

Mathematics in Vermont

The newsletter for Vermont's Mathematics Educators and Supporters

Winter 2024

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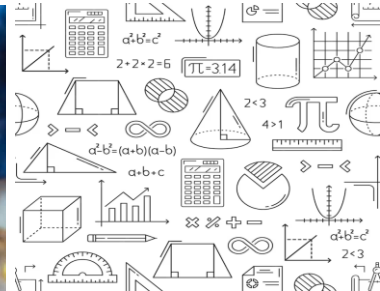
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- ✓ Subscribe to our listserv by emailing [Kevin Feal-Staub](mailto:Kevin.Feal-Staub@vermont.gov)
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Greetings

The days are getting longer and warmer, maple syrup is being made, and we are more than halfway through the school year. In this newsletter I am giving an update on what I recently learned about the learning difference dyscalculia and providing some updates on upcoming events and resources.

Dyscalculia: An Introduction

For the past few years, dyslexia has been getting a great deal of press as the educational community has focused on how to improve literacy skills in students. Recently I had an opportunity to attend a webinar focused on dyscalculia, a lesser-known learning difference that poses unique challenges for students in mathematics classrooms. Dyscalculia is characterized by difficulties in understanding and manipulating numerical and mathematical concepts. It is thought that up to seven percent of K-12 students are affected by dyscalculia. Students with dyscalculia may struggle with basic arithmetic operations, have difficulty understanding mathematical symbols, and face challenges in recalling mathematical facts. Like dyslexia, dyscalculia is a “specific learning disorder” and must be diagnosed by a psychologist. Also, just as with dyslexia, students who are affected by dyscalculia struggle with mathematics not because of low effort or intelligence, but rather from a different brain structure that impairs the basic processing of numbers, patterns, and mathematical processes.

Some common signs to look for as indicators that a student might be affected by dyscalculia include difficulties with:

- Number sense and equality
- Grasping and remembering mathematical concepts, rules, formulas, and sequences
- Memorizing numerical facts
- Performing mental math
- Estimating time, distance, and volume

Only students who are appropriately evaluated through a school's MTSS system will qualify for IEPs documenting required supports for dyscalculia. However, almost all students who struggle with mathematics will benefit from the kinds of instructional strategies that support students affected with dyscalculia:

- Avoid memory overload. Assign manageable amounts of work as skills are learned.
- Build retention by providing review within a day or two of the initial learning of difficult skills.

- Provide supervised practice to prevent students from practicing misconceptions and "misrules".
- Make new learning meaningful by relating practice of subskills to the performance of the whole task.
- Reduce processing demands by preteaching component skills of algorithms and strategies.
- Help students to visualize math problems by drawing.
- Use visual and auditory examples.
- Do math problems on graph paper to keep the numbers in line.

Collaborative efforts between mathematics educators, special education professionals, and parents play a crucial role in tailoring interventions to meet the individual needs of students with dyscalculia. By promoting a supportive and understanding atmosphere, educators can empower students with dyscalculia to develop a positive attitude towards mathematics and unlock their full potential.

The information on dyscalculia above was gathered from: [The Diagnosis and Treatment of Dyscalculia](#), and [What are strategies for teaching a student with a math-related learning disability?](#)

Total Solar Eclipse

The total solar eclipse, visible in Vermont, occurring in the afternoon of Monday, April 8th will provide a great opportunity for putting a context around many aspects of mathematics. Below are a few resources you might use to infuse some mathematics into this exciting and rare event with your students:

- [What is a Solar Eclipse](#): An accessible animated video explaining what a solar eclipse is and how the moon, sun, and earth must be arranged for it to happen.
- [Solar Palooza](#): An activity that focuses on using the predicted times at which the moon's shadow will pass over various cities in the United States to calculate the speed at which the shadow is racing over the surface of the earth.
- [Eclipsing Enigma: A 'Pi in the Sky' Math Challenge](#): From NASA, an activity that has students use similar triangles to predict the size of the moon's shadow on earth.

Seeking Reviewers for K-8 Mathematics Learning Proficiency Hierarchies

I have drafted exemplar learning proficiencies for grades K-8 to support schools and districts as they move further into the world of proficiency-based teaching and learning. Once published, these along with Proficiency Hierarchies from other content areas, and for other grade levels can be adapted for use in individual SU/SDs or adopted as is. I am currently seeking educators to review the drafts and provide feedback for revisions. The review work will be mostly asynchronous, with a short online meeting at the beginning to set the stage, along with another meeting at the end for us to share comments with one another and get each other's perspective. Professional development hours will be awarded for this work. Please let me know if this is something you are interested in participating in, and if you know of another educator who might be a good fit for this, please have them contact me. Contact me at kevin.feal-staub@vermont.gov.

Professional Offerings

All Learners Network

The AOE continues to collaborate with All Learners Network to offer a rich and varied set of professional learning opportunities free of charge to Vermont educators. There are several workshops still scheduled this year and more will be coming next year. Most of this year's sessions are now full, but check back because sometimes spots do open up. Any events that list "VT AOE" in the title are free of charge to all Vermont educators. There are a couple of events without this tag, and those do have a cost.

EMC²: Essential Mathematics for College and Careers

EMC² is an innovative math course designed for high school seniors who have completed Algebra I, Geometry, Algebra II, or the equivalent but still need to strengthen their math preparedness to be ready to launch into technical training, college, or careers.

The course was developed by Vermont Student Assistance Corporation (VSAC) GEAR UP, the Vermont Agency of Education (AOE), and the Vermont State College System (VSCS), together with high school and postsecondary math faculty, and is designed to be project-based with guided student discussion. Concepts are not taught by giving students algorithms but rather by discovering those algorithms within a set of rich problem-based tasks. In addition to 16 identified math content skills, EMC² address many of the Transferable Skills recommended for career and college readiness including: Creative and Practical Problem-Solving, Clear and Effective Communication, and Informed and Integrative Thinking.

EMC² is currently taught at three Vermont high schools as well as through the Vermont Virtual Learning Collaborative (EMC² through VTVLC is free of charge through the 24-25 school year). EMC² is recruiting additional schools for the 2024-2025 school year.

For more information, or to find out how your school can participate, visit the [EMC² website](#).

VMI Now Accepting Applications for the Master's Degree Program and Stand-Alone Summer Courses

The Vermont Mathematics Initiative (VMI) master's program is now accepting applications for the 2024 Cohort. This summer's courses will take place during the weeks of July 8-12 and July 15-19.

The VMI master's program is a three-year comprehensive program dedicated to providing mathematics teachers and teacher leaders with the knowledge, skills and confidence to improve their own teaching of mathematics, and to lead, support and inspire systemic change in their schools and districts. Offered in partnership with Vermont State University (VTSU), the mission of the VMI Master's program is to significantly improve the teaching and learning of mathematics in grades PreK-12.

For more information visit the [VMI website](#).

Announcing VMI's Summer 2024 Professional Development Opportunities

The VMI is excited to offer two different mathematics education courses this summer in the Burlington area and one in Lyndon.

Kevin Feal-Staub

Mathematics Specialist
Proficiency-Based Learning
Team

Vermont Agency of Education
1 National Life Drive, Davis 5
Montpelier, VT 05620-2501

PHONE:
(802) 828-0054

E-MAIL:
kevin.feal-staub@vermont.gov

- **Mathematics as a Second Language – Burlington - July 8-12 and Lyndon - June 24-28**
This course provides for a deep understanding of the basic themes of arithmetic as well as the inter-relationships among arithmetic, algebra, and geometry. As VMI's signature course, a major theme of *Mathematics as a Second Language* is the understanding of arithmetic and algebra through language. Participants will explore the mathematics content related to these topics, the intimate relationship among them, and the important pedagogical strategies and skills that educational research suggests can have a strong impact on student learning.
- **Mathematical Modeling with Probability – June 24-28**
This course is intended for teachers seeking to increase their understanding of probability and strengthen their instructional skills, particularly in the area of mathematical modeling. In this course, students will work together while modeling real-life situations that involve uncertainty and solving applied problems. Taught through a problem solving and collaborative manner, this course focuses on the basic terminology and concepts of probability theory, including random experiments, sample spaces, and discrete variables. Topics also include Bayes' Rule, expected value, and the fundamental properties of various distributions, such as Bernoulli, binomial, geometric, and negative binomial. This course is ideal for middle and high school teachers and VMI graduates.

For more information visit the [VMI website](#).

We're on the Web!

See us at:

<https://education.vermont.gov/student-learning/content-areas/mathematics>