

Mathesis

NHTM and ATMNE Announce Fall Conferences

Upcoming Deadlines:

- September 13: Early Bird registration for Baltimore NCTM Regional.
- September 17: MAA Contributed Paper Abstracts for 2014 Joint Mathematics Meetings
- November 1: Registration deadline for Dine and Discuss
- December 15: Prevost and Evans nominations due
- January 1: Nominations for Balomenos award due

Formative Assessment Focus of NHTM's Dine & Discuss in November

New Hampshire Teachers of Mathematics is continuing its tradition of offering mathematics teachers the opportunity to gather one evening in the fall to discuss a current topic of mathematics education. In addition to a dinner, the evening's program includes a keynote speaker and grade-level breakout sessions.

This year's mini-conference features keynote speaker Judi Keeley, former state supervisor of mathematics for the Rhode Island Department of Education. Keeley is currently a consultant working on the Mathematics Assessment Project through the Shell Centre. The theme will be Formative Assessment: What it is & What it is Not.

The event will take place at the Holiday Inn in Concord on Tuesday, November 12, from 4:30-7:45 pm. Registration is due November 1. More information and a sharable flyer is available inside this [issue](#) and at nhmathteachers.org.

ATMNE Conference Gets to the Core

Inside this issue:

Art's Attic	2
President's Message	3
Post-Secondary Rep	4
Middle Level Rep	5
High School Contest	7
Elementary Rep	8
Affiliate Workshop	10
Secondary Rep	12
Honorary Doctorate	16
Membership	17
NHTM Awards	18
Professional Development	20

The Association of Teachers of Mathematics in New England will hold its Fall 2013 conference at Killington Grand Hotel and Resort in Vermont on October 24-25.

With a theme of "Getting to the Core," sessions are focused on ways in which mathematics educators can implement and assess the Common Core State Standards in Mathematics. Keynote speakers include Jason Zimba, Lead CCSSM Writer and Founding Principal of the Student Achievement Partners, Shelbi Cole, Director of Mathematics at Smarter Balanced Assessment Consortium, and Hayley Freeman of the Partnership for Assessment of Readiness for College and Careers—

Core Leadership Group and the Massachusetts Department of Elementary and Secondary Education. The program is designed to provide professional development for all levels of education from Pre-K through 12 and beyond.

To register, visit the conference website www.atmne2013.com.

Volunteers are needed. If you can offer two hours of time to assist at the conference, contact Jackie Mitchell at jadamitchell@aol.com. Indicate whether there is a particular committee (Equipment & Technology, Exhibitors, Hospitality, Registration & Membership, Session & Workshop Support, Signs & Pricing, or Student Hosts) that you would like to serve.

Art's Attic: Who Invented Coordinates?

By Art Johnson

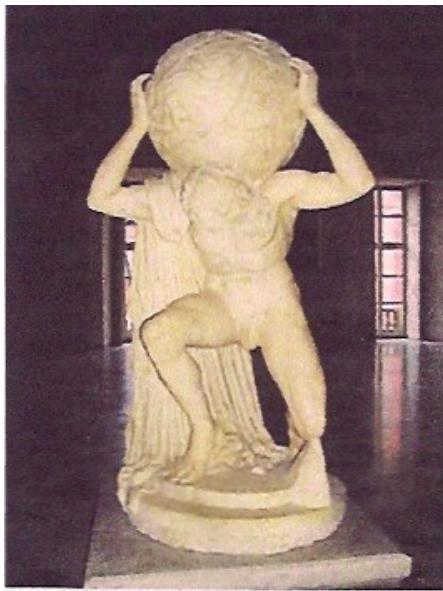
If you teach algebra or geometry you have probably told your students that it was Rene Descartes who invented coordinate geometry. This is technically true. It was "Descartes who invented coordinate geometry and so merged algebra and geometry. However, the idea of coordinates was used by mathematicians in earlier times. Al-Biruni (973–1048) and Ptolemy (90–168) are both credited with employing some sort of coordinate system in their cartography explorations. A recent discovery now suggests that it was Greek mathematician Hipparchus who first conceived of a coordinate system. Who was Hipparchus?

Hipparchus (190 BCE - 120 BCE) was born in what is now northwestern Turkey, in a classical Greek/Roman society. Little else is known about his life except that he spent some time in Alexandria and the island of Rhodes. Nor do we know much writings. Many contemporary mathematicians refer to Hipparchus, but no one quotes him directly. Only one work by him has survived, and that is a three-part commentary on other mathematicians' work.

According to his contemporaries, Hipparchus was an accomplished mathematician. He invented trigonometry by developing a table of chord lengths based on angle measure that is essentially a table of tangent values. Many high school geometry books replicate his method for determining the distance between the earth and the moon. His calculations determined the moon was 59-67 earth radii away from Earth. The actual figure is about 60 earth radii, a remarkable finding for so long ago. Hipparchus also developed astronomical tables of various planet and star movements, essentially transforming Greek astronomy from a purely theoretical science to a practical predictive one. In addition he calculated the length of a year to within just 6 minutes and is credited with establishing that a circle is composed of 360 degrees (probably importing this from the Babylonians). Finally, Hip-

parchus developed the star brightness magnitudes that are still used by astronomers today.

What is the new evidence that Hipparchus invented coordinates? In this case the evidence has been in plain sight for over 700 years, on a Titan's shoulder. A Roman statue, known as the *Farnese Atlas* depicts the mythical Atlas carrying the earth on his shoulder. The statue is a 2nd Century CE copy of an older Greek original. It was unearthed about 1400 and is now housed in the National Archeological Museum in Naples. What Atlas holds on his shoulder is a globe, two feet in diameter. If you look closely, you can see the globe. It is covered with 41 star constellations against a grid of circles, including the equator, the tropics, and the Arctic and Antarctic circles. The locations of these constellations match up with the star catalogue of Hipparchus that was lost when the Library at Alexandria burned.



For years historians had speculated about the globe on Atlas's shoulder. In 2005 astrophysicist Bradley Schaefer from Louisiana State University toured the Museum while on vacation. He too, was captivated by the markings on Atlas' globe. He ran an analysis to determine just when the star map was created. He dated it to 125 BCE, well within Hipparchus's lifetime. His dating also ruled out other astronomers, including Ptolemy himself, leaving Hipparchus as the creator of coordinates, with the marble statue of Atlas as rock solid evidence (I couldn't resist).

And so a new historical find confirms ancient writings. And the find was there for centuries for all to see. Might there be more discoveries in ancient statues, manuscripts that are hidden in the recesses of a library, so some other evidence that is simply waiting to be found? The next Art's Attic will describe such a find.

President's Message

By Greg Superchi

Welcome back for the 2013-14 school year! I consider each year a brand new start for all: students, parents, teachers, support staff, and administrators alike. Speaking of new starts, I would like to welcome the newest members of the NHTM Board including Kellie Gabriel (Treasurer), Gretchen Scruton (Membership Chair), Michelle Fox (Secondary Representative), and Cecile Carlton as President-Elect (moving over from her long standing role as Membership Chair)! Additionally, we had two positions open that were filled by Andrea Drake (Secretary) and Amanda Benware (Media & Public Relations Representative). Unfortunately, that means we've had some folks move on. As excited as I am to gain the new Board members, I will greatly miss those folks who are leaving which include Greta Mills (Secondary Rep.), Judy Curran Buck (Past-President), and Connie Upshulte (moving on after her long standing role as Treasurer). I am so lucky to have worked with each of these folks and know that they will continue to serve the mathematics education community of New Hampshire in any way that they can.

This also marks the second and final year in my role as President. Wow! We have accomplished so much in the past year. These accomplishments include the following...

- ◆ Planned and held NHTM's 50th Conference & Celebration
- ◆ Planned and held our 2nd Annual Fall Dine & Discuss
- ◆ Continued to provide professional development through our Regional Structure
- ◆ Launched the new website
- ◆ Went "green" with this newsletter, *Mathesis*, via pdf/email
- ◆ Worked with the NH Dept. of Education to recommend improving/raising the high school mathematics standards
- ◆ Worked with the NH Dept. of Education to draft a new set of School Approval Standards in Mathematics
- ◆ Selected and presented three awards to NH mathematics educators including both beginning teachers and veterans
- ◆ Supported the annual NH State Mathematics

Contest

- ◆ Amended the NHTM Constitution by updating the Government Relations/Publicity Chair to Media & Public Relations Representative
- ◆ Joined social networking by having a presence on both Facebook & Twitter
- ◆ Began NHTM's Summer Institute Program which selects and sends two current NHTM members to go to NCTM national summer institutes who will bring back and share with us what they learned via workshops
- ◆ Offered NH schools NHTM student certificates for *Outstanding Achievement in Mathematics*

As I have stated before, NHTM is that place NH mathematics teachers can go to for help, guidance, and to improve themselves. As a *pre-service* mathematics teacher, I went to my first NHTM Spring Conference and fell in love right away! Thank you Dr. Evans for *persuading* me to go! I could not believe the selection of workshops, quality of presentations, and the passion I saw from people just like all of you. As you can see from the list above, NHTM continued its long-standing focus on providing professional development to NH teachers to help ensure quality mathematics instruction for all NH students. Although we focus on NH mathematics teachers, we know that our true passion and targets are the mathematics students of NH. We want to see that they have the highest possible quality mathematics education opportunity of any state in this country or region of the world.

Finally, thank you to all the NHTM Board members and volunteers who give up a great deal of their personal time and resources. And, thank you to the membership for giving us this wonderful opportunity to serve you; it truly is an honor and pleasure. When this reaches you, the Board will have recently held our annual Summer Retreat where we spend an entire day together planning and discussing the next year (thank you to Betty Erickson for your hospitality by hosting the event!). I look forward to meeting many of you at NHTM events and working with the new Board over the coming year. Please, feel free to contact me at gsuperchi@yahoo.com with any comments, questions, or concerns that you have. Have a great new (school) year!

Post-Secondary Representative: School Approval Standards for K-12 Mathematics Update

By Rich Andrusiak

My last few columns have focused on the fact that the School Approval Standards (ED 306) were set to expire July 1, 2013 and that the revision process of the new set of standards is underway.

Since my last column, Greg Superchi was asked by the Department of Education to form a committee to review the standards for mathematics and appointed me as chair of that committee. The committee was comprised of mathematics education leaders that represented elementary, middle, secondary, and post-secondary levels. We were charged with creating new standards for mathematics (Ed.306.43) within an existing approved template. While our draft has not yet been posted for public comment on the Department of Education website, below are a few highlights (not necessarily how they appear in the document).

Pursuant to Ed.306.26 and Ed. 306.27, the local school board shall require that a Mathematics Program be provided for each K-12 student, and that each school provides planned learning strategies and opportunities to:

- Solve problems by using multiple strategies, communicating mathematical ideas through speaking and writing, reading and interpreting mathematics, and making logical connections between different mathematical concepts and representations;
- Build and construct knowledge and understanding of mathematical concepts through sustained projects and labs incorporating multiple mathematical ideas, research, technology, mathematical communication, and interdisciplinary interactions which encourage students to solve problems that are meaningful and unique to their lives (Middle & High School Levels);
- Use authentic tasks that encourage students to develop and defend unique problem-solving strategies and conjectures made and analyzed from patterns and data collected;
- Develop positive attitudes and habits of the mind such as curiosity about, perseverance in doing, and an appreciation for the power and beauty of mathematics and multiple ways to approach and solve mathematical situations;
- Access a coherent curriculum focused on the Common Core Standards, quantitative literacy and statistical reasoning;
- Access quality interactive instruction as outlined in the CCSS Mathematical Practices through the use of sustained activities designed to enable all students to demonstrate mathematical proficiency using concepts and skills articulated in the Common Core State Standards for Mathematics; and
- Access flexible paths that include courses that are sequential, integrated, or applied, or a combination of the 3 that require all students to complete mathematics each of their four years in high school demonstrating proficiency and substantial depth of understanding, through a focus on communication, reasoning and sense making, and mathematical modeling, that is directly aligned to any of the four model course pathways articulated in *Common Core State Standards for Mathematics Appendix A : Designing High School Mathematics Courses Based on the Common Core State Standards* (High School Level).

In addition to the Ed.306.43 section on mathematics, it is important for anyone connected to secondary education to read Ed.306.27 – High School Curriculum, Credits, Graduation Requirements, and Cocurricular program. Draft Table 306-2 in section 306.43 requires the following:

Mathematics that encompasses algebra, mathematical modeling, statistics and probability, complex

(Continued on page 5)

Post-Secondary Representative: School Approval Standards Update

(Continued from page 4)

applications of measurement, applied geometry, graphical presentation and interpretation, statistics and data analysis (3 credits).

The recommendation from the NHTM is the following:

All students must demonstrate proficiency and substantial depth of understanding that is directly aligned to any one of the four model course pathways articulated in *Common Core State Standards for Mathematics Appendix A : Designing High School Mathematics Courses Based on the Common Core State Standards.* (3 credits)

Alternatively worded:

Mathematics directly aligned to any one of the four model course pathways articulated in *Common Core State Standards for Mathematics Appendix A : Designing High School Mathematics Courses Based on the Common Core State Standards.*

We submitted our recommendation to the Department of Education and also through their on-line feedback form. If you would like to support our recommendation or provide feedback on the standards, please do so by using the on-line feedback form found at <https://www.surveymonkey.com/s/HT6TPKR>.

It is the goal of NHTM to advance mathematics education for all students in New Hampshire and setting school approval standards is an important step in achieving that goal.

If you have comments, questions, or concerns, please feel free to write to me at randrusiak@ccsnh.edu.



At last April's NHTM 50th Celebration, Cecile Carlton, NHTM President-Elect and then Membership Chair, presents an Honorary Lifetime Membership to Dave Kent, NHTM Historian and former Mathesis Editor and High School Math Contest Coordinator.

Middle Levels Representative: Why is Math So ... ?

By Katrina Hall

Over the course of the summer, educators enjoy the glorious weather but also spend time preparing for the upcoming year. This often entails reviewing curriculum, aligning assessments to standards, adjusting procedures and reflecting on what was successful from years past. Educators will often take on the job of creating new, challenging and exciting tasks which they cannot wait to present to students. And as many educators know, the newly designed work can quickly seem like wasted time spent when the time comes to present it to the students.

The task is distributed, the teacher is excited and the class is bursting with energy. Unfortunately, the energy is talk about lunch, the school dance or what is happening next weekend. The teacher will patrol the classroom and quickly find that students do not care about unit cost, cost comparisons and the best deal; they don't even do the grocery shopping. The complaint which can be heard throughout the classroom, "Why do you make math so pointless?"

(Continued on page 6)

Middle Levels Representative: Why is Math So ... ?

(Continued from page 5)

The goal for educators is certainly not based on turning students off from mathematics. In fact it is quite the opposite. There is the never ending hunt and challenge of creating daily lessons which spark enthusiasm, intrigue and excitement in the eyes of every student in the classroom. However, there is often the roadblock of students who just don't care about the math. They have no desire to make efforts to learn about the mathematics and see no point in persevering through useless problems on cross products, linear equations or proportional reasoning. These are the students who speak their minds, "Why do you make math so boring?"

There are also the cases when a task initially excites students but then something happens and the students give up. This can happen for some of the reasons noted earlier but also can occur when a task is seen as too easy or too hard. Students will quickly give up on a task when they come to the realization that they have a few days to complete it and really only need one class period. This means plenty of play time. On the other hand there are the students who just can't wrap their heads around the task and aren't quite sure where to start. In their minds, they shouldn't bother to waste time on the task. The complaints that are shared all stem from, "Why do you make math so difficult? Can't we just do problems from the book?"

For educators these are the dreaded questions which they have worked on diminishing via their summer work. Now they have come to a place where there is frustration and a feeling of giving up. "Why not assign 25 problems from the textbook? Students will be happier and I will have saved months of wasted time."

For these educators, keep in mind the goals of inspiring these young minds and preparing them for the world beyond the classroom. Accepting the challenge of turning math into a meaningful, exciting, and pertinent subject for all students is the focus. The question is, "How can this be done?"

First and foremost, remember that not all students are going to love every lesson created. However, try creating a survey asking student about their interests and hobbies. Ask students to take a multiple intelli-

gence test to determine who is sitting in the room. Is the class full of interpersonal students who tend to be musical? Or is the class full of intrapersonal students who are focused on the environment? Use the results to form mathematical lessons around the make-up of the students. Or to make it even easier, use problems from a math textbook as the foundation.

Take out the math textbook. Choose a problem which students have shown an interest in the past. Analyze this problem and determine how it can be changed from a closed, one-answer problem to an open ended problem which allows students to be creative in their solutions. Instead of asking students to determine the area of 12 foot by 13 foot room ask students to design a dream room (or a combination of rooms or even an entire floor plan) and be prepared to discuss the dimensions and make-up of the design. Leave it open as to how students create the room and share their design. Some may choose good old paper and pencil while others may turn to technology. The artists in the classroom are going to add their creative touches and the mathematicians are going to bring out the precision.

Of course there is still going to be the student who is complaining. Pull this student aside. Talk with this student and get to the bottom of the complaint. Work with this student to redesign the task so make it pertinent to them. Are they interested in a skateboarding? Design a skateboard park. Interested in horseback riding? Design a new arena. Don't take "it is boring" as an answer. Make this task one which they have vested interest in. In the end, make it a point to showcase this student's work. Students will see the willingness to make math connected to their lives and the creativity will start flying.

The most challenging aspect of this type of task is student adjustment. Students are accustomed to being told what to do and how to do it. By letting go of the reins, they will struggle with less parameters and the openness of the task. However, the result students who are excited about the mathematics take pride in their work and ownership in the task. A boring, unrelated and challenging problem can be redesigned to become exciting, pertinent and focused on the individual in a matter of minutes; say hello to summer again.

High School Students Compete in Rescheduled Contest

By David Kent, Historian

Plymouth State University (PSU) was again the site of this year's 41st annual State Mathematics Contest sponsored by NHTM and USNH. Originally scheduled for March 19 or 20, heavy snowfall caused schools to be closed. The competition finally took place on Thursday, May 23rd. Seventeen schools, represented by their 10-member teams, took part in this annual competition. In the contest, a special team category requires each school to divide its team into two groups of five and work together for 35 minutes. Part 1 of this team category consists of three problems for which short answers only are checked. Part 2 has each group working together on an essay-type question demanding not only a final answer but a complete justification of the solution. This second part was canceled. In all other categories of the competition, students work individually to solve three problems.

The majority of the schools participate during the school year in one of five math leagues.

We extend our congratulations to our numerous high achievers and to our winning teams and advisors in each division. Advisor Kellie Gabriel, and her Nashua HS South team of 10, competing in the large school division, was the overall winner. The team scored 260 out of a possible 432 points as they solved problems in the areas of recreational mathematics, algebra 1 and 2, geometry and advanced mathematics. There was a tie for second place overall – Salem HS, also competing in the large school division, and Hollis Brookline HS, the intermediate school division winner earned 255 points; Londonderry HS placed fourth overall with 254 points. Portsmouth Christian Academy (Dover) took the small school division with 204 points; the second place winner in class S was Bishop Brady HS (Concord) with 191 points and the team from Trinity HS (Manchester) came in third. In the medium school division, Oyster River HS (Durham) scored 214 points to win the division, St. Thomas Aquinas HS (Dover) won second place with 183 points. The team from Somersworth HS came in third. One student achieved a perfect score of 36 points this year. Four students earned a score of 32.

Perfect Scorer (36 points):

Gr 11: David Chen, Oyster River High School(Durham).

2nd place Scorers (32 points)

Gr 9: Jayanth Dabbi, Bedford High School

Gr 11: Lucas Arruda, Hopkinton High School

Sohil Shah, Nashua High School South

Gr 12: Junha Kim, Dover High School

Our congratulations also to all who participated: to the winning teams and their advisors as noted above, to the students who were awarded prizes for outstanding performances. There were over 100 certificates given for a perfect score in a category. NHTM awarded a plaque to each school finishing first, second and third in all four divisions, medallions to each member of the first place teams in each division, and inscribed pencils to all participants. Special words of thanks to those who were able to accommodate our needs at the site – Professor Shawn Hackshaw, Math Dept PSU, Dr. Bill Roberts, Math Dept PSU (retired), and Jennifer Smith, coordinator of activities at the Hartman student union building. Our sincere thanks to all who contributed in any way to our contest this year.

And now, plans are being made for our 42nd contest to be held next spring. As you can see, the contest requires the input and assistance of many people. We would really like to have yours for this special event. Send comments/suggestions to: David G. Kent, PO Box 413, Contoocook NH 03229-0413. (H) 746-5505, email: dg_kent@conknet.com.

Elementary Representative:

Guess My Number Activity for Student or Staff Development

By Stephanie Wheeler

For me, the beginning of every school year always holds such excitement and promise. As I write this article in July, this year is no different. In fact, this year in particular I am excited, anxious and hopeful as I am starting school as a Principal in two schools new to me. I think my feelings must mimic those of so many students at the start of the school year, regardless of whether or not they are in a new building. As I consider how I am going to get to know the students and staff in two buildings, my mind has continually been drawn to math activities that make great “ice-breakers.”

In an effort for the staff in my buildings to get to know me and my love of teaching math, I am starting my first staff meeting with a great activity called “Guess My Number.” The premise of “Guess My Number” is so simple, yet the activity itself is very versatile. Directions for “Guess My Number” are:

Each student has a number on their back. No one knows the number on their own back, but everyone can see the number on everyone else’s back. (Teacher note: create an array of numbers on sticky stickers that can be easily peeled and put on student backs).

The goal of the activity is to determine the number on your own back.

You may ask any student two questions about your number. However, the questions must be questions that can be answered with a “yes” or a “no.”

Once you have asked a student two questions and that student has asked you two questions, move on to another student.

You may take notes on the information you are learning about your number.

Once you have determined your own number, have a seat. (Teacher note: this will allow you to determine who is still working on their number). Any student that is seated can still answer questions for another student.

An example scenario might look something like this:

Stephanie is a student in my class. She has no idea what number, or even what kind of number is on her back, but she is taking hints from the types of numbers she sees on other students’ backs. Some of the numbers she sees are: $\frac{1}{2}$, .8, $\frac{2}{3}$ and $\frac{5}{4}$. Stephanie has the number $\frac{3}{5}$ on her back. The students begin the activity and Stephanie asks Greg the following two questions:

S: Is my number less than 5?

G: Yes.

Stephanie makes the following note: <5.

S: Is my number less than 1?

G: Yes.

Stephanie makes the following note: <1. She answers Greg’s questions about his number and moves on to work with another student, Katrina.

S: Does my number have a numerator and a denominator?

K: Yes.

Stephanie makes the following note: Fraction - N/D

S: Is my denominator odd or even?

K: I can’t answer that. Your question must be answered only with a yes or a no.

S: Oh yeah. Is my denominator even?

K: No.

Stephanie makes the following note: D is odd; 3, 5, 7, 9... Consider here...Why did Stephanie not include the number 1 as an option for the denominator? She answers Katrina’s questions about her number and moves on to work with another student, Rob.

S: Does my denominator have 2 digits in it?

(Continued on page 9)

Elementary Representative:

Interactive Problem-Solving enables Assessment and Differentiation

(Continued from page 8)

R: No.

Stephanie makes the following note: D is 3, 5, 7 or 9. Consider here... Could Stephanie's denominator have more than 2 digits? Yes, but she uses the "clues" from other fractions she is seeing and assumes (correctly in this instance) that the denominator is only one digit.

S: Is my denominator greater than 5?

R: No.

Stephanie makes the following note: D is 3. Consider here... What information might Stephanie be overlooking? She answers Rob's questions about his number and moves on to work with another student, Cecile.

S: Is my denominator 3?

C: No.

S: What? I'm pretty sure my denominator is only 1 digit. I know my number is not greater than 5. Does my denominator have more than 2 digits in it?

C: No.

Stephanie is stumped. She answers Cecile's questions about her number and moves on to work with another student, Rich.

S: Is my denominator less than 5?

R: No.

S: I don't know what my denominator is. Rob told me my denominator is not greater than 5 and you say my denominator is not less than 5... Ohhh – is my denominator 5?

R: Yes!

Stephanie makes the following note: D is 5. Stephanie answers Rich's questions about his number and moves on to work with another student, Lisa.

S: Is my fraction greater than $\frac{1}{2}$?

L: Yes.

Stephanie makes the following note: N is 3 or 4. Consider here... Why does Stephanie know the numerator is not 1, 2 or 5?

S: Is my fraction $\frac{3}{5}$?

L: Yes!

What are the highlights of "Guess My Number?"

This activity allows students to:

Move,

Interact with each other,
Formulate questions based on information gathered, and
Utilize vocabulary.

It also enables the teacher to:

Actively listen to student dialogue.
Determine student misunderstandings (think about the greater than/less than 5 scenario).

Use the activity at the beginning of a unit to inform instruction.
Use the activity at the end of a unit to evaluate understanding of concepts and vocabulary.

Differentiate for the needs of students:

For a struggling student, you may make sure the fraction on his/her back is $\frac{1}{2}$.

For a gifted student, you may make sure the fraction on his/her back is more challenging.

I have used this activity with Kindergarten students (who have the numbers 1 – 10 on their backs), middle school students and teachers from all different levels. In fact, one of the funniest stories I remember is doing this activity with a group of teachers, including a 4th grade teacher who chose to do the activity with her class the next day. When we met a week later she shared the following story. One little boy had not been able to determine the number on his back. She called him up front and was going to have the class help answer his questions. She started off by asking him, "What do you know about your number?" He looked confused, so she said, "What information have you collected about your number?" He looked down at his notes and answered, "Yes, yes, no, no, no, yes, yes." Point taken. Students often need us to model how to record information.

Like me, I hope you find an opportunity to use this activity early in the school year. It's a great way to get students talking, moving and thinking mathematically. And if you are like me, you will use it many times throughout the year. I would love to hear your stories!

I first participated in this activity in a workshop with Dick Evans. He credits an Australian colleague Barbara Clarke with this activity.

NCTM Affiliate Leadership Conference

Prepares Board to Meet Challenges

By Cecile Carlton, NHTM President-Elect

Thanks to our affiliate group ATMNE (Association of Teachers of Mathematics in New England), three NHTM board members had the pleasure of attending this summer's NCTM sponsored leadership conference, **Leadership: Building Responsive Affiliates in an iPad World** in Annapolis,



Linda Gojak, NCTM President (second from right) poses with NHTM Board Members Katrina Hall (Middle Levels Representative), Cecile Carlton (President-Elect), and Andrea Drake (Secretary) at the NCTM Affiliate Leadership Conference in July.

Maryland. From July 26-28, Middle Levels Representative Katrina Hall, Secretary Andrea Drake and I participated in discussions and met leaders in similar roles from affiliates across the United States.

What did we do? Think about this quote: "Technology is a tool, not a learning outcome." Of course there is a learning curve involved in becoming familiar and comfortable with technological tools, but

we were asked to consider how the tools could help us improve in the way we communicate with our membership. Questions we had to ponder included: How are social media and innovative technology changing the way we operate and view ourselves as an NCTM Affiliate? What can leaders do to meet the needs of a new generation of mathematics teachers? What steps are we taking to advance knowledge about equity in

mathematics education to strengthen Affiliate activities and organizations? As conference participants, our NHTM team had opportunities to:

- learn and share ideas and explore examples around effective use of social media and new technology to advance NHTM's goals;
 - develop strategies to consider for strengthening NHTM's leadership role and advocating for mathematics education;
 - identify ways of addressing equity in NHTM activities;
 - learn more about the NCTM structure, resources, and initiatives as we participated in discussions with NCTM President Linda Gojak; and our team developed a draft of a proposed strategic plan for NHTM where we integrated ideas gathered through discussion with other Affiliate leaders.
- The team returned with some great ideas and resources that will be shared with the NHTM Executive Board at the summer retreat and hopefully will move our organization to a level where we can involve more teachers to realize the benefits of being part of the state's mathematics learning community.

New Hampshire Teachers of Mathematics Dine & Discuss

The Dine & Discuss Mini-Conference provides a forum for educators to come together and explore a particular mathematical topic.

Fall 2013 Dine & Discuss

Formative Assessment: What it is & What it is Not

Tuesday, November 12

4:30 p.m. until 7:45 p.m.

Holiday Inn, 172 N. Main Street, Concord, NH

The Fall 2013 Dine & Discuss will feature Judi Keeley as our keynote speaker. Judi is the former state supervisor of mathematics for the Rhode Island Department of Education and currently working as a mathematics consultant. She is working on the Mathematics Assessment Project through the Shell Centre. Judi's keynote address will focus on what formative assessment is and what it is not. The keynote is followed by dinner and K-4, 5-8, and high school grade-level breakout explorations. NHTM Board members will facilitate the grade-level breakout sessions.

Registration

Register early as seating may be limited.

Registration is due by November 1, 2013.

Registration is \$40/person for NHTM members and \$65/person for non-members (includes the option of membership).

Full-time undergraduate students – \$20/person.

To Register go to <http://tinyurl.com/m7s5smo>.

For more information contact Rich Andrusiak at randrusiak@ccsnh.edu.

Secondary Representative:

NCTM Institute Inspires and Clarifies

By Michelle Fox-Bushaw

On July 31st, our esteemed NHTM President and I traveled to Washington, DC for the NCTM 2013 Institute “Engaging Students in Learning: Mathematics Standards and Process Standards (grades 9-12)”. I was attending as a participant, and Greg as a presenter. I had never been to an institute like this before, and I had never been to our nation’s capital, so this was a great adventure for me! In this article, I am going to discuss a small part of the conference because I think I could go on for hours!

For me, the institute in Washington was informative, motivational, and eye opening. I attended several sessions facilitated by some huge names in the mathematical community, and got to meet, hear, and/or share a cab with the three authors of the Algebra I/Geometry/Algebra II mathematics series that we are currently using at Groveton High School: Tim Kanold, Lee Stiff, and Laurie Boswell. I felt a little like a mathematics groupie and I found myself wishing I had an autograph book! In all seriousness, it was awe-inspiring to be in the presence of so many accomplished mathematicians. At one point during the conference, Greg and I were sitting at a table with two past NCTM presidents!

Although I saw and experienced many meaningful things throughout the Institute, the one speaker whose message and presence stands out the most in my mind would be that of Lee Stiff. His talk was extremely motivational for me, and really made me think about my and my colleagues’ teaching styles and what we are currently able to accomplish in our

classrooms. His evangelical manner and quirky sense of humor kept me on the edge of my seat the entire time he was speaking. I will share a few things that he discussed with us and that I think are important to share with as many mathematics educators as possible.

At the very beginning of his talk, Mr. Stiff “redefined” rigor as “teaching and learning that is active, deep, and engaging”. He then went into more detail:

Active learning involves conversation about the mathematics at hand, as well as hands-on, minds-on activities. Deep learning is learning that is focused, with attention given to details and students concentrate on problem solving.

Engaging learning makes real connections with the content and the work is challenging but satisfying.

This is not anything new, right? We all know, as mathematics educators, that we need to engage the students in order for them to find meaning and achieve mastery of the content that we are presenting to them. However, while attending the many breakout sessions and keynote speakers and so on during the institute, this idea of “rigor” being achieved through challenging but satisfying

work was very clearly supported throughout the week and was a common thread of almost every session I attended. The key is that students need to be challenged, and need to be presented with problems that will take time to figure out and get “right” (if there is one right answer) but that will make them work hard, talk to others about their thinking and be

(Continued on page 13)



NHTM Secondary Representative Michelle Fox-Bushaw and President Greg Superchi in Washington DC for an NCTM Institute.

Secondary Representative:

CC Mathematical Practices Are Not Really New

(Continued from page 12)

able to justify his or her reasoning and work. Even though the problem at hand is rigorous and challenging, in the end, the student becomes satisfied with him- or herself because of the perseverance and discipline that it took to solve the problem.

Mr. Stiff also spoke about the NCTM Process Standards and the Common Core Mathematical Practices (CCMPs), and listed each Process Standard and the connection he saw between those and the CCMPs.

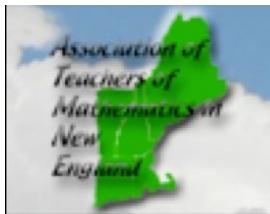
NCTM Process Standard	Common Core Mathematical Practice
Problem Solving	#1 – Make sense of problems and persevere in solving them #5 – Use appropriate tools strategically
Reasoning and Proof	#2 – Reason abstractly and quantitatively #3 – Construct viable arguments and critique the reasoning of others #8 – Look for and express regularity in repeated reasoning
Communication	#3 – Construct viable arguments and critique the reasoning of others
Connections	#6 – Attend to precision #7 – Look for and make use of structure
Representation	#4 – Model with mathematics

After an entire school year of working with the Common Core State Standards and the CCMPs, coming up with Priority Standards, Unit Plans, and Common Formative Assessments for my school district, I was shocked to see, and hear Lee Stiff say, that we are not doing anything new. If we were following the Process Standards that the NCTM adopted, we are already following the CCMPs in our classrooms. I felt a huge weight lift off my shoulders – and I found myself wishing that I had heard Mr. Stiff talk last summer! This was a huge connection that I never made, but as Mr. Stiff spoke, really hit home for me. We truly aren't doing anything new, and this mindset and approach to the CCMPs made it that much more accessible to me as an educator, and made me stop and think about the work that we had done in our district, and how I can improve on it.

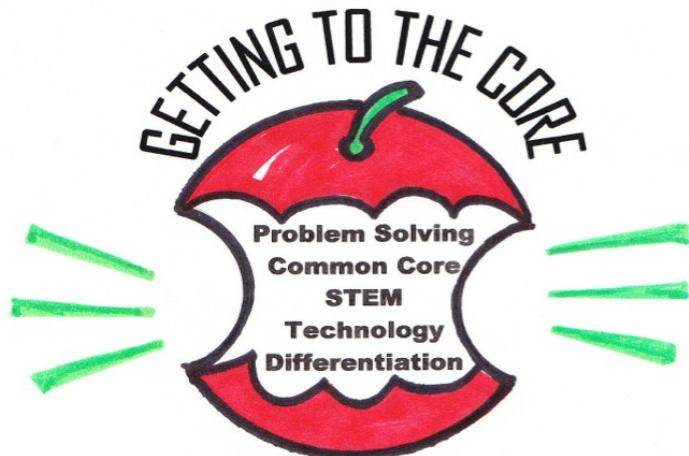
All in all, after attending this Institute, I find myself encouraged and even more energized to start the year and attack the Common Core curriculum standards and the CCMPs in my classroom. I want my students to leave my classroom prepared for their futures, and (hopefully) be excited about learning – even if mathematics is not his or her passion. If we can teach them “how” to think by posing challenging problems that are challenging but satisfying – it won’t matter what concept they learning, because they will have developed good skills and the perseverance to see them through.

NHTM Awards Scholarship to High School Graduate

The New Hampshire Teachers of Mathematics organization congratulates Hinsdale High School graduate Roxanne Toussaint. Roxanne has been awarded the NHTM Scholarship for 2013. We wish her well as she continues her study of mathematics!



Association of Teachers of Mathematics in New England



ATMNE 2013

October 24–25, 2013
Killington Grand Hotel and Resort, Killington, Vermont
For more information go to

atmne2013.com

The Association of Teachers of Mathematics in New England's Fall 2013 Conference, "**Getting to the Core!**" will be held at Killington, Vermont on October 24-25, 2013. The Vermont Council of Teachers of Mathematics is a co-sponsor of the conference.

The program is designed to provide professional development for all levels of education from Pre-K through 12 and beyond. Sessions are focused on ways in which mathematics educators can implement the Common Core State Standards in Mathematics (CCSSM) as well as explore assessment of the skills and mathematical practices in the CCSSM.

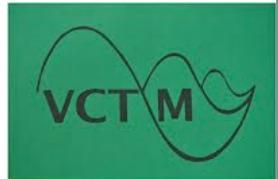
Plan on coming to join colleagues from throughout New England to meet, learn and share about mathematics during the Fall Foliage season in Vermont!

For registration and other information go to
www.atmne2013.com.

Keynote Speakers include

Jason Zimba – Lead CCSSM writer and Founding Principal of the Student Achievement Partners
Shelbi Cole – Director of Mathematics at Smarter Balanced Assessment Consortium

Hayley Freeman - Partnership for Assessment of Readiness for College and Careers -Core Leadership Group and Massachusetts Department of Elementary and Secondary Education



ATMNE Fall Conference

October 24 & 25, 2013

Killington Grand Resort
Killington, VT

Call for Volunteers

Mary Calder
General Co-Chair
Vermont
calder50@comcast.net

Jacqueline Mitchell
General Co-Chair
Maine
jadamitchell@aol.com

William Bowdish
General Co-Chair
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RMorin1035@cox.net

Gary Finch
Signs & Printing
Vermont
gfinch@mail.ruhs.k12.vt.us

Roberta Baker
Treasurer

The success of the 2013 ATMNE Fall Conference in Killington, VT depends on committed volunteers. Several committees have been established to handle various aspects of this conference. Volunteers, who are not ATMNE members, will be able to register for the conference at member rates. We urge you to consider volunteering two hours of your time at the conference. It certainly could be a rewarding experience as you provide a needed service for **all** conference participants. You will also have the opportunity to work with members of our educational community from different geographical areas.

The committees:

- | | |
|-----------------------------|--|
| Equipment & Technology: | works with the co-chairs and equipment supplier to ensure that audiovisual and other equipment is available at the correct locations and times |
| Exhibitors: | works with co-chairs to ensure that exhibitors needs are met |
| Hospitality: | provides on and off-site assistance, i.e. directions, special functions, etc. |
| Registration & Membership: | provides member services and information; assists conference attendees in becoming members of ATMNE and its affiliate groups; distributes exhibitor badges; provides registration assistance |
| Session & Workshop Support: | assists session, workshop, and mini-course presenters |
| Signs & Printing: | creates and places signs and other printed materials |
| Students Hosts: | works with local high schools to enlist students to serve as ATMNE conference hosts |

If you are interested in volunteering, please email Jackie Mitchell at jadamitchell@aol.com, Mary Calder at calder50@comcast.net or William Bowdish at bilbowdish@gmail.com. Include your name, email address, phone number, and the committee on which you would like to serve. You will be contacted by the appropriate chair.

Kindly distribute this announcement to other educators

The Association of Teachers of Mathematics in New England is an affiliate of the National Council of Teachers of Mathematics

Keene State Recognizes Prevost with Honorary Doctorate

Adapted from May 14, 2013 KSC Press Release:

NHTM Co-Founder Dr. Fernand Prevost was presented with the Honorary Doctorate of Science during Keene State College's Commencement on May 11, 2013.

A Keene State alumnus of 1957, Dr. Prevost was recognized for his contributions to mathematics education over 50 years on regional, state, and national stages, as well as for his service to the College as an alumnus. Dr. Prevost served for 30 years as the New Hampshire State

Mathematics Consultant. In this role, he touched the lives of countless mathematics teachers and students at all grade levels. He often presented workshops for teachers with a vision of making New Hampshire mathematics classrooms vibrant and dynamic learning centers.

Fifty years ago, Dr. Prevost and mathematics education colleagues established the New Hampshire Section of the Association of Teachers of Mathematics in New England (NH-ATMNE) now renamed as the New Hampshire Teachers of Mathematics (NHTM). In 1994, NHTM recog-

nized Dr. Prevost for his service to the profession by creating the Fernand J. Prevost Mathematics Teaching Award. This award is given annually to a New Hampshire mathematics teacher in his or her first, second, third, or fourth year who meets criteria based on characteristics that Dr. Prevost exemplified in his own teaching.

Dr. Prevost has also contributed to mathematics education on a national level via his work with the National Council of Teachers of Mathematics (NCTM) and with the Association of State Supervisors of Mathematics (ASSM). In 2007, the Mathematics Departments of the University of New Hampshire came together to honor him for his outstanding contributions to mathematics education. He also received the Granite State Award from what was then Plymouth State College in 1985.

Dr. Prevost cites his education at Keene State as a foundation for his success in teaching. In the 56 years since his graduation, he has brought great recognition not only to the discipline of mathematics education, but also to Keene State. He is highly respected by generations of Keene State educators, and is seen as a leader among them.



Fernand Prevost shares his reflections on NHTM during the 50th Conference last April.

From the desk of the Membership Chair:

Please RENEW & Invite Colleagues to Join NHTM

Now is the time to renew! You can expect to receive an emailed reminder when your membership is about to expire. Please renew your membership online, use the application form in this issue, or go to the website for a renewal application form. Let NHTM be your state level professional conduit that extends your networking with mathematics colleagues. Enhance your effectiveness, mathematical expertise, and teaching skills. Invite a colleague to join. *Application available at website: www.nhmathteachers.org. Contact Gretchen Scruton, Membership Chair if you have any further questions: Gretchen.Scruton@gmail.com.

NH-JEM Memberships

If you teach at the elementary grade level, the New Hampshire Joint Elementary Membership (NH-JEM), may be for you! A \$50 annual membership fee provides you with most of the membership benefits of four organizations (NHTM, New Hampshire Council of Teachers of English, New Hampshire Council for the Social Studies, and New Hampshire Science Teachers Association). See the website www.nhmathteachers.org for more details. Note that the NH-JEM membership does not include ATMNE benefits.

Institutional Memberships

NHTM offers all of the many benefits of an individual membership to elementary schools containing grades six and below. An elementary school may join NHTM through an institutional membership which will allow staff members to attend conferences at the membership rate. All publications will be received by a named contact person.

Individual Membership in NHTM provides you with:

- Mathesis (newsletter) – includes current happenings in math education, Common Core resources, interesting articles and math activities
- Reduced rates at Fall Dine & Discuss (November 12, 2013) and Annual Spring Conference
- Membership in ATMNE (the Association of Teachers of Mathematics in New England) including its two publications, the ATMNE Newsletter and the New England Mathematics Journal, and reduced rates at ATMNE conferences. Note that the ATMNE Newsletter has gone GREEN – be sure your email is up to date in our database.
- In-Service Education Forums on current Math Ed initiatives – Regional PD offerings, networking

What Your Membership Supports:

Scholarship programs for graduating high school seniors who will pursue mathematics related college studies and for college students enrolled in mathematics education programs

State Mathematics Contest for high school students and MATHCOUNTS for middle school students in New Hampshire

Student Recognition program – for students who have demonstrated creativity, interest, or talent in the study of mathematics

Mathematics Educator Recognition Programs:

- **Richard H. Balomenos Memorial Service Award**
- **Presidential Awardees (PAESMT)** at the elementary and secondary levels
- **Fernand J. Prevost Mathematics Teaching Award** – for outstanding teacher of mathematics in their first, second, third, or fourth year of teaching
- **Richard C. Evans Distinguished Mathematics Educator Award** – for distinguished mathematics teacher/educator who works actively with students and/or teachers for five or more years at any level (PreK-16)
- Recognition of math educators with 25 or more years of service
- Lifetime Honorary Memberships

NHTM has a new membership chair, Gretchen Scruton. Congratulations to Cecile Carlton our President-Elect and thank you for your numerous years of service as NHTM's membership chair. Membership questions or contact information updates may be sent to: Gretchen.Scruton@gmail.com. Membership forms may be mailed to:

Gretchen Scruton, NHTM Membership
44 Greenough Road
Plaistow, NH 03865

Nominations Sought for NHTM Teaching and Service Awards

Each year NHTM encourages its members to nominate mathematics teachers for the Fernand J. Prevost Teaching Award, the Richard C. Evans Distinguished Educator Award, and the Richard H. Balomenos Memorial Award. Nomination forms and applications for each of these awards can be found on the NHTM website www.nhmathteachers.org.

The descriptions and instructions for each of these awards are described below:

The Fernand J. Prevost Mathematics Teaching Award

Nominees are being sought for the annual FERNAND J. PREVOST MATHEMATICS TEACHING AWARD. NHTM is presenting the award in recognition of the contribution that Ferd has made to the mathematics educators of New Hampshire during his thirty years as the state mathematics consultant. The award is being given to a beginning teacher in her/his first, second, third, or fourth year who meets the following criteria which exemplify the characteristics which Ferd has brought to his teaching:

- * commitment to good mathematics
- * confidence that children can learn
- * a spirit of self reflection and professional curiosity
- * caring and concern for colleagues
- * a willingness to explore, to learn, and to grow as a teacher of mathematics
- * a willingness to share mathematical and pedagogical activities with others

The recipient will receive a plaque of achievement, a \$250 prize, and a one year membership to NHTM. The presentation of the award will be made at the NHTM Spring Conference.

Nominations are due by December 15, 2013 and should be sent to:

Rich Andrusiak
r_andrusiak@ccnhs.edu

River Valley Community College
 One College Place
 Claremont NH 03743

The Richard C. Evans Distinguished Educator Award

In December 2006, Dr. Richard Evans retired from Plymouth State University after serving for more than 40

years as a mathematics educator. The extent of his work in the State of New Hampshire is enormous. It is difficult to find a mathematics teacher in the State who has not been affected by his work. Dick has an unsurpassed passion for mathematics education and has dedicated his life to improving mathematics education for all in the State of New Hampshire.

The intent of this award is to highlight that passion, creativity and innovation in the teaching of mathematics to all students. The recipient of this award will represent Dr. Evans philosophy, passion and knowledge of mathematics education. Those with 5 or more years experience teaching mathematics at any level from Pre-K to 16 may be nominated.

The award recipient will receive \$500, a plaque, a one year membership to NHTM, become an honorary board member for one year, be invited to present at the spring conference, invited to contribute articles for the quarterly newsletter, *Mathesis*, and will be encouraged to offer professional development opportunities for mathematics educators with the support of NHTM. The presentation of the award will be made at the NHTM Spring Conference.

Please consider nominating a Pre-K to 16 mathematics educator for the ***Richard C. Evans Distinguished Mathematics Educator Award*** given by the New Hampshire Teachers of Mathematics. Nomination forms and applications are due by December 15th and should be sent to:

Stephanie Wheeler
stwheeler@mv.k12.nh.us or slwheeler3@aol.com.

The Richard H. Balomenos Memorial Award

The Richard H. Balomenos Memorial Award is presented annually to a New Hampshire mathematics educator who has shown outstanding or meritorious service or leadership to the mathematics education community on a statewide basis. Established by the Executive Board of NH-ATMNE in 1987, the award remembers and honors a former colleague, educator, and friend, Richard Balomenos, and his wife, Georgia, who died tragically in an automobile accident in December 1986. As both teacher and administrator at the University of New Hampshire for almost 25 years, Richard had a profound influence on mathematics education in the state of New Hampshire.

(Continued on page 19)

NHTM Executive Board

Officers

<u>President</u>	Greg Superchi, Lisbon Regional School	gsuperchi@yahoo.com
<u>Secretary</u>	Andrea Drake, Oyster River High School	adrake@orcisd.org
<u>Treasurer</u>	Kellie Gabriel, Nashua High School South	kgab@comcast.net

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<u>Secondary Representative</u>	Michelle Fox-Bushaw, Groveton High School	m_fox@sau58.org
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<u>ATMNE Representative</u>	Rob Lukasiak, Mathematics Consulting Services	r.lukasiak@comcast.net
<u>NCTM Representative</u>	Annie Wallace, Hampstead Middle School	anniekwallace@hotmail.com
<u>Membership Committee Chair</u>	Gretchen Scruton, Timberlane Middle School	gretchen.scruton@gmail.com
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<u>Webmaster</u>	Matt Treamer, NCED Services	matt@ncedservices.org

Please visit <www.nhmathteachers.org> for more detailed Board information.

Balomenos Award to Recognize Service

(Continued from page 18)

If you would like to nominate someone for the Richard H. Balomenos Memorial Award, please send his/her name and a 1-2 page letter describing contributions to the State of New Hampshire in the field of mathematics education to:

Greg Superchi
NHTM President
159 Jim Noyes Hill Rd.
Landaff, NH 03585

All nominations must be received by January 1. A list of previous recipients is posted on the NHTM website www.nhmathteachers.org.

How are Juggling and Mathematics Related?



Participants at the April 2013 NCTM Conference had the opportunity to learn juggling and hear what Betty Erickson had to share about teaching elementary mathematics..

Don't miss the 2014 Conference! Save the date!

March 11, 2014

NHTI Concord's Community College
Concord NH

Professional Development and Conferences

National

AMATYC 39th Annual Conference	Anaheim CA	31 October - 3 November 2013
Joint Mathematics Meetings	Baltimore MD	15 - 18 January 2014
NCSM 45th Annual Conference	New Orleans LA	7 - 9 April 2014
NCTM 91st Annual Meeting & Exposition	New Orleans LA	9-12 April 2014
T3 Annual Conference	Las Vegas NV	7 - 9 March 2014
ICTCM 25th Annual Conference	San Antonio TX	20 - 23 March 2014

Regional

NCTM	Baltimore MD	16-18 October, 2013
NCTM	Las Vegas NV	23-25 October 2013
NCTM	Louisville KY	6-8 November 2013

State

NHTM Dine & Discuss	Concord NH	12 November 2013
Christa McAuliffe Technology Conference	Manchester NH	3 - 5 December 2013
NHTM 51st Annual Spring Conference	NHTI, Concord NH	March 11, 2014
42 nd annual State Mathematics Contest	TBA	March 2014

Mathesis is the newsletter of the New Hampshire Teachers of Mathematics. It is published four times a year: August, November, February, and May. The mission of the New Hampshire Teachers of Mathematics is to provide vision and leadership in improving the teaching of mathematics so that each student is ensured quality mathematics education and each teacher of mathematics is ensured the opportunity to grow professionally.