

Math Reading Readiness in the Upper Grades

By: José Martinez; Administrative Representative

Have you ever *really* tried to figure out the root causes of why some students understand math and some struggle mightily? For the past 27 years I've wrestled with this dilemma. Difficulties in Algebra and Geometry seem to be the worst - as they are the "wordiest" of the math courses that I've taught.

My experiences tell me that there are many students that understand the underlying math concepts yet struggle to produce answers to seemingly easy questions.

Have your students ever been confused by words such as: expression, equation, range, factor, division, operation, term, slope, or cord?

The former words have precise meaning in the math classroom and different meaning(s) elsewhere and are often confusing to children. I am fascinated by the struggles of students that try hard yet "just don't get it". In fact, I have decided that this is a topic worth researching and writing a dissertation for.

The purpose of my dissertation is to investigate the relationship between student achievement in mathematics, teacher professional development in the teaching of reading strategies in the content area, and reading comprehension of secondary level math students.

I am curious as to how well-trained secondary math teachers

are in the teaching of reading strategies for their content area. Are WE the problem? How many "teaching of reading" classes have you had?

I remember taking one course in my master's program (I believe that was in 1983) where the teaching of reading was the primary focus. How well are YOU trained in the teaching of reading or vocabulary comprehension skills?

Many of us are not going to sign up for the next reading class at the local state university. So, what can we do NOW?

Recently, I have spent much of my time preparing for my dissertation by reading current research related to building vocabulary, reading comprehension, and teacher preparation in the area of literacy.

I have found one text to be especially practical and easy to follow. Word Wise & Content Rich: Five Essential Steps to Teaching Academic Vocabulary



by Douglas Fisher and Nancy Frey is loaded with strategies that can be applied to the math (or any) classroom.

I found chapter four "*Make it Useable: Building Academic Vocabulary through Peer Talk*"

especially useful because of the focus my school has put on student-to-student dialogue.

Throughout the text the authors reference current research where the reader can go to further investigate topics of interest. They give sensible suggestions for building the student's vocabulary comprehension.

One strategy that I have used for years and found to be effective was to insist that students demonstrate their knowledge in multiple ways.

I frequently ask students to answer a question in three ways:

- 1) solve the equation (or give the expression)
- 2) draw a picture of the answer (this could be a graph)
- 3) Say it in words (or write the answer in words)

Yes it takes a little more time, but if the student could do all three I was satisfied they knew the concept.

For most of us the desired outcome is to have our students clearly and precisely communicate mathematical knowledge and to effectively apply math concepts in real world situations. The question that remains to be answered is "how are we going to accomplish this?"

Up for a Challenge?

Connecticut will again participate in the Real World Design Challenge (RWDC), a national education initiative that connects schools with industry, government, and community partners.

Each year, student teams will be asked to address a challenge that confronts our nation's leading industries. Students will be paired with engineering experts and will utilize professional engineering software to develop their solutions. Presentations that convincingly demonstrate the value of their solutions are presented.

The RWDC provides students with opportunities to apply the lessons of the classroom to the technical problems that are being faced in the workplace.

The challenge pairs high school students with engineering experts to gain insights and experience by developing a solution to an actual industry problem.

Students from Xavier High School in Middletown, CT were the 2011 Connecticut State and RWDC National Champions.

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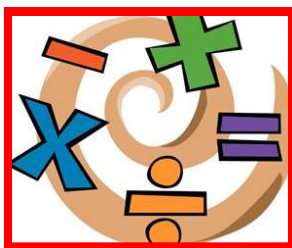
11 Math

To multiply a number by 11 you add pairs of numbers next to each other, except for the numbers on the edges.

Let me illustrate:

To multiply 436 by 11 go from right to left.

First write down the 6 then add 6 to its neighbor on the left, 3, to get 9.



Write down 9 to the left of 6.

Then add 4 to 3 to get 7. Write down 7.

Then, write down the leftmost digit, 4.

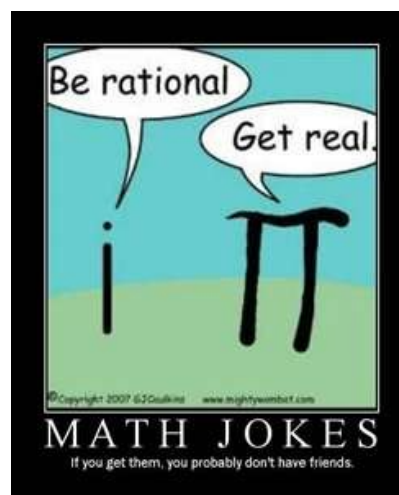
So, $436 \times 11 = 4796$.

Fun 11 Facts by Robin Kalder

We all know that 2011 is a very special year.

We've already seen 1/1/11 and 1/11/11, while 11/1/11 and 11/11/11 are still to come.

But did you know that if you add the last two digits of the year in which you were born to the age you will be on your birthday this year, the sum will be 11?



Fabulous Fibonacci

By: Vivian Bambino Administrative Representative

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987...



Sunflower with 34 petals

Fibonacci Petals:

- 3 petals lily, iris
- 5 petals buttercup, wild rose, larkspur, columbine, vinca
- 8 petals delphiniums, coreopsis
- 13 petals ragwort, corn marigold, cineraria
- 21 petals aster, black-eyed susan, chicory
- 34 petals plantain, pytethrum, daisy
- 55, 89 petals michelmas daisies, the asteraceae family

If you have wondered why four-leaf clovers are so rare, it is because four is not in the Fibonacci sequence. Mutations and variations are the exceptions to this list.



Nautilus Shell

Teaching students how to recognize patterns in mathematics, create rules, and solve n^{th} of a sequence are abilities we give them that can be used throughout their lives.

In high school and college, students learn from algebra through calculus about functions; the pattern of how a number changes into another number. In science research and study, the symmetry of plant growth, molecular structure and the human body are analyzed for patterns in order to evaluate, predict and to modify. Analysts study trends, patterns, to forecast future outcome. Artists, Architects, and Designers use a myriad of materials to create beautiful and functional patterns and structures in the world around us.

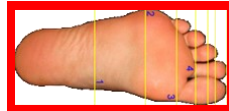
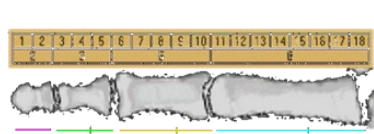
The Fibonacci sequence is nature's numbering system. The ratio of successive pairs from the Fibonacci series tends toward Phi (1.618), or the golden ratio. From this ratio comes the golden rectangle and the spiral shape that is found throughout nature, and



the universe. Phi was thought of as a divine number by the ancients and has been used by mankind throughout the ages in architecture. Phi relationships were used by Egyptian architects in constructing temples, and the Great Pyramid; the Greeks in constructing the



Parthenon, and the Europeans in Gothic Cathedrals.



Parts of the human body reveal these ratios (the human hand, arm, and foot). Each section of an index finger, from the tip to the base of the wrist, is larger than the preceding section by the Fibonacci ratio 1.618 (2, 3, 5, 8). The fingernail is 1. Humans have 2 hands, each with 5 fingers, with 8 fingers comprised of 3 sections! They are all Fibonacci numbers. The ratio of the forearm to the hand is also 1.618. The foot has Phi proportions as well.

Fibonacci series can be seen in a piano that produces harmony through music. A piano has one keyboard with five black keys (sharps and flats) that are arranged in groups of two and three, with 8 white keys (whole tones) for the 13 chromatic musical octaves.

What is very interesting is the relationship between Pi and the Fibonacci sequence in a composition. The climax of a piece of music is 61.8% of the way through which equates to 20th bar in a 32 bar song.



Presidential Awardees

By: Charlene Tate-Nichols; State Math Education Consultant

The Presidential Award is the highest recognition that a kindergarten through 12th-grade mathematics or science teacher may receive for outstanding teaching in the United States. Established by Congress in 1983, the PAEMST program authorizes the President of the United States to bestow up to 108 awards each year. Awards are given to mathematics and science teachers from each of the 50 states and four U.S. jurisdictions. The award recognizes those teachers who are knowledgeable about the content they teach and know how to inspire student interest and promote learning. Since the program's inception, more than 4,100 teachers have been recognized for their contributions in the classroom and to their profession.

The Connecticut State Department of Education is proud to announce this year's State Finalists for Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST):

Science-Tyler Hoxley
Mathematics-Angela Miller
Mathematics Karen Thomas
Science-Dr. Benjamin Wrubel

Finalists' applications were forwarded to the PAEMST national selection panel convened by the National Science Foundation this summer. The panel reviewed the application materials with the intent of identifying from each state, one Presidential Awardee in science and one in mathematics.

Their recommendations are sent to The White House, and the award winners are announced by The White House in the spring. In addition to a \$10,000 prize, Presidential Awardees and their guests are invited to Washington, D.C., to meet the President of the United States, discuss education policy with legislators and education leaders, and participate in professional development and celebratory activities. Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of mathematics and science education.

ATOMIC will introduce the mathematics state finalists at the conference on November 29th.

Angela Miller has 22 years of experience teaching mathematics, and currently teaches at Haddam **Killingworth High School** in Higganum. She holds a B.S. in Mathematics from Palm Beach Atlantic University; an M.S. in Secondary Mathematics Education from Central Connecticut State University; and a Sixth-Year Degree in Educational Leadership from Southern Connecticut State University. Her PAEMST application featured a lesson on mathematical modeling of quadratic equations.

Karen Thomas has been a mathematics educator for 16 years. She currently teaches Geometry, Algebra 2, and Pre-Calculus at **Staples High School** in Westport. She holds a B.A. in Mathematics from Mount Holyoke College; an MST in Mathematics from the University of New Hampshire; and a Sixth-Year Degree in Educational Leadership from Southern Connecticut State University. Her PAEMST application featured a lesson on students discovering and proving the midsegment theorem for a triangle.



K-6 teachers of mathematics are eligible to apply for the award during this year's cycle.

Nominations will be accepted through April 1, 2012.

Applications will be available in November and are due May 1, 2012.

Nominations and application information are available at: www.paemst.org

CCSS - Clear, Coherent and Challenging

By: Charlene Tate-Nichols; State Math Education Consultant

Effective 7 July 2010, the CT State Board of Education voted unanimously to adopt the Common Core Standards in English Language Arts and Mathematics.

Connecticut, along with the District of Columbia, 2 territories and 43 other states, has adopted the K-12 [Common Core State Standards in Mathematics](#) (CCSSM).

The new CT Standards (CCSSM) reflect the coherence and rigor required to prepare Connecticut's K-12 students for college and career readiness.

The new CT standards include standards for practice and content; all of which will be assessed at grades 3 through 8 and 11 in the 2014-15 school year.

The [K-12 Standards for Mathematical Practice](#) (SMP) describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

Teachers of mathematics should currently be providing opportunities for all of their students to develop the habits of mind and expertise described in the SMP. Intentional focus on the SMP is recommended regardless of the stage of implementation of the new content standards.

There are fewer content standards at each grade level than was commonly the case in most state standards, mirroring the standards of other nations that have been successful on international benchmark assessments.



The Connecticut State Department of Education has conducted numerous regional and district informational and work sessions to support districts and teachers in their transition to the new CT Standards.

For more information and materials, visit the [CSDE web site](#).



Common Core State Standards for Mathematics K-8 Mathematics Content

DOMAINS	Counting & Cardinality	Operations & Algebraic Thinking	Number & Operations in Base Ten	Measurement & Data	Geometry	Number & Operations: Fractions	Ratios & Proportional Relationships	The Number System	Expressions & Equations	Statistics & Probability	Functions
K	X	X	X	X	X						
1		X	X	X	X						
2		X	X	X	X						
3		X	X	X	X	X					
4		X	X	X	X	X					
5		X	X	X	X	X					
6					X		X	X	X	X	
7					X		X	X	X	X	
8					X			X	X	X	X

CCSS continued

The new K-8 CT Standards provide a clearer, continuous progression from grade to grade.

The standards stress not only procedural skill but also conceptual understanding, to make sure students are learning and absorbing the critical information they need to succeed at higher levels.

This is a departure or paradigm shift from current practices by which many students learn enough to get by on the next test, but forget it shortly thereafter, only to review again the following year.

Common Core State Standards – Mathematics Learning Progressions									
Kindergarten	1	2	3	4	5	6	7	8	HS
Counting and Cardinality									Number and Quantity
Number and Operations in Base Ten						Ratios and Proportional Relationships			
			Number and Operations: Fractions			The Number System			
Operations and Algebraic Thinking						Expressions and Equations		Algebra	
						Functions		Functions	
Geometry						Geometry		Geometry	
Measurement and Data						Statistics and Probability		Statistics And Probability	

<http://education.ohio.gov/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=1704&ContentID=83475&Content=102764>

CT teachers of mathematics will notice that some of the content taught under previous standards at many grade levels has been deemphasized or shifted to another level.

- The K-5 standards provide students with a *solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions and decimals*—which help young students build the foundation to successfully apply more demanding math concepts and procedures, and move into applications.
- The middle school standards are robust and provide a coherent and rich *preparation for high school mathematics*. Having built a strong foundation K-5, students can do hands on learning in geometry, algebra and probability and statistics. Students who have completed 7th grade and mastered the content and skills through the 7th grade will be *well-prepared for algebra* in grade 8.
- The high school standards *emphasize mathematical modeling*, the use of mathematics and statistics to analyze empirical situations, understand them better, and improve decisions. The high school standards set a *rigorous definition of college and career readiness*, by helping students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do.

These Standards are not intended to be new names for old ways of doing business. They are a call to take the next step. It is time for states to work together to build on lessons learned from two decades of standards based reforms. It is time to recognize that standards are not just promises to our children, but promises we intend to keep.
— CCSS (2010, p.5)

ATOMIC

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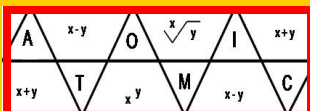
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Calling All Members

ATOMIC needs your help!

We know you are very knowledgeable about Mathematics Education – please share. Submit articles to help your fellow members excel in educating Connecticut’s students from grade K-16. Submissions can be made to the President at quirkle5@sbcglobal.net.

Vacancies:

Are you looking to get more involved in ATOMIC? We are seeking people to fill the following positions:
Newsletter Editor
Vo-tech Representative
Webmaster – we are reworking the website and need talented people to help with the re-design.

All interested members can email the President at quirkle5@sbcglobal.net.

PD Opportunities

REGISTER NOW

ASSOCIATION OF
TEACHERS OF
MATHEMATICS IN NEW
ENGLAND

ANNUAL CONFERENCE
November 9 and 10, 2011
at The State Information and Program Details
to WWW.ATMNEcon.COM

Enlighten Yourself!

NCTM President *J. Michael Shaughnessy*
and NCTM Past-Presidents *Hank Kepner* and *Johnny Lott*
Mathematics Coaching Strand Wednesday, Make and Take both days.
Large Exhibitor Showcase with Door Prizes from The Discovery Channel, vendors and more.
Thomas Banchoff, Calvin Irons, Greg Tang, and Stuart J. Murphy and the
Balamosos Memorial Lecture by James Bierden

EARLY BIRD DEADLINE 10/12/11
PRE-REGISTRATION DEADLINE 10/31/11

ASSOCIATION OF MATHEMATICS TEACHERS OF NEW JERSEY
PRESENTS
4th Annual Conference
**Special Education – Mathematics
Language Arts - Science**

**PREPARING FOR
COMMON CORE STATE
STANDARDS & ASSESSMENTS**

Implications for Instruction - Update 2011

A Conference for ALL Grades PK-12
Crowne Plaza, Jamesburg, NJ
Tuesday, December 6, 2011
8:15am-3pm

DESCRIPTIONS OF EACH PRESENTATION WILL BE AVAILABLE ON THE AMTNJ WEBSITE: www.amtnj.org
LOOK FOR "4th Annual Special Education-Mathematics-Language Arts-Science Conference", DECEMBER 6, 2011
Visit the Exhibits

Professional Development Certificates for 6.5 hours will be distributed at the conclusion of the program.

**Save this Date
December 6, 2011**



Keynote Speaker
 Steve Leinwand
 The Common Core State
 Standards for
 Mathematics: Hopes,
 Fears, and Challenges

2011 ANNUAL ATOMIC CONFERENCE

TUESDAY, NOVEMBER 29, 2011
CROWNE PLAZA CROMWELL
8:00 AM - 3:30 PM



CCSSM grade level sessions

- for:
- K-2**
- 3-5**
- 6-8**
- 9-12**

Register Now

Visit www.atomicmath.org
 for registration and program
 information.

Cost and information:

Member: \$75 _____ Non-member: \$100 _____ (includes 1 year membership)
 Students: \$35 _____ Retired member: \$50 _____

Download registration form at www.atomicmath.org

Please enclose a check payable to: ATOMIC.

Mail registration and check to: ATOMIC, c/o 17 Hammonasset Meadows, Madison, CT 06443.

2011 ATOMIC FALL CONFERENCE REGISTRATION FORM

Tuesday, November 29, 2011

Crowne Plaza - Cromwell

Visit our web site for the program: www.atomicmath.org

Deadline for Registration: November 22, 2011 ~~~ No on-site registrations!

Confirmations will be **emailed** for registrations received by November 22, 2011.

Please provide your email below. Please Print (one form per person)

Last Name _____ First Name _____

Mailing Address: Street _____

State: _____ Zip _____ **Email:** _____

Home Phone _____ Work Phone _____

Name of School: _____

School Address _____

My School is an ATOMIC member ___ Yes ___ No

Registration Fees include Buffet Lunch.

Member: \$75 _____

Non-member: \$100 _____ (includes 1 year membership)

Students: \$35 _____

Retired member: \$50 _____

Please enclose a check payable to: **ATOMIC**.

Mail registration and check to: [ATOMIC, c/o 17 Hammonasset Meadows, Madison, CT 06443](mailto:atomic@atomicmath.org).

~~~ All sessions/workshops require tickets ~~~

~~~ Mark the session number for your workshop requests below ~~~

~~~ Pick up your tickets at the registration table at the conference ~~~

~~~ Buffet lunch will be available 12:00 -2:00 pm ~~~

| Time blocks | Choice #1 | Choice #2 | Choice #3 |
|-------------------|----------------------------------|-----------|-----------|
| 8:30 – 9:00 am | Opening Remarks and Recognitions | | |
| 9:00 – 10:00 am | Keynote Speaker | | |
| 10:15-11:15 am | | | |
| 11:30 am-12:30 pm | | | |
| 1:15-2:15 pm | | | |
| 2:30-3:30 pm | | | |

CEU Equivalents – ATOMIC is not awarding CEUs for the Annual conference. However, if you would like to apply within your district, all schools have a CEU handbook for their district containing a "CEU Equivalent Credit Verification" sheet. Please bring your district form to the conference and list the sessions you will attend in the appropriate sections. The speakers will sign next to each one in order to verify your attendance at the end of each session. Remember, you must be present for the full sessions in order to gain credit.