

**Little Compton Mathematics Curriculum-Grade 7**  
 By Heather Davidson, Nicole Hawes, George Mullins, Janet Griffith-May 2011

**RATIOS & PROPORTIONAL RELATIONSHIPS**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GLEs	Instructional Strategies	Assessment Opportunities	Resources
<p><b>Ratios &amp; Proportional Relationships- Grade 7 :</b></p> <p><b>Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p> <p>1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2 ÷ 1/4 miles per hour, equivalently 2 miles per hour.</i></p> <p>2. Recognize and represent proportional relationships between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c. Represent proportional relationships by equations. <i>For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</i></p> <p>d. Explain what a point <math>(x, y)</math> on the graph of a proportional relationship means in terms of the situation, with special attention to the points <math>(0, 0)</math> and <math>(1, r)</math> where <math>r</math> is the unit rate.</p> <p>3. Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i></p>	<p><b>GLE: M (N&amp;O)–7–1 Demonstrates conceptual understanding of rational numbers with respect to square roots of perfect squares, rates, and proportional reasoning. (Local)</b>  <b>**This part is NOT addressed here (see Grade 8)</b></p> <p><b>GLE: M (N&amp;O)–7–1 Demonstrates conceptual understanding of rational numbers with respect to percents as a means of comparing the same or different parts of the whole when the wholes vary in magnitude (e.g., 8 girls in a classroom of 16 students compared to 8 girls in a classroom of 20 students, or 20% of 400 compared to 50% of 100); and percents as a way of expressing multiples of a number (e.g., 200% of 50) using models, explanations, or other representations. (State)</b></p> <p><b>GLE: M(F&amp;A)–7–2 solving problems involving the relationship between slope and rate of change, by describing the meaning of slope in concrete situations, or informally determining the slope of a line from a table or graph; and distinguishes between constant and varying rates of change in concrete situations represented in tables or graphs. (part of this GLE is taken from below- Expressions &amp; Equations)</b></p> <p><b>GLE: M (N &amp; O)- 7–4 Accurately solves problems involving proportional reasoning: percents involving discounts, tax, or tips; and rates. (State)</b></p> <p><b>GLE: M (N&amp;O)–7–4 Accurately solves problems involving the addition or subtraction of integers, raising numbers to whole number powers, and determining square roots of perfect square numbers and non-perfect square numbers. (Local) **This is NOT addressed here (see Grade 8).</b></p> <p><b>GLE: M(N&amp;O)–7–7 Makes estimates in a given situation (including tips, discounts, and tax) by identifying when estimation is appropriate, selecting the appropriate method of estimation, determining the level of accuracy needed given the situation, analyzing the effect of the estimation method on the accuracy of results, and evaluating the reasonableness of solutions appropriate to grade level GLEs across content strands. (Local) (IMPORTANT: The intent of this GLE is to embed estimation throughout the instructional program, not to teach it as a separate unit.)</b></p>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>Describe the process standards and proficiencies important to reach mastery level</li> <li>Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Identify developmental skills</li> <li>Reinforcement of skills</li> <li>Drill and practice skills</li> </ul> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>Demonstrate how to calculate unit rates in a variety of problem-solving situations</li> <li>Provide multiple methods for determining proportionality (e.g., tables, graphs, observations, similar figures) and identifying the constant of proportionality using tables, graphs, equations, diagrams, and verbal descriptions</li> <li>Model writing equations of proportional relationships</li> <li>Analyze a variety of graphs that represent proportional relationships</li> <li>Provide a variety of examples involving proportional relationships including problems about simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error</li> <li>Facilitate cooperative group work</li> <li>Use math language often and consistently</li> <li>Model questioning and inferring</li> <li>Model and justify thinking</li> <li>Facilitate constructing written responses to defend mathematics</li> <li>Integrate content with other core subjects</li> <li>Use appropriate technology</li> <li>Model functions of the graphing and scientific calculators</li> <li>Model and/or facilitate common tasks</li> <li>Model and provide practice mental math thinking</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>Teacher Observations during Classroom Math Activities</li> <li>Formative &amp; Summative</li> <li>Tiered assignments</li> <li>Anecdotal records</li> <li>Exhibits</li> <li>Interviews</li> <li>Journals/notebooks</li> <li>Oral &amp; Visual presentations</li> <li>Portfolios (samples of process &amp; products)</li> <li>Performance/problem-based tasks</li> <li>Exemplars &amp; Rubrics</li> <li>Collaboration/Conferencing</li> <li>Common Local Assessments (quarterly)</li> <li>Common Tasks</li> </ul> <p><u>Performance Indicators:</u></p> <p>The student will:</p> <ul style="list-style-type: none"> <li>Compute the unit rates of two quantities with different units, which could be fractions</li> <li>Decide whether two quantities are in a proportional relationship</li> <li>Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships</li> <li>Represent proportional relationships by equations</li> <li>Identify the unit rate on a graph of a proportional relationship and explain what any point on a graph represents</li> <li>Use proportional relationships to solve multistep ratio and percent problems.</li> <li>Justify their thinking when approaching mathematics in general and support their thinking with evidence</li> <li>Question, analyze and solve real world problems from contexts outside of and within mathematics including those that cut across content strands or disciplines</li> <li>Construct written responses defending their work</li> <li>Demonstrate proficiency with common tasks, such as role playing (i.e., banker); 15% tip; 20% discount</li> </ul>	<p><u>Programs &amp; Materials:</u></p> <ul style="list-style-type: none"> <li><i>Big Ideas Math Learning</i> by Larson Texts Inc.</li> <li><i>Impact Mathematics</i> Course 2 by Glencoe</li> <li>Scientific and graphing calculators</li> <li>Interactive TI-Connects graphing software</li> <li>Computer lab</li> <li>Calculators</li> <li>Smart Board</li> <li><i>Study Island/ALEKS</i> Interventions</li> <li>Rulers (metric), protractors</li> <li>Scissors, glue</li> <li>Four-quadrant multiplication grid</li> <li>Multiple Intelligences and Brain Dominance</li> <li>Differentiation</li> <li>Jigsaw, Anchoring, Think-Pair-Share, Cubing, etc.</li> <li>Questioning and making conjectures</li> <li><i>Classroom Instruction That Works</i> by Robert Marzano</li> <li><a href="http://www.glencoe.com">www.glencoe.com</a></li> <li><a href="http://www.bigideasmath.com">www.bigideasmath.com</a></li> <li><a href="http://www.ridoe.net">www.ridoe.net</a></li> <li><a href="http://www.ride.ri.gov/instruction/curriculum">www.ride.ri.gov/instruction/curriculum</a></li> <li>NECAP Release tasks</li> <li><a href="http://www.NECompact.org">www.NECompact.org</a></li> </ul> <p><u>Professional Resources (partial list):</u></p> <ul style="list-style-type: none"> <li><i>A Collection of Performance Tasks and Rubrics High School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><i>A Collection of Performance Tasks and Rubrics Middle School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><a href="http://www.exemplars.com/about/">http://www.exemplars.com/about/</a></li> <li><i>Improving Adolescent Literacy</i> by Fisher &amp; Frey</li> <li><i>MARS</i> Balanced Assessment series of common tasks</li> </ul>

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**NUMBER SYSTEM -Template # 1 (NUMBER & OPERATIONS)**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GLEs	Instructional Strategies	Assessment Opportunities	Resources
<p><b>The Number System-Grade 7:</b>  <b>Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</b>            1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.            a. Describe situations in which opposite quantities combine to make 0. <i>For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</i>            b. Understand <math>p + q</math> as the number located a distance <math> q </math> from <math>p</math>, in the positive or negative direction depending on whether <math>q</math> is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.            c. Understand subtraction of rational numbers as adding the additive inverse, <math>p - q = p + (-q)</math>. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.            d. Apply properties of operations as strategies to add and subtract rational numbers.</p>	<p><b>GLE: M (N&amp;O)–7–2</b>  <b>Demonstrates understanding of the relative magnitude of numbers</b> by ordering, comparing, or identifying equivalent rational numbers across <b>number formats</b>, numbers with whole number bases and whole number exponents (e.g., <math>3^2</math>, <math>4^3</math>), integers, <b>absolute values</b>, or <b>numbers represented in scientific notation</b> using number lines or equality and inequality symbols. (State) <b>**This is NOT addressed here (see Grade 8).</b></p> <p><b>GLE: M (N&amp;O)–7–3</b>  <b>Demonstrates conceptual understanding of operations with integers and whole number exponents</b> (where the base is a whole number) using models, diagrams, or explanations. (Local) <b>**This is NOT addressed here (see Grade 8).</b></p> <p><b>GLE: M (N&amp;O)–7–8</b> <b>Applies properties of numbers</b> (odd, even, remainders, divisibility, and prime factorization) and <b>field properties</b> (commutative, associative, identity, distributive, inverses) <b>to solve problems and to simplify computations, and demonstrates conceptual understanding of field properties as they apply to subsets of the real numbers</b> (e.g., the set of whole numbers does not have additive inverses, the set of integers does not have multiplicative inverses). (Local) <b>**This is NOT addressed here (see Grade 8)</b>  <b>(IMPORTANT: Applies the conventions of order of operations including parentheses, brackets, or exponents)</b></p>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>Describe the process standards and proficiencies important to reach mastery level</li> <li>Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Identify developmental skills</li> <li>Reinforcement of skills</li> <li>Drill and practice skills</li> </ul> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>Model and show rational numbers that are opposite on a number line</li> <li>Connect the concept of absolute value to addition and subtraction of rational numbers</li> <li>Provide examples of rewriting subtraction problems as addition problems by adding the opposite</li> <li>Show that the absolute value of the difference of two rational numbers is the distance between them on a number line</li> <li>Provide examples showing properties of operations to add and subtract rational numbers</li> <li>Review properties of numbers to solve new problems</li> <li>Identify properties relating to specific operations when solving mathematical problems, simplifying computations, and comparing properties and number systems</li> <li>Show efficient techniques to solve field property problems, identity problems, and inverse properties</li> <li>Facilitate cooperative group work</li> <li>Use math language often and consistently</li> <li>Model questioning and inferring</li> <li>Model and justify thinking</li> <li>Facilitate constructing written responses to defend mathematics</li> <li>Integrate content with other core subjects</li> <li>Use appropriate technology</li> <li>Model functions of the graphing and scientific calculators</li> <li>Model and/or facilitate common tasks</li> <li>Model and provide practice mental math</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>Teacher Observations during Classroom Math Activities</li> <li>Formative &amp; Summative</li> <li>Tiered assignments</li> <li>Anecdotal records</li> <li>Exhibits</li> <li>Interviews</li> <li>Journals/notebooks</li> <li>Oral &amp; Visual presentations</li> <li>Portfolios (samples of process &amp; products)</li> <li>Performance/problem-based tasks</li> <li>Exemplars &amp; Rubrics</li> <li>Collaboration/Conferencing</li> <li>Common Local Assessments (quarterly)</li> <li>Common Tasks</li> </ul> <p><u>Performance Indicators:</u>            The student will:</p> <ul style="list-style-type: none"> <li>Identify opposite quantities of rational numbers on a number line that combine to make 0, and apply in real-life situations.</li> <li>Explain the relationship of absolute value to the addition and subtraction of rational numbers, including additive inverses and apply to real-world contexts</li> <li>Construct equations to rewrite subtraction problems as addition problems by adding the opposite</li> <li>Show the distance between two rational numbers is the absolute value of their difference</li> <li>Apply the properties of operations to add and subtract rational numbers</li> <li>Practice and apply properties of numbers to solve problems, simplify computations, or compare and contrast the properties of numbers and number systems:               <ul style="list-style-type: none"> <li>Field properties: Commutative; associative; identity; inverses</li> <li>Identity properties: Additive identity; multiplicative identity</li> <li>Inverse properties: Additive inverse; multiplicative inverse</li> </ul> </li> <li>Justify their thinking when approaching mathematics in general and support their thinking with evidence</li> <li>Question, analyze and solve real world problems from contexts outside of and within mathematics including those that cut across content strands or disciplines</li> <li>Construct written responses defending their work</li> <li>Demonstrate proficiency with common tasks: role playing (e.g., banker); chemistry experiment; 15% tip; 20% discount; area and volume</li> </ul>	<p><u>Programs &amp; Materials:</u></p> <ul style="list-style-type: none"> <li><i>Big Ideas Math Learning</i> by Larson Texts Inc.</li> <li><i>Impact Mathematics</i> Course 2 by Glencoe</li> <li>Scientific and graphing calculators</li> <li>Interactive TI-Connects graphing software</li> <li>Computer lab</li> <li>Calculators</li> <li>Smart Board</li> <li><i>Study Island/ALEKS</i> Interventions</li> <li>Rulers (metric), protractors</li> <li>Scissors, glue</li> <li>Four-quadrant multiplication grid</li> <li>Multiple Intelligences and Brain Dominance</li> <li>Differentiation</li> <li>Jigsaw, Anchoring, Think-Pair-Share, Cubing, etc.</li> <li>Questioning and making conjectures</li> <li><i>Classroom Instruction That Works</i> by Robert Marzano</li> <li><a href="http://www.glencoe.com">www.glencoe.com</a></li> <li><a href="http://www.bigideasmath.com">www.bigideasmath.com</a></li> <li><a href="http://www.ride.net">www.ride.net</a></li> <li><a href="http://www.ride.ri.gov/instruction/curriculum">www.ride.ri.gov/instruction/curriculum</a></li> <li>NECAP Release tasks</li> <li><a href="http://www.NECompact.org">www.NECompact.org</a></li> </ul> <p><u>Professional Resources (partial list):</u></p> <ul style="list-style-type: none"> <li><i>A Collection of Performance Tasks and Rubrics High School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><i>A Collection of Performance Tasks and Rubrics Middle School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><a href="http://www.exemplars.com/about/">http://www.exemplars.com/about/</a></li> <li><i>Improving Adolescent Literacy</i> by Fisher &amp; 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**NUMBER SYSTEM Template #2 (NUMBER & OPERATIONS)**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GLEs	Instructional Strategies	Assessment Opportunities	Resources
<p><b>The Number System-Grade 7:</b>  <b>Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</b>            2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.            a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as <math>(-1)(-1) = 1</math> and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.            b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If <math>p</math> and <math>q</math> are integers, then <math>-(p/q) = (-p)/q = p/(-q)</math>. Interpret quotients of rational numbers by describing real world contexts.            c. Apply properties of operations as strategies to multiply and divide rational numbers.            d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.             3. Solve real-world and mathematical problems involving the four operations with rational numbers. **Computations with rational numbers extend the rules for manipulating fractions to complex fractions</p>	<p>GLE: M (N &amp; O)- 7-6 Uses a variety of mental computation strategies to solve problems (e.g., using compatible numbers, applying properties of operations, using mental imagery, using patterns) and to determine the reasonableness of answers; and mentally calculates benchmark perfect squares and related square roots (e.g., <math>1^2, 2^2, \dots, 12^2, 15^2, 20^2, 25^2, 100^2, 1000^2</math>); determines the part of a number using benchmark percents and related fractions (1%, 10%, 25%, <math>33\frac{1}{3}\%</math>, 50%, <math>66\frac{2}{3}\%</math>, 75%, and 100%) (e.g., 25% of 16; <math>33\frac{1}{3}\%</math> of 330). (Local) (IMPORTANT: <i>The intent of this GSE is to embed mental arithmetic throughout the instructional program, not to teach it as a separate unit.</i>)            **This is NOT addressed here... (see Grade 8).</p>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>Describe the process standards and proficiencies important to reach mastery level</li> <li>Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Identify developmental skills</li> <li>Reinforcement of skills</li> <li>Drill and practice skills</li> </ul> <hr/> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>Review previous understandings of multiplying and dividing fractions</li> <li>Demonstrate the pattern of multiplication of two integers extended to signed rational numbers</li> <li>Show the concept of division by zero as undefined</li> <li>Use fact families to explain why the quotient of two integers results in a rational number</li> <li>Review and explain how to use long division to convert rational numbers to terminating and repeating decimals</li> <li>Provide opportunities to solve real-world and mathematical problems using the four operations with rational numbers and complex fractions</li> <li>Provide opportunities to show conversions of percents, fractions and decimals, using tables, grids, and technology</li> <li>Facilitate cooperative group work</li> <li>Use math language often and consistently</li> <li>Model questioning and inferencing</li> <li>Model and justify thinking</li> <li>Facilitate constructing written responses to defend mathematics</li> <li>Integrate content with other core subjects</li> <li>Use appropriate technology</li> <li>Model functions of the graphing and scientific calculators</li> <li>Model and/or facilitate common tasks</li> <li>Model and provide practice mental math thinking</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>Teacher Observations during Classroom Math Activities</li> <li>Formative &amp; 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Materials:</u></p> <ul style="list-style-type: none"> <li><i>Big Ideas Math Learning</i> by Larson Texts Inc.</li> <li><i>Impact Mathematics</i> Course 2 by Glencoe</li> <li>Scientific and graphing calculators</li> <li>Interactive TI-Connects graphing software</li> <li>Computer lab</li> <li>Calculators</li> <li>Smart Board</li> <li><i>Study Island/ALEKS</i> Interventions</li> <li>Rulers (metric), protractors</li> <li>Scissors, glue</li> <li>Four-quadrant multiplication grid</li> <li>Multiple Intelligences and Brain Dominance</li> <li>Differentiation</li> <li>Jigsaw, Anchoring, Think-Pair-Share, Cubing, etc.</li> <li>Questioning and making conjectures</li> <li><i>Classroom Instruction That Works</i> by Robert Marzano</li> <li><a href="http://www.glencoe.com">www.glencoe.com</a></li> <li><a href="http://www.bigideasmath.com">www.bigideasmath.com</a></li> <li><a href="http://www.ride.ri.gov">www.ride.ri.gov</a></li> <li><a href="http://www.ride.ri.gov/instruction/curriculum">www.ride.ri.gov/instruction/curriculum</a></li> <li>NECAP Release tasks</li> <li><a href="http://www.NECompact.org">www.NECompact.org</a></li> </ul> <p><u>Professional Resources (partial list):</u></p> <ul style="list-style-type: none"> <li><i>A Collection of Performance Tasks and Rubrics High School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><i>A Collection of Performance Tasks and Rubrics Middle School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><a href="http://www.exemplars.com/about/">http://www.exemplars.com/about/</a></li> <li><i>Improving Adolescent Literacy</i> by Fisher &amp; 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**EXPRESSIONS & EQUATIONS (FUNCTIONS & ALGEBRA)**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GLEs	Instructional Strategies	Assessment Opportunities	Resources
<p><b>Expressions &amp; Equations-Gr 7:</b>  <b>Use properties of operations to generate equivalent expressions.</b>                      1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.                      2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, <math>a + 0.05a = 1.05a</math> means that "increase by 5%" is the same as "multiply by 1.05."</i>  <b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b>                      3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <i>For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional <math>\frac{1}{10}</math> of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar <math>9\frac{3}{4}</math> inches long in the center of a door that is <math>27\frac{1}{2}</math> inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.</i>                      4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.                      a. Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i>                      b. Solve word problems leading to inequalities of the form <math>px + q &gt; r</math> or <math>px + q &lt; r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. <i>For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.</i></p>	<p><b>GLE: M (F &amp; A)-7-1 Identifies and extends to specific cases a variety of patterns</b> (linear and nonlinear) represented in models, tables, sequences, graphs, or in problem situations; <b>and generalizes a linear relationship using words and symbols; generalizes a linear relationship to find a specific case; or writes an expression or equation using words or (s) symbols to express the generalization of a nonlinear relationship.</b> (State)</p> <p><b>GLE: M(F&amp;A)-7-2 Demonstrates conceptual understanding of linear relationships</b> (<math>y = kx</math>; <math>y = mx + b</math>) <b>as a constant rate of change by solving problems involving the relationship between slope and rate of change, by describing the meaning of slope in concrete situations, or informally determining the slope of a line from a table or graph; and distinguishes between constant and varying rates of change in concrete situations represented in tables or graphs; or describe how change in the value of one variable relates to change in the value of a second variable in problem situations with constant rates of change.</b> (State) <b>**This is NOT addressed here... (see Grade 8)</b>  <b>**** This is addressed above, under Ratio and Proportional Relationships</b></p> <p><b>GLE: M(F&amp;A)-7-3 Demonstrates conceptual understanding of algebraic expressions</b> by using letters to represent unknown quantities to write algebraic expressions (including those with whole number exponents or more than one variable); or by evaluating algebraic expressions (including those with whole number exponents or more than one variable); or by evaluating an expression within an equation (e.g., determine the value of <math>y</math> when <math>x = 4</math> given <math>y = 5x^2 - 2</math>). (State) <b>**This is NOT addressed here... (see Grade 8)</b></p> <p><b>GLE: M(F&amp;A)-7-4 Demonstrates conceptual understanding of equality</b> by showing equivalence between two expressions (expressions consistent with the parameters of the left- and right-hand sides of the equations being solved at this grade level) using models or different representations of the expressions, solving multi-step linear equations of the form <math>ax \pm b = c</math> with <math>a \neq 0</math>, <math>ax \pm b = cx \pm d</math> with <math>a, c \neq 0</math>, and <math>(x/a) \pm b = c</math> with <math>a \neq 0</math>, where <math>a, b, c</math> and <math>d</math> are whole numbers; or by translating a problem-solving situation into an equation consistent with the parameters of the type of equations being solved for this grade level. (State)</p>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>Describe the process standards and proficiencies important to reach mastery level</li> <li>Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Identify developmental skills</li> <li>Reinforcement of skills</li> <li>Drill and practice skills</li> </ul> <hr/> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>Formulate a series of rules for simplifying and evaluating numerical and algebraic expressions</li> <li>Model and provide practice how to translate problem situations into algebraic expressions with rational coefficients</li> <li>Use tables and graphs to show the relationship between linear and non-linear equations, and in word problems</li> <li>Demonstrate multiple representations of linear and non-linear relationships and how to solve those equations</li> <li>Facilitate scenarios when students analyze the reasonableness of their answers using mental math and estimation skills</li> <li>Identify properties relating to specific operations when solving mathematical problems</li> <li>Model solving equations and inequalities in the form <math>px + q = r</math>; <math>p(x + q) = r</math>; <math>px + q &gt; r</math>; or <math>px + q &lt; r</math> where <math>p, q</math>, and <math>r</math> are rational numbers</li> <li>Model and provide practice graphing solutions of inequalities on a number line</li> <li>Facilitate the use of technology to solve mathematical problems</li> <li>Integrate mathematics with science concepts, e.g., astronomy, microbiology</li> <li>Facilitate cooperative group work</li> <li>Use math language often and consistently</li> <li>Model questioning and inferencing</li> <li>Model and justify thinking</li> <li>Facilitate constructing written responses to defend mathematics</li> <li>Integrate content with other core subjects</li> <li>Use appropriate technology</li> <li>Model functions of the graphing and scientific calculators</li> <li>Model and/or facilitate common tasks</li> <li>Model and provide practice mental math thinking</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>Teacher Observations during Classroom Math Activities</li> <li>Formative &amp; Summative</li> <li>Tiered assignments</li> <li>Anecdotal records</li> <li>Exhibits</li> <li>Interviews</li> <li>Journals/notebooks</li> <li>Oral &amp; Visual presentations</li> <li>Portfolios (samples of process &amp; products)</li> <li>Performance/problem-based tasks</li> <li>Exemplars &amp; Rubrics</li> <li>Collaboration/Conferencing</li> <li>Common Local Assessments (quarterly, mid-term, final term)</li> <li>Common Tasks</li> </ul> <p><u>Performance Indicators:</u>      The student will:</p> <ul style="list-style-type: none"> <li>Demonstrate conceptual understanding of numerical and algebraic expressions and equations by simplifying linear and non-linear expressions with rational coefficients</li> <li>Evaluate expressions by rewriting them in different forms</li> <li>Translate problem situations into algebraic expressions using whole numbers, fractions, and decimals as coefficients of variables</li> <li>Apply linear and non-linear equations using words or symbols to represent and solve multi-step and real-life problems</li> <li>Assess the reasonableness of answers using mental math and estimation</li> <li>Solve multi-step linear and non-linear equations</li> <li>Use variables to represent quantities in a real-world or mathematical problem</li> <li>Construct simple equations and inequalities to solve problems by reasoning about the quantities</li> <li>Understand, use, and applies appropriate technology and software programs to solve problems</li> <li>Justify their thinking when approaching mathematics in general and support their thinking with evidence</li> <li>Question, analyze and solve real world problems from contexts outside of and within mathematics including those that cut across content strands or disciplines</li> <li>Construct written responses defending their work</li> <li>Demonstrate proficiency with common tasks</li> </ul>	<p><u>Programs &amp; Materials:</u></p> <ul style="list-style-type: none"> <li><i>Big Ideas Math Learning</i> by Larson Texts Inc.</li> <li><i>Impact Mathematics Course 2</i> by Glencoe</li> <li>Scientific and graphing calculators</li> <li>Interactive TI-Connects graphing software</li> <li>Computer lab</li> <li>Calculators</li> <li>Smart Board</li> <li><i>Study Island/ALEKS</i> Interventions</li> <li>Rulers (metric), protractors</li> <li>Scissors, glue</li> <li>Four-quadrant multiplication grid</li> <li>Multiple Intelligences and Brain Dominance</li> <li>Differentiation</li> <li>Jigsaw, Anchoring, Think-Pair-Share, Cubing, etc.</li> <li>Questioning and making conjectures</li> <li><i>Classroom Instruction That Works</i> by Robert Marzano</li> <li>Magazines: <i>Scope; Junior Scholastic; National Geographic; Science World</i></li> <li><a href="http://www.glencoe.com">www.glencoe.com</a></li> <li><a href="http://www.bigideasmath.com">www.bigideasmath.com</a></li> <li><a href="http://www.ridoe.net">www.ridoe.net</a></li> <li><a href="http://www.ridoe.net/instruction/curriculum">www.ridoe.net/instruction/curriculum</a></li> <li>NECAP Release tasks</li> <li><a href="http://www.NECcompact.org">www.NECcompact.org</a></li> </ul> <p><u>Professional Resources (partial list):</u></p> <ul style="list-style-type: none"> <li><i>A Collection of Performance Tasks and Rubrics High School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><i>A Collection of Performance Tasks and Rubrics Middle School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><a href="http://www.exemplars.com/about/">http://www.exemplars.com/about/</a></li> <li><i>Improving Adolescent Literacy</i> by Fisher &amp; 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**Little Compton Mathematics Curriculum-Grade 7**  
**By Heather Davidson, Nicole Hawes, George Mullins, Janet Griffith-May 2011**

**GEOMETRY (GEOMETRY & MEASUREMENT)**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GLEs	Instructional Strategies	Assessment Opportunities	Resources
<p><b>Geometry-Grade 7:</b>  <b>Draw, construct, and describe geometrical figures and describe the relationships between them.</b></p> <p>1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p> <p>2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p> <p>3. Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</p> <p>4. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</p> <p>5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</p> <p>6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p>	<p><b>GLE: M (G&amp;M)–7–1 Uses properties of angle relationships resulting from two or three intersecting lines (adjacent angles, vertical angles, straight angles, or angle relationships formed by two non-parallel lines cut by a transversal), or two parallel lines cut by a transversal to solve problems.</b> (State)</p> <p><b>GLE: M (G&amp;M)–7–2 Applies theorems or relationships</b> (triangle inequality or sum of the measures of interior angles of regular polygons) to solve problems. (State)</p> <p><b>GLE: M (G&amp;M)–7–4 Applies the concepts of congruency by solving problems on a coordinate plane involving reflections, translations, or rotations.</b> (State)</p> <p><b>GLE: M(G&amp;M)–7–5 Applies concepts of similarity by solving problems</b> involving scaling up or down and their impact on angle measures, linear dimensions and areas of polygons, and circles when the linear dimensions are multiplied by a constant factor. Describe effects using models or (sc) explanations. (State)</p> <p><b>GLE: M (G&amp;M)–7–6 Demonstrates conceptual understanding of the area of circles or the area or perimeter of composite figures (quadrilaterals, triangles, or parts of circles), and the surface area of rectangular prisms, or volume of rectangular prisms, triangular prisms, or cylinders</b> using models, formulas, or by solving related problems. Expresses all measures using appropriate units. (State)</p> <p><b>GLE: M (G&amp;M)-7-10 Demonstrates conceptual understanding of spatial reasoning and visualization by sketching three dimensional solids; and draws nets of rectangular and triangular prisms, cylinders, and pyramids and uses the nets as a technique for finding surface area.</b> (Local)</p>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>Describe the process standards and proficiencies important to reach mastery level</li> <li>Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <p>~~~~~</p> <ul style="list-style-type: none"> <li>Identify developmental skills</li> <li>Reinforcement of skills</li> <li>Drill and practice skills</li> </ul> <p>~~~~~</p> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>Facilitate the scaling of a two-dimensional shape for students to explore the impact on lengths, perimeters, and areas</li> <li>Facilitate the construction of similar figures using a variety of tools</li> <li>Provide examples of the proof that the sum of interior angles of triangles always equal 180° and apply the proof to the similarity of two triangles when two angles are congruent</li> <li>Demonstrate when a triangle can be produced given the lengths of three sides of a possible triangle</li> <li>Facilitate discourse by modeling cross-sections of three-dimensional solids that result in different two-dimensional shapes</li> <li>Model drawing three-dimensional solids and provide opportunities to construct and explore nets for a variety of three-dimensional solids to help calculate surface area and understand the components of the three-dimensional shapes</li> <li>Model, and provide practice applying the formulas of a circle and the relationship among the measurements of a circle</li> <li>Facilitate exploring measurements of interior and exterior angles of polygons</li> <li>Provide examples of vertical, alternate interior, alternate exterior, adjacent, complementary, and supplementary angles</li> <li>Review and extend concepts of perimeter, area, surface area, and volume of two- and three-dimensional figures</li> <li>Model drawing shapes that exhibit rotation, reflection, and translation of two-dimensional shapes showing congruency that have undergone one or more transformations</li> <li>Facilitate cooperative group work</li> <li>Use math language often and consistently</li> <li>Model questioning and inferring</li> <li>Model and justify thinking</li> <li>Facilitate constructing written responses to defend mathematics</li> <li>Integrate content with other core subjects</li> <li>Use appropriate technology</li> <li>Model functions of the graphing and scientific calculators</li> <li>Model and/or facilitate common tasks</li> <li>Model and provide practice mental math thinking</li> <li>Identify properties relating to specific operations when solving mathematical problems</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>Teacher Observations during Classroom Math Activities</li> <li>Formative &amp; 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Materials:</u></p> <ul style="list-style-type: none"> <li><i>Big Ideas Math Learning</i> by Larson Texts Inc.</li> <li><i>Impact Mathematics</i> Course 2 by Glencoe</li> <li>Scientific and graphing calculators</li> <li>Interactive TI-Connects graphing software</li> <li>Computer lab</li> <li>Calculators</li> <li>Smart Board</li> <li><i>Study Island/ALEKS</i> Interventions</li> <li>Rulers (metric), protractors</li> <li>Scissors, glue</li> <li>Geometric manipulatives</li> <li>Algebra lab gear</li> <li>Four-quadrant multiplication grid</li> <li>Geyer Scientific and Math products</li> <li>Multiple Intelligences and Brain Dominance</li> <li>Differentiation</li> <li>Jigsaw, Anchoring, Think-Pair-Share, Cubing, etc.</li> <li>Questioning and making conjectures</li> <li><i>Classroom Instruction That Works</i> by Robert Marzano</li> <li><a href="http://www.glencoe.com">www.glencoe.com</a></li> <li><a href="http://www.bigideasmath.com">www.bigideasmath.com</a></li> <li><a href="http://www.ridoe.net">www.ridoe.net</a></li> <li><a href="http://www.ride.ri.gov/instruction/curriculum">www.ride.ri.gov/instruction/curriculum</a></li> <li>NECAP Release tasks</li> <li><a href="http://www.NECompact.org">www.NECompact.org</a></li> </ul> <p><u>Professional Resources</u> (partial list):</p> <ul style="list-style-type: none"> <li><i>A Collection of Performance Tasks and Rubrics High School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><i>A Collection of Performance Tasks and Rubrics Middle School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><a href="http://www.exemplars.com/about/">http://www.exemplars.com/about/</a></li> <li><i>Improving Adolescent Literacy</i> by Fisher &amp; 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**Little Compton Mathematics Curriculum-Grade 7**  
 By Heather Davidson, Nicole Hawes, George Mullins, Janet Griffith-May 2011

**STATISTICS & PROBABILITY Template # 1 (DATA, STATISTICS & PROBABILITY)**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GLEs	Instructional Strategies	Assessment Opportunities	Resources
<p><b>Statistics and Probability-Grade 7:</b>  <b>Use random sampling to draw inferences about a population.</b>                      1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.</p> <p>2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i></p> <p><b>Draw informal comparative inferences about two populations.</b>                      3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. <i>For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</i></p> <p>4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</i></p>	<p><b>GLE: M (DSP)–7–1 Interprets a given representation</b> (circle graphs, scatter plots that represent discrete linear relationships, or histograms) to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (State)                      (IMPORTANT: Analyzes data consistent with concepts and skills in M (DSP)–7–2.)</p> <p><b>GLE: M (DSP)- 7–2 Analyzes patterns, trends, or distributions in data in a variety of contexts by solving problems using</b> measures of central tendency (mean, median, or mode), dispersion (range or variation), or outliers to analyze situations to determine their effect on mean, median, or mode; and evaluates the sample from which the statistics were developed (bias). (State)</p> <p><b>GLE: M (DSP)–7–3 Organizes and displays data</b> using tables, line graphs, scatter plots, and circle graphs to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (Local)</p> <p><b>GLE: M(DSP)–7–3 Identifies or describes representations or elements of representations that best display a given set of data or situation</b>, consistent with the representations required in M (DSP)–7–1. (State)                      (IMPORTANT: Analyzes data consistent with concepts and skills in M (DSP)–6–2.)</p> <p><b>GLE: M(DSP)–7–6 In response to a teacher or student generated question or hypothesis</b> decides the most effective method (e.g., survey, observation, experimentation) to collect the data (numerical or categorical) necessary to answer the question; collects, organizes, and appropriately displays the data; analyzes the data to draw conclusions about the question or hypothesis being tested while considering the limitations that could affect interpretations; and when appropriate makes predictions; and asks new questions and makes connections to real world situations. (Local)                      (IMPORTANT: Analyzes data consistent with concepts and skills in M (DSP)–7–2.)</p>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>Describe the process standards and proficiencies important to reach mastery level</li> <li>Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Identify developmental skills</li> <li>Reinforcement of skills</li> <li>Drill and practice skills</li> </ul> <hr/> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>Use random sampling to draw inferences about a population based on statistics</li> <li>Identify each tool in collecting data and the advantages/disadvantages of each tool</li> <li>Provide multiple samples of information about a population to reinforce validity</li> <li>Model the construction of various displays to analyze data and show the effectiveness of each tool</li> <li>Discuss and explain limitations in data collection that affect interpretations</li> <li>Differentiate similar data to identify commonalities and where the spread of data overlaps; contrast their central relationships</li> <li>Facilitate cooperative group work</li> <li>Use math language often and consistently</li> <li>Model questioning and inferring</li> <li>Model and justify thinking</li> <li>Facilitate constructing written responses to defend mathematics</li> <li>Integrate content with other core subjects</li> <li>Use appropriate technology</li> <li>Model functions of the graphing and scientific calculators</li> <li>Model and/or facilitate common tasks</li> <li>Model and provide practice mental math thinking</li> <li>Identify properties relating to specific operations when solving mathematical problems</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>Teacher Observations during Classroom Math Activities</li> <li>Formative &amp; Summative</li> <li>Tiered assignments</li> <li>Anecdotal records</li> <li>Exhibits</li> <li>Interviews</li> <li>Journals/notebooks</li> <li>Oral &amp; Visual presentations</li> <li>Portfolios (samples of process &amp; 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 By Heather Davidson, Nicole Hawes, George Mullins, Janet Griffith-May 2011

**STATISTICS & PROBABILITY Template # 2 (DATA, STATISTICS & PROBABILITY)**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GLEs	Instructional Strategies	Assessment Opportunities	Resources
<p><b>Statistics and Probability-Grade 7:</b>  <b>Investigate chance processes and develop, use, and evaluate probability models.</b></p> <p>5. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</p> <p>6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. <i>For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</i></p> <p>7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.</p> <p>a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.</i></p> <p>b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. <i>For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?</i></p> <p>8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p> <p>a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.</p> <p>b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.</p> <p>c. Design and use a simulation to generate frequencies for compound events. <i>For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?</i></p>	<p><b>GLE: M(DSP)–7–4 Uses counting techniques to solve problems in context involving combinations or permutations</b> (e.g., How many different ways can eight students place first, second, and third in a race?) using a variety of strategies (e.g., organized lists, tables, tree diagrams, models, Fundamental Counting Principle, or (sc) others). (Local) <b>**This is not addressed in the Common Core Standards at any level.</b></p> <p><b>GLE: M(DSP)–7–5 For a probability event in which the sample space may or may not contain equally likely outcomes, predicts the theoretical probability of an event and tests the prediction through experiments and simulations; and compares and contrasts theoretical and experimental probabilities.</b> (Local)</p> <p><b>GLE: M(DSP)–7–5 For a probability event in which the sample space may or may not contain equally likely outcomes, determines the experimental or theoretical probability of an event in a problem-solving situation.</b> (State)</p>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>Describe the process standards and proficiencies important to reach mastery level</li> <li>Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Identify developmental skills</li> <li>Reinforcement of skills</li> <li>Drill and practice skills</li> </ul> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>Define probability as determining chance in situations using experimental and theoretical modeling</li> <li>Demonstrate examples of experimental probability where the outcome is different from the theoretical probability</li> <li>Explain and identify the distinction between dependent and independent events</li> <li>Show multiple opportunities to explore situations that result in equally-likely and non equally-likely outcomes</li> <li>Model using lists, tables, and tree diagrams to represent sample spaces for compound events to identify outcomes</li> <li>Facilitate the construction of a simulation of compound events to generate frequencies</li> <li>Model and provide practice different techniques using permutations to solve problems <b>**See GLE</b></li> <li>Facilitate cooperative group work</li> <li>Use math language often and consistently</li> <li>Model questioning and inferring</li> <li>Model and justify thinking</li> <li>Facilitate constructing written responses to defend mathematics</li> <li>Integrate content with other core subjects</li> <li>Use appropriate technology</li> <li>Model functions of the graphing and scientific calculators</li> <li>Model and/or facilitate common tasks</li> <li>Model and provide practice mental math thinking</li> <li>Identify properties relating to specific operations when solving mathematical problems</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>Teacher Observations during Classroom Math Activities</li> <li>Formative &amp; Summative</li> <li>Tiered assignments</li> <li>Anecdotal records</li> <li>Exhibits</li> <li>Interviews</li> <li>Journals/notebooks</li> <li>Oral &amp; Visual presentations</li> <li>Portfolios (samples of process &amp; products)</li> <li>Performance/problem-based tasks</li> <li>Exemplars &amp; Rubrics</li> <li>Collaboration/Conferencing</li> <li>Common Local Assessments (quarterly)</li> <li>Common Tasks</li> </ul> <hr/> <p><u>Performance Indicators:</u>      The student will:</p> <ul style="list-style-type: none"> <li>Express probability as decimals, fractions, or percents to show understanding of simple and compound events</li> <li>Conduct experiments and collect data to determine experimental probability of an event and compare theoretical probability to the results</li> <li>Distinguish between dependent and independent events</li> <li>Determine the probability of an event when there are equally-likely and non equally-likely outcomes</li> <li>Represent compound events using organized lists, tables, and tree diagrams and identify the outcomes</li> <li>Create a simulation of compound events to generate data to solve problems</li> <li>Use different techniques to solve problems involving permutations <b>**see GLE</b></li> <li>Justify their thinking when approaching mathematics in general and support their thinking with evidence</li> <li>Question, analyze and solve real world problems from contexts outside of and within mathematics including those that cut across content strands or disciplines</li> <li>Construct written responses defending their work</li> <li>Demonstrate proficiency with common tasks</li> </ul>	<p><u>Programs &amp; Materials:</u></p> <ul style="list-style-type: none"> <li><i>Big Ideas Math Learning</i> by Larson Texts Inc.</li> <li><i>Impact Mathematics</i> Course 2 by Glencoe</li> <li>Scientific and graphing calculators</li> <li>Interactive TI-Connects graphing software</li> <li>Computer lab</li> <li>Calculators</li> <li>Smart Board</li> <li><i>Study Island/ALEKS</i> Interventions</li> <li>Rulers (metric), protractors</li> <li>Scissors, glue</li> <li>Four-quadrant multiplication grid</li> <li>Multiple Intelligences and Brain Dominance</li> <li>Differentiation</li> <li>Jigsaw, Anchoring, Think-Pair-Share, Cubing, etc.</li> <li>Questioning and making conjectures</li> <li><i>Classroom Instruction That Works</i> by Robert Marzano</li> <li><a href="http://www.glencoe.com">www.glencoe.com</a></li> <li><a href="http://www.bigideasmath.com">www.bigideasmath.com</a></li> <li><a href="http://www.ridoe.net">www.ridoe.net</a></li> <li><a href="http://www.ride.ri.gov/instruction/curriculum">www.ride.ri.gov/instruction/curriculum</a></li> <li>NECAP Release tasks</li> <li><a href="http://www.NECompact.org">www.NECompact.org</a></li> </ul> <p><u>Professional Resources</u> (partial list):</p> <ul style="list-style-type: none"> <li><i>A Collection of Performance Tasks and Rubrics High School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><i>A Collection of Performance Tasks and Rubrics Middle School Mathematics</i> by Charlotte Danielson, ASCD</li> <li><a href="http://www.exemplars.com/about/">http://www.exemplars.com/about/</a></li> <li><i>Improving Adolescent Literacy</i> by Fisher &amp; Frey</li> <li><i>MARS</i> Balanced Assessment series of common tasks</li> </ul>

**Little Compton Mathematics Curriculum-Grade 7**  
**By Heather Davidson, Nicole Hawes, George Mullins, Janet Griffith-May 2011**

**MATHEMATICAL PRACTICES/PROBLEM SOLVING, REASONING & PROOF**

*Applied Learning Standards: (SCANS)-Critical Thinking, Problem Solving, Research, Communication, Reflection and Evaluation; Principles of Learning; Disciplinary Literacy*

Common Core	GSEs (6-8)	Instructional Strategies	Assessment Opportunities	Resources
<p><b>Mathematical Practices-K-12 :</b></p> <ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	<p><b>GSE: M (PRP)-8-1</b>  <b>Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content</b> and be able to:</p> <ul style="list-style-type: none"> <li>• Use problem-solving strategies appropriately and effectively for a given situation.</li> <li>• Determine, collect and organize the relevant information needed to solve real-world problems.</li> <li>• Apply integrated problem-solving strategies to solve problems in the physical, natural, and social sciences and in pure mathematics.</li> <li>• Use technology when appropriate to solve problems.</li> <li>• Reflect on solutions and the problem-solving process for a given situation and refine strategies as needed.</li> </ul> <p><b>GSE: M (PRP)-8-2</b>  <b>Students will use mathematical reasoning and proof</b> and be able to:</p> <ul style="list-style-type: none"> <li>• Draw logical conclusions and make generalizations using deductive and inductive reasoning.</li> <li>• Formulate, test, and justify mathematical conjectures and arguments.</li> <li>• Construct and determine the validity of a mathematical argument or a solution.</li> <li>• Apply mathematical reasoning skills in other disciplines.</li> </ul>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>• Describe the process standards and proficiencies important to reach mastery level</li> <li>• Show an exemplar that models the framework of set tasks; revisit as needed (content &amp; process)</li> <li>• Provide an understanding of key ideas/concepts; define what should be done (contextual framework)</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• Identify developmental skills</li> <li>• Reinforcement of skills</li> <li>• Drill and practice skills</li> </ul> <p><u>The Teacher Will:</u></p> <ul style="list-style-type: none"> <li>• Model dissecting problems in determining what steps to take to solve them</li> <li>• Scaffold instruction to help students move from concrete thinking to abstract numerical thinking</li> <li>• Model and provide practice how to write using evidence to support mathematical thinking</li> <li>• Facilitate group conversations where students practice giving and receiving constructive feedback of others</li> <li>• Stress the importance of accuracy and precision of solutions</li> <li>• Provide frameworks to demonstrate the structure in mathematics</li> <li>• Identify commonalities that repeatedly occur</li> <li>• Direct students through problem-solving processes in a variety of scenarios</li> <li>• Model and justify thinking</li> <li>• Model and show how to make logical conclusions and generalizations by using inductive and deductive reasoning</li> <li>• Demonstrate how to look at solutions in the problem-solving process to determine if revisions are needed</li> <li>• Model and/or facilitate common tasks</li> <li>• Show exemplars that demonstrate proficiency in common tasks</li> <li>• Facilitate cooperative group work</li> <li>• Use math language often and consistently</li> <li>• Model questioning and inferencing</li> <li>• Integrate content with other core subjects</li> <li>• Use appropriate technology</li> <li>• Model functions of the graphing and scientific calculators</li> <li>• Model and provide practice mental math thinking</li> <li>• Identify properties relating to specific operations when solving mathematical problems</li> </ul>	<p><u>District Assessment</u></p> <ul style="list-style-type: none"> <li>• Teacher Observations during Classroom Math Activities</li> <li>• Formative &amp; 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**MATHEMATICAL PRACTICES/COMMUNICATION, CONNECTIONS & REPRESENTATIONS**

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Common Core	GSEs (6-8)	Instructional Strategies	Assessment Opportunities	Resources
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Look for and express regularity in repeated reasoning.</li> </ol>	<p><b>GSE: M (CCR)-8-1</b>  <b>Students will communicate their understanding of mathematics</b> and be able to:</p> <ul style="list-style-type: none"> <li>• Articulate ideas clearly and logically in both written and oral form.</li> <li>• Present, share, explain, and justify thinking with others and build upon the ideas of others to solve problems.</li> <li>• Use mathematical symbols and notation.</li> <li>• Formulate questions, conjectures, definitions, and generalizations about data, information, and problem situations.</li> </ul> <p><b>GSE: M (CCR)-8-2</b>  <b>Students will create and use representations to communicate mathematical ideas and to solve problems</b> and to be able to:</p> <ul style="list-style-type: none"> <li>• Use models and technology to develop equivalent representations of the same mathematical concept.</li> <li>• Use and create representations to solve problems and organize their thoughts and ideas.</li> <li>• Convert between representations (e.g., a table of values, an equation, and a graph may all be representations of the same function.)</li> </ul> <p><b>GSE: M (CCR)-8-3</b>  <b>Students will recognize, explore, and develop mathematical connections</b> and be able to:</p> <ul style="list-style-type: none"> <li>• Connect new mathematical ideas to those already studied and build upon them.</li> <li>• Understand that many real-world applications require an understanding of mathematical concepts (e.g., personal finance, running a business, building a house, following a recipe, or sending a rocket to the moon).</li> <li>• Explain in oral and written form the relationships between a real-world problem and an appropriate mathematical model.</li> <li>• Explain in oral and written form the relationships among various mathematical concepts (e.g., the relationship between exponentiation and multiplication).</li> </ul>	<p><u>Gradual Release of Responsibility:</u></p> <ul style="list-style-type: none"> <li>• Describe the process standards and proficiencies important to reach mastery level</li> <li>• Show an exemplar that models the framework of set tasks; 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Summative</li> <li>• Tiered assignments</li> <li>• Anecdotal records</li> <li>• Exhibits</li> <li>• Interviews</li> <li>• Journals/notebooks</li> <li>• Oral &amp; Visual presentations</li> <li>• Portfolios (samples of process &amp; products)</li> <li>• Performance/problem-based tasks</li> <li>• Exemplars &amp; Rubrics</li> <li>• Collaboration/Conferencing</li> <li>• Common Local Assessments (quarterly)</li> <li>• Common Tasks</li> </ul> <p><u>Performance Indicators:</u>  The student will:</p> <ul style="list-style-type: none"> <li>• Articulate mathematical ideas clearly and logically in both written and oral forms</li> <li>• Justify their thinking when approaching mathematics in general and support their thinking with evidence, building upon the ideas of others to solve problems</li> <li>• Correctly use mathematical symbols and notation</li> <li>• Formulate questions, conjectures, definitions, and generalizations; analyze data and information; and, solve real world problems from contexts outside of and within mathematics including those that cut across content strands or disciplines</li> <li>• Use multiple models and technology that directly represent the same mathematical concepts, converting between them for regularity in the reasoning</li> <li>• Create representations to solve problems and organize their thoughts and ideas</li> <li>• Solve problems building upon prior knowledge to connect new ideas</li> <li>• Connect real world applications to mathematical concepts in solving problems and explain the relationships among mathematical concepts</li> <li>• Construct oral and written responses defending their work and identifying relationships between real world problems and mathematical models</li> <li>• Demonstrate proficiency with common tasks</li> </ul>	<p><u>Programs &amp; Materials:</u></p> <ul style="list-style-type: none"> <li>• <i>Big Ideas Math Learning</i> by Larson Texts Inc.</li> <li>• <i>Impact Mathematics</i> Course 2 by Glencoe</li> <li>• Scientific and graphing calculators</li> <li>• Interactive TI-Connects graphing software</li> <li>• Computer lab</li> <li>• Calculators</li> <li>• Smart Board</li> <li>• <i>Study Island/ALEKS</i> Interventions</li> <li>• Rulers (metric), protractors</li> <li>• Scissors, glue</li> <li>• Four-quadrant multiplication grid</li> <li>• Multiple Intelligences and Brain Dominance</li> <li>• Differentiation</li> <li>• Jigsaw, Anchoring, Think-Pair-Share, Cubing, etc.</li> <li>• Questioning and making conjectures</li> <li>• <i>Classroom Instruction That Works</i> by Robert Marzano</li> <li>• <a href="http://www.glencoe.com">www.glencoe.com</a></li> <li>• <a href="http://www.bigideasmath.com">www.bigideasmath.com</a></li> <li>• <a href="http://www.ridoe.net">www.ridoe.net</a></li> <li>• <a href="http://www.ridoe.net/instruction/curriculum">www.ridoe.net/instruction/curriculum</a></li> <li>• NECAP Release tasks</li> <li>• <a href="http://www.NECompact.org">www.NECompact.org</a></li> </ul> <p><u>Professional Resources</u> (partial list):</p> <ul style="list-style-type: none"> <li>• <i>A Collection of Performance Tasks and Rubrics High School Mathematics</i> by Charlotte Danielson, ASCD</li> <li>• <i>A Collection of Performance Tasks and Rubrics Middle School Mathematics</i> by Charlotte Danielson, ASCD</li> <li>• <a href="http://www.exemplars.com/about/">http://www.exemplars.com/about/</a></li> <li>• <i>Improving Adolescent Literacy</i> by Fisher &amp; 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