



Mathesis

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President's Message **Complex or Complicated?**

By Annie Wallace



This past fall I had the privilege of taking an online multi-week workshop on *An Introduction to Problem Based Lessons* with Robert Kaplinsky. One of the things that fascinated me in this course was on how we use words synonymously that really are not, and that in turn may play into how we look at problems and tasks as we plan for our students' learning and in our own conversations with each other. The Standard of Mathematical Practice 6 is to attend to precision, which includes our use of language and vocabulary. The terms complex and complicated stood out for me in our workshop lessons and discussions. I realized that I have interchanged them and used them both to indicate that something is not simple or straightforward. I had never really before stopped to consider how they differ, or if they are even really different at all.

In looking at complex and complicated with a little more precision, does this change how I look at and evaluate problems and tasks for students? Mr. Kaplinsky gave the following examples to help distinguish between the two and in how they apply to depth of knowledge and rigor as we look at problems and tasks. (And in looking further into the differences, I found two other sites that pull in similar examples and provide more detail beyond the classroom to think about. These are: [Value Creating Outcomes](#) and [Learning for Sustainability](#)). Mr. Kaplinsky states that while complex and complicated may both be difficult, they are difficult for different reasons. Complicated are situations that are well defined and have all situations accounted for. Programming a TV with a remote control may be complicated. Sending a rocket to the moon is complicated. Complicated situations can be completed, most likely getting the same result each time; if one follows the procedures exactly. Complex situations have so many changing variables that one can never account for. Driving a car or raising a child (or teaching) has too many variables to account for them all. What procedures or strategies work for one may not work for another. The complex situation may not be well defined.



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President's Message **Complex or Complicated?**

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Irene Ng in *Value Creating Systems* expands by saying that complicated situations have outcomes that can be determined with good algorithms, calculations and specifications. There is a control structure in place. Whereas complex situations have little teacher direction towards one solution; the solution(s) emerge through the problem solving itself. The parts are autonomous and require collaboration and cooperation with the outcomes emerging from the situation. Will Allen in *Learning for Sustainability* further builds upon this by stating that complex situations (systems) are adaptive and relationship building. That one acts, learns, and plans at the same time and the outcome(s) build upon what works.

So as I move forward in my looking at and evaluating problems for my students; as I consider the DOK level (students should be working within all levels), the SMPs, the conceptual understandings, the procedural skills, and the transference or application of the learnings (rigor) in problems; I am also considering complexity vs. complicated. I am asking myself if I am including in the building of my students' understandings problems that allow multiple entry points, allowing for students to explore different pathways and for discussions about strategies used and options considered, not just about what the answer is.

If considered with greater clarification or precision, applying SMP 6, how would this change our planning for our students, our colleagues, and our own learnings?

Please consider the following:

- NCTM scholarship applications. Encourage [high school seniors](#) and [college students](#) interested in teaching mathematics to apply for our two scholarships. Information is on our website.
- The [Student Recognition](#) in Mathematics program
- [25-Year NHTM Mathematics Educator](#) Recognition – Please notify NHTM's Membership Chair if you or a colleague is eligible, send your name, your e-mail address, school & district information by e-mail to: Bernadette Kuhn at membership@nhmathteachers.org
- The 46th NH HS Math Contest— The contest date is Tuesday, March 20th 2018 (and the make-up date is Friday, March 23rd) and will be held at Plymouth State University. For more information please contact Steve Latvis at slatvis@windhamsd.org

Elementary Representative **Formative Assessment**

By Amy Gregoire

The marking period just ended at my school so the topic of assessment has been at the forefront of most conversations lately. With the shift towards competency based grading, teachers are working to figure out how to break a summative assessment down by standards. The challenge teachers are now facing is how to report this information to parents when our reporting system is not yet set up by competencies.

As important as summative assessments are in determining if a student has met a given competency, as an educator, I find formative assessments to be at the heart of instruction. Since there are so many definitions of formative assessment out there I am going to define what I mean by formative assessment. Formative assessments are assessments given throughout your unit, which are not graded. These kinds of assessments inform your instruction, and provide students with feedback about their learning along the way as opposed to at the end of a unit. The kinds of formative assessments and techniques out there are endless. The beauty of a formative assessment is that it is a quick check in, gathers immediate feedback on whether students understand the material, and allows the teacher to change the instruction to meet the varied needs of the learners in the classroom.

One of my favorite tools is the individual white board. Using white boards gives all students a chance to answer a question and provides a quick and easy way to see if all students understand what has just been taught. When I first started teaching,

the school I was in did not have funds for whiteboards. If you don't have white boards, don't let this stop you. What I ended up doing was going to Home Depot and purchasing shower board. They cut it down for me in the store and I had an entire class set of white boards for under \$10.

Another one of my go to techniques is one I learned on the Teaching Channel called "My Favorite No." Have students solve one or two warm up problems at the start of class on index cards. Sort the cards into yes and no piles. Choose your favorite no, rewrite on a new index card and have the class analyze the work.

Exit tickets can also be used to gather information at the end of class. Sometimes I may ask a specific targeted question while other times the question/s may be more open ended such as,

- What are three things you learned today?
- What are two things you found interesting?
- What is one question you still have?

I also gather a ton of information about my students' understanding by simply circulating around the classroom and listening to the mathematical conversations happening. One tip I learned is to have a sheet of labels with me on a clipboard. This is used to jot down quick notes about a student. All I need to do is put down the initials of the student on the label and any information I want to take note of, whether that is a misconception or demonstration of learning. I have a binder with a tab for each student and a piece of paper for each student. All I have to do is peel off the label, put it on the paper, and put the date next to the label. This provides an easy

Elementary Representative **Formative Assessment**

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way to go back and see if there are any developing patterns noticed during observations.

Fist to five is another quick way to check in to see how comfortable students are feeling with the material. If I call, Fist to Five check, students put up the number of fingers to represent their level of comfort with the material. You can post a chart on the wall, which students can refer to. A fist represents I don't understand at all, one finger stands for I need help, a two means I need more practice, a three means I understand pretty well, four fingers means I mostly understand, and finally five fingers mean I completely understand.

Homework can also be used as a formative assessment. At the beginning of class I have students sit in their small groups and discuss their homework. This provides a way to get immediate feedback from their peers and gives the opportunity for someone who may have understood

the material to explain it to a student who was having difficulty. I can learn a lot by just walking around and listening. Since students know that homework is not graded, but is simply used as practice, there is much less worry about having every answer perfect when they walk in the door and the emphasis switches to learning. There may be times that I collect homework to provide written feedback, but it is never for a grade.

A traditional quiz can also be given as formative assessment, but again, I would not take this as a grade. A quiz would be used to provide feedback to students as well as to help inform my instruction. Having said that, if I was to give a "quiz" it would be very short, so I could give these back to my students the very next day to provide feedback which can help inform their learning.

The options for formative assessment are endless. The more varied the tools and techniques we use to formatively assess students, the better picture we will have of their understanding and how to guide our instruction to meet their needs.

Middle Level Representative **Grab a Shovel: The Importance of Surface Level Learning**

By Katrina Hall

Math teachers present mathematical concepts from different avenues to support the various learners in the classroom. It is not surprising to walk into a classroom and hear singing, see collaborative work or direct instruction, students using manipulatives or other tools to create models, or even the incorporation of dancing to include movement. Accessing the various modes to help students develop mathematics is a common practice.

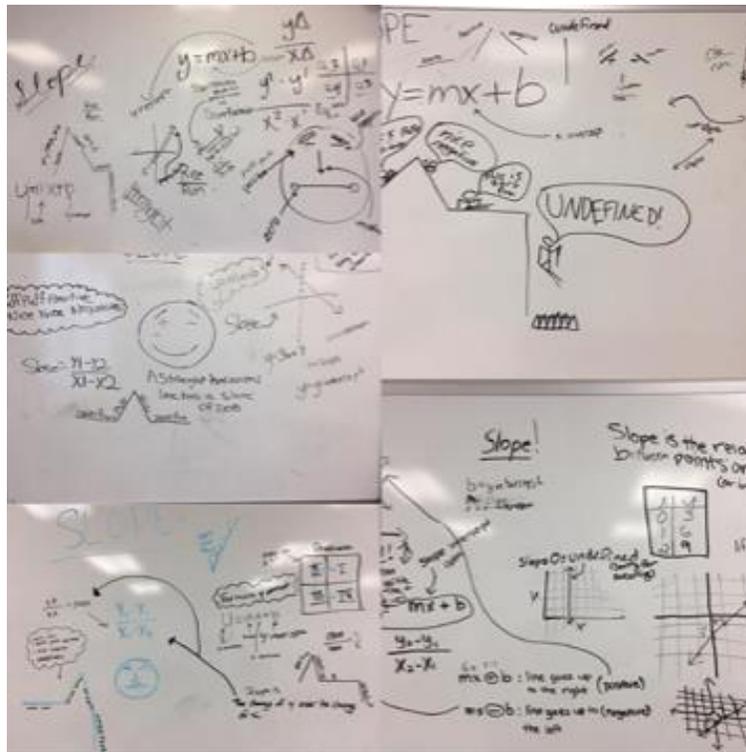
Recently, students were asked to do a brain dump in small groups. Groups were

Middle Level Representative

Grab a Shovel: The Importance of Surface Level Learning

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directed to whiteboards to discuss and record everything they could remember about linear equations. Students recorded the slope formula, slope-intercept form, the y-intercept, rise over run and several mnemonics such as Slope Guy and Puff-Puff Positive. Nothing was more exciting as a teacher to see boards full of knowledge.



The next class, the class was ready to jump right into our work, or so I thought. When it came time to discuss the meaning of slope and intercepts as they related to a real-world context, students were at a loss. When we examine graphs and tried to make connections to the real-world, students were quickly confused. They struggled to understand what a positive slope meant or how the negative sign in the equation related to the appearance on the graph. What happened?

The students had done an excellent job of memorizing all the mnemonics from previous years. The catchy songs and the visuals had been filed in their brains under Linear Equations but the connections were lost along the way.

This made me think of all the time and energy I spent in previous years creating lessons where I shared funny videos, did some line dancing, created funny visuals and practiced the songs like the Circle Song or the Slope Song. How much of an impact had I made on the learning of students? I wasn't really making connections but simply making a

Middle Level Representative

Grab a Shovel: The Importance of Surface Level Learning

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mental file for students that didn't necessarily have mathematical knowledge inside. I needed time to reflect to see what was really going on.

After some personal regrouping, I realized the day's activity was not a complete loss. I was quickly reminded of how valuable it is to take the time to determine what students already know. While some may qualify the use of manipulatives, the singing of songs and the use memorization as mnemonics as adhering to superficial learning, Fisher and Frey (2016) would qualify such work as a surface level and "over time they use those concepts and apply what they have learned." What initially appeared as a waste of class time, helped me to identify what students needed to deepen their learning. They had the initial concepts but needed further help in making connections and forming generalizations. They were ready to participating in higher-level cognitive tasks.

Students can rattle off important mathematical language and not have any understanding of what they are talking about or may indeed have more hidden beneath. My role as the teacher is to ask probing questions requiring students to explain and elaborate on their thinking. Taking the time to ask higher-order questions allows a teacher to delve deeper in student understanding and develop lessons for the next phase of student learning.

As you begin your next phase of planning, consider how you are going to determine where your students are, where they need to go and what it will look like when they get there. Don't be deterred by the surface level of understanding they may show. This is your guide to their learning needs. Give them a shovel and show them how to dig deeper.

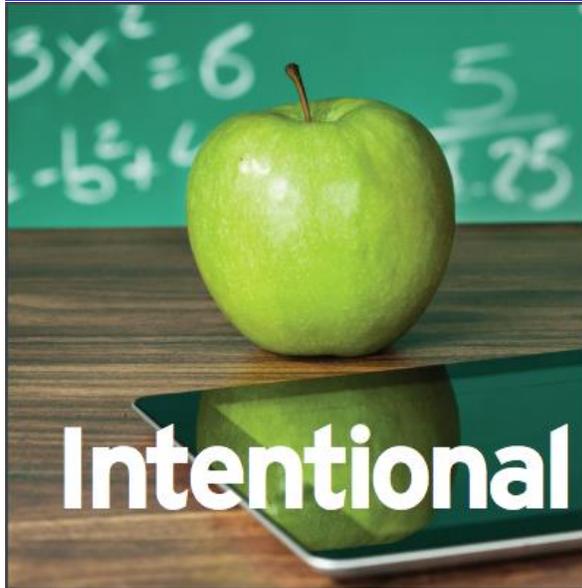
Fisher, D.B. & Frey, N. (September 30, 2016). "How Can Teachers Make Mathematics Learning Visible?" Obtained from: <http://corwin-connect.com/2016/09/can-teachers-make-mathematics-learning-visible/>



Reprinted from NCTM's journal *Mathematics Teacher*.

To see full article--

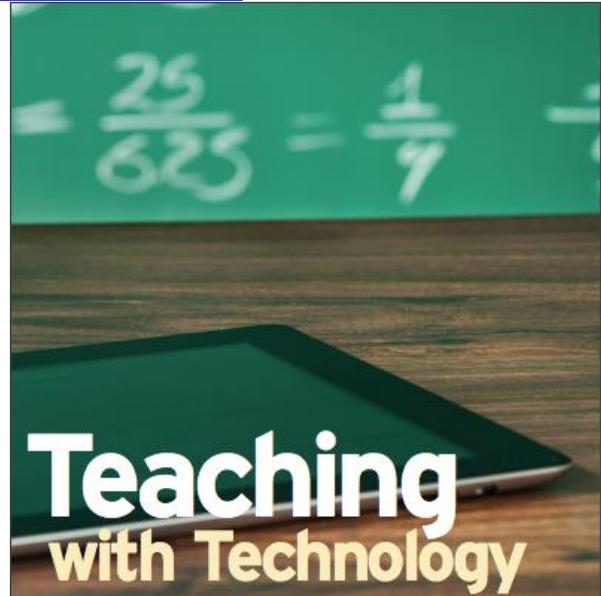
<http://www.nctm.org/Publications/Mathematics-Teacher/2018/Vol111/Issue4/mt2018-01-264a/>



For effective implementation in the classroom, this author uses technological, pedagogical, and content knowledge along with Pólya's four-step problem-solving approach.

Eileen B. Mooney

In my fourteen years of teaching, I have often been given fancy technology to use in my classroom, and the hardware did nothing but sit around and collect dust. I feel guilty just thinking about it, but I know I am not the only teacher who has had this experience. Top-down implementation of technology is one of the most pervasive phenomena of the last couple of decades in educational history (Cuban 2001; Mishra and Koehler 2006). It is the subject of many books, articles, and blog posts on how to fix our



schools or why educational technology is not working in the classroom (Cuban 2001; Mishra and Koehler 2006). The idea of providing teachers with technology so they can make our students ready for the real world or make learning an easier task is well intentioned, although, unfortunately, the time and money invested is often unproductive.

But poor implementation does not necessarily imply expensive mistakes. Well-intentioned lessons have led to extraneous uses of social media in the classroom. For

SAVE THE DATE:

When: April 7, 2018 - Math and Science Joint Annual Conference.

Who: NHTM and NHSTA (NH math and science professional organizations)

Where: Pinkerton Academy

Theme: Modeling

Key Note: Diana M. Fisher (STELLA & Systems Dynamic)

<https://ccmodelingsystems.com/>



Post-Secondary Representative **NHTM Mathematics Major and Mathematics Education Scholarships: High School and College Students**

By Sharon McCrone

It's scholarship season! And we need your help to get the word out about **The New Hampshire Teachers of Mathematics Scholarships**.

NHTM provides **two** \$1000 scholarships each year, (1) a \$1000 scholarship for a graduating high school senior who is interested in pursuing a major in mathematics or education, and (2) a \$1000 scholarship for a college student currently majoring in mathematics or education who will obtain junior or senior status in the 2018-2019 academic year. More specific scholarship criteria are provided below.

The **high school scholarship** will be awarded to a graduating senior who will be attending an accredited college or university in the fall and plans to major in mathematics, mathematics education, or education with the intent of becoming a mathematics educator. The selection team will consider academic achievement, financial need, extra-curricular activities, and community and school service.

The **college scholarship** will be awarded to a student preparing for certification to teach middle school or secondary mathematics, or elementary education. Eligible candidates will be enrolled in a middle or secondary mathematics education certification program, elementary education certification program, or mathematics majors with the intent of becoming teachers. Applicants must be New Hampshire residents, or attending a New Hampshire institution of higher education. Preference will be given to students who are NH residents and who are attending a NH institution of higher education. The selection team will consider academic achievement, financial need, and will look for evidence of promise as a teacher of mathematics.

Information about these scholarships will be e-mailed to high schools and institutes of higher education across NH in the next few weeks. Additional information, along with the on-line application, can be found at <http://www.nhmathteachers.org/> by following the Awards and Scholarships drop-down menu. **The application deadline is May 1, 2018.**

If you have any questions, please contact me at Sharon.mccrone@unh.edu

Art's Attic **GIMPS**

By Art Johnson

Math is in the news again. It is the consortium at GIMPS that hit the headlines this time. GIMPS is the acronym for Great Internet Mersenne Prime Search. As the name implies, it is a group that searches for prime numbers. GIMPS will install software onto your

Art's Attic

GIMPS

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computer and it will search for Mersenne primes during computer downtime.

Finding prime numbers is not as easy as it sounds. Marin Mersenne (1588-1648) was a French cleric who dabbled in various academic pursuits, including mathematics. In 1639 Mersenne began to host Thursday meetings attended by Pascal, Descartes, Desargues, Roberval, and others. Any topic was up for discussion, including mathematics. One mathematics discussion dealt with prime numbers, and Mersenne proposed a formula for finding primes: $2^n - 1$, where n is prime. But the formula doesn't work all the time. As it turns out, there is no known formula that will generate prime numbers, and Mersenne's flawed formula is as good as any other method.



Marin Mersenne

On December 26, 2017 a computer volunteered to GIMPS by Jon Pace found only the 50th Mersenne prime. Pace is a 51-year old electrical engineer from Tennessee. His prime is a monster, with 23,249,425 digits. It is $2^{77232917} - 1$, or M50 for short. He needed 69½ pages of 11 x 17 paper to print out his prime. Price has been looking for a Mersenne prime for nearly 15 years. He began his search hoping to win a cash award, but now he is driven by the desire to discover something no one else knew existed, sort of like being the first to climb a mountain. For his efforts Pace was awarded \$ 3000 by the GIMPS Society. Other cash awards have reached as high as \$50,000. The first mathematician to find a Mersenne prime with 100 million digits will collect \$150,000. For a billion digits the prize is \$250,000. Why not give it a try?



Jon Pace

NCTM Representative News from NCTM

By Terri Magnus

Upcoming Events and Deadlines:

- The Hartford CT Regional meeting is scheduled for October 4-6, 2018. If you would like to submit a proposal to present a talk or workshop, the deadline is March 1, 2018. To see the conference strands and submit your proposal, go to www.nctm.org/speak. There are also regional conferences in Kansas City and Seattle in November if you're willing to travel a bit further.
- The 2018 Annual Meeting/Exposition is being held April 25-28, 2018 in Washington, D.C. Register by March 23 to get the early bird discount. Some hotels have already sold out. For more information or to register, go to <http://www.nctm.org/Conferences-and-Professional-Development/Annual-Meeting-and-Exposition/>.
- MET grant applications due May 4 in the following categories: pre-service coursework, current teacher coursework, school in-service training grants, enhancing teaching through technology. More information at <http://www.nctm.org/Grants/>.

Recent NCTM blogs at

<https://www.nctm.org/News-and-Calendar/NCTM-Blog/> :

- “Are we breaking down barriers to student learning?” by Matthew Larson
- “An Endless Journey in Learning,” by Aristotle Ou
- “Reflect and Discuss: NCTM Supports Research and Researchers” by Robert Berry

Have you checked out MyNCTM yet? It's a social network for mathematics teachers. Get advice, lesson plans, ask questions, share your experience, hear from NCTM leaders, and more!

Also peruse the NCTM catalogue before our joint NHTM-NHSTA Spring Conference. You'll have the opportunity to order most NCTM publications at a 25% discount (off their regular price).



Biographical Information about the Candidates: 2018 NHTM Election Approaching!

Biographical information on the candidates running for positions of **Secretary, Elementary Representative, and NCTM Representative** positions are given below. Keep in mind that you will be able to 'write-in' names for candidates.

Voting ballots will again be cast online via the Internet. NHTM Ballot and Election information will be emailed to current NHTM members during the end of February or early March. Voting will close at **on Friday, April 6, 2018** the day before the NHTM-NHSTA joint conference. Results will be announced at the business meeting at the end of this event.

Remember you can now log into your NHTM account to check that NHTM has your preferred email address and check on your membership status. **Your vote is important!** If for some reason you do not receive an email with a link to the online voting ballot and know that your membership is current, please contact Allison Friend-Gray at webmaster@nhmathteachers.org directly after the first week in March 2018. We wish to give a huge thank you to the following candidates for their willingness to serve you by running in this year's election.

Candidates for Secretary:

Natalie LaFlamme currently teaches Mathematics at Fairgrounds Middle School in Nashua, NH. Previously, she taught at Mountain View Middle School in Goffstown, NH for 20 years. Over the years, she has served on the NHTM board as the Middle Level Representative and as the NCTM Representative. She has also been on the Board of Directors for the New Hampshire Association of Middle Level Educators. Natalie has presented at numerous NHTM and NELMS (New England League of Middle Schools) conferences. She is consistently involved in curriculum development and promoting the implementation of best practices. Natalie received her Bachelors of Arts in Mathematics from Smith College and her Masters of Education in Curriculum and Instruction from Plymouth State College. Recently, she received an additional NH certification in ELL. Natalie loves teaching math at the middle level where the students make her laugh every day! She also loves being involved in making mathematics education at the middle level relevant and exciting for students.



Jessica Jaques is the Mathematics Specialist for the Merrimack Valley School District, which serves the communities of Boscawen, Loudon, Penacook, Salisbury, and Webster, NH. She primarily works with the five elementary schools and middle school supporting teachers with the implementation of a more inquiry based approach by providing resources to support grade specific math curriculum, modeling lessons,

and providing professional development opportunities for staff so that they can develop a deeper understanding of mathematical concepts.

Prior to acquiring this position, Jessica graduated from Keene State College with a Bachelor of Science in Elementary Education and Middle School Math Education with a minor in Mathematics; she accepted a middle school position with Merrimack Valley Middle School in 1997. Jessica has taught grades 6, 7, and 8 at the middle school for seventeen years, coached the math team for ten years, and assumed a leadership role within the math department. During her time at Merrimack Valley Middle School, she earned her Masters of Education in Mathematics K-8 at Plymouth State University in 2004 as well as her certification as a math specialist in 2014.

Jessica continually seeks out and participates in opportunities to continue to grow as a professional. Besides attending many local math conferences, she has co-presented twice at the NHTM dine and discuss events and presented at the NHTM spring conference in 2016. Additionally, she was the signs and printing chair for the fall ATMNE conference in 2016. Lastly, she was the recipient of the Richard C. Evans Distinguished Mathematics Educator Award in 2016. Her current professional memberships include NHTM and NCTM.

Candidates for Elementary Representative:



Ann Elise Record is an Elementary Math Specialist at Hillside Elementary School in Berlin, NH working with teachers, students, educational assistants, and parents. She is also an adjunct faculty member of White Mountain Community College and Plymouth State University teaching math methods classes for pre-service teachers in the North Country Teaching Program. Ann Elise earned her BA from Bates College in 1990, her M.Ed from Plymouth State University in 2001, and her NH Elementary Math Specialist Certification in 2015.

She taught in a self-contained 5th grade classroom for 13 years and for the last four years has been a Math Coach K-5 first splitting her time between the K-2 and 3-5 buildings in Berlin but is now able to be full-time at her 3-5 school. Ann Elise is passionate about sharing growth mindset messages with anyone she meets (yes, even grocery store cashiers who tell her that they were never good at math) that everyone can learn math, making mistakes is part of the learning process, and you don't need to be fast to be good at math.

She wholeheartedly believes that there is nothing elementary about teaching elementary math! The early numeracy concepts of K-2 set the foundation for all future math learning and require special expertise to help students acquire number sense through a variety of learning experiences. She is a strong believer in the power of the concrete-pictorial-abstract progression of teaching math concepts to make all topics

accessible to students. When teachers deepen their own understandings of the entire progression of concepts throughout many grade levels, they are better able to meet the various individual needs of the entire spectrum of student abilities especially if they include small group lessons within a Guided Math structure in their classrooms. She has spearheaded work within the math intervention times at Hillside to include math fact fluency work based on data gleaned from administering Dr. Nicki Newton's Math Running Records, CGI word problem structure work based on data gleaned from assessments she created, as well as the instructional methods needed to build conceptual understanding and progress students on their math journeys. She would love the opportunity to serve as the elementary representative for NHTM and continue sharing her ideas of teaching math and creating classroom climates that promote positive attitudes towards math and the development of lifelong mathematicians.

Mollie Wolff has been an educator in the Monadnock Region for over 15 years. After earning her Masters in Curriculum and Instruction from Keene State College, she began her career teaching third and fourth grade. She continued working as a classroom teacher, instructing grades three through six for eleven years. When she was provided the opportunity to serve her K-6 school as the math interventionist and lead teacher, she eagerly accepted the opportunity. Molly's passion for math was able to come full circle as she embraced teaching mathematics kindergarten through sixth in collaborative settings. In 2013, Molly obtained her Elementary Math Specialist certification through the state of New Hampshire and has continued with her love for teaching and learning mathematics in varying capacities. She can be found co-teaching, modeling, providing intervention and enrichment, leading book studies, and providing professional development to teachers. She regularly takes advantage of continuing education learning opportunities (INTEL Math Course, 2 Week Intensive with Mahesh Sharma, courses offered through KSC and UNH and many local math conferences). Molly is also an active participant on her District's Math Curriculum Committee. Molly would be honored to have the opportunity to collaborate with others who are also dedicated to the work of instilling a love for mathematics to all.

Candidate for NCTM Representative:

Teresa "Terri" Magnus has enjoyed serving the NHTM Board as Post-Secondary Representative (2007-2010), Mathesis Editor (2010-2015), and NCTM Representative (2015-present). She appreciates how her participation on the board has allowed her to meet and work with mathematics educators and researchers across the state and the country. She would love to continue for a second term in her role as NCTM Representative. She has learned a lot about how the national organization has identified connections between promoting access and equity for all students and mathematical teaching practices and she hopes to help NHTM share both the philosophical and practical implications of this message with state teachers and policy makers. She also works with the NCTM Affiliates office to make sure NHTM's needs are being met.

For the last twenty years, Terri has taught mathematics at Rivier University in Nashua where she continues to lead the mathematics programs. She has also directed the Rivier University M.A.T and B.A. Mathematics Education Programs, advised and supervised prospective secondary mathematics teachers, taught elementary teachers in the Intel Mathematics program, presented at NHTM, ATMNE, NCTM, and MAA conferences, and participated in NHDOE standards revision committees. Terri has always believed in the importance of student participation in their learning, encouraging her students to discover mathematical concepts via exploration and to apply mathematical principles through rich problem solving. In her presentation, "Teaching Preservice K-8 Teachers Geometry and Reasoning Through Purposeful Play," accepted for this year's NCTM Annual Conference, she looks forward to sharing how she models these practices and helps future teachers build a growth mindset.

In her free time, Terri loves to hike, travel, play card and board games, and try new recipes. She has climbed 33 of New Hampshire's 48 4K-footers and hopes to reach the remaining summits in the near future. She and her husband live in Milford with their "American Shelter Mix". They have one son who will be completing his undergraduate studies in math and computer science this spring.

NHTM Historian Needed

Interested in being the Historian for NHTM? Please contact NHTM President Annie Wallace (nhtmpresident@nhmathteachers.org) or President-Elect Rob Lukasiak (nhtmpresidentelect@nhmathteachers.org).

46th Annual NH State High School Mathematics Contest

NHTM (New Hampshire Teachers of Mathematics), and the Plymouth State University Mathematics Department invite you to form one 10-member mathematics team (with no more than four seniors and a maximum of eight juniors and seniors combined) and to join us for our 45th annual competition this year on **Tuesday, March 20, 2018 at Plymouth State University** (with a snow date of Friday, March 23 - still at Plymouth State University). Your team will have the opportunity to meet with other students from throughout the state in a day of exciting, challenging, competitive mathematics exercises in six different categories.

The **Team category** involves all 10 members of the team separated into two groups of five. One of the four team category questions will require each group of five students working together to submit an expanded, detailed written response. That particular response will be judged on the style of solution, the coherence of the explanation and the organization of the correct solution. In other words, teams will need to present more than the correct answer to receive maximum credit for this question! A special group of judges will be responsible for scoring these papers. Each registered school will be assigned a code to be used for this category.

The remaining categories in the contest are **Recreational Mathematics, Algebra 1, Geometry, Algebra 2, and Advanced Mathematics**. Each of these 12-minute categories will consist of three questions of equal value taken by six members from each team. In these categories students work independently.

Any non-laptop type calculator allowed in the mathematics sections of the SATs and the College Board AP exams may be used in the contest. It is assumed that every participant will have a graphing calculator available to use in the contest. Please use the following link for reference:

<http://sat.collegeboard.org/register/calculator-policy>

There will be four divisions of competition. Use **October 2nd, 2017** as the official date for school enrollment figures. Please check this figure with school officials to avoid problems of being registered in an incorrect division. **As was done last year – divisions will be as evenly balanced number-wise as possible based on registrations received.** Division information will be sent out to registered teams at least a week in advance of the contest.

The contest is scheduled to begin at 9:40 am and the awards ceremony at 1:00 pm.

Awards: Certificates of participation will be awarded to all schools.¹⁵ In each division there will be team awards, individual prizes to the highest scorers, and members of the first-place team in each division will receive medallions. Certificates of achievement will be awarded to all those obtaining a perfect score in a category.¹⁵

Registration deadline: Friday, February 23, 2018

ONCE AGAIN FOR 2018 – You may also fill out this registration form, scan it, and e-mail your registration! E-mail your registration as an attachment to:

slatvis@windhamsd.org

Fees will be accepted after February 23rd if it is not possible for a school to make the payment in time. However, the **registration form** must be postmarked or e-mailed as an attachment by February 23, 2018. Any registration forms received after that date will be assessed an extra \$10.00 fee.

If you have any questions about the contest, please feel free to e-mail the NHTM State Mathematics Coordinator, **Stephen Latvis**, at the following e-mail address:

slatvis@windhamsd.org

From the Archives--

February, 1992

MATHESIS

NEW HAMPSHIRE - ASSOCIATION of TEACHERS of MATHEMATICS in NEW ENGLAND

President's Column

Joan Ferrini-Mundy

I am fortunate to be involved in a number of professional activities that bring me into contact with people interested in mathematics education throughout the country. At a recent conference I was talking with a teacher from another state who said "New Hampshire really has a lot of very active teachers of mathematics", meaning that he is very aware of the names of some of you. It actually is quite remarkable that such a small state can boast the president of the Council of Presidential Awardees in Mathematics (Laurie Brownell of Bethlehem), a member of the Woodrow Wilson Summer Program Visiting Team (Darwin Laufen of Oyster River High School), and a national winner of the State Farm Good Neighbor Award (Nancy Belsky). I know by beginning to list names I run the risk of omitting many, so my apologies. We have people in the state serving as authors on national textbook series, writing software that is distributed nationally, working on doctoral degrees in a variety of institutions, participating in leadership institutes both inside the state and elsewhere, writing grant proposals to state and federal agencies.

When we also begin to think of the tremendous expertise and professional commitment residing here, measured by the willingness of teachers to devote their time, creativity, and energy to helping their peers in countless inservice activities, I am all the more grateful for the expertise we have here. We have a fine model that seems to have permeated the state based on teachers teaching teachers, and from all observations this is effective.

This fall's leadership conference is a good example; the Eisenhower Institute on Functions last summer is another; and if anyone needs more evidence, a glance at the NCTM Nashua Conference Program should suffice. We have teachers in kindergartens through grade twelve who are introducing significant change in their own classrooms and schools, who have the special talent of helping others to do the same, and who are willing to take on this professional commitment above and beyond the more than demanding schedule of being a full time classroom teacher. While I am delighted to see this brand of professional contributing in so many ways in our state, I'm also very nervous for them.

Too many of these same individuals have told me that struggling to balance their classroom and school commitments with their emerging commitments in the larger professional community takes a heavy toll, and in some cases is causing serious reconsideration of priorities and career goals. Their strong feeling of responsibility to their own students come into direct conflict with the realization that they can do perhaps equal (or greater?) good by working with groups of teachers to help make change for many students, in many classrooms. The dilemma no doubt is troublesome; on a more practical level, I'm sure, so is the challenge of asking for professional days and finding ways to stretch personal budgets enough to allow for the travel expenses that arise.

I only hope that the schools and communities where these teachers work recognize not only the tremendous benefits they stand to experience by supporting and encouraging these teachers who are becoming professional leaders, but are willing to buttress that recognition with actual innovation. We need more examples of re-organizations that reward and encourage this sort of professional development; in other parts of the country, differentiated responsibilities and staffing patterns are an example of one type of response. Released time, travel support, and summer stipends for professional activity, all should be explored within our schools and communities. Without such support, I fear greatly that this exciting and emerging group of New Hampshire teachers may truly "burn out" as the logo goes. We can't afford for this to happen.

NH-ATMNE
Spring Conference
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 St. Paul's School, Concord, NH

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Upcoming Deadline

- Information for May Mathesis- May 1st

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