year, totaling \$10,989.42, and were recognized at the annual dinner:

**1. Bird's Eye View** - written by Kristine Cobb, Art teacher at Shrewsbury High School

**2. Art Across Curriculum: Expanding Literacy through Art** - written by Pamela LeBlanc, Visual Arts Director at Shrewsbury High School

**3. Game On: Bored vs. Board** - written by Camille Viscomi; teacher at Paton School

**4. Modeling the World with Math** - written by Peter Collins, math teacher at Shrewsbury High School

**5. From the Mouth of Shakespeare** - written by Dayna Brown-Dolan, English teacher at Shrewsbury High School

**6. Making History Come Alive** - written by Joan Beall and Helene Bisceglia, teachers at Floral Street School

**7. Redefining Expectations for Student Produced Digital Media: Podcast with Professional Quality Sound Recording Tools While Targeting Effective 21st Century Communication Skills** - written by Steve Flahive,

English teacher at Shrewsbury High School

**8. Preschool Read Aloud Big Books** - written by Jenna Roxo and Catherine Dowling, teachers at Parker Road Preschool/Wesleyan Terrace

**9. Students Build Computers** - written by Chris Radkowski, Class of 2016 and Tracy Calabresi, computer Science teacher at Shrewsbury High School

**10. Mind-Body Connections: Incorporating Kinesthetic Practices into the Learning Environment** - written by Ellen O'Leary, Speech & Language Pathologist; Suzanne Margiano and Cara Demoga, School Psychologists at Floral Street School

**11. Social Thinking Curriculum for Preschool** - written by Cynthia Mietkiewicz, Integrated Classroom Teacher and Amanda Park, School Psychologist at Parker Road Preschool

**12. Roller Coaster Walls: Stem in Action in Preschool** - written by Catherine Dowling and Melissa Johnson, Special Education teachers at Parker Road Preschool; Sponsored by Central One Federal Credit Union

**13. I Excel! Using On-line Technology to Engage ALL Learners, Address the Standards and Improve Student Writing** - written by Kristine Gustafson and Ann Early, teachers at Paton School



Pictured above is "I-Excel" grant recipient Ann Early, second grade teacher at Walter J. Paton School, sharing a congratulatory handshake with Shrewsbury Education Foundation's co-president, Melanie Petrucci.

Along with the awarding of grants, nine staff members were honored with John P. Collins Awards for Excellence. These recipients were recognized for their exemplary efforts in the following categories:

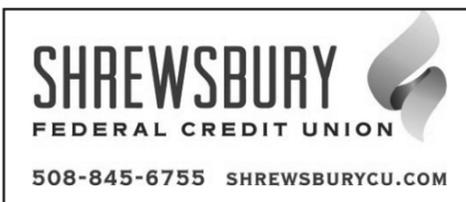
#### Leadership

- Mary Beth Banios - Assistant Superintendent for Curriculum and Instruction

## A great match!

### Colonial Fund Update: We Exceeded Our Goal to Raise \$15,000

We are very pleased to announce that we have met the challenge! Shrewsbury Federal Credit Union (SFCU) became our first Innovation Partner when, in October, they generously donated \$5,000 to the Shrewsbury Public Schools Colonial Fund. In addition,



SFCU pledged to match individual donations up to another \$5,000.

Thanks to our many generous donors, we were able to meet and exceed this challenge. With private donations and \$10,000 from SFCU, we raised over \$22,000 for our schools. These Colonial Fund dollars allow us to bring innovative projects to our district without sacrificing existing programs.

For more information about the Colonial Fund and the projects we support, please visit the Colonial Fund website at [www.schools.shrewsbury-ma.gov/future](http://www.schools.shrewsbury-ma.gov/future). To learn more about Shrewsbury Federal Credit Union and the services they provide in our community visit their website at [www.shrewsburycu.com](http://www.shrewsburycu.com).



Pictured above are Michael Lapomardo, to the left, and Brian Liporto, to the right, both SHS music teachers and recipients of the John P. Collins Awards for Excellence in the Professional category.

- Greg Nevader - Assistant Principal, Shrewsbury High School

#### Professional

- Susan Conley - Elementary Instructional Coach, Calvin Coolidge School
- Elin Dolen - 7 Green Science Teacher, Oak Middle School
- Michael Lapomardo - Music Teacher, Shrewsbury High School
- Brian Liporto - Music Teacher, Sherwood Middle & Shrewsbury High School

#### Paraprofessional

- Ann Marie Lockwood - Aide, Oak Middle School
- Cathy Shaw - Aide, Sherwood Middle School

#### Support

- Litza Rivera - IT Support Specialist, Sherwood Middle School

See more details on the SEF site: <http://www.shrewsbury-edfoundation.org>



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## Providing inspiration

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in classes such as English, students may be given an organizer to help with their writing; in Science, students are provided a procedure to follow when conducting a lab; yet in Technology Education, the students must determine the steps they take to arrive at a successful solution. Add effective collaboration, malleable materials (such as wood, plastic, foam, etc.), and some coaching from Mr. Beer, and students have everything they need



Pictured above are examples of balsa wood bridge structures ready for a destructive analysis test to determine strength.

to solve a problem.

Projects range from creating wind-powered cars to catapults, and in the end, there is always diversity amongst prototypes. Rather than waiting for everyone to arrive at the correct solution in math class, or for everyone to jot down the same notes in history class, there is a buzz of creativity in the air in Mr. Beer's class as groups collaborate to find their own solution. As 8th grader Michael DiNoia comments, "You're given opportunities to do entirely what you want." Technology Education at Oak Middle School puts students in the middle of their learning. Olivia Costa, an 8th grader on 8 Green, appreciates the responsibility: "[We are] treated... like young adults." Maggie Brown, who recently completed the 8th grade Technology Education class, thinks the class prepares students for the future: "[The] world can never run out of ingenuity."

## Problem?

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or deciding how much we can afford for that car payment. Applying math to problem solving is the basis of how math is used in everyday life, both personally and professionally.

Our elementary students work hard to understand problems, think critically, and create models to help them understand the math they are computing. Although problem solving is a main component of our math curriculum, computation skills and fact mastery remain critical building blocks.

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# New math course adds fresh flavor

BY JAMES HE  
SHS STUDENT  
CLASS OF 2016

The 2015-16 school year marks the debut of Mathematical Modeling, an honors-level course for upperclassmen who are taking or have taken AP Calculus. Taught by Mr. Peter Collins, the course is designed to give the most advanced students a challenging math option for senior year.

Mathematical Modeling is centered around problem solving in real-world scenarios. Major modeling projects, assigned once or twice per

maximize the security of its paintings.

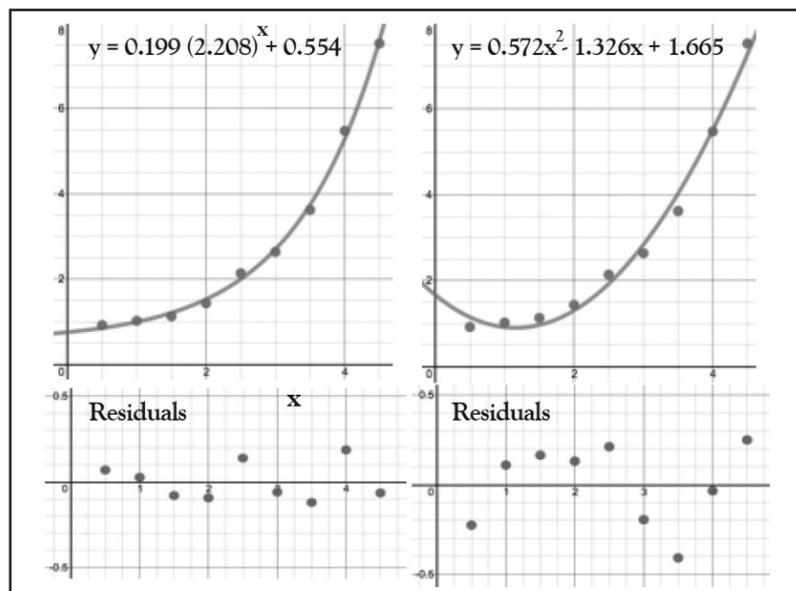
Mathematical Modeling stretches the boundaries of conventional math. In traditional courses, learning new mathematical concepts takes center stage. Students know that problems can be solved using techniques from the current unit. In Mathematical Modeling, the students are left in the dark. In small teams, the students collaborate on real-life problems—sometimes with very little data, sometimes with an excess of data, but never with hints about what math would help to solve the often "vague" problems.

Every solution has its flaws; such is the nature of modeling. An integral part of the solution is a reflection on its strengths and weakness, as well as improvements that could be made given more information or time. The final unique aspect of Mathematical Modeling is its emphasis on communication. At the end of every project, a written report or PowerPoint must be presented to demonstrate a team's solution. Writing and speaking skills have never been emphasized so much in a math course.

Because students spend so much time working together, the class bonds exceptionally well. Nothing, however, contributed more to this "bonding" than the High School Mathematical Contest in Modeling (HiMCM). In November, over 700 teams of four from all over the world competed in a 36-hour modeling competition. This year, the task was to determine the relative safety of a city given over 11,000 rows of its crime data. From Friday morning into Saturday evening, Shrewsbury's three teams underwent a grueling process of nearly nonstop work, both at school and at home. By the end, brains were fried and bodies worn, but everyone agreed that the experience had been incredibly rewarding. Everyone was proud of their professional final reports—the results of hard work, budding camaraderie, and sheer willpower. All three groups received the Meritorious designation for their solutions, meaning they performed better than about two-thirds of the participants.

For math at SHS, Mathematical Modeling is a "fresh flavor" because it brings critical thinking, innovation, collaboration, and communication to the table. The future of the course is bright and ripe for further growth.

### Mathematical Modeling Class Real-world problem solving sample work



Students in the modeling course often have to work with data. This student work shows two possible equations that could be used to model a given data set, along with an analysis of the residuals (error analysis) to help determine the more appropriate model.

month, form the core of the curriculum. Supplemental topics such as regression analysis, statistics, probability, and finance fill the gaps between projects and provide additional tools for handling the modeling problems. Examples of modeling problems include devising an efficient elevator system to get people to work on time, using statistics to determine whether an insect carries a deadly disease, and designing a museum layout to

Technology is one of the most important resources at the students' disposal. Programs such as Microsoft Excel and Mathematica are used to crunch high volumes of data, carry out simulations, or fit curves. By learning how to use advanced programs, students are expanding their powers far beyond the boundaries of a graphing calculator. Perhaps the biggest departure from math convention, however, is that there is no right

# Road Scholars 5k Race & 1 Mile Fun Run 2016

It's time to get off the couch and lace up your running shoes! The annual Road Scholars 5k and 1 Mile Fun Run will be held on Sunday, April 10th at Oak Middle School, 45 Oak Street. All ages and all levels of runners and walkers are welcome!

This is our 9th year hosting the Road Scholars race and we hope to make it even bigger and better than before! Last year we had over 450 runners, walkers and strollers join us on a beautiful sunny day. We were able to raise almost \$10,000 for the Colonial Fund, which supports innovation in our classrooms. This year we hope to encourage more kids, moms, dads, teachers, grandparents and even some serious runners to join our race.



In addition to an easy 5k course which meanders through local neighborhoods, there is a 1 mile Fun Run that any age can walk or run. Participation medals will be given to all children who complete the

CONTINUED on back page

# News from Finance & Operations

BY STEVE ROCCO  
TRANSPORTATION, SAFETY &  
SECURITY COORDINATOR

## Online Payment System -

In conjunction with the 2016-2017 bus registration process, the district will be offering an online payment option. This new system will streamline the payment system for parents and eliminate the need for mailing in a registration form and a check. More information will be sent via email to all parents when the system is activated.

## Emergency Radios

As of early February, emergency hand held radios and base stations with their own dedicated frequency have been installed at each school site location. These radios are monitored by a police dispatcher at all times.

This allows the schools direct contact with the Police Department in case of an emergency. It also allows for redundancy for emergency contact by schools in case the telephones were disabled. Training for utilization has been provided by the Police Department to staff.

## Emergency Critical Response Training

Training has been provided to all school site emergency critical response team members regarding the newly adapted emergency Standard

ANNOUNCING  
**ONLINE PAYMENT SYSTEM**  
FOR 2016-2017 BUSING

**2016-2017 Bus Registration News**

Parents should be attentive to their email in late March for bus registration and fee payment information.

The district will introduce a new registration process and online payment system.

Fee payers using the online system will automatically receive an emailed payment confirmation and receipt.

Parents may pay by credit card (Mastercard, Visa, Discover) or debit card with no additional processing fee.

Stay tuned for more information!

Response Protocols (SRP) for the Shrewsbury Public School System. The Standard Response Protocol (SRP) is based not on individual scenarios but on the response to any given situation. Like the Incident Command System (ICS), SRP demands a specific vocabulary but also allows for great flexibility. The premise is simple - there are four specific actions that can be performed during an incident. When communicating these, the action is labeled with a Action and is then followed by a "Directive." Execution of the action is performed by active participants, including students, staff, teachers and first

responders. The SRP was based on current Department of Homeland Security guidelines, implementation of best practices, as well as recommendations and input from the Shrewsbury Police Department. The SRP is designed to create a "time barrier" until first responders arrive at scene. Creating "time barriers", empowering staff in the decision making process of identifying and declaring an incident, and making informed and sound judgments based on situational awareness are all critical components of this program.

## STEM learning Continued from page 2

At Floral Street School, media aide Shelley Crowell led a popular MakerSpace Club. Each week students were presented



In the photo above are grade 1 Spring Street students Sam Par-seghian, left, and Liam Bratane, right. They are showing off their parachute prototypes made during the Engineering Club. The goal was to make design modifications so that the parachute could handle the weight of the object attached.

with commonly found materials and given a challenge to complete. One week the task was to create an airplane using paper, tape and a drinking straw. Students brainstormed, built, and tested their devices. They then evaluated their results, made improvements to their designs and tried again. The relaxed atmosphere encouraged students to try new things without fear of failure and students collaborated to find successful solutions.

Floral also offered a Cribbage Club, taught by 4th grade teacher Laura Spangenberg. "My goals with the club were to introduce kids to a game I loved to play, and to build their mental math skills in the process. One of the foundational skills of cribbage is getting points for combinations of cards that add up to 15. You can add up to 5 different cards together to get to 15." Ms. Spangenberg introduced the concepts of the

game slowly and building upon the skills learned in previous weeks. This scaffolding made a complicated game easy to learn and several parents report their children have begun playing at home and teaching friends and siblings.

Spring Street School offered an Engineering Club to 1st and 2nd graders. The class was co-taught by Irene Alvarez, a Spring Street parent and engineer with GE, and Emma Madsen, special education teacher at Spring. Ms. Alvarez reflects, "I think the power of knowledge was a key element for the children in the Engineering Club. The fact that they were given problems for which they had to design solutions, build prototypes and then test, was engineering at its best. It was great to see how they used their imagination and ingenuity to solve

CONTINUED at right

## Problem?

CONTINUED from far left bottom

The work students are doing as problem solvers helps develop and foster a positive attitude towards mathematics.

Across the district, teachers work together in grade level groups with instructional coaches, who provide ongoing consultation and training, to share and analyze student work, focusing on improving instruction in math problem solving.

According to third grade teacher, Joan Carlson, "Problem solving in grade three offers the students more opportunities to work with peers and encourages their risk taking as there is more student talk than teacher talk. Students are slowing down their thinking as they represent what they know from the problem before they solve. They enjoy working on problems and see it as a challenge."

With this continued practice, our teachers believe students will leave the elementary level as proficient problem solvers. This positive attitude towards math and the ability to solve problems will benefit all students as they take on the challenge of middle school and beyond.

## STEM learning

CONTINUED from lower left

problems. I must say I was surprised to see some of their designs and how they solved the problem. Even when their solutions didn't work, they learned that it was okay to try a different answer."

Technology classes were offered in several different schools in January and February. Tara Gauthier, Instructional Technology Specialist at Shrewsbury High, utilized the district's iPads to teach classes such as "Introduction to Broadcasting," "Comic Strips in the 21st century" and "Digital App-smashed News." So far, her classes have been offered at Paton and Spring, and she also ran a popular program for 3rd and 4th graders at Sherwood over February vacation. She will continue to offer technology classes throughout the district in the coming months, including an introduction to programming class for 1st and 2nd grades.

Parents of students in all the elementary schools can look for new sessions of elementary ASAP in March and May.



The photo above (left to right), shows Sreya Etherajan and Boyoung Paik playing a friendly game of cribbage. The Cribbage Club was developed and taught by Floral Street 4th grade teacher, Laura Spangenberg, with the goal of helping students improve their mental math skills.



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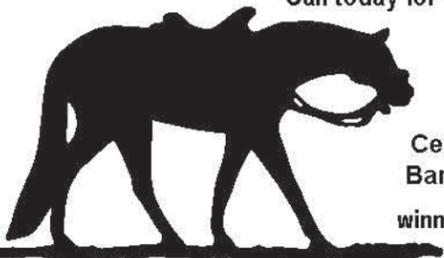
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## Road Scholars

CONTINUED from page 4

race. Strollers are welcome, but we ask that dogs be left at home for the safety of our participants.

### NEW THIS YEAR:

Synergy Health and Wellness of Shrewsbury is offering a complimentary training run program for all registrants! Classes will be held Mondays and Thursdays at 4:15. Classes started on March 3rd but you can join any time! See our facebook page, <https://www.facebook.com/ShrewsburyRoadScholars/>, or contact Synergy at 508-845-6152 for more information. Also, children will be able to complete the 1 mile Fun Run before the 5k is started so parents can cheer on their kids. In addition, they will be kept busy afterwards with a fun stretching and yoga class provided Synergy Health and Wellness.

We invite everyone to grab a drink and nutritious snack and stick around for the awards ceremony. While you are waiting, visit one of a variety of local Health and Wellness vendors who will offer stretching techniques, massages and other tips to get your running season off to a great start. Please help us to thank all the generous businesses who are sponsoring us so far this year: Representative Hannah Kane, National Facility Services, Inc., Avidia Bank, Synergy Health and Wellness, Crossfit 1727, MECTA (Massachusetts Emergency Care Training Academy), Polar Beverages, Raw Revolution bars and Wegman's.

To register for this fun family event, please visit our website <http://shrewsburyroadscholars.org> and "LIKE" our Facebook page <https://www.facebook.com/ShrewsburyRoadScholars/>.

## Global travel

CONTINUED from page 3

points to educate the students on what they are viewing at these locations.

These field trips are collections of virtual reality (VR) panoramas — 360° photo spheres, 3D images and video, ambient sounds — annotated with details, points of interest, and questions. While nothing replaces hopping on the bus for a field trip, Expeditions provide an engaging opportunity for supplemental learning. The Wildlife Conservation Society, PBS, the American Museum of Natural History, the Planetary Society, and the Palace of Versailles contributed to developing the curriculum for students.

Google supplies the tools to make this experience come to life for the students. A box arrives with everything students need to travel: a tablet for the teacher, and Cardboard viewers\* and phones for every student. Next, the teacher selects a destination, and the entire classroom jumps there automatically.

\*Google Cardboard is a virtual reality viewer made almost entirely of actual cardboard. Cardboard allows anyone with a modern smartphone to experience virtual reality. There have been more than 5 million Cardboard viewers shipped.



**SUPERINTENDENT'S PAGE:** <https://www.facebook.com/pages/Dr-Joseph-M-Sawyer/185507388294562>

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**DISTRICT ACCOUNT:** <https://twitter.com/ShrewsburyPS>



**SUPERINTENDENT'S BLOG:**  
<http://shrewsburysuperintendent.blogspot.com/>

### Statement of Non-discrimination

Shrewsbury Public Schools is required by the Massachusetts Department of Education to publish an annual statement of non-discrimination. This notice serves to meet that requirement. The Massachusetts Equal Educational Opportunity statute, General Laws Chapter 76, § 5, ensures that all students have the right to equal educational opportunities in the public schools. The Shrewsbury Public School District is committed to ensuring equal educational opportunities for all students, and does not discriminate on the basis of race, color, sex, religion, national origin, sexual orientation or disability. The Shrewsbury Public Schools are in compliance with state and federal laws prohibiting discrimination and harassment. The following laws apply: Massachusetts General Law Chapter 76, § 5, which states, "No person shall be excluded from or discriminated against in the admission to a public school or in obtaining the advantages, privileges, and course of study of such public school on account of race, color, sex, religion, national origin, gender identity or expression, or sexual orientation." Title IX of the Educational Amendments of 1972 is a Federal statute which states, in part, "No person in the United States shall on the basis of sex be excluded from participation in, be denied the benefits of, or be subject to discrimination under any educational program receiving federal assistance." This requirement not to discriminate in educational programs and activities also extends to employment. Ms. Barb Malone, is the Title IX Coordinator, Director of Human Resources at (508) 841-8400. Title VI of the Civil Rights Act of 1964, provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in be denied the benefits of or be otherwise subjected to discrimination under any program or activity receiving federal financial assistance. Title VI provided for equal access and prohibits discrimination in the assignment of students to classes. It also prohibits discrimination in ability grouping or tracking students. The Shrewsbury School Committee's Policies #316 and #645 deal directly with the issues of harassment. Copies of these policies are available in the Principal's Office at each school or through the Superintendent's Office, located at 100 Maple Avenue, Shrewsbury, MA 01545. Further information may be obtained by contacting Ms. Barb Malone, Director of Human Resources @ 508 841-8400. The following grievance procedure, which was approved by the Shrewsbury School Committee, is to be used for all issues relating to harassment or discrimination involving student and/or staff: 1. The Shrewsbury Public Schools does not and will not knowingly discriminate against any student or employee on the basis of race, color, sex, religion, national origin, sexual orientation or disability. All reports of harassment or discrimination will be taken seriously and investigated in a timely fashion. Reports will be held in the utmost confidence. Any individual who believes he/she has been the subject of harassment or discrimination should immediately report the incident, either verbally or in writing to an administrator, adjustment counselor, guidance counselor, or teacher. The principal must be notified in all cases of harassment or discrimination. All cases of harassment involving a staff member will be reported to the Director of Human Resources. An administrator will first meet with the parties involved in an attempt to resolve the issue informally. If the complainant is unable to meet with the alleged harasser, the administrator, teacher, or counselor may assist the complainant in drafting a letter clearly describing the incident (behavior, where and when it occurred), how the complainant felt, and a request that the behavior stop immediately. Any letter should be signed by the complainant, sent to the alleged harasser and is kept on file by the school administrator. The alleged harasser may be encouraged to apologize, personally or by letter or to write a letter refuting the allegations. In cases of alleged harassment requiring formal investigations, the following shall be implemented. The complainant shall have the support of a staff member of his/her choice

and the alleged harasser will also have the opportunity to select representation (union representative, attorney, teacher, etc.). An administrator from the appropriate level will complete an investigation promptly and make a decision regarding the allegations. In serious cases, where alleged harassment does not stop following a warning, appropriate disciplinary sanction may be imposed, up to and including suspension or dismissal. If the conduct violates the law, the incident will be reported to the appropriate authorities by the school administration. Retaliation or threats of retaliation are unlawful and will not be tolerated. In all cases of harassment or discrimination, the investigating administrator will make a final disposition and issue a written report, which will be maintained in the school files. If the complainant cannot utilize the procedure detailed above because the alleged harasser is involved in the procedure, the complainant should contact the Superintendent of Schools. Complaints about the Superintendent of Schools should be made to the Chairperson of the School Committee. Section 504 of the Rehabilitation Act of 1973 is a federal statute which states, in part, "No otherwise qualified individual, shall solely on the basis of handicap, be excluded from participation in, be denied benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance." This requirement not to discriminate in educational programs and activities also extends to employment. Each school has a designated Section 504 Coordinator. Initial inquiries relating to Section 504 should be directed to the building-based Section 504 Coordinator who can be contacted through the principal's office. Further information may be requested by contacting Ms. Melissa Maguire, Director of Special Education and Pupil Personnel, the district's Section 504 Coordinator at (508) 841-8400. The following grievance procedure should be used to report discrimination under Section 504 of the Rehabilitation Acts of 1973: To fulfill its obligation under Section 504, the Shrewsbury Public Schools recognizes a responsibility to avoid discrimination in policies and practices regarding personnel and students. No discrimination against a person with a disability will knowingly be permitted in any of the programs or activities of the Shrewsbury Public Schools. The school district has a specific requirement under the Rehabilitation Act of 1973, which includes the responsibility to identify, evaluate and if the child is determined to be eligible under Section 504, to afford access to free and appropriate educational services. Questions about eligibility or services should be first directed to the building-based coordinator. If a parent or guardian disagrees with the determination made by the professional staff of the school, he/she has a right to a hearing, first with the district's Section 504 Coordinator, and secondly with an impartial hearing officer. The district's Section 504 Coordinator can be reached at 100 Maple Avenue, Shrewsbury, MA 01545 or by phone at (508) 841-8400. The Director of Special Education and Pupil Personnel, the district's Section 504 Coordinator, who will provide a written report of the district's findings, will hear all grievances in a timely manner. If a parent or guardian is unsatisfied with the results of the review, they may contact one of the agencies listed below. For grievances not resolved at the Director of Special Education and Pupil Personnel level, a review by an impartial hearing officer may be scheduled. Individuals with grievances are not required to use the Shrewsbury Public School's grievance procedure. Written complaints may be filed with the following agencies: Massachusetts Department of Education, 75 Pleasant Street, Malden, MA 02148, (781) 338-3000; United States Department of Education Region 1 - Office of Civil Rights, 8th Floor, 5 Post Office Square, Boston, MA 02203 (800) 368-1019; Equal Employment Opportunity Commission, John F. Kennedy Federal Building, 475 Government Center, Boston, MA 02203 (800) 669-4000; Massachusetts Commission Against Discrimination, One Ashburton Place, Room 601, Boston, MA 02108 (617) 994-6000.