

# Links to the SED Core Curriculum and related sites.<sup>1</sup>

## *1.) History of New York State Learning Standards in Mathematics*

<http://www.emsc.nysed.gov/3-8/mathoverview.htm>

*Mathematics Standards Committee:*

<http://www.emsc.nysed.gov/msc/>

*Preliminary Report of the Mathematic Standards Committee (contains statements regarding the power and beauty of mathematics and the use of technology.)*

<http://www.regents.nysed.gov/2004Meetings/November2004/1104brd4.htm>

## *2.) Overall SED Mathematics Web site:*

<http://www.emsc.nysed.gov/3-8/m-home.htm>

## *3.) SED Mathematics Tool Kit:*

<http://www.emsc.nysed.gov/3-8/guidance912.htm>

*This page contains a complete New York State Mathematics Core Curriculum (New Mathematics Standards) Download a pdf, Microsoft Word or html document.*

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<sup>1</sup> This document was prepared by Stephen F. West, SUNY Geneseo Mathematics Department

**Mathematics Toolkit**  
**Curriculum Guidance Materials & Resources**

Grade 9 to Grade 12 - Commencement-Level Mathematics Toolkit

- **NYS Mathematics Core Curriculum** Revised March 2005

What Core Curriculum Should School Districts be Using?	
<b>NYS Mathematics Core Curriculum</b> (Revised March 2005) <ul style="list-style-type: none"> <li>• <a href="#">PDF / Microsoft Word / HTML</a></li> </ul>	<a href="#">Mathematics Resource Guide with Core Curriculum</a> (1999)
The Commencement-level portion of this core becomes effective in September of 2007. Implementation may begin sooner based on local choice.	The Commencement-level portion of this core remains in effect until January 2009 for Math A, and June 2010 for Math B. For last administration dates see <a href="#">Implementation Timeline for Regents Examination in Mathematics</a>

- [Overview of NYS Mathematics Core Curriculum](#), March 2005 (PowerPoint)
- **Regents Approved Commencement-Level Mathematics Course Descriptions**  
[Word Document / PDF / HTML](#)
- **Commencement-Level Crosswalk 1996-2005**
  - Entire Document  
[Word Document / PDF / HTML](#)
  - Document by Section
    - Introduction  
[Word Document / PDF / HTML](#)
    - Structural Organization  
[Word Document / PDF / HTML](#)
    - Comparison of 1999 Seven Key Ideas and 2005 Process and Content Strands  
[Word Document / PDF / HTML](#)
    - Performance Indicator Organization  
[Word Document / PDF / HTML](#)
    - Performance Indicator Alignment  
[Word Document / PDF / HTML](#)
    - Content Performance Indicator Chart  
[Word Document / PDF / HTML](#)
  - Crosswalks

#### 4.) *Glossary K-12*

<http://www.emsc.nysed.gov/3-8/glossary.htm>

5.) ***Virtual Learning System – VLS*** : The NYSED has posted a wealth of resources for mathematics teachers on the ***Virtual Learning System – VLS*** . Follow the steps below to access these resources. There are quite a few steps, so keep this sheet for future reference.

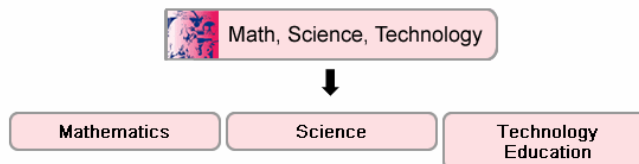
- 1) Type this web address in your browser:

<http://eservices.nysed.gov/vls/>

- 2) select **MST**:



and then select **Mathematics** :

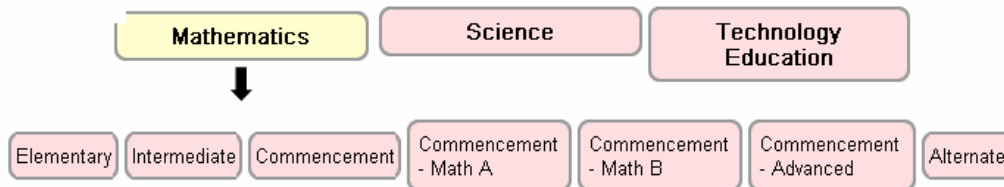


- 3) Approximately one-third of the way down the page press the arrow indicating Standards and associated resources:

## Standards and associated resources



- 4) Under Mathematics, select **Elementary** (grades K-4), **Intermediate** (grades 5-8) or **Commencement** (Integrated Algebra, Geometry or Algebra 2/Trigonometry.) for the “new” Standards ( revised 2005) or **Math A**, **Math B**, **Advanced** or **Alternate** for the “old” Standards (approved 1996):



- 5) Select ”Standard 3 – Mathematics (Revised 2005)”:

Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.

**Standard 3 - Mathematics (Revised 2005)**  
 Students will understand the concepts of and become proficient with the skills of mathematics; communicate and reason mathematically; become problem solvers by using appropriate tools and strategies; through the integrated study of number sense and operations, algebra, geometry, measurement, and statistics and probability

**Standard 6 - Interconnectedness: Common Themes**  
 Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the

- 6) Choose your **Grade Level or Course**, and then choose a **Strand**:

<b>Strands</b>	
Process	Content
<a href="#">Problem Solving</a> <a href="#">Reasoning and Proof</a> <a href="#">Communication</a> <a href="#">Connections</a> <a href="#">Representation</a>	<a href="#">Number Sense and Operation</a> <a href="#">Algebra</a> <a href="#">Geometry</a> <a href="#">Measurement</a> <a href="#">Statistics and Probability</a>
(Choose Your Strand Level)	

- 7) Select a **Major Understanding...**

Content Strand - Number Sense and Operation

**Major Understanding:**

Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.

Students will understand meanings of operations and procedures, and how they relate to one another.

Students will compute accurately and make reasonable estimates.

(Choose The Major Understanding)

and then a **Performance Indicator**:

Content Strand - Number Sense and Operation

Major Understanding - Students will understand meanings of operations and procedures, and how they relate to one another.

**Performance Indicators:**

**Operations**

- PI 6.N.16 Add and subtract fractions with unlike denominators
- PI 6.N.17 Multiply and divide fractions with unlike denominators
- PI 6.N.18 Add, subtract, multiply, and divide mixed numbers with unlike denominators
- PI 6.N.19 Identify the multiplicative inverse (reciprocal) of a number
- PI 6.N.20 Represent fractions as terminating or repeating decimals
- PI 6.N.21 Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100)

8) Finally, select either a **Sample Task** or, if available, a **Lesson Plan**.

**Operations**

- PI 6.N.18 Add, subtract, multiply, and divide mixed numbers with unlike denominators

**Learning Resources**

**Instructional Strategies**

Teaching plans for helping students acquire skills, knowledge or understandings

- [Lesson Plans](#)
- [Sample Tasks](#)

## New Commencement Level Mathematics Courses



### Regents Approved Commencement level Mathematics Course Descriptions

The three new high school mathematics courses (Integrated Algebra, Geometry, Algebra & Trigonometry) are built around five process strands: Problem Solving, Reasoning and Proof, Communication, Connections, and Representation as well as five content strands: Number Sense and Operations, Algebra, Geometry, Measurement, and Statistics and Probability. Within these courses, students will be expected to make connections between the verbal, numerical, algebraic, and geometric representations of problem situations. These courses will require students to apply and adapt a selection of strategies and algorithms to solve a variety of problems. It is expected that these strategies and algorithms will be implemented using both traditional and technological tools. A brief description of the three courses follows.

On December 8, 2005 the Board of Regents unanimously approved the Education Department's recommended [implementation timeline](#) for the Regents Examinations in Integrated Algebra, Geometry, and Algebra 2 and Trigonometry.

*Integrated Algebra* is the first mathematics course in the high school. The integrated algebra course set forth here is not the algebra of 30 years ago. The focal point of this course is the algebra content strand. Algebra provides tools and ways of thinking that are necessary for solving problems in a wide variety of disciplines, such as science, business, social sciences, fine arts, and technology. This course will assist students in developing skills and processes to be applied using a variety of techniques to successfully solve problems in a variety of settings. Problem situations may result in all types of linear equations in one variable, quadratic functions with integral coefficients and roots as well as absolute value and exponential functions. Coordinate geometry will be integrated into the investigation of these functions allowing students to make connections between their analytical and geometrical representations. Problem situations resulting in systems of equations will also be presented. Alternative solution methods should be given equal value within the strategies used for problem solving. For example, a matrix solution to a system of equations is just as valid as a graphical solution or an algebraic algorithm such as elimination. Measurement within a problem-solving context will include calculating rates using appropriate units and converting within measurement systems. Data analysis including measures of central tendency and visual representations of data will be studied. An understanding of correlation and causation will be developed and reasonable lines of best fit will be used to make predictions. Students will solve problem situations requiring

right triangle trigonometry. Elementary probability theory will be used to determine the probability of events including independent, dependent and mutually exclusive events.

**Geometry** is intended to be the second course in mathematics for high school students. There is no other school mathematics course that offers students the opportunity to act as mathematicians. Within this course, students will have the opportunity to make conjectures about geometric situations and prove in a variety of ways, both formal and informal, that their conclusion follows logically from their hypothesis. This course is meant to employ an integrated approach to the study of geometric relationships. Integrating synthetic, transformational, and coordinate approaches to geometry, students will justify geometric relationships and properties of geometric figures. Congruence and similarity of triangles will be established using appropriate theorems. Transformations including rotations, reflections, translations, and glide reflections and coordinate geometry will be used to establish and verify geometric relationships. A major emphasis of this course is to allow students to investigate geometric situations. Properties of triangles, quadrilaterals, and circles should receive particular attention. It is intended that students will use the traditional tools of compass and straightedge as well as dynamic geometry software that models these tools more efficiently and accurately, to assist in these investigations. Geometry is meant to lead students to an understanding that reasoning and proof are fundamental aspects of mathematics and something that sets it apart from the other sciences.

**Algebra 2 and Trigonometry** is the capstone course of the three units of credit required for a Regents diploma. This course is a continuation and extension of the two courses that preceded it. While developing the algebraic techniques that will be required of those students that continue their study of mathematics, this course is also intended to continue developing alternative solution strategies and algorithms. For example, technology can provide to many students the means to address a problem situation to which they might not otherwise have access. Within this course, the number system will be extended to include imaginary and complex numbers. The families of functions to be studied will include polynomial, absolute value, radical, trigonometric, exponential, and logarithmic functions. Problem situations involving direct and indirect variation will be solved. Problems resulting in systems of equations will be solved graphically and algebraically. Algebraic techniques will be developed to facilitate rewriting mathematical expressions into multiple equivalent forms. Data analysis will be extended to include measures of dispersion and the analysis of regression that model functions studied throughout this course. Associated correlation coefficients will be determined, using technology tools and interpreted as a measure of strength of the relationship. Arithmetic and geometric sequences will be expressed in multiple forms, and arithmetic and geometric series will be evaluated. Binomial experiments will provide the basis for the study of probability theory and the normal probability distribution will be analyzed and used as an approximation for these binomial experiments. Right triangle trigonometry will be expanded to include the investigation of circular functions. Problem situations requiring the use of trigonometric equations and identities will also be investigated.