

Scope:

Math 8 is the final middle level Mathematics course at Scotia-Glenville Middle School. Students should have successfully completed Math 7 (Course 2). Math 8 is a course designed to help students become better problem solvers, use reasoning and proof, communicate Mathematics, and make connections and representations across a variety of topics. Math 8 topics include Integers & Algebraic Expressions, Equations and Inequalities, Graphing in the Coordinate Plane, Applications of Proportion and Percent, Rules of Exponents and Powers, Geometry and Measurement, and Polynomials

Assessment:

Assessment comes in a variety of forms and wherever possible should be used to reflect and enhance the teaching and learning process that occurs in a classroom. Assessment should not be seen as a separate activity, but as an integral part of the teaching and learning process. Alternative assessments apply to any and all assessments that differ from multiple choice, timed, one-shot approaches that characterize most standardized and classroom assessment. Authentic assessments are assessments that engage students in applying knowledge and skills in the same way they are used in the real-world. Performance assessment is a broad term, encompassing many of the characteristics of both authentic and alternative assessments.

As this course of study demonstrates, it is clear that no single type of assessment could provide an accurate measurement of the learning experience. Students should have the best opportunity to demonstrate their understanding of the learning experience. Therefore, it is suggested that a variety of data gathering methods be used such as objective tests, observations, products, written reports, performances and a collection of student works.

The **TIME** column offers a suggested time-line so that all topics listed in the **CONTENT/SKILLS** column are feasibly met. It is understood that times will need adjustments as the course develops. The **APPLICATION/PROJECT IDEAS** column offers suggestions and sources for the teacher. This column should be updated periodically to keep current and as new ideas are generated. The **CHAPTER/SPECIAL NOTES** column coordinates topics by chapter and allows for any special notes that may need to go with the topic.

7th Grade Post-March Topics

Combining like terms

Equation Solving

Graphing and functions

Pythagorean Theorem

Unit pricing with proportions

Developing the rule for the sum of the interior angles of a polygon

Please Note:

Italics –Indicates topics that are listed as process strands and could be taught through application, problem solving,, warm-ups or review

*Asterisk – Indicates topics that should be supplemented

TIME	CONTENT/SKILLS	KEY IDEA/ PERFORM INDICATOR	CHAPTERS/ SPECIAL NOTES
September (13 Days)	<p><u>Integers and Algebraic Expressions</u></p> <ul style="list-style-type: none"> • Write verbal expressions • <i>Develop a problem solving plan</i> • Choosing best measure of central tendency • Evaluate expressions with integral exponents • Distributive property 	<p>8.A.2 Write verbal expressions that match given mathematical expressions</p> <p>8.N.2 Evaluate expressions with integral exponents</p>	<p><u>Chapter 1</u></p> <p>Integers and Absolute Value, Adding and Subtracting Integers, and Multiplying and Dividing integers are 7th grade topics to be reviewed through applications (2 days suggested)</p> <p>Emphasize the distributive property and discuss other properties in the context of a problem</p>

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September-October (15 Days)	<p><u>Equations and Inequalities (Part I)</u></p> <ul style="list-style-type: none"> • Solving multi-step/advanced equations • <i>Solve a problem using 2 different methods</i> • Combining like terms using distributive property (reinforce 7th grade topic) • Write an equation to represent a function from a table of values. 	8.A.2 Write verbal expressions that match given mathematical expressions	<p><u>Chapter 2</u></p> <p>Solving One and Two Step Equations and Simplifying Algebraic Expressions are 7th grade topics that should be reviewed through applications (2 days suggested)</p> <p>Sections 2-6 through 2-8 will be covered post-March in Equations and Inequalities (Part II)</p> <p>Discuss usefulness of distributive property for $3(x + 6)$ and distinguish from $3(3 + 6)$</p> <p>Writing equations for function rules is a post March 7th grade topic students are weak in.</p>

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October (16 Days)	<p><u>Graphing In The Coordinate Plane (Part I)/ Applications of Proportion</u></p> <ul style="list-style-type: none"> • Describe variable relationships given graph • Create graphs from a situation • Describe translations, reflections, rotations, and dilations using notation; draw their images; and identify the properties which are preserved • Use proportions to convert units within a system <ul style="list-style-type: none"> • Convert between Fahrenheit and Celsius • Solve mixture problems using pictures or equations • Unit pricing with proportions (reinforce post March 7th grade topic) • Calculate distance using a map scale (reinforce post March 7th grade topic) 	<p>8.A.3 Describe a situation involving relationships that matches a given graph</p> <p>8.A.4 Create a graph given a description or an expression for a situation involving a linear or nonlinear relationship</p> <p>8.G.7 Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations)</p> <p>8.G.8 Draw the image of a figure under rotations of 90 and 180 degrees</p> <p>8.G.9 Draw the image of a figure under a reflection over a given line</p> <p>8.G.10 Draw the image of a figure under a translation</p> <p>8.G.11 Draw the image of a figure under a dilation</p> <p>8.G.12 Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation</p> <p>8.M.1 Solve equations/proportions to convert to equivalent measurements within metric and customary measurement systems <i>Note: Also allow Fahrenheit to Celsius and vice versa.</i></p>	<p><u>Chapters 3 and 5</u></p> <p>This unit is a melding of chapters 3 and 5.</p> <p>OMIT 3-1 Plotting points is a 7th grade topic</p> <p>OMIT 5-1 Ratios and rates is a 6th grade topic</p> <p>Sections 3-2, 3-3, 3-4 and 3-7 are post-March topics</p> <p>5-4 Solving Proportions, 5-5 Similar Figures and Proportions, 5-7 Scale models and maps, and 5-8 Similarity and indirect measurement are 7th grade topics to be covered through application (recommended 2 days)</p> <p>Omit 5-9 Sine and cosine, no longer in curriculum</p>

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November - December (9 Days)	<p><u>Applications of Percent</u></p> <ul style="list-style-type: none"> • Read, write and identify percents less than 1 and greater than 100 • Estimate percent of a quantity given an application • Estimate to justify reasonableness • Percent applications <ul style="list-style-type: none"> • Find percent of a number by multiplying the percent in decimal form. 	<p>8.N.3 Read, write, and identify percents less than 1% and greater than 100%</p> <p>8.N.4 Apply percents to: tax, percent increase/decrease, simple interest, sale price, commission, interest rates, gratuities</p> <p>8.N.5 Estimate a percent of quantity, given an application</p> <p>8.N.6 Justify the reasonableness of answers using estimation</p>	<p><u>Chapter 6</u></p> <p>OMIT 6-4 Percents and equations as we traditionally solve percent problems by setting up proportions</p> <p>OMIT 6-3 Percent Proportion problems and 6-9 Probability (7th GRADE TOPICS)</p> <p>OMIT 6-8 Compound Interest-only- not in curriculum (could be used as enrichment)</p>
December (6 days)	<p><u>Number Systems</u></p> <ul style="list-style-type: none"> • Classify numbers according to number systems • Simplify rational expressions without a calculator • Find square roots of perfect squares <p><u>Approximate irrational roots using a calculator</u></p>		<p>Reinforces 7th grade topics and high school topic.</p>

<p>December (4 Days)</p>	<p><u>Exponents and Powers</u></p> <ul style="list-style-type: none"> • Develop and apply exponent rules for multiplication and division <p>NOTE 1: Virtually all of chapters 4, 9, 10 and 11 are eliminated since they include topics that have been moved to the 7th grade level. The problem solving sections of those chapters have been retained see below.</p> <p>NOTE 2: During the last two weeks of December we will devote some extra time to problem solving with sections 9-8, 10-8, 11-6, 4-7 and a Holiday Activity. This would be a good time to introduce a Geometer Sketchpad activity.</p> <p>NOTE 3: During the 3 weeks immediately prior to the Math 8 Assessment Test in March, we will review Post-March material from 7th grade syllabus and devote time to specific Assessment questions from past years. This assessment practice is in addition to the practice we intersperse within chapters throughout the year.</p> <p>NOTE 4: Following the last chapter in May, we will begin to focus on High School Readiness Essential Topics – Fractions, Pythagorean theorem, proportion and similarity and geometry. These topics were traditionally in Math 8 but are no longer here to a great degree.</p> <p>NOTE 5: Final review takes place for about 8 – 10 days immediately prior to the Math 8 Final in June.</p>	<p>8.N.1 Develop and apply the laws of exponents for multiplication and division</p>	<p><u>Chapter 7</u></p> <p>This includes discussion of negative exponents</p>
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January (9 days)	<p><u>Geometry</u></p> <ul style="list-style-type: none"> • Angle relationships – vertical angles, complementary, supplementary angles w/ missing angles • Parallel lines/ transversal and resulting angles • <i>Solve a simpler problem</i> • <i>Look for a pattern</i> • Sum of the interior angles rule for polygons * 	<p>8.A.12 Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines</p> <p>8.G.1 Identify pairs of vertical angles as congruent</p> <p>8.G.2 Identify pairs of supplementary and complementary angles</p> <p>8.G.3 Calculate the missing angle in a supplementary or complementary pair</p> <p>8.G.4 Determine angle pair relationships when given two parallel lines cut by a transversal</p> <p>8.G.5 Calculate the missing angle measurements when given two parallel lines cut by a transversal</p> <p>8.G.6 Calculate the missing angle measurements when given two intersecting lines and an angle</p>	<p><u>Chapter 8</u></p> <p>OMIT 8-3 Polygons, 8-5 classifying triangles and quadrilaterals, 8-6 sum of the angles in a polygon, 8-7 Areas of Polygons, and 8-8 Circumference and areas of circles (7th grade topics)</p> <p>8-9 Is a post-march topic</p> <p>*interior angle rule is a post March 7th grade topic</p>

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January-February (21 Days)	<p><u>Algebraic Relationships (Part I)</u></p> <ul style="list-style-type: none"> • Match a situation to a graph & describe • Create a graph given a situation • Use physical models to perform operations with polynomials • Multiply monomials • Multiply a binomial by a monomial or binomial <p>missing topics from text</p> <ul style="list-style-type: none"> • dividing monomials • dividing polynomial by a monomial • factoring algebraic expressions using GCF • factoring a trinomial in the form $ax^2 + bx + c$ where $a=1$ and c has no more than 3 sets of factors 	<p>8.A.3 Describe a situation involving relationships that matches a given graph</p> <p>8.A.4 Create a graph given a description or an expression for a situation involving a linear or nonlinear relationship</p> <p>8.A.5 Use physical models to perform operations with polynomials</p> <p>8.A.6 Multiply and divide monomials</p> <p>8.A.7 Add and subtract polynomials (integer coefficients)</p> <p>8.A.8 Multiply a binomial by a monomial or a binomial (integer coefficients)</p> <p>8.A.9 Divide a polynomial by a monomial (integer coefficients) <i>Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables.</i></p> <p>8.A.10 Factor algebraic expressions using the GCF</p> <p>8.A.11 Factor a trinomial in the form $ax^2 + bx + c$; $a=1$ and c having no more than three sets of factors</p>	<p><u>Chapter 12</u></p> <p>This topic is new to Math 8 in 2005.</p> <p>Missing topics from Prentice Hall Mathematics, Course 3 will be covered through Applied I and IR worksheets</p> <p>OMIT 12-1 Sequences and 12- 7 Write a function rule for a quadratic</p>

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March – April (13 Days)	<p><u>Graphing In The Coordinate Plane (Part II)</u></p> <ul style="list-style-type: none"> • Graph a line using a table of values • Explain slope as a constant rate of change • Determine and explain y intercept • Determine the equation given slope and intercept • Determine the equation given the graph • Solve a system of equations graphically 	<p>8.G.15 Graph a line using a table of values</p> <p>8.G.13 Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change</p> <p>8.G.14 Determine the y-intercept of a line from a graph and be able to explain the y-intercept</p> <p>8.G.16 Determine the equation of a line given the slope and the y-intercept</p> <p>8.G.17 Graph a line from an equation in slope-intercept form ($y = mx + b$)</p> <p>8.G.18 Solve systems of equations graphically (only linear, integral solutions, $y = mx + b$ format, no vertical/horizontal lines)</p>	<p><u>Chapter 3</u></p> <p>Graphing calculators should be explored for this unit</p> <p>Vertical and horizontal lines are not part of the 8th grade curriculum</p>

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April (7 days)	<p><u>Constructions</u></p> <ul style="list-style-type: none"> • Congruent segment, congruent angle, angle bisector, perpendicular bisector • Congruent triangles 	8.G.0 Construct the following using a straight edge and compass: segment congruent to segment, angle congruent to angle, perpendicular and angle bisectors.	
April - May (10 Days)	<p><u>Algebraic Relationships (Part II)</u></p> <ul style="list-style-type: none"> • Understand multiple representation of data • Determine relations that are functions • Determine functions from tables, graphs and equations • Identify characteristics of quadratics <p>missing topic from text</p> <ul style="list-style-type: none"> • Correctly identify domain and range when using a function 	<p>8.A.15 Understand that numerical information can be represented in multiple ways: arithmetically, algebraically, and graphically</p> <p>8.A.16 Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line</p> <p>8.A.17 Define and use correct terminology when referring to function (domain and range)</p> <p>8.A.18 Determine if a relation is a function</p> <p>8.A.19 Interpret multiple representations using equation, table of values, and graph</p> <p>8.G.20 Distinguish between linear and nonlinear equations $ax^2 + bx + c$; $a=1$ (only graphically)</p> <p>8.G.21 Recognize the characteristics of quadratics in tables, graphs, equations, and situations</p>	<p><u>Chapter 12</u></p> <p>Use Glencoe Pre-algebra book and Applied I and IR worksheets as resources for Domain and range (not in text)</p>

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May (6 days)	<p><u>Equations and Inequalities (Part II)</u></p> <ul style="list-style-type: none"> • Translating, solving and graphing inequalities • Multiplying and dividing coefficients • Solving and graphing multi-step inequalities including use of the distributive property, variables on both sides and like terms 	<p>8.A.1 Translate verbal sentences into algebraic inequalities</p> <p>8.A.2 Write verbal expressions that match given mathematical expressions</p> <p>8.A.19 Interpret multiple representations using equation, table of values, and graph</p> <p>8.G.19 Graph the solution set of an inequality on a number line</p> <p>8.A.13 Solve multi-step inequalities and graph the solution set on a number line</p> <p>8.A.14 Solve linear inequalities by combining like terms, using the distributive property, or moving variables to one side of the inequality (include multiplication or division of inequalities by a negative number)</p>	<p>Emphasize negative coefficients</p>