The V²CTM Reflection

Fall Meeting Set for November 12 at Skyline Middle

The Annual Fall V²CTM Meeting will be held on Thursday, November 12, at Skyline Middle School, Harrisonburg City's newest middle school. To get to Skyline Middle, from Interstate 81 take Exit 247 (US 33 East). Immediately get into left lane, then turn left at first traffic light onto Linda Lane. Continue through this light; turn right when you see the school signs: Skyline Middle is the first school on the right. A registration form is available on the last page of this newsletter. Better yet, registration is available on-line at http://www.rockingham.k12.va.us/register. Registrations need to be in before November 7. The cost of membership and dinner is just $10 ($5 for students). Door prizes will be given at dinner! The program is as follows:

5:00 – 5:30   **Registration**

5:30 - 6:00   **Business Meeting and Discussion of 2010 VCTM Meeting at JMU** by John Matherly, V²CTM President and LouAnn Lovin, 2010 VCTM Conference Chairperson

6:00 – 6:30   **Dinner** (Mr. J's Subs)

6:45 - 7:30   **Program:** *Mathematics Education in a Changing World* by Michael Bolling, VA Department of Education

\New DOE Math Specialist to Speak at Fall Meeting

Michael Bolling was recently appointed as the Mathematics Coordinator, Office of Middle and High School Instruction, at the Virginia Department of Education. Succeeding Debbie Bliss, Michael steps into a prominent and important position in leading mathematics education in the Commonwealth. He has generously agreed to speak at our Fall Conference.   His program will be *Mathematics Education in a Changing World* in which he'll discuss connecting future jobs, the 2009 Virginia Mathematics Standards of Learning, assessment, accountability, and student engagement in the mathematics classroom.

Prior to joining the VDOE, Michael served as Instructional Specialist for Chesterfield County Public Schools, Mathematics and Science Coordinator for Powhatan County Schools, and as a classroom teacher in Hanover County. He has held leadership roles within many mathematics educational organizations including the NCTM, VCTM, VCMS, VMSC, and GRCTM and has presented at the local, state, and national levels.

VCTM hosted by V^{2}CTM is just around the corner
V^{2}CTM Needs YOU!

The **2010 Virginia Council of Teachers of Mathematics Annual Conference** will be hosted by V^{2}CTM on James Madison University's campus March 12-13, 2010. Featured speakers will be Robert Berry and John Almarode, both from University of Virginia, and Kristina Doubet from James Madison University. You are encouraged to submit a proposal to present at the conference. We are accepting proposals through December 1, 2009. The proposal submission form can be found at www5.rockingham.k12.va.us/vctm/proposal.html. The V^{2}CTM Board also welcomes all members to volunteer to help with conference preparations and conference events. You can sign up to volunteer at the V^{2}CTM Fall Meeting. You can also contact LouAnn Lovin at lovinla@jmu.edu to find out how you can help support your organization host the state conference. Come "Journey to Mathematics in the Valley" with your colleagues!

*J*ourney to *M*athematics in the *U*alley
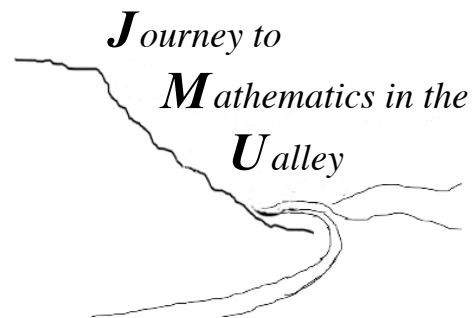
Changes Made in Mathematics Requirements for Graduation

On May 28, 2009, the State Board of Education amended the Courses to Satisfy Graduation Requirements for the Standard, Standard Technical, Advanced Studies, Advanced Technical, and Modified Standard Diplomas in Virginia Public Schools beginning with students entering the ninth grade in 2010-2011. This change in the Standards of Accreditation removed of the option to earn two standard credits in mathematics for completing Algebra I in a two-course sequence or Geometry in a two-course sequence to satisfy the Standard Diploma or that one of the two-course sequences may be used to satisfy the Advanced Studies Diploma. This document also included the addition of an end-of-course assessment for Algebra, Functions, and Data Analysis, effective in 2011-2012, to enable students to earn a verified credit for successful completion of the course. And it listed the courses approved for the Standard Technical and Advanced Technical Diplomas. To read more about this significant change, visit
http://www.doe.virginia.gov/info_centers/administrators/superintendents_memos/2009/170-09.shtml

New Math SOL Timetable

Last February, the State Board of Education adopted the revised 2009 Mathematics Standards of Learning. The implementation table for the new SOL is shown below:

Mathematics Standards of Learning Instruction and Assessment Implementation Timeline

Grade Level/ Course	School Year		
	2009-2010	2010-2011*	2011-2012**
K-3 Mathematics	o 2001 SOL taught and assessed	o 2001 SOL and new content from 2009 SOL taught o 2001 SOL assessed with field test of items from 2009 SOL for grade 3 only	o 2009 SOL taught and assessed o New grade 3 assessment will cover grade 3 SOL only
4-8 Mathematics	o 2001 SOL taught and assessed	o 2001 SOL and new content from 2009 SOL taught o 2001 SOL assessed, with field test of items from 2009 SOL	o 2009 SOL taught and assessed
Algebra I, Geometry, Algebra II	o 2001 SOL taught and assessed	o 2001 SOL and new content from 2009 SOL taught o 2001 SOL assessed, with field test of items from 2009 SOL	o 2009 SOL taught and assessed
Algebra, Functions, and Data Analysis	o 2007 SOL taught o No assessment	o 2007 SOL and new content from 2009 SOL taught o Fieldtest all content for a new assessment	o 2009 SOL taught and assessed
Probability and Statistics	o 2001 SOL taught o No assessment	o 2001 SOL and new content from 2009 SOL taught o No assessment	o 2009 SOL taught o No assessment
Discrete Mathematics	o 2001 SOL taught o No assessment	o 2001 SOL and new content from 2009 SOL taught o No assessment	o 2009 SOL taught o No assessment
Mathematical Analysis	o 2001 SOL taught o No assessment	o 2001 SOL and new content from 2009 SOL taught o No assessment	o 2009 SOL taught o No assessment

*School divisions are expected to begin implementation of the 2009 Mathematics Standards of Learning by September 2010.
**School divisions are expected to fully implement the 2009 Mathematics Standards of Learning in the 2011-2012 academic year.

As part of the development of new tests to measure the revised SOL and curriculum framework, there will be some changes in the structure of the SOL mathematics tests. First, beginning in spring 2012, the grade-3 mathematics test will no longer be a cumulative test covering the SOL for grades K-3. Instead, the grade-3 mathematics test will cover the grade-3 SOL only. In addition, a new end-of-course test, Algebra, Functions, and Data Analysis (AFDA), will be developed for implementation in spring 2012 with field testing occurring in spring 2011. The AFDA assessment will be developed in an online format enabling the use of innovative item types.

State Board Approves New Curriculum Framework

On October 22 the proposed revised Curriculum Framework was accepted by the State Board of Education. Work now begins on transforming the strikethrough version. The content of the final document will not differ from what you find in this document, although technical (minor) edits are allowable as per the Board of Education. As a reminder, you can find this document here
http://www.doe.virginia.gov/boe/meetings/2009/10_oct/agenda_items/item_h.pdf

Math Textbook Adoption Schedule

As shown on the chart below, it won't be long until it's Math Textbook Adoption time:

Adoption Area	SOL Adoption	SOL Curriculum Framework Adoption	State Textbook/ Instructional Materials Review	Expiration of Existing Contracts	LEA Textbook/ Materials Review	New Contract Date
Mathematics	2009	2009	2010-2011	2011	2011	July 1, 2011

A Summary of Changes in new Math SOL for Grades K-12
by Jenny Gibson, Rockingham County Public Schools

Kindergarten

Added Objectives:
- Given a set of *15* items, count the items, write the number of items, and select the number from a given set
- Identify the ordinal positions first through *tenth*
- Count forward to *100*, and count by fives and tens to *100*
- Identify one more than and one less than a number
- Identify the part of a set and/or region that represents a fraction for halves and fourths
- Use an analog *and* digital clock to tell time to the hour
- Answer questions related to data the students have gathered and displayed in graphs and tables

Objectives that have been Removed:
- *Draw* plane geometric figures (Instead, students will *trace* them)
- Investigate and describe the results of dropping a 2-colored counter or using a multi-colored spinner

Math 1

Added Objectives:
- Count from *0* to 100
- Count by twos to *100* and backward by ones from *30*
- Identify the part of a set and/or region that represents a fraction for halves, thirds, and fourths, and write the fraction
- Recall basic addition facts with sums to *18* or less
- Create one-step story and picture problems using basic addition facts with sums to *18* or less and the corresponding subtraction facts
- Use an analog *and* digital clock to tell time to the half-hour
- Use non-standard units to measure length, weight/mass, *and volume*.
- Compare the weights and the volumes of two objects *using the concepts of "more, less, and equivalent"*
- Use calendar language appropriately (months, today, yesterday, next week, last week)
- Sort plane geometric figures according to their number of *vertices* (rather than corners) and *right angles* (rather than square corners)
- *Construct, model* and describe objects in the environment as geometric shapes and *explain the reasonableness of the choice*
- Demonstrate an understanding of equality through the use of the equal sign

Objectives that have been Removed:

- Identify ordinal positions first through tenth
- *Draw* plane geometric figures (Instead, students will *trace* them)

Math 2

Added Objectives:
- *Write* the ordinal numbers (for positions first through twentieth)
- Identify the part of a set and/or region that represents *sixths*
- Compare the unit fractions for halves, thirds, fourths, sixths, eighths, and tenths
- Recall addition facts with sums to *20* or less
- Create and solve one- *or two-step* addition and subtraction problems
- Measure weight/mass in pounds, *ounces* and kilograms, *grams*
- Tell and write time to the nearest five minutes
- Identify specific *days* and dates on a given calendar
- Draw a line of symmetry in a figure
- Identify and create figures *with at least one line of symmetry*
- Refer to rectangular "solids" as rectangular *prisms*
- Use data from experiments to construct picture graphs, pictographs, and bar graphs
- Analyze data displayed in picture graphs, pictographs, and bar graphs
- Demonstrate an understanding of equality by recognizing that the symbol = in an equation indicates equivalent quantities, and the symbol ≠ indicates that quantities are not equivalent

Objectives that have been Removed:
- Group objects by threes and fours
- Measure the distance around a polygon to determine perimeter
- Compare weight/mass and volume of objects using the concepts "more, less, and equivalent"
- Estimate and count the number of square units needed to cover a surface to determine area
- Estimate and count the number of cubes in a rectangular box to determine volume
- Use calendar language appropriately
- Identify, describe, and sort 3-D (solid) figures (square pyramid, cylinder, cone, ...) according to their attributes

Math 3

Added Objectives:
- Identify the *value* of each digit in a six-digit number
- Model fractions and mixed numbers, and write their names
- Use symbols (<, >, =) to compare fractions
- Estimate solutions and solve *multi-step* problems involving sum/difference of two whole numbers
- Recall multiplication and division facts through the *twelves* table
- Represent multiplication/division using number line models
- Add/Subtract proper fractions with like denominators of *12* or less
- Measure length in parts of an inch (1/2)
- Estimate and measure perimeter (distance around a polygon) and area (count number of square units that cover a given surface)
- Determine elapsed time in one-hour increments over a 12-hour period
- Refer to corners and square corners of plane figures as angles and vertices
- Identify and draw representations of points, rays, and lines
- Identify and describe congruent and *non-congruent* figures
- Identify examples of the Identity and Commutative Properties for Addition and Multiplication

Objectives that have been Removed:
- Decimals
- Tell time to nearest five-minute interval

- Identify and describe symmetrical figures

Math 4

Added Objectives:
- Order fractions and mixed numbers
- Identify the division statement that represents a fraction
- Order decimals (through thousandths)
- Solve *multi-step* addition, subtraction, and multiplication problems with whole numbers
- Find quotients of whole numbers, with and without remainders
- Determine common multiples and factors, including LCM and GCF of up to two fractions
- Simplify sums and differences of fractions using common multiples and factors
- Solve *multi-step* practical problems involving addition and subtraction of fractions and decimals
- Identify equivalent measurements among ounces, pounds, *and tons*
- Identify equivalent measurements between yards and miles
- Determine elapsed time in hours and minutes within a 12-hour period
- Identify and describe endpoints of line segments, rays and vertices of angles
- Recognize images of figures resulting from a geometric transformation (translation, reflection, and rotation)
- Define polygon, and identify polygons with 10 or fewer sides
- Represent probability as a number between 0 and 1, inclusive
- Investigate and describe the Associative Properties of Addition and Multiplication

Objectives that have been Removed:
- Conversions from U.S. Customary units to metric units and vice-versa
- Measure liquid volume using metric units (mL and L)
- Identify and describe situations representing the use of perimeter and area
- Find the perimeter, using standard and non-standard units of measure
- Identify congruent and non-congruent shapes
- Analyze and compare properties of 2-D figures (circle, square, etc.) and 3-D figures (sphere, cube, etc.)
- Identify ordered pairs and plot them in the first quadrant

Math 5

Added Objectives:
- Compare fractions and decimals, and order them from greatest to least
- Identify and describe characteristics of prime and composite numbers
- Identify and describe characteristics of even and odd numbers
- Create and solve *multi-step* practical problems involving addition, subtraction, multiplication and division *with and without remainders*
- Create and solve *multi-step* practical problems involving decimals
- Solve *multi-step* practical problems involving addition/subtraction of fractions and mixed numbers
- Evaluate whole number numerical expressions using the Order of Operations (limited to parentheses, multiply/divide, add/subtract)
- Find perimeter, area, *and volume* in standard units of measure
- Identify equivalent measurements within the metric system
- *Estimate* and then measure to solve problems using U.S. Customary and metric units
- Measure *straight* angles (in addition to right, acute, and obtuse)
- Classify triangles as right, acute, obtuse, *equilateral, scalene, or isosceles*
- Describe mean, median, and mode as measures of center
- Describe Mean as Fair Share
- Describe Range of a data set as a measure of Variation

- Model one-step linear equations in 1-variable using addition/subtraction
- Investigate and recognize the distributive property of multiplication over addition

<u>Objectives that have been Removed:</u>
- *Draw* right, acute, and obtuse angles and triangles
- Kites
- Identify congruent, non-congruent, and similar figures
- Identify and describe a line of symmetry
- Recognize images resulting from transformations
- Identify, compare, and analyze properties of solid figures
- Tree diagrams
- Bar graphs
- Use a variable expression to represent a given verbal expression

Math 6

<u>Added Objectives:</u>
- Identify and describe absolute value of integers
- Demonstrate multiple representations of multiplication/division of fractions
- Order of Operations
- Describe and determine volume and surface area of rectangular prisms
- Identify and graph ordered pairs
- Construct, draw conclusions from, and make predictions using *Circle Graphs* – compare/contrast these with other graphs made from the same data set
- Describe the Mean as the Balance point
- Decide which measure of central tendency is appropriate for a given purpose
- Compare/Contrast dependent and independent events; determine probabilities for each
- Investigate and recognize Identity Properties of Mult. and Add., Inverse Prop. of Mult., Multiplicative Prop. of Zero
- Graph inequalities on a number line

<u>Objectives that have been Removed:</u>
- Square roots
- Sample space – tree diagrams
- Finding range of a data set
- Line graph, Bar graph, Histograms, Stem-Leaf Plots, Box-Whisker Plots
- Solid Figures (except rectangular prisms)
- Perpendicular bisector/Angle bisector
- Angle measures
- Estimating/Measuring with non-standard and standard units of measure
- LCM and GCF
- Prime/Composite
- Even/Odd
- Scientific Notation

Math 7

Added Objectives:

- Investigate and describe negative exponents for powers of 10
- Determine square roots
- Identify and describe absolute value for rational numbers
- Describe and represent arithmetic and geometric sequences using variable expressions
- *Model* all integer operations (add, subtr, mult, div)
- Solve *multi-step* problems using proportional reasoning
- Describe how changing one measured attribute of a rectangular prism affects its volume and surface area
- Reflections and Dilations
- Determine probability of compound events
- Construct *Histograms*; compare/contrast these with other graphs made from same data set
- Write algebraic expressions as verbal expressions and equations as sentences
- Evaluate algebraic expressions for given replacement values of the variable
- Solve 2-step linear equations
- Graph solutions to inequalities on the number line

Objectives that have been Removed:

- Order of Operations
- Find area of polygons by subdividing
- Identify and draw polygons (pentagon, hexagon, . . .)
- Identify and graph ordered pairs
- Tree diagrams
- Measures of Central Tendency

Math 8

Added Objectives:

- Determine the Percent Increase or Decrease for a given situation
- Describe adjacent angles
- Describe how changing one measured attribute of cylinders, cones, and pyramids affects the volume and surface area
- Solve practical area and perimeter problems involving composite figures
- Determine probability of independent and dependent events with and without replacement
- *Construct* scatterplots
- Solve *multi-step* equations
- Graph results of 2-step inequalities on a number line
- Identify properties of operations used to solve equations

Objectives that have been Removed:

- Matrices

Algebra I

<u>Added Objectives:</u>

- Express cube roots of whole numbers and square roots of monomial algebraic expressions in simplest radical form
- Solve multi-step linear and quadratic equations and inequalities in *two* variables
- Solve real-world problems involving inequalities algebraically and graphically
- Solve systems of inequalities
- Recognize and represent Inverse Variation algebraically, given a real-world context
- Interpret variation in real-world contexts, and calculate and interpret mean absolute deviation, standard deviation, and z-scores
- Collect and analyze data and determine the *curve* of best fit to make predictions (linear *and quadratic* models)
- Division of polynomials is no longer restricted to monomial divisors

<u>Objectives that have been Removed:</u>

- Matrices
- Approximate square roots to the nearest tenth

Geometry

<u>Added Objectives:</u>

- Apply slope to verify and determine if lines are parallel or perpendicular
- Determine whether a figure has been dilated
- Construct and justify the constructions of
    1. the perpendicular bisector of a segment and
    2. a line parallel to a given line through a point not on the line
- Determine the range in which the length of the 3rd side of a triangle must lie
- Use the *converse* of the Pythagorean Theorem to solve problems
- *Verify* and apply properties of circles
- Write the equation of a circle, given the coordinates of the center and a point on the circle
- Use 2-D or 3-D similar objects to
    1. compare ratios between side lengths, perimeters, areas, and volumes
    2. determine how changes in area/volume of an object affect one or more dimensions of the object

<u>Objectives that have been Removed:</u>

- Make a model of a 3-D figure from a 2-D drawing, and create a 2-D representation of a 3-D object
- Direct focus on complementary, supplementary, and vertical angles

Algebra II

<u>Added Objectives:</u>
- Recognize the general shape of function families (*absolute value, square root, cube root, rational,* polynomial, exponential, and logarithmic) and their transformations
- When investigating functions, focus on x- and y-intercepts, intervals in which the function is increasing/decreasing, asymptotes, and end behavior
- Make predictions and solve real-world problems using *polynomial* models
- Identify, create, and solve *joint variation* problems
- Identify properties of a normal distribution and apply those to determine probabilities associated with areas under the standard normal curve
- Compute and distinguish between permutations and combinations and use technology for applications

<u>Objectives that have been Removed:</u>
- Linear Programming
- Matrices
- Conic Sections
- Linear and Quadratic modeling
- Find the equation of a circle, given the coordinates of the center and a point on the circle

V²CTM Fall 2009 Meeting Registration
Return this registration form to Joe Hill, Rockingham County Public Schools,
100 Mount Clinton Pike, Harrisonburg VA 22802. Better yet, register on the web at
http://www.rockingham.k12.va.us/register
You may pay at the door on November 12.

Name _____

School   _____

School Address   _____

Home Address _____

Annual Membership & Dinner Fees $10.00

Student Membership & Dinner Fees...$5.00

Enclosed _____

E-mail Address _____

See you at Skyline Middle School on November 12!

V²CTM Reflection
Joe Hill, Editor
Rockingham County Public Schools
100 Mount Clinton Pike
Harrisonburg VA 22802

PLEASE SHARE THIS NEWSLETTER WITH ALL MATHEMATICS TEACHERS, GRADES K-12