Mathesis

Volume 46, Issue 3 February 2014

NHTM Annual Spring Conference Offers a "Pot of Gold"

Upcoming Deadlines:

- March 1: NHTM Early Registration due..
- March 7: Early NCTM Conference Registration discount ends.
- April 1: Nominations for K-6 Presidential Award of Excellence in Mathematics and Science Teaching due.
- May 5: NHTM scholarship applications due.

Inside this issue:

March 17, 2014, St. Patrick's Day, is very special to many people but this year there is an extra reason to enjoy the day, the NHTM Annual Spring Conference! Come spend the day at New Hampshire Technical Institute in Concord with colleagues who want to increase their mathematical knowledge and teaching methods. Rich Andrusiak and his committee have been very busy creating an exciting program for you. This year's conference theme, Leading Us to the Pot 'O Gold: The Standards For Mathematical Practice, was chosen to acquire sessions and workshops that would help all teachers with the eight mathematical practices. We are fortunate to have NCTM President, Linda Gojak, presenting the keynote address "Putting the Standards for Mathematical Practice into Action." Linda will also join 36 other presenters giving sessions and workshops during the day.

Many teachers feel they cannot attend conferences as they don't want to leave their classrooms and students for a day. If you discover just one idea, technique, new software, etc. at the conference your students will have a more informed educator. We all need to constantly improve our teaching and meeting with colleagues from around the state and New England is well worth the effort. In each of the three time slots, there are ten or more sessions to choose from. All grade levels and mathematical areas are addressed. You're certain to return home with new ideas and lessons to use in your classroom.

We look forward to seeing you on March 17th at NHTI in Concord.

Please visit http://nhtm.wildapricot.org/ for the program, schedule, and registration form.

Art's Attic: The Disappointed Daughter

By Art Johnson

When most mathematicians write a book on mathematics, they give it a title that describes the contents of the book. Not Bhaskaracharya (1114-1185), the last great Hindu mathematician of the Medieval Ages. He named his life's work *Lilavati*, after his daughter. He did it to comfort her.

Bhaskara is credited with the shortest proof in mathematics. His proof of the Pythagorean theorem consists of a single word "Behold!". You can find a discussion of his proof at http://www.math.hmc.edu/funfacts/ffiles/10013.2.shtml. Bhaskara also worked with algebraic topics. He solved the equation $x^2 = 1 + py^2$ for integer values of x and y when $p = 67$, getting $x = 1{,}776{,}319{,}049$ and $y = 22{,}615{,}390$.

Bhaskara also wrote about the mathematics of zero. Although the concept of zero was discovered and in common use years before Bhaskara (The earliest written form of zero is in a temple in Gvalior, India which dates from 840), some claim that Bhaskara was the first mathematician to fully understand the implications of using zero in computations. In *Vija-Ganita* (Root Calculations), Bhaskara suggests, for example, that $3 \div 0$ results in an infinite quantity, and not in zero. However, he also suggests that $(3/0) \times 0 = 3$, thus indicating that he still had not fully developed modern concepts of zero. He also accepted the existence of negative numbers as solutions to problems like $x^2 = 9$.

But, back to Bhaskara's daughter. Bhaskara was not only a mathematician but also an astrologer. To ensure a happy marriage for his daughter, he determined the exact day and hour for his daughter's wedding. No other time would do; Bhaskara insisted on that. As the day arrived, his daughter anxiously checked the water clock every few minutes so she would be sure to be ready for the eventful time. During one of the times she checked, a pearl fell from her headdress into the water clock and plugged up the timing hole. Before anyone realized what had happened, the hour set by her father had passed. There would be no wedding for Lilavati, not then or ever. Her time had passed. We don't know if having her father's book named after her made Lilavati feel any better, but it made her name known all over the world.

Three of the problems from the book *Lilavati* are below. You might try them with your students.

1. If a bamboo 32 cubits high is broken by the wind so the tip meets the ground 16 cubits from the base, at what height was it broken?

2. The eighth portion of a troop of monkeys, squared, was skipping in a grove and delighted in their sport. Twelve remaining monkeys were seen on a hill, amused with chattering to each other. How many monkeys were there in all?

3. The mixed price of 9 citrons and 7 fragrant wood apples is 107; again the mixed price of 7 citrons and 9 fragrant wood apples is 101. O, you arithmetician, tell me quickly the price of a citron and a wood apple, having distinctly separated those prices as well.

1. 12 feet, 2. 16 or 48, 3. 8 citrons and 5 wooden apples

President's Message:

From Fractals, to Einstein, to Cacti, and a Few Things in-Between

By Greg Superchi

I sit in my classroom at my desk with the task of writing my President's Message for the next *Mathesis*! It can feel quite daunting to say something of value and importance to all of you. At least, that's what I think I'm expected to do. Sometimes I write a more informational column about the happenings of NHTM. Other times, I try to make a statement about mathematics education that makes you think. I look around my room for something to spark my thoughts. I see many things: some quite recent, others many years old. I'm sure my classroom is not that much different than most of yours. It starts me thinking...

As I walk through the door, I see a great deal of mathematical art. Along the top border of the classroom is almost all student artwork. There are line, daisy, and knot designs, optical art, and mandalas. Some of them date back to student work from 1993! They were inspired by the first chapter in my favorite math textbook of all time, *Discovering Geometry: An Inductive Approach* by Michael Serra. Some may call the hour or two of geometrical art a waste. For me, it is a great way for students to see that geometry is everywhere, including art, so that they might make connections. That original text from the early 90's is closest to my heart, but there are a couple of newer editions. The text framed my overall teaching style to this very day: the inductive approach. I still teach versions of some of the lessons in that text to this very day. They are timeless to me.

It is amazing the effect one person or one workshop can have on a career.

Next, I see a SMART Board. Wow, have things changed. I still remember student teaching and getting chalk all over my pants and shirt! The students thought that was pretty funny. To help, I bought a chalk holder…what a nerd…in the cool sense of the word, of course! Then we moved to whiteboards. The yellow chalk was replaced by black all over my clothes and hands. The fumes from the markers were sometimes more than I could bear! I think about what that meant about my teaching style on those days? Thankfully, we have progressed! And, I do enjoy being, literally, in the spotlight (of the projector) when I teach using the SMART Board! Interactive lessons, direct connection to the Internet, and the ability for us all to "be on the same page," have changed the classroom. One might wonder if it is for the better. I guess that depends on how it is used. I don't think it is any better if we just preach from PowerPoint or Notebook files, is it?

My shelves are full of trinkets, manipulatives, and tokens from the past. Included are many different unit origami pieces. Thank you Mrs. Kent! It was at my very first NHTM Spring Conference that I chose to go to a workshop on origami because, "That sounds like fun." Mrs. Kent did such a great job of not only teaching the basics of unit origami, but also modeling how it can be part of a math lesson integrating mathematics connections. As it was 1992, graphing calculators were just gaining momentum. Of course I used them in my college courses, but I had limited experience as to how to make them a "learning tool" and not just a "solving tool." These workshops were so important to me as a mathematics education undergraduate and prospective teacher. Thank you, Dr. Evans, for giving me the opportunity and push to go. It is amazing the effect one person or one workshop can have on a career.

On the back walls of my classroom are pictures of fractals, several Einstein posters with his famous quotes, as well as Escher prints. For many students, this is their first exposure to

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President's Message

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these pictures and quotes. It opens a whole new world for them and gives me a chance to talk about all sorts of mathematical ideas such as the connections between pure and applied mathematics. I remind them that Mandelbrot did not necessarily envision an application for fractals. He worked with them because he loved them. And today, fractals are used in cell phone antennas, computer integrated imagery (CGI – what makes movies like *The Hobbit* possible), and are currently being used in the search for a cure for cancer. If you have not seen it, the PBS documentary, *Fractals: The Hidden Dimension*, is phenomenal. The DVD can be purchased, but I'm sure all or at least part of it is on YouTube as well.

As with so many classrooms around the state, I have my *Habits of Mind* and *Problem-Solving Strategies* posters displayed with pride. I refer to them often. These were given out at many events around the state a few years back, including at NHTM conferences. They were made possible by a grant given to the NH-IMPACT Center at PSU. These posters put so many things that I had been trying to accomplish as a teacher in one place. Having them on posters in my classroom also challenged me to keep them at the forefront of all I do. Now beside them, on poster I made myself, are the Common Core's *Standards for Mathematical Practice*. The saying, "The more things change, the more they stay the same," fits well here I believe. Whether it's the 1989 or 2000 *NCTM Standards*, the *Habits of Mind*, or *the Standards for Mathematical Practice*, aren't we just trying to accomplish the same goal in similar ways? We've been saying the same thing for a long time. I believe it is paying off.

Whether it's the 1989 or 2000 *NCTM Standards*, the *Habits of Mind*, or *the Standards for Mathematical Practice*, aren't we just trying to accomplish the same goal in similar ways?

There are also many things around my classroom that I just don't use anymore or are tributes to times gone by. Included is a four foot slide rule used to demonstrate in front of a class. I rescued it from the attic of the school storage building many years ago. Some of you remember these I'm sure! I can't imagine the excitement the teacher and students had the day it was delivered from a catalog order! I bet it was the same excitement I felt when my TI-82/83 Viewscreen came that now sits in the corner on top of an old overhead projector that gets used once or twice a year. I wonder if there is a slide rule for my SMART Board? Maybe I shouldn't have used the, "More things change…" quote so soon!

Finally, there is a cactus that sits behind my desk on a shelf. I bought it in the first year or two of my teaching when it was about six inches tall. Students didn't really notice it for a while, but it has been the topic of conversation among them as well as visitors to my classroom many times ever since it reached about two feet tall. Today, excluding the height of the shelf, it stands about five and a half feet tall. It's about a foot from the ceiling. There's no mathematical lesson here, but there is a teacher appreciation to this story. A few years back I estimated that at the rate it was growing, it would probably reach the ceiling at about the time I would retire. Wait, maybe there is a mathematical lesson here… Anyway, I have begun to tell students, colleagues, and others that when that cactus reaches the ceiling, I'm going to retire. Let me just say that there are some days I take care of that cactus more than others. But what I can't figure out for the life of me is why there are some people in the building I've caught giving *it Miracle Grow*…

Have a productive winter and spring. I hope to see you at our 51st Spring Conference in March!

Post-Secondary Representative

Post-Secondary STEM Updates

By Rich Andrusiak

The Community College System of NH together with the University System of NH have committed to increasing by 50% the number of Science, Technology, Engineering, and Mathematics (STEM) graduates by 2020 and doubling that number by 2025 (Community College System of New Hampshire, 2012). As one step in meeting this goal, last Academic Year, the Community College System of NH established a system-wide STEM committee to focus on the promotion of STEM career opportunities and the creation of transfer pathways to four-year institutions.

Each community college in the NH system is creating a web page focusing on STEM educational pathways, opportunities, and jobs. A similar effort is occurring at the university system. Furthermore, the community colleges are increasing their STEM programs. For example, River Valley Community College has recently added an Associate in Science Degree in Mathematics and Science where students can concentrate in mathematics, engineering, physical science, or biological science. While STEM opportunities are increasing, transferability of courses and programs both within the community college system and from the community college system to the university system remains a critical issue.

To help address the pressing transferability issue, the community college system is working to establish equivalencies in key STEM courses. The community college system STEM committee will be establishing two subcommittees. One subcommittee will work on creating equivalencies, within the community college system, among the biological science course sequence and the other subcommittee will establish equivalencies among the calculus course sequence. Once those equivalencies are established, they will be presented to the university system for acceptance of transfer as equivalent courses. These subcommittees will begin work during spring semester 2014.

If you are a higher education faculty member who is interested in finding out more about this project or becoming involved in this project, please contact Rich Andrusiak at randrusiak@ccsnh.edu.

NHTM Pre-Service Mathematics Education Scholarships for High School and College Students

By Rich Andrusiak

The New Hampshire Teachers of Mathematics provides a $1000 scholarship for a graduating high school senior and a $1000 scholarship for a college student who will obtain junior or senior status in the 2013-2014 academic year.

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 or mathematics 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 certification program or elementary education certification program. Preference will be given to students attending a New Hampshire institution of higher education. The selection team will consider academic achievement, financial need, and will look for evidence of promise of a teacher of mathematics.

In January, I e-mailed information about these scholarships to high schools and institutes of higher education across NH. Additional information, along with the on-line application, can be found at http://nhtm.wildapricot.org by following the resources drop-down menu. The application deadline is May 5, 2014.

If you have any questions, please contact me at randrusiak@ccsnh.edu.

Secondary Representative

Sparking New Interest

By Michelle Fox-Bushaw

So…there I was presenting the Converse of the Pythagorean Theorem (again)…and some of my students' eyes were glazing over, some of them are wondering "where on Earth am I ever going to use this?" and the whole time I was thinking – there must be a better way! Just because I think it is important, and I find value in something, does not mean that I can telepathically make kids want to learn, or really, master the concept if there is no passion there…or any interest in the subject matter, for that matter, if I can't put it into a context that is concrete and meaningful to them. Sigh…there will be better days…

The time was fast approaching when I was going to cover this topic again, and I was having flashbacks! I was determined to do something different. I think that sometimes, as the wonderful and fabulous teachers of the best subject EVER we forget that kids aren't going to be excited to come to math class every day, or that they will be able to find the passion that we have for our subject matter. Pondering this idea for a while, and thinking about how kids learn and what I could do to have them be more invested in the topic, I came up with this activity. My kids loved it!

Before I got ready to do this with my students, I knew that I needed some kind of material that the students could touch, feel, and play with to make this all work, and so I recruited our integrated arts teacher to help me. He cut out strips of wood for the students to use, that were in the lengths given on the first half of the worksheet (I have used straws in the past – but the kids LOVE going to shop class). The students could then manipulate the pieces of wood to form the triangles given, and actually see that the triangles could LOOK pretty right, but were in fact acute or obtuse (and not by much in some cases).

I hope that, if you don't use this exact activity exactly how I used it, it will inspire someone to do something different in his or her mathematics classroom this year. Sometimes, going back to basics, and putting myself in the shoes of my students makes me that much more exited and invigorated about sharing mathematics with others – which is why most of us got into this business in the first place.

Check Out the NCTM Annual Meeting Preview Online

The online preview has everything you need to know about the Annual Meeting, including an overview of the conference and what you can expect when you get there. Learn more about the sessions and workshops, featured speakers, strands, and exhibit hall—plus use the sampling of presentations and topics of focus to **demonstrate the value** of this professional development opportunity to your administrator and share the preview with colleagues.

Geometry Triangle Investigation

Please show all work on this sheet of paper.

Mr. Blodgett made three different triangles using different lengths of wood.

One of them was made with sides of 5 in, 12 in, and 12 in. Use the pieces of wood given to construct this triangle and sketch it in the space provided below.

Use the converse of the Pythagorean Theorem to decide what type of triangle (acute, obtuse, or right) it is.

One of them was made with sides of 5 in, 12 in, and 14 in. Use the pieces of wood given to construct this triangle and sketch it in the space provided below.

Use the converse of the Pythagorean Theorem to decide what type of triangle (acute, obtuse, or right) it is.

One of them was made with sides of 5 in, 12 in, and 13 in. Use the pieces of wood given to construct this triangle and sketch it in the space provided below.

Use the converse of the Pythagorean Theorem to decide what type of triangle (acute, obtuse, or right) it is.

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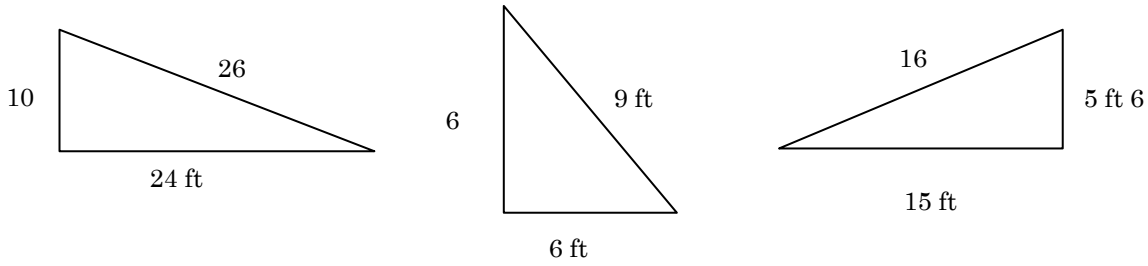
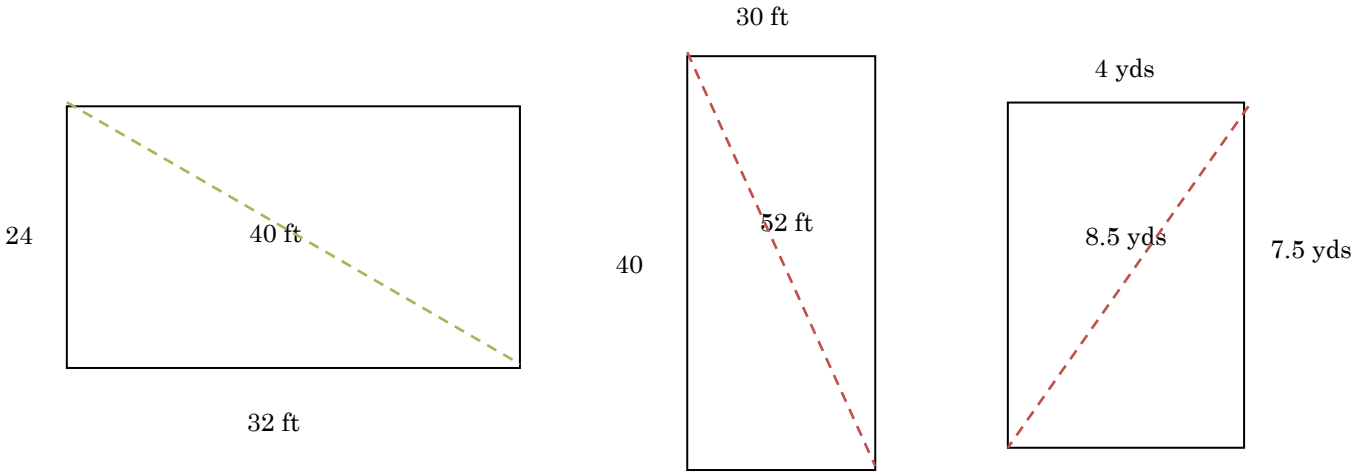
Geometry Triangle Investigation

Check and make sure that the ramps that are shown below have perpendicular bases and heights. If they don't, name what kind of triangle is formed by these measurements.



Decide whether or not these rectangular-looking basement plans are "square". If not, name what kind of triangle is formed by these measurements.



NHTM 2014 Election

Biographical Information about the Candidates

Watch your USPS mail for the NHTM Ballot and election information. Mailings were made in late January. Remember to have your ballot postmarked to Cecile Carlton, NHTM President-Elect, 3 Wentworth Street, Nashua NH 03060, no later than March 1, 2014. You can put it in the ballot box at the registration table by 10 a.m. at the NHTM Conference on March 17, 2014. Do remember to bring the ballot mailed to you – there will not be extras available. If you do not receive a ballot by February 25th then first check your membership with Gretchen Scruton, is it current? Second, do we have a current mailing address. Remember your vote is important!

Candidates for Secretary:

Andrea Drake

Andrea Drake currently serves as NHTM's secretary. In 2008 she was the recipient of the Fernand J. Prevost Mathematics Teaching Award when she was a teacher at Goffstown High School. Andrea is a graduate of Keene State College and is in her ninth year of teaching. Currently, Andrea teaches at Oyster River High School where her particular area of interest is in the teaching of Algebra 2. She uses many innovative tools to engage ALL her students, challenging each of them in a positive manner. Her philosophy about her profession: "*I take in as much content and collaborate as often as I can so that I may continue to grow and learn. This is how I am able to stay as up-to-date as possible, to evolve as an educator, and I embrace it wholeheartedly".* This past July, Andrea attended NCTM's Leadership conference held in Annapolis Maryland, and continues to provide sessions for teachers at NHTM activities.

Amy Gregoire

Amy Gregoire joined Bow Memorial School this school year where she serves as their math specialist. She is currently developing a program in which she provides math intervention to students, co-teaches with teachers, runs a math lab, and serves as a professional resource for those teaching mathematics. Prior to this position she worked at Bow Elementary School and has worked at the elementary level for 21 years. Throughout her teaching career Amy has served as the co-chair of her school's math leadership team, chair of the math adoption committee, and has provided professional development for teachers. In addition she has presented Family Math at the NHTM conference. She is an active member of the district math leadership team and is currently serving on Bow's District data team. Amy is also a member of the New Hampshire College and Career Ready Standards Training Corps through the Department of Education and the NEA. This responsibility will result in providing workshops on the Common Core for her region. Amy earned her Bachelor's degree from Boston College and her Masters degree in Math Education from Lesley University.

Candidates for Secondary Representative:

Michelle Fox-Bushaw

Michelle earned her Bachelor of Science in Mathematics from Elmira College in 1999, and her Master's degree in Secondary Education from Plymouth State College in 2008. She has been teaching high school mathematics for the past 14 years at Groveton High School, teaching everything from Algebra I to Calculus. For the past three years, she has offered Pre-Calculus and Calculus classes through the White Mountains Community College Project Running Start program, and dozens of students have earned college credits in this manner. She previously served as a Program Chair for the NHTM Annual Spring Conference and on the Board of NHTM as the Secondary Representative for the past year, stepping in for Greta Mills. She has presented Secondary Mathematics workshops during North Country In-Service Day, as well as at the Dine and Discuss and past NHTM conferences.

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Candidate Biographies

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Heidi Boyle

Heidi is the Curriculum and Assessment Specialist for Mathematics at Pinkerton Academy in Derry NH. In this role she creates, provides, and supports professional development on implementing the Common Core Mathematics Standards; assists teachers in responding to trends in assessment data; supports teachers as they develop rigorous assessments; co-teaches in math classrooms and teaches her own section of geometry students. During Heidi's 22 years of mathematics experience, in NH, VA and FL, she taught middle and high school, and worked as an Assessment Editor for Harcourt School Publishers gaining valuable experience with national, state, regional, and local mathematics standards in relation to print and database assessment. Her particular educational interests include a passion for research and data to improve instruction, learning, and achievement in math, assisting teachers in differentiating quality mathematics lessons for everyone, and working with at-risk populations to make math accessible for all learners. Evidence of these interests is the Make-and-Take Room, which Heidi has facilitated at NHTM conferences since 2009 and at ATMNE in 2010 and 2011. Heidi studied at the University of Central Florida where she earned her B.S. and M.Ed. in Mathematics Education, through the Martin Marietta/UCF Academy for Mathematics and Science.

Candidates for Middle Level Representative:

Katrina Hall

Katrina Hall is a 7th grade teacher at Hollis Brookline Middle School. This is her 13th year at HBMS where her main duty is teaching mathematics to seventh grade students. Katrina has been a member of NHTM since her pre-teaching years. She is the current Middle Level Representative but has also volunteered as the Regional Coordinator as well as the South Central Coordinator. All levels of the NHTM membership have allowed her to support the learning, and teaching of mathematics with others, for her own continued learning, and across New Hampshire. In addition to her work at HBMS and NHTM, Katrina is also an online mentor and facilitator for 'The New Teacher Center'. Through the Teacher Center she mentors beginning teachers to increase effectiveness in the teaching arena. She also facilitates teacher courses at 'Open NH'. Most recently, Katrina is a doctoral student where she focuses on a students' ability to learn mathematics. Her personal belief is that all students can learn mathematics; she does not believe there are students who have a genetic disposition which creates the inability to learn mathematics. How can we change this misconception and negativity towards mathematics to better prepare our children and students for their future careers? What roles can teachers and schools take on to rid our communities of this misconception and the existence of this "mutated gene?" These are foundations for her upcoming areas of studies.

Matina Goulakos

Matina Goulakos is a recent graduate of the elementary mathematics specialist program at Keene State College. She is currently working in a Grades 5-6 school which is part of the middle school configuration in Newport NH. She is serving as the Title I Mathematics Teacher. In the short time she has been in Newport, she has been a great asset and really motivated to get involved with many professional activities.

Candidates for ATMNE Representative:

Robert Lukasiak

Rob Lukasiak has enjoyed serving NHTM as a Board member and Representative to ATMNE over the past 3 years. Rob also served as Program Chair for the 2009 Spring Conference, Technology Chair for NHTM's 2013 Spring Con-

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From the desk of the Membership Chair...

As of January 2014

	SY 13-14	SY 14-15	SY 15-16	SY 16-17	NHJEM 2014	Up-to-date Total
Individual	223**	42	3	2	2	
Institutional						
Totals	223	42	3	2	2	272

** Includes 6 Honorary Life-time Members

Thank you for your membership renewals. Our current membership is at 272.

On March 17th at our 51st Annual NHTM Spring Conference to be held at NHTI in Concord, NH we plan to honor our members who have been in the organization for 25 years. If you plan on attending the Conference this year and you fall into this veteran category please check with me through email at Gretchen.Scruton@gmail.com so you too will be recognized!

Gretchen Scruton

Two Candidates Vie for ATMNE Representative

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ference, and as Technology Co-Chair for the 2010 ATMNE Fall Conference. Rob, a graduate of St. Anselm College and UNH, has been teaching (and learning!) mathematics in one form or another for well over 30 years, 22 of which were at Goffstown High School. He also has a lot of experience teaching as an adjunct instructor at the college level. Since leaving the classroom in 2004, Rob has continued to work with schools, teachers, and students in a variety of contexts. Rob currently works as an independent consultant in the role of "math coach" for several school districts. Rob has also been involved in a variety of other projects including assisting teachers to obtain alternative teacher certification, Praxis preparation, competency development, standards based grading, assessment, ELO's, and working with Charter Schools.

Suzy Gagnon

Suzy teaches mathematics education for the University of New Hampshire, coaching in-service teachers of grades K-12 around the state. Prior to her time with UNH, Suzy was selected as a Distinguished Educator for the NH Department of Education and in that role worked with SINI schools and helped to lead teams during HOPE summer institutes. Suzy also taught grades 1-8 with Oyster River Schools and during her experience at Mast Way Elementary, Suzy was honored with the Presidential Award for Excellence in Elementary Mathematics Teaching. Suzy is an active member of NHTM and NCTM, having spoken at regional conferences and serving on the committee of last year's Anniversary Celebration. Suzy has also served as President of NHTM, and looks forward to returning to the board.

Middle Levels Representative

Twitter, Blogs, and Mathematics

By Katrina Hall

Are you tweeting? Are your blogging? How are you using social media to enhance your teaching and the learning of your students?

Over the past years, I have gone to numerous events with the goal of progressing and developing student learning. This includes networking daily discussions with fellow teachers, attending whole day and evening workshops, as well as conferences, which can last several days. No matter the format, I reflect upon the experience and think of ways in which I can use my new knowledge to support the students in the classroom.

As times have changed, educators have found time and money to be factors, which limit the professional development opportunities in which they can partake. With districts tightening budgets there just is not enough money or professional days to be shared. How can educators get around this? My answer would be using social media. It is free and available at all times and the professional learning communities which benefit student learning are truly astounding.

For some the idea of transforming to social media for professional learning may be frightening. The best way to overcome this challenge is to take baby steps. Try reading or following a few bloggers. You will find a range of individuals sharing their professional philosophies, lessons, projects, articles and brainstorming sessions. Some of my favorite bloggers are Elissa Miller (http://misscalculate.blogspot.com) and Julie Reulbach (http://ispeakmath.org). Have you read Dan Meyer's blog (http://blog.mrmeyer.com)? How about Fawn Nguyen's blog (http://fawnnguyen.com)?

And then there is Twitter. Ask a peer to help you create a Twitter account. For those who are fearful, don't worry; you do not have to "tweet." Instead start to check in with #mathchat or #mathed once a week. Here you will find other teachers who are sharing their mathematics from daily problems to lessons, which they need help developing. Start to follow these people. Soon you will find yourself surrounded by professionals and resources which you could never gain in a single workshop. You will have a flood of professionals available to you beyond the one day.

The ultimate goal is to build upon the mathematical network you currently have. Go outside the walls of your classroom, your building and your district. Use social media to develop your professional learning communities; it is there all the time, and there is no cost. No budget restraints and the benefits you bring back to the classroom will be nothing but substantial for your math students.

I hope to see you on Twitter soon and would enjoy reading your blog post some day.

Visit nhtm.wildapricot.org for up-to-date news about New Hampshire Teachers of Mathematics.

ATMNE Update

NHTM Receives ATMNE Grant for Summer Project

By Rob Lukasiak, ATMNE Representative

NHTM was one of two organizations that recently received grants from ATMNE. The awards were announced this past October at the ATMNE Conference that was held in Killington, VT. ATOMIM (Association of Teachers of Mathematics in Maine) was the other award winner.

The $2000 award will be used to help support a pilot program focused on children from immigrant or low socioeconomic families who may be performing below their potential. NHTM will seek to recruit 20 -25 students, entering grades 3 through 8, to participate in a one week camp experience this summer (2014) at Keene State College.

Keene State College will be hosting the camp and has generously donated classroom space. Dr. Beverly Ferrucci, a Professor of Mathematics at Keene, will serve as Director for the project. The Impact Center at Plymouth State University has also graciously offered access to their collection of *Australian Tasks* as a source for materials. Dr. Richard Evans and Dr. Fernand Prevost have also volunteered their time to help train and mentor two instructors who will be chosen to work at the camp and with the *Australian Tasks*. One of the goals of the project is to expand the camp to other areas in the state in the future.

The hope is that these students will benefit from the opportunity to:

- learn significant mathematics from high quality instructors
- experience a college campus
- be a part of a community of learners
- realize that college is within their reach
- learn how to take on the responsibility for their own learning

Drs. Ferrucci, Prevost, Evans, along with the instructors, will be presenting the outcome of this project at the 2015 NHTM Conference and at the 2015 ATMNE Conference. In addition, the outcomes along with some activities will be shared in future issues of *Mathesis,* ATMNE's newsletter, or The New England Journal of Mathematics.

ATMIM Announces Saturday Conference in Massachusetts

Find it hard to attend a conference during the schoolweek? Our neighboring affiliate, the Association of Teachers of Mathematics in Massachusetts (ATMIM), is proud to present their Annual Spring Conference, honoring ATMIM's 111th year of service to mathematics educators across Massachusetts and the New England region. It will take place in Hopedale, Massachusetts, at ***Hopedale Jr - Sr HS*** on ***Saturday, March 29, 2014.*** The theme for the conference is Connecting the Math We Teach to the Real World and Margaret Decker, Director of STEM Education at MA DESE, will deliver the keynote address. The conference fee of $60 includes a light breakfast and lunch as well as the opportunity to attend a day of presentations covering the spectrum of K-12 mathematics. Visit www.atmim.net for additional information or to register.

NCTM News:

Annual Meeting and Statistics Resources

Just a reminder that registration is open for the NCTM Annual Meeting and Exposition being held in New Orleans on 9 – 12 April. There is an $80 savings on registration if you register by March 7th.

Some of the excitement of the Annual Meeting and exposition includes Steven Strogatz, author of The Joy of X, as the speaker in the opening session and Bill Amend, creator of *Foxtrot,* the speaker at the closing session. In between there are over 700 sessions, workshops and bursts covering areas such as:

- Learning practices central to teaching to the Common Core State Standards**.**
- Practical solutions to transform your classroom into an environment rich in problem solving**.**
- New and effective methods to incorporate technology in the classroom.
- Answers to pivotal questions and concerns of new and soon-to-be teachers.
- Ideas and discussions that will refresh and excite the seasoned among us.

For more information on some of the key presenters and offerings go to http://www.nctm.org/conferences/content.aspx?id=39874http://www.nctm.org/conferences/content.aspx?id=39874

An online Conference Planner is available at http://nctm.confex.com/nctm/2014AM/webprogram/start.html . Here you can see what is being offered each day and begin to plan what you would like to attend. I hope to see you there!

On top of the anticipation and excitement of annual conferences and expositions, remember that the NCTM has a lot to offer us in our day to day work with students and our professional growth. One of the new offerings is STEW (Statistics Education Web) – a k-12 online resource of peer-reviewed statistical lessons whose concepts follow the recommendations of the Guidelines for Assessment and Instruction in Statistics Education (GAISE), the Common Core State Standards and the NCTM Principals and Standards for School Mathematics. STEW materials can be accessed at http://www.amstat.org/education/stew/ .

Professional Development and Coursework

- Masters of Science for Teachers (MST) in Mathematics Program at UNH is designed primarily for teachers of secondary and middle school mathematics and provides a broader and deeper background in several areas of mathematics including algebra, geometry, and analysis. There are opportunities to explore additional content areas of mathematics and issues related to mathematics education with fellow educators. Courses being offered this summer, June 26—August 1, are MATH 906: Analytic and Transformational Geometry, MATH 913: Graph Theory, MATH 915: Algebraic Structures, and MATH 917: Proof and Problem Solving. For course descriptions and more information about the program, visit our website at http://math.unh.edu/graduate/teach.
- Rivier University will offer two mathematics courses for teachers at its Nashua campus this summer. MA565 Concepts in Calculus will be offered on Tuesday and Thursday evenings from May 27 through July 3 while the one-week course MA523 Mathematical Patterns and Connections will run during the day July 14-18. For course descriptions or information on the Master of Arts in Teaching Mathematics program, see www.rivier.edu or contact tmagnus@rivier.edu.

MoMath Reveals Mathematical Wonders

Have you had the chance to visit the National Museum of Math (MoMath) yet? This museum in New York City recently celebrated its first birthday, and has a lot to offer you, your family, and your students.

MoMath's mission is to enhance public understanding and perception of mathematics. It has dynamic exhibits and programs which stimulate inquiry, spark curiosity, and reveal the wonders of mathematics. Exhibits include a Hyper Hyperboloid, Polypaint digital canvas, a square-wheeled trike, unusual construction materials to experiment with, and opportunities to see how shapes can be transformed by mathematical operations.

Check out their website www.momath.org for more information on the exhibits and planning your visit. They will help you plan special activities for school groups. In addition, MoMath offers special activities throughout the year. Some of the upcoming activities include:

***Math Encounters*: Modeling the Melt**, **Wednesday, March 5, 4:00 pm or 7:00 pm**
Come along with Ken Golden, the Indiana Jones of mathematics, as he explores the mathematical underpinnings of this mysterious precipitous loss of Arctic sea ice and takes us (via video) on an Antarctic expedition. Contact mathencounters.org.

***Family Friday*: MoMath's Pi Day Celebration**, **Friday, March 14, 6:00 pm**
Celebrate Pi Day at MoMath! Join us on March 14 (that's 3.14) to celebrate Pi Day, featuring KenKen® inventor Tetsuya Miyamoto and Presidential Teaching Award recipient Dave Masunaga. Space is limited, so register early at piday.momath.org.

MathematiComics, **Sunday, April 6, 2:00pm**
Come play inside the strange and unexpected world of math in art! Internationally known comics artist Marek Bennett will teach children mathematical patterns and tricks to create original mini-comics. No comics experience necessary—if you can draw a circle, two points, and a line segment, you've got yourself an original character! All supplies provided. Families welcome but space is limited, so register at mathematicomics.momath.org.

Tweet! Hashtag! Like! Share!

That's right, these do not need to be just words spoken by your students.

Follow NHTM on Twitter and Like Us on Facebook and stay connected professionally.

@NHTM1964

Like us on Facebook

NHTM tweets and posts all upcoming events, so that you never miss the professional development geared towards you.

Join in on the hashtag fun during this year's Spring Conference.
Use #NHTM14 to tweet upcoming sessions, inspiration, discussions, links, and even pictures of your conference experience. Keep the entire conference connected. If you love what you are learning, tweet it so others not in your session can also learn.
Its a great way to connect and share!

The Spring Conference will also have a Mobile App! More details coming soon!

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

Professional Development and Conferences

National

T^3 Annual Conference	Las Vegas NV	7 - 9 March 2014
ICTCM 25th Annual Conference	San Antonio TX	20-23 March 2014
NCSM 46th Annual Conference	New Orleans LA	7 - 9 April 2014
NCTM 91st Annual Meeting & Exposition	New Orleans LA	10 -12 April 2014
MAA Mathfest	Portland OR	6-9 August 2014
AMATYC 40th Annual Conference	Nashville TN	13-16 November 2014
Joint Mathematics Meetings	San Antonio TX	10-13 January 2014

State

NHTM Annual Spring Conference	Concord NH	17 March 2014
41st annual State Mathematics Contest	Plymouth NH	18 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 The purposes of NHTM shall be to increase interest in mathematics, to secure improvement in the methods of teaching and learning mathematics, to improve the selection of the subject matter, to establish close relations among teachers and users of mathematics, and to promote professional and social relations among mathematics teachers in schools and colleges.