



Mathesis

Volume 50, Issue 1

August 2017

Happy 50th!

Message from the Editor
Elisabeth Johnston

This year marks the 50th volume of the Mathesis! To celebrate this milestone, you will find nods to the number 50 in various articles this year. In addition, we will scour the archives of the newsletter to share articles from the past 50 years.. To start the year, we have a problem for you and your students to solve.

The first issue of the Mathesis was published in 1967. Using these digits (1, 9, 6, and 7), can you make the number 50? How many ways can you find?

Have a solution that you would like to share? Please email your solutions to NHTM President, Annie Wallace at nhtmpresident@nhmathteachers.org by November 1st. We will share solutions in the next edition of the Mathesis.

President's Message

By Annie K Wallace



While most everyone has been busy throughout the summer preparing for the 2017-18 school year, it is now approaching time for opening day! I think that we truly are one of the few professions that can have a new start, a new year. As we reflect upon what we have done, on what works well, on what we can change/modify, or try for the first time, we can

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President's Message **Opening Day—Welcome to the 201-2018 School Year!**

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begin to plan for our students. And as we progress through the first few weeks, the first act, we get to know our students, allowing for us to plan with greater intention for each class and each student; better able to reach that fairness in providing for the class as a whole, as well as the student as an individual. It is that planning and teaching with intention --- of reflecting upon ourselves and in the consideration of each student within our class(es) that allows equity to be fostered for each student in their learning.

John Hattie et al. in the book *Visible Learning for Mathematics* (2017) states that there is a balance of methods that makes for strong instruction and effective learning. "Good instruction – must be intentionally designed and carefully orchestrated within the classroom, and should always focus on impacting student learning." (p.3-4) This begins with understanding ourselves, our curriculum, the standards, mathematical practices, and learning objectives for each lesson along with knowing each student and where they are in their own learning progressions. It is also in recognizing, that we, as teachers, specialists, and administrators, take on the roles of producers, directors, managers, and stagehands, along with being a minor character (facilitator) on stage. The students are the ones who take on the starring roles as they take ownership of their learning, participate in discourse and

collaborate as they work on challenging tasks together.

So much of what we hear about math in the media and in social conversations can be very discouraging. "Oh math, I was never good at it", "Oh well, it is math, what do you expect", and so on. The counter action can often be that math is needed and useful, so you must accept it as a necessary burden and learn. Recently on [the PBS NewsHour](#), I heard the mathematician Eugenia Cheng speak. Her talk may help provide the background scenery and music for our year. She discusses that while it is important to learn math because it is useful, that this alone is probably not going to get a young person interested in it. We need to let people know that while math may be useful, that not all math began as anything useful or practical. Cryptography comes from some number theory which begun 300 years ago. Calculus depends on irrational numbers that the Egyptians wondered about thousands of years ago and the icosahedron, created by the ancient Greek mathematicians, is now being applied to the study of viruses. Math can be fascinating, fun and its learning stimulated by sheer curiosity; if we see the excitement in math and share our own curiosity and fascination as well as the appreciation for the power and usefulness that mathematics can provide, then we are more likely to draw our students in and engage them in the good tasks and problems we have chosen for them to explore. So, as you do all of the last minute production things and preparation for opening day --- think about enjoying and celebrating with the students during this new year of learning!

President's Message **Opening Day—Welcome to the 201-2018 School Year!**

(CONTINUED FROM PAGE 2)

And as we go through the year; getting closer and closer to the final show in June, facilitating, engaging our students in their learning, and setting attitudes towards mathematics, we are also creating memories, some of which may not be treasured or appreciated until years later.

It is here that I would like to give our sympathy and condolences to the family, friends, colleagues, and students of David Kent, NHTM's historian, and coordinator for many years of the annual NH High School Math Competition. He will be missed, but has left us with many good memories to cherish and share. We thank you for these David and for enriching our lives.

David (Dave) Gordon Kent (12/31/1938-8/12/2017)

By Steve Latvis



Dave, a friend, colleague, and mentor to so many mathematicians and mathematics educators in New Hampshire, passed away on August 12th. He will be dearly missed and it is my honor to attempt to sum up this great man in a mere few words.

Dave was able to combine his love of mathematics and competitions as a mathematics team coach. He coached the Contoocook High School mathematics team for several years and ended up coordinating the NHTM State Mathematics contest for as long as I can remember. Always happy, positive, and upbeat, Dave was able to bring together upwards of 50 schools every year to meet for one day in March (weather permitting) to compete in this academically rigorous, yet fun event. With his beloved wife, Barbara, by his side, the two of them would host about 500 students and 100 coaches (with the coaches snacking on lots of tasty treats).

Several years ago, Dave passed the baton to me to carry the contest forward. I learned so much from Dave about how to run a successful contest and have done my best to carry his traditions forward. Every year all anyone that is at the contest looks forward to are the beloved mechanical pencils given to all participants at the contest. Students and coaches alike use these pencils for many, many years, after the contest and look back with fond memories of that day.

It is with deep sadness that I write these words. Dave was a dear man and his love of mathematics and his inspiring enthusiasm for competition will live on in the hearts of all the students that attended the competitions. You will be missed, my friend.

Elementary Representative **Growth Mindset and Mathematics**

By Amy Gregoire

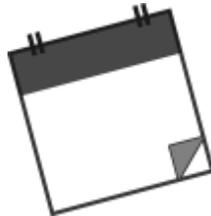
How often have you heard an adult say, “Oh I’m just not a math person”? Have you heard a parent say to a child, “Oh don’t worry, I was never any good at math either”? We would never hear an adult say to a child, “Oh I’m not a reader” or “Don’t worry, I can’t read either.” Some how it has been socially acceptable for people to say that they can’t do math. This idea that only certain people have the ability to perform mathematical problems is called a fixed mindset.

There has been a ton of research completed about how the brain grows. What scientists have found is that those

people who have a growth mindset and who believe that they can succeed, often outperform those with a fixed mindset. They have also discovered that when a person makes a mistake, as well as if they realize they made a mistake, their brain creates new connections among neurons.

Due to this research, it is so important to send students the message that they can succeed in math with some perseverance. They may not understand a concept, but as Carol Dweck says, they may just not understand it yet. Jo Boaler has a set of free online videos that teachers can share with students to help them understand the power of having a growth mindset, where one is willing to make mistakes and learn from their mistakes. For more information on growth mindset in mathematics head to <https://www.youcubed.org>.

Save the Date!



Fall Dine & Discuss

October 10, 2017

4:30-8:00pm

[Kimball Jenkins Estate](#)

Concord, NH

Topic: Access and Equity

**Keynote Speaker: Robert Q. Berry, NCTM President-elect and
Associate Professor at University of Virginia**

In celebration of NHTM's 50th volume of the Mathesis
Elementary Representative
Activities Involving the Number 50

By Amy Gregoire

Target 50

Players choose four number cards and arrange them to obtain a total as close to 50 as possible using both addition and subtraction. The player with the closest total wins the round. This game is great for practicing mental math.

50th day of School Activities

On the 50th day of school have students bring in 50 of one kind of object. Students can count the objects and group objects by 2's, 5's or 10's.

Have students brainstorm all the different ways they could represent the number 50. This could be with a variety of manipulatives such as money, base ten blocks, cubes, Cuisenaire rods, tally marks, roman numerals, or expressions.

Have students go shopping. Using a shopping flyer, give students fifty dollars of play money. Have them purchase as many items as possible without going over. They could then figure out how much money they would have left.

NHTM Scholarship Awardees

Nicholas Payne of Salem HS is the recipient of the HS Scholarship. Nicholas will be attending Northeastern University this fall to major in Mathematics. In speaking of his wish to become a teacher someday, Nicholas commented that, "I enjoy being able to start at the very beginning of a topic with another student and then work towards the mastery of it. This also allows me to have an opportunity to see a topic from a different perspective. Because of this, I also learn about the topic that is being discussed. This is why I enjoy teaching."

A quote from one of Nick's recommenders, "A dear young man with a bright future and I couldn't be more excited to learn he may

be taking his talents to education. What an asset and role model he would be to young students!"



Photo of Nicholas (Nick) Payne and Salem HS Mathematics Teacher, Gregory Paris

NHTM Scholarship Awardees

(CONTINUED FROM PAGE 5)

Maria Aiello, an Elementary Education Major at Keene State College, is the recipient of the College Scholarship. A quote from Maria's application, "I believe elementary schools are in need of educators who are very skilled and knowledgeable about the field of mathematics. In the future, I would love to do math education research to find new, effective ways to help children not only understand, but love and appreciate mathematics."

A quote from one of Maria's recommenders, "When she becomes an elementary school teacher, she will be an important math resource for other teachers at her school ... I am impressed by her irrepressible enthusiasm and commitment."

Middle Level Representative **Goal Setting for Student Empowerment**

By Katrina Hall

In the August NCTM President's Message, Matt Larson, discussed *Setting Goals for a New Year*. Larson's key points made me think about goal setting and how goal setting is not only a tool for teachers but also a powerful tool in empowering students and supporting equity in the classroom.

Larson emphasized a commitment to collaboration amongst colleagues as a key component in equitable learning experiences for all students. Failing to collaborate puts teachers in a position where they fail to discuss, compare, debate, reflect, revise and improve. This same idea of commitment to collaboration and avoidance of isolation can be expanded to students. If they fail to collaborate with others they too will work in isolation and fail to benefit from positives of collaboration. As teachers, we should look for students to void their learning experiences of isolation and guide students in a commitment to collaboration so they too can have ample opportunities to discuss, compare, debate, reflect, revise and improve.

Guide students in becoming active participants in their learning. Provide students with the time to reflect on who they are as math students. In fact, do this frequently and not just at the start of the year. Lead students in understanding their past achievements in math and how they can build on these achievements to become successful math students. Turn their focus from math levels, weaknesses and groupings to a focus on learning targets where individual goal achievement is the focus. Taking the time to talk and listen to each student is an initial step in empowering students and giving them a voice in their learning.

The task at hand is not to make drastic changes to your classroom practices. The task

Middle Level Representative **Goal Setting for Student Empowerment**

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is to collaborate with students to design individualized goals that will help students build on their current knowledge. The task is to listen to students so to provide them with the supports they can continue to grow mathematically. The task is to teach students how to persevere.

Empower students in the math classroom by giving them a voice in their learning. Provide a classroom where collaboration, goal setting, revision, perseverance and reflection are common practices. Use goal setting as a tool for student empowerment in the math classroom. Make change happen.

Where do you start? Start by setting goals this year that are manageable and achievable. Look through some of the rich resources on student empowerment, collaboration and equity available through NCTM. Reach out to a fellow colleague to collaborate on a common goal or ask for feedback to refine. Set the goal and move forward. Stop and reflect at various times throughout the year. Remember, you might make mistakes. Revise and move on. Persevere to the end. Your students need you.

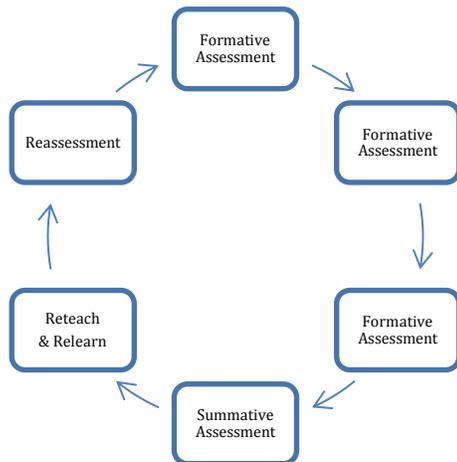


**Keynote Addresses by
Steve Leinwand and Tracy Zager**

**Come learn with us on the theme of
Common Sense Mathematics. Explore
thoughts and ideas related to curriculum
and instruction in your classroom.**

Secondary Representative Obsessed with Assessment

By Lesley Fallu



August is here and I am beginning to redesign units, wondering how to manage the assessment cycle in each of my classes. The move toward competency-based learning has presented some challenges. How can I ensure that each of my one hundred, or more, students is reaching learning goals and moving toward competency? I wish I had the answer. It is a bit overwhelming. In a perfect world, I would begin the cycle with formative assessments such as

- Promoting student discussion using Think-Pair-Share, Four Corners Connections, Turn and Talk, and other activities
- Observing students while taking notes on individual learning styles
- Incorporating collaborative work culminating with student presentations
- Encouraging students to write in journals and portfolios
- Fostering self-assessment opportunities for students using rubrics to examine their work

- Monitoring progress using warm-ups and exit tickets
- Giving constant feedback to enhance the learning process

I am certain that you can add to the list of formative assessments. All of this is followed by the summative assessment: a traditional unit test, a project, a written journal, or a presentation. This is, of course, where the reassessment comes in. Based on performance, if a reassessment is indicated, reteaching and relearning may include:

- Student self-reflection on preparedness, or lack thereof, for the assessment
- Completion of formative assignments leading to the summative assessment
- Extra practice to improve skills
- Using online resources to relearn content
- Making corrections and identifying the type of errors made
- Meeting with me to explain misconceptions and errors

In a 2013 article, [Reassessments and Retakes: A Necessary Part of a School-Wide Grading Policy](#), Brian Stack reminds us that, “Making reassessments a school-wide practice changes the learning culture for students from one where they are trying to earn enough points to *pass* to one in which they are held accountable for everything they need to know and be able to do.” My question is how can we find the time to do this individually for each student requiring reassessment, while continuing to move forward in the curriculum?

Secondary Representative **Obsessed with Assessment**

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I, for one, am going to take advice from [NCTM's Alternate Forms of Assessment](#), "Don't try to do it all at once. Pick one assessment idea... and try it for a while. Revise and try again. Find ways to make the idea simpler and work with your unique classroom needs. In [Focus on Learning, Not Grades](#), Barbara A. Swartz recommends "assessing *for* learning" by providing feedback rather than using grades on formative quizzes. She stopped assigning grades and began using comments that required students to further explain their work. These quizzes

contained questions similar to those used on summative assessments. Her students found this extremely helpful. They were able to focus on the learning, rather than being "distracted" by a poor grade. Take a look at other teachers' comments on her blog.

Although, I am not sure how parents will respond to this change in grading procedure, I am going to give it a try. I am hoping to see an increase in learning and a decrease in the number of reassessments. How do you manage reassessment? Do you use a particular reassessment form? What reassessment strategies do you find most appropriate in high school? I'd love to hear from you.

NCTM Representative **Access, Equity, and Advocacy, at the Affiliate Level**

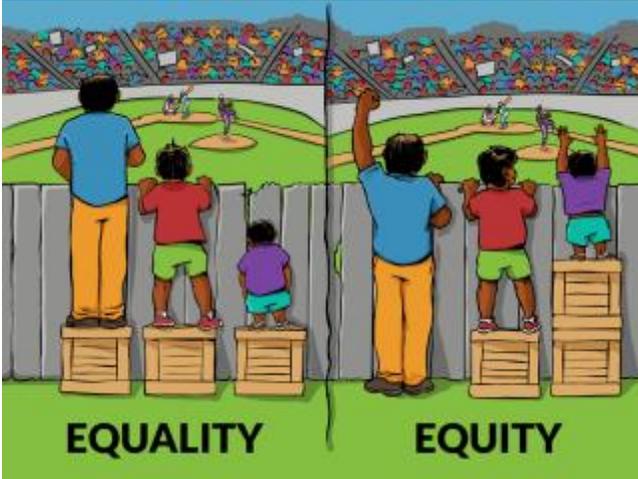
By Terri Magnus

At the end of July, Rob Lukasiak, NHTM President-Elect, and I had the honor of representing NHTM at the NCTM Affiliate Leadership Conference (NCTM-ALC) in Baltimore, MD. Although this conference only lasted two days, we were kept busy with discussions of NCTM initiatives, the sharing of affiliate successes and challenges, and the development and critique of an action plan for our affiliate. We met new friends and rekindled old relationships and learned a lot. The action plan we're developing is definitely a work in progress and will need to be approved by the rest of the board before it can be shared. We hope that we can sustain the energy from the conference and bring about important change.

Much of the work revolved around the theme of the conference, "Intent to Impact: Addressing Access, Equity, and Advocacy in your Affiliate," and we will be encouraging the NHTM Board and Membership to consider these themes. As we reflected on mathematics education in New Hampshire, we thought about a number of possible factors affecting New Hampshire students' access to high quality mathematics education: the financial resources of each district, the tracking of students, teachers' preconceptions of students' ability, the way teachers are assigned classes, the willingness of teachers to use best practices, and the socio-economic, racial, and ethnic background of each student. We also have immigrants and English Language Learners

NCTM Representative Access, Equity, and Advocacy, at the Affiliate Level

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in our schools. How can we insure that EVERY student has the opportunity to learn mathematics?

The term equity is different than the term equality. The graphic here helps to illustrate the difference. Equality suggests that we give the same lessons, support, and resources to all students, but with equity we recognize that the students are individuals who enter our classrooms (and the school) with different needs and at different places. Attending to individual student

needs is essential to enable each student to participate fully in the learning environment. At the NCTM-ALC, we were also shown a third frame in which the fence had been removed and the word “liberation” was written encouraging us to think about removing the barriers that our students might encounter. A participant suggested that a fourth frame should be introduced as well where the students are no longer mere observers but active participants in the game. As teachers we should be mindful of our goal to help our students become independent learners, independent problem solvers, and independent thinkers. Are we giving these reasoning and sense-making opportunities to all students or just the ones we predetermine to be “ready”? How can we give ALL students rich mathematical experiences?

My column this issue is one small step in advocacy for access and equity in mathematics education. We can reflect on our own practices and the structures within the schools where we teach to identify the existing barriers to access and equity and then advocate within our departments and institutions to improve. We can advocate to parents and friends about why and how we teach for mathematical understanding and reasoning rather than rote recall. We can help our fellow citizens and elected officials understand the facts and dispel the myths behind the Common Core State Standards in Mathematics and speak up for fair and adequate funding of schools in our state.

INNOV8
CONFERENCE



Breaking Barriers:

Actionable approaches to reach each
and every learner in mathematics

November 15–17
Las Vegas

NCTM Representative **Access, Equity, and Advocacy, at the Affiliate Level**

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NCTM offers a number of resources to help mathematics educators as they advocate for access and equity:

- Links to official policy statements of NCTM including statements on Access and Equity, Use of Calculators, Algebra for All, the Rush to Calculus, Teacher Evaluation, High-stakes Assessment, Linking Research to Practice, High Expectations, Intervention, Early Childhood Mathematics Education, the Common Core, Teaching English Language Learners, Procedural Fluency, Elementary Mathematics Specialists, and more: <http://www.nctm.org/Standards-and-Positions/NCTM-Position-Statements/>
- Innov8 Conference November 15-17, 2017 will have the theme “Actionable Approaches to Reach Each and Every Learner of Mathematics”: <http://www.nctm.org/innov8/>
- Webinars, including the NCTM President’s messages and a series on equity and social justice: <http://www.nctm.org/Conferences-and-Professional-Development/Webinars-and-Webcasts/>
- Numerous books and other publications: www.nctm.org
- An advocacy toolkit with a guide to communicating with the media and elected officials: <http://www.nctm.org/Research-and-Advocacy/advocacy-toolkit/>
- At-large affiliates advocating for equity with a focus on specific groups of students:
 - TODOS: Mathematics for All (multicultural, especially Latino/as): www.todos-math.org
 - Benjamin Banneker Association (African American): www.bbamath.org
 - Women and Mathematics Education: www.wme-usa.org

Art’s Attic **Thales and the Solar Eclipse**

By Art Johnson

Did you see the total eclipse that cast its shadow across the United States recently? No? Well, another one is coming in 2024 and will darken northern Vermont and Montreal, so you’ll have another opportunity to see one. We take the accuracy of eclipse predictions for granted,

but it involves detailed mathematics and scientific knowledge.

Who was the first to predict a solar eclipse? Greek historian Herodotus (writing some 100 years later) credits Greek mathematician Thales (c.624 BCE - c.547 BCE) with predicting the eclipse of 585 BCE. Thales did not predict the exact date but only the year. Because his fame, however, that was good enough for most people. Who was Thales?

Art's Attic

Thales and the Solar Eclipse

(CONTINUED FROM PAGE 10)

Thales was born in the Turkish city of Miletus. As a young man he showed a natural curiosity for nature and for mathematics, but found there was little time left for these things after working all day. That would soon change and he would be free to spend the rest of his life in the pursuit of knowledge. One spring when Thales was in his 20's he noticed that all the olive trees were full of buds. That meant a large olive crop in the fall. Others noticed too and there was a buying frenzy, as many opportunists tried to buy up the olive groves. Thales had another idea. He bought up all the olive presses he could find. In the fall, a bumper crop of olives came in. By then Thales had a virtual monopoly on olive presses. He was in a position to charge whatever price he wanted to press the olives. As it turned out he charged just a bit above normal. Why? Thales had already calculated that he would be a rich man, even with his moderate prices for pressing the olives. By not raising prices to stratospheric heights, Thales demonstrated that if he wanted to, he could be a man of wealth, but that the pursuit of riches didn't interest him. Thales wanted to be a man of knowledge.

Now that he was independently wealthy, Thales began to travel, gathering knowledge wherever he went. Eventually he went to Egypt. While there, he amazed the priests by using shadows and his knowledge of similar triangles to measure the heights of the pyramids. He also learned about all the geometry that the Egyptians had accumulated, including the

fact that a triangle with sides in the ratio of 3:4:5 must be a right triangle.

Eventually Thales returned to Miletus and began to apply his logical thinking to the study of geometry. Some historians claim that Thales was the first to formally prove a geometric theorem. In fact, he is credited with proving the following five theorems.

1. A circle is bisected by its diameter
2. The base angles of an isosceles triangle are congruent
3. The two angles formed by two straight lines (vertical angles) are congruent.
4. Two triangles are congruent if they have 2 pairs of congruent angles and a pair of congruent sides.
5. An angle inscribed in a half circle is a right angle.

Did Thales really prove these five theorems? It is hard to be categorical about it. None of his writings survived to even Aristotle's time (c.350 BCE) but Aristotle and other ancient historians claim that Thales was the first to prove geometric theorems.

Little else is known about Thales. He is recognized as the first philosopher to try to explain man's origin without using myths about gods and goddesses. For example, he postulated that all life originated from water. While such a statement seems primitive by today's standards, it was a revolutionary departure from all preceding explanations of man's beginnings. He was the only one of the Seven Sages who used observations of nature to frame conjectures. Thales is also credited with the advice to "Know thyself." That advice is as valuable today as when Thales first pronounced it.

Art's Attic **Thales and the Solar Eclipse**

(CONTINUED FROM PAGE 12)

There is one last story about Thales. It took place when he was a young man, before he pressed all those olives. It seems that Thales was leading a donkey loaded with salt to market. While crossing one of the many streams on the way, the donkey stumbled into water. The water dissolved some of the salt, and when the donkey regained its feet, its load was appreciably lighter. The donkey was a quick learner. At the next stream, it purposely fell into the water and got up with an even lighter load. And so it went, until by the time Thales and his donkey got to market there was hardly any salt left. There was just enough, however, to buy a load of sponges. Sponges? Thales loaded the donkey with the sponges and at the first stream the donkey fell again. This time when the donkey got up its load was exponentially heavier. One last falling routine at the next stream and the donkey

was cured, never again to fall into water to lighten its load. Thales had worked out how to cure the donkey of its bad habit in under an hour.

What about the eclipse? Despite what Herodotus wrote, Thales could not have had the mathematics knowledge or the scientific understanding about our solar system to make such a prediction. Well, how did he do it? He might have had access to Babylonian astronomical records about eclipses and noticed a pattern to them that enabled him to make his successful conjecture. There is no discernable pattern to the eclipses and whatever pattern Thales thought he saw did not repeat. Supporting this is the fact that Thales never made another prediction about an eclipse. Maybe it was a lucky coincidence. It is more likely that Thales was in the vicinity of the total eclipse and the populace there created the myth that the Wise Sage Thales must have known it was coming. It was not until about 150 BCE that Hipparchus was able to explain and predict solar eclipses.

Post Secondary Representative **A New School Year—New Adventures and New Challenges**

By Sharon McCrone

One year ago I wrote my first article for the Mathesis. The article started with the following sentence: "Summer is a great time for reflecting on one's work from the previous school year, learning new things, and looking ahead to the upcoming school year." In that spirit, I would like to reflect on the many new things I learned over the past year, including the summer, as I prepare for new classes and new students, new adventures and challenges.

Attending workshops and seminars over the past several months has helped to renew my commitment to help all learners in mathematics. At the same time, I have begun to think more deeply about what that means, *helping all learners*. Several of the workshops and conferences that I attended in the spring and summer had an overarching or underlying theme of access and equity. In some cases, the workshop

Post Secondary Representative **A New School Year—New Adventures and New Challenges**

(CONTINUED FROM PAGE 12)

leaders encouraged problem solving and for teachers to listen to all students' ideas as a means of bringing access and equity into the classroom. Others advocated for much more, and used words such as *culturally relevant* and *social justice*. I have been reflecting on these ideas, and struggling with how to implement them in my classroom, at the college level. What does culturally relevant geometry look like for mathematics majors? How can social justice be a part of Mathematics for Elementary Teachers? How will these approaches help me to make a difference in helping all learners of mathematics?

Well, I don't yet have answers to all of my questions, but I do have ideas for making strides in new directions, and that gets me excited for the new school year. Below are some thoughts and goals for myself (and for all teachers) related to my reflections above:

- Relating to access ... I believe all students should have access to relevant and high quality mathematics instruction. One way to provide access is to focus on problem solving and making sense of the mathematics involved.
- One way to provide access to relevant and cognitively demanding mathematics problems is to consider activities that (a) allow all students to have some success, and (b) open doors to higher learning or more abstract concepts. This idea of "low threshold – high ceiling" does not mean that some students are provided with mathematics that is less cognitively demanding. But it does mean that teachers need to be aware of students' challenges, their interests, and their backgrounds in choosing or designing tasks.
- Think about the students in your class who struggle with mathematics, and let them show you what they CAN do. Celebrate this with them! Then build on that to help them move forward.
- Help students to help each other make sense of the mathematical ideas in a problem situation.
- Learn about the students we serve and make connections through mathematics to their world. We should challenge ourselves to go beyond merely using students' names or interests in word problems. Can we find a social topic that of interest to a range of students and dig into the related mathematics?
- Think of the teacher you want to be – the best teacher you can be – and work toward that goal this year.

Stay Informed!



- NHTM New Hampshire
Teachers of Mathematics



- @NHTM1964

From the Archives--

Mathesis

NEW HAMPSHIRE TEACHERS OF MATHEMATICS WINTER 2000

PRESIDENT'S COLUMN

Beverly J. Ferrucci

It is proving to be another exciting year for the mathematics education community as we anticipate the debut of NCTM's Principles and Standards for School Mathematics at the national meeting in April. The Principles and Standards will build upon the Council's three previous Standards documents: Curriculum and Evaluation Standards for School Mathematics, Professional Standards for Teaching Mathematics, and Assessment Standards for School Mathematics. The update will include six principles that address Equity, Curriculum, Learning, Assessment, Teaching, and Technology.

This document will provide an excellent opportunity to reflect on where we have come since 1989 with the release of the Curriculum and Evaluation Standards to where we will be going as we move forward in this new century. We should try to find the time to read this new document, to implement some of these new ideas at the classroom level, and to share with colleagues our thinking and experimenting in this area. It can and should be used as a resource to help us in our efforts to improve the teaching and learning of mathematics at all levels.

These Standards will, of course, include a much more extensive dialog and discussion of the use of technology in our mathematics classes. It does seem amazing, though, that in 1989 we didn't have extensive access to the World Wide Web in our classrooms, and now it is a common event. Also, the document is expected to discuss changes and innovations that are affecting all aspects of teaching, learning, and assessing mathematics. The Standards do not expect us to throw out everything we have done in the past, but rather, to re-examine those practices, content, and delivery methods to carefully ensure that we are meeting both the current and future needs of our students in a thorough and efficient manner.

Individual teachers must decide what and how they are going to contribute to the improvement of mathematics instruction in their own classrooms and local districts. We are given that challenge at a time when our budgets are frozen or being cut, classes seem to get larger, and public support for what we do seems to be waning. Each class that we teach seems to take more energy than the last. How do we bring about the change that we desire in the face of this adversity? There is no program we can quickly adopt that will give us the answer, there are not large numbers of models that we can follow, and no quick solutions are within our sights. These situations all emphasize the need to provide teachers of mathematics with professional development opportunities to gain important curriculum information, share ideas, and formulate new methods and strategies for implementing this new vision.

Many of you have been involved with the local, state, and regional efforts to use the Standards to improve mathematics teaching and learning. Much has been learned about the Standards this past decade as they have helped to guide the development of many curriculum guides, assessment materials, and professional development programs. If we are to adequately prepare the students of today for the challenges that they must face in the world of their future, the Standards indicate that we must change how, as well as what we teach. Hopefully, many of us will be challenged and energized by this current focus on mathematics education.



Think about nominating yourself or a colleague for:

- [Richard H. Balomenos Memorial Award](#)
- [Richard C. Evans Distinguished Mathematics Educator Award](#)
- [Fernand J. Prevost Mathematics Teaching Award](#)
- [Presidential Awards for Excellence in Mathematics and Science Teaching](#)

Also encourage a college student and a high school senior to apply for one of the following scholarships:

- [NHTM Mathematics Education Major, Mathematics Major, and Elementary Education Scholarship](#) (HS)
- [NHTM Mathematics Education Major, Mathematics Major, and Elementary Education Scholarship](#) (College)

NHTM Executive Board

<http://www.nhmathteachers.org/page-1715832>

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Professional Development & Conferences

National

NCTM Regional Conferences	Orlando, FL Chicago, IL	October 18-20, 2017 November 29- December 1, 2017
NCTM Innov8 Conference	Las Vegas, NV	November 15-17, 2017
NCTM Annual Meeting	Washington, DC	April 25-28, 2018

Regional

ATMNE 2017	Marlboro, MA	November 2-3, 2017
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State

Fall Dine & Discuss	Concord, NH	October 10, 2017
Math & Science Joint Conference	Derry, NH	April 7, 2018

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 shall be to provide vision and leadership in improving the teaching and learning of mathematics so that each student is ensured quality mathematics education and each teacher of mathematics is ensured the opportunity to grow professionally.



Upcoming Deadlines

- Information for November Mathesis- November 1st
- Nominations for NHTM Awards
 - Balomenos- January 1st
 - Evans- December 15th
 - Provost- December 15th