

Mathematics in Vermont

The newsletter for Vermont's Mathematics Educators and supporters

May/June 2018

National Mathematics
Conference 2018

JumpStart Financial Literacy
Standards

Better Math Teaching
Network

*Catalyzing Change in High
School Mathematics:
Initiating Critical
Conversations*

Events, Announcements and
Resources



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- AOE Website: [The mathematics content page](#).

National Mathematics Conferences 2018

I was very fortunate to be able to attend the National Council of Supervisors of Mathematics (NCSM) and the National Council of Teachers of Mathematics (NCTM) conferences in Washington, DC in April. When I return from the conferences, I feel inspired, hopeful, uplifted, and motivated to set new goals for myself professionally, read new research and books, and the follow up on the connections made with people from around the country.

Throughout all of the sessions, I kept hearing the same message. "We have to look for evidence of student learning and listen to student thinking." Although these ideas seem obvious, I seemed to hear them in a new way. I was thinking about Vermont's shift to a proficiency-based model of teaching and learning and connecting the research and teaching practices that promise to improve the outcome of ALL students. Equity was a major focus for NCSM and NCTM this year, and when we do listen to student thinking and look for evidence of student learning, we can address the needs of all students. In this issue, I will focus on the book *Catalyzing Change in High School Mathematics* (NCTM 2018). In future issues, I will share additional materials around access and equity as presented at the national conferences.

JumpStart Financial Literacy Standards

In January 2018, the State Board of Education adopted [Jumpstart National Standards in K-12 Personal Finance Education](#) to replace the Vital Results Career Choice and Personal Economics standards of Vermont's Framework of Standards and Learning Opportunities. The Jumpstart standards supplement the current College, Career and Civic Life (C3) State Standards for Social Studies, Common Core State Standards in Mathematics (CCSSM), and Family and Consumer Sciences Education Grade Expectations. The State Board of Education recognized the multidisciplinary nature of financial literacy as these standards can be addressed within social studies, math, business and family and consumer science learning opportunities. Until a Financial Literacy page is created and curated by the Agency of Education (AOE), please note that links to the standards and pertinent financial literacy information will be maintained on both the AOE Global Citizenship and Mathematics sites.

Relevant resources can be accessed at [NextGen Personal Finance](#). This site is aligned with Jumpstart Standards and includes individual lessons, semester-long courses, assessments, case studies and projects. All of the resources on this website are free. Also, you can find resources at the [Jumpstart Clearing House](#).

Better Math Teaching Network

I had the opportunity to talk with Heather Vonada who is a math teacher at Woodstock Union High School. She is teaching Algebra 1 and Algebra 2 this year. Heather is in her second year of participation in a research study called the [Better Math Teaching Network](#). On their website they state, “The Better Math Teaching Network (BMTN) involves researchers, teachers and instructional leaders working side-by-side to improve instruction. The work involves specifying a common problem and ongoing testing and refinement.” The core principles of the network are:

- Teachers are central to change.
- Student-centered teaching is complex and almost impossible to do in isolation.
- Teaching can be continuously improved.
- Quick-cycle improvement methods provide opportunities to study and improve teaching.
- Research and practice should be seamlessly integrated.

Heather had to apply and be accepted into this program. She had full support from her school to pursue this opportunity. There are 25 participants from states in New England and West Virginia. The group meets for a week in the summer and then meet three times throughout the school year. The teachers have to identify change ideas that center on mathematical connections, justifications, or problem solving. The change idea is written into a Plan, Do, Study, Act (PDSA) cycle and carried out over a course of time. Evidence is collected and evaluated to determine the effectiveness of the change idea. The next cycle of change requires either a revision of the last PDSA or a new change idea.

When asked if this experience has changed Heather’s classes, she stated, “Yes! The biggest change is being more mindful of what is going on with every student. What are kids doing? What are kids saying?” Last year, Heather focused on having student-centered math talks to help students make connections. These math talks were centered on carefully selected math tasks. She found that students could make connections if the tasks allowed it. The task selection was an important part of the learning. This year, she is focusing on mathematical justification. She has learned that students need explicit instruction in how to state their thinking.

Heather has taken her learning and shared in various ways. Heather says that her department is changing. They are all part of a Teacher Development Group. She also presented some of her findings at the Vermont Council of Teachers of Mathematics (VCTM) 2017 Annual Fall Conference this past fall. She has also submitted a proposal to speak at the 2019 annual conference for the National Council of Teachers of Mathematics (NCTM).

When asked what’s the best part of being in the BMTN was, Heather stated that a few reasons came to mind. Having the opportunity to work with other teachers and from other places and collaborate on math was so valuable. Having time to talk and brainstorm solutions, get feedback and then apply the ideas improved teachings. Finally, she appreciated that the BMTN group treated the teachers extremely professionally and that professional opportunities were extended to the group.

Catalyzing Change in High School Mathematics: Initiating Critical Conversations

This year at NCTM, the book *Catalyzing Change in High School Mathematics: Initiating Critical Conversations* (NCTM, 2018) was introduced and was the focus of many of the sessions. Matt Larson (NCTM president at the time) presented a powerful session introducing the book.

Catalyzing Change in High School Mathematics (cont.)

Catalyzing Change seeks to initiate critical conversations around the following challenges:

- Explicitly broadening the purposes for teaching high school mathematics beyond a focus on college and career readiness.
- Dismantling structural obstacles that stand in the way of mathematics working for each and every student.
- Implementing equitable instructional practices to cultivate students' mathematical identity and high sense of agency.
- Identifying Essential Concepts that all high school students should learn and understand at a deep level.
- Organizing the high school curriculum around these Essential Concepts in order to support students' future personal and professional goals.

The book highlights four Key Recommendations:

1. Each and every student should learn the Essential Concepts in order to expand professional opportunities, understand and critique the world, and experience the joy, wonder, and beauty of mathematics.
2. High School mathematics should discontinue the practice of tracking teachers as well as the practice of tracking students into qualitatively different or dead-end course pathways.
3. Classroom instruction should be consistent with research-informed and equitable teaching practice.
4. High school should offer continuous four-year mathematics pathways with all students studying mathematics each year, including two to three years of mathematics in a common shared pathway focusing on the Essential Concepts, to ensure the highest-quality mathematics education for all students.

What does this mean for Vermont students? How do we begin this conversation in our state? I have created a [survey](#) to ask about ways to create a community to read through this book and start to initiate an effort to bring the recommendations of this resource to the mathematics community in Vermont. Please fill it out and make your requests for your school system.

For more information about *Catalyzing Change*, [Read the executive summary here](#). [Look at the NCTM infographic here](#).

**Please fill out the [survey](#) if you would like to create a community for a book study.

Events, Announcements, and Resources

PNOA and the Common Core

Date: June 4, 2018

Location: Quality Inn and Conference Center in Brattleboro, VT

Grade Levels: K-2

[Register for PNOA and the Common Core](#)

Working with Math for Students on IEPs – Two-day Summer Workshop with John Tapper, Ph.D.

Dates: June 21 and 22, 2018

Location: Hampton Inn in Colchester, VT

Target Audience: Special Educators and Math Interventionists

Special Educators and Math Interventionists will use key components of John's book "Solving for Why" and the All Learners Project to leave with new skills that you can put into practice for more successful work with students on IEPs who struggle with math. [Learn more and visit CVEDC website.](#)

Differentiation through Math Menu: Meeting the Needs of All K-6 Students

Dates: June 25-28, 2018

Instructor: Christian Courtemanche

Location: Champlain Valley Educator Development Center (CVEDC) Fort Ethan Allen, Colchester, VT

This three-credit graduate course explores a menu model for differentiation, reframing Tier I math instruction in order to meet the ongoing range of instructional needs. Learn how to manage a "centers" approach to your teaching and restructuring your math block to allow for small group and individualized lessons. [Learn more and visit CVEDC website.](#)

Math for Struggling Learners

Dates: June 26-29, 2018

Instructors: John Tapper and Sandi Stanhope

Location: CVEDC Fort Ethan Allen, Colchester, VT

Target Audience: Math Instructors and Interventionists K-8

MSL is a three-credit course that answers the question: What an I do for the students in my class who have difficulty with mathematics? The techniques in this course have been used by hundreds of regular and special education teachers to understand- and then teach- the students in their classes who need support. [Learn more and visit CVEDC website.](#)

Math Lab School- Language Concepts & Fluency: Deeper Learning of Mathematics

Dates: July 23-27, 2018

Instructor: Professor Mahesh Sharma

Location: Main Street Middle School Montpelier, VT

Target Audience: K-4 educators and special educators

When so many children have difficulty in learning mathematics, it is important for teachers to know how children learn mathematics more effectively. This three-credit graduate course is guided by learning theories, special education, mathematics teaching and learning, and clinical practice in working with children and adults with learning problems in mathematics. [Learn more and visit CVEDC website.](#)

VCTM's 2018 Annual Conference: Save the Date

Date: October 19, 2018

Location: Norwich University, Northfield, VT

[Apply to speak at VCTM's 2018 Annual Conference:](#) Share the awesome work you have been doing in your classrooms and with your peers. Speaker proposals due by July 1, 2018. Selected speakers will be notified by mid-August.

Vermont Jump\$tart Educator Conference: Save the Date

Date: November 2, 2018

Location: Vermont Technical College, Randolph, VT

Topics: Financial literacy in content areas and within PLPs

Registration information will come out later this summer.

CMP National Summer Workshops

Connected Mathematics Project (CMP) is offering six national workshops this summer on the campus of Michigan State University (MSU). These workshops will occur over the course of a week June 18 to 22, 2018.

Getting to Know CMP: Grade 6, Grade 7, and Grade 8

Experience and discuss a pedagogical model for teaching CMP and discuss how student learning can be enhanced with the Mathematical Practices in CMP. We will look in-depth at CMP3 for Grade 6, 7 or 8. We will examine the development of the mathematics and how understanding is developed and connected across units. Strategies for implementation, management, and grading are also discussed.

Leadership, Coaching, and Mentoring

As a teacher leader, coach, or mentoring teacher we will discuss ways to implement, sustain, and enhance the implementation of CMP in our school districts. The workshop will also focus on strategies for deepening teachers' mathematical and pedagogical knowledge for teaching beyond initial Unit training.

Meeting the Needs of Special Populations

We will focus on effective strategies to support the needs of special populations, including English Language Learners, gifted, and students who struggle. This workshop will draw on activities from all three grade levels of CMP.

Registration is open! [For more information visit CMP website.](#)

Resources:

[VCTM Website](#): A great place for events and resources.

Online Math tools:

- [MathPapa](#)
- [Symbolab](#)
- [Wyzant](#)
- [QuickMath](#)
- [Teachers Choice](#)
- [I-Pad – Photomath](#)
- [Math Solver \(Android\)](#)

Classpad.net (New April 2018. Check it out.)

[ClassPad.net](#) is designed to be a free, open digital space where teachers, students, and others can express themselves mathematically. We aim to tear down the technological walls that have forced us to use several different software packages to accomplish simple daily classroom tasks. We pledge to provide you with an intuitive, fluid technology that actually enhances instruction and learning, rather than hindering it with steep learning curves. We're committed to ongoing development, improvement, and innovation. Together with you, we're committed to education.

Jo Boaler/youcubed: Mathematical Mindset Teaching Guide, Teaching Video and Additional Resources (New April 2018)

We have designed a Mathematical Mindset Guide to help teachers create or strengthen a growth mindset culture. This guide contains five Mathematical Mindset Practices along with links to teaching videos. The videos all show Jo and Cathy teaching middle school students. There are different stages described in each practice to help capture the journey of a mathematical mindset classroom and the evidence teachers may collect along the way for their own reflection or for discussion with colleagues. The guide has been designed for teachers to use in the process of self-reflection, or for coaches or administrators to use to encourage a mindset teaching culture. In the interactive version of the guide on this [web page](#), you can click on the arrow buttons in the Expanding descriptors to see a short extract of Jo/Cathy teaching in the ways described.

Our goal for the guide is to support a mathematical mindset journey of learning and growth. Teachers can work with the guide individually or in collaboration with others. The guide is intended to be non-judgmental, non-evaluative, and iterative in nature. When using the guide consider the classroom community as a whole rather than the teacher alone. It is also important to note that while the goal of the guide is to communicate all aspects of a mathematical mindset classroom, it is not always possible to find evidence of all practices in one lesson. We encourage teachers, coaches, and administrators to use this guide, and our reflection suggestions iteratively over multiple lessons.

You can download the [guide online](#). We have also created a document that contains [advice on how to use the guide](#) and an [example teacher journal](#). We would like to thank the Tulare County Office of Education for their help in developing the guide.

Directions for Submissions: If you would like to submit an article, announcement, event, or resource for a future newsletter, please email information to heidi.whipple@vermont.gov. This newsletter will be published bi-monthly (even months). Time sensitive materials will be prioritized but check the dates to see if the bi-monthly publication will delay the sharing of information.

To subscribe, or unsubscribe to the Mathematics in Vermont e-bulletin, write to heidi.whipple@vermont.gov or call (802) 479-1379.

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