# Subject <u>Pre-algebra</u> Grade 7

GLE 0706.2.2 (NS.7.1, NS.7.1.d, NS.7.2.a, NS.7.2.c) Understand and work with the properties of and operations on the system of rational numbers.

Knowledge and Skills	Checks for Understanding & Guiding Question(s)	Resources & Instructional Practices	Assessments	Differentiated Instruction	Technology & Additional Web-based Resources
WEEKS 1 – 2 SPI 0706.2.1 Simplify numerical expressions involving rational numbers. (NS.7.1, NS.7.2) What is it? Rational Number Review Vocabulary Factors, exponent, base, powers, squared, cubed, evaluate, standard form, numerical expression, order of operations, like fractions, unlike fractions	Guiding Question(s): How do you simplify numerical expressions which contain rational numbers with different denominators? Associative & Commutative PowerPoint	<ul> <li>Math Connects Course 2: Chapter 1 1-1A (Pg. 25 - 28); 1-1B (Pg. 29 - 32)</li> <li>Chapter 3 3-2A (Pg. 139 - 143);3-2B (Pg. 144 - 145); 3-2C (Pg. 146 - 151); 3-2D (Pg. 152 - 156); 3-3A (Pg. 158 - 159); 3-3B (Pg. 160 - 165); 3-3D (Pg. 168 - 173)</li> <li>5 Minute Check</li> <li>Spiral Reviews (Pg. 143, 151, 156, 165, 173)</li> <li>H.O.T. Problems (Pg. 143, 151, 156, 165, 173)</li> <li>TN Test Practice (Pg. 28, 32,143,151,156,165,173)</li> <li>Problem Solving Investigation P.167</li> <li>Hands-on Activity Tools &amp; Resources Hands-on project p. 80, 88</li> <li>Quick Review Math Handbook</li> <li>Foldables</li> <li>Chapter Resource Masters (Leveled Worksheets, Explore Worksheets, Reading/Writing Math)</li> <li>Divide class into groups of two. Ask each student to write a step-by-step solution to solving a problem that involves adding mixed numbers. Have each student exchange work with partner. Partners study the work to determine if it is correct. If incorrect, label the errors and discuss.</li> </ul>	• Are You Ready For The Chapter? • Chapter 1 Pg. 24 ; Chapter 3 Pg. 126 • Ticket Out the Door Pg. 143,165) • Stop and Reflect Pg. 41, 156, 173 • Mid Chapter Check Pg. 51, 157 • Problem Solving Investigation Pg 167 • Chapter Study Guide and Review Pg. 64-67, 190 – 193 • Chapter Quizzes (Chapter Resource Masters) • Practice Chapter Test Pg. 68, 194 • Chapter Test (Chapter Resource Masters) • Mastering TCAP Workbook • Preparing for Standardized Test Pg. 195 • Test Practice Pg. 122 – 123, 196 - 197 • Self Check Quiz <b>TCAP Practice Item(s):</b> An average slice of American cheese is about $\frac{1}{8}$ inch thick. What is the height in <b>simplest</b> form of a package containing 20 slices? a. $\frac{20}{8}$ b. $\frac{8}{20}$ c. $2\frac{1}{2}$ d. 5	Intervention: • Stanford Math: 90 min./wk • Destination Math • Response to Intervention Pg. 24A and 126A (Teacher's Edition) • Are You Ready For The Chapter? Chapter 1 Pg. 24 Chapter 3 Pg. 126 • Differentiated Instruction Options Pg. 25c, 139d, 158c-158c (Teacher's Ed) Reteach Masters (Chapter Resource Masters) Enrichment: • Stanford Math • Enrichment Master (Chapter Resource Masters) • Are You Ready For the Chapter? Apply Section – Chapter Resource Masters • Destination Math • Differentiated Instruction Options Pg. 25c, 139d, 158c-158c (Teacher's Ed) • Chapter Project	<ul> <li>Teacher's Edition CD Rom</li> <li>Graphing Calculators</li> <li>Destination Math</li> <li>Publisher's Website: connectED.mcgraw-hill.com</li> <li>NCTM Website: http://illuminations.nctm.org</li> <li>www.internet4classrooms.com</li> <li>www.tnelc.org</li> <li>www.education.ti.com</li> <li>Interactive Manipulatives: http://nlvm.usu.edu/</li> <li>STEM Resources: http://nlvm.usu.edu/</li> <li>STEM Resources: http://jc- schools.net/index.html</li> <li>www.softschools.com</li> <li>Examview Pro</li> <li>www.brightstorm.com</li> <li>http://exchange.smartt ech.com</li> <li>www.discoveryeducation.com</li> </ul>

Subject <u>Pre-algebra</u> Grade 7

GLE 0706.3.7 (EE.7.3, EE.7.4) Use mathematical models involving linear equations to analyze real-world phenomena.

Knowledge and Skills	Checks for Understanding & Guiding Question(s)	Resources & Instructional Practices	Assessments	Differentiated Instruction	Technology & Additional Web-based Resources
WEEK 3 SPI 0706.3.7 (EE.7.2, EE.7.4.a) Translate between verbal and symbolic representations of real- world phenomena involving linear equations. Links: Internet 4 Classrooms Vocabulary function rule, function table, domain, range, independent variable, dependent variable, function notation, linear function	<ul> <li>0706.3.2 (EE.7.1, EE.7.2, EE.7.4.a) Represent and analyze mathematical situations using algebraic symbols. Words for Operations Writing Algebraic Equations Translating word sentences to math equations</li> <li>0706.3.11 (EE.7.2) Relate the features of a linear equation to a table and/or graph of the equation. Graphing Linear Equations and Functions</li> <li>Guiding Question(s) How are verbal phrases written as mathematical expressions?</li> </ul>	Glencoe Tennessee Math Connects Course 2: Chapter 7 Lessons: 7-1A (Pg. 377), 7-1B (Pg. 378 -384), 7-1C (Pg. 385-389), 7-1D (Pg. 390) Chapter 4 Lessons: 4-1B (Pg. 204-205), 1D (pp. 208-213); 4-2A (Pg. 214), 4-2C (Pg. 220) Impact Math Unit C, Inv. 2 pp. 43-46 • 5 Minute Check • H.O.T. Problems (Pg. 382, 389) • Test Practice (Pg. 382, 389) • Hands-on Activity Tools & Resources: Using Virtual Manipulatives p. 100 • Quick Review Math Handbook • Foldables • Chapter Resource Masters (Leveled Worksheets, Explore Worksheets, Reading/Writing Math)	<ul> <li>Are You Ready For The Chapter? Chapter 7 Pg. 376 and Chapter 4 Pg. 200</li> <li>Ticket Out the Door Pg. 389</li> <li>Stop and Reflect Pg. 390</li> <li>Mid Chapter Check Pg. 401</li> <li>Chapter Study Guide and Review Pg. 418-419</li> <li>Chapter Quizzes (Chapter Resource Masters)</li> <li>Practice Chapter Test Pg. 422</li> <li>Chapter Test (Chapter Resource Masters)</li> <li>Mastering TCAP Workbook</li> <li>Test Practice Pg. 424-425</li> <li>Self Check Quiz</li> </ul>	Intervention: Stanford Math: 90 min/wk Destination Math Are You Ready For The Chapter? Chapter 7 Pg. 376 and Chapter 4 Pg. 200 Response To Intervention Pg. 376a Differentiated Instruction Options Pg. 377c (Teacher's Ed) Reteach Master (Chapter Resource Masters) Words for Operations Enrichment: Stanford Math Destination Math Are You Ready For The Chapter? Chapter 7 Pg. 376 and Chapter 4 Pg. 200 Enrichment Masters (Chapter Resource Masters) Differentiated Instruction Options Pg. 377c (Teacher's Ed) Differentiated Instruction Options Pg. 377c (Teacher's Ed) Chapter Projects Have pairs of students write an algebraic expression. Put these in a hat. Each pair draws out one algebraic expression and write a real-life situation, which corresponds to the algebraic expression they drew.	<ul> <li>Teacher's Edition CD Rom</li> <li>Graphing Calculators</li> <li>Destination Math</li> <li>Publisher's Website: connectED.mcgraw- hill.com</li> <li>NCTM Website: http://illuminations.nctm. org</li> <li>www.internet4classroo ms.com</li> <li>www.internet4classroo ms.com</li> <li>www.education.ti.com</li> <li>Interactive Manipulatives: http://nlvm.usu.edu/</li> <li>STEM Resources: http://nlvm.usu.edu/</li> <li>STEM Resources: http://www.stemresourc es.com/</li> <li>Informational Math Site (PowerPoints/Games</li> <li>http://jc- schools.net/index.html</li> <li>www.softschools.com</li> <li>Examview Pro</li> <li>www.discoveryeducatio n.com</li> <li>http://exchange. smarttech.com</li> </ul>

## Subject <u>Pre-algebra</u> Grade 7

GLE 0706.3.1 (EE.7.4) Recognize and generate equivalent forms for simple algebraic expressions.

Knowledge and Skills	Checks for Understanding & Guiding Question(s)	Resources & Instructional Practices	Assessments	Differentiated Instruction	Technology & Additional Web-based Resources
WEEK 4 SPI 0706.3.1 Evaluate algebraic expressions involving rational values for coefficients and/or variables. (EE.7.1) Evaluating Expressions SPI 0706.1.2 Generalize a variety of patterns to a symbolic rule from tables, graphs, or words. (RP.7.2.a) Writing Function Rules Slideshow Internet4classrooms Links Functions as Tables, Patterns, & Graphs Vocabulary Variable, algebra, algebraic expression, coefficient, define a variable, sequence, term, arithmetic sequence, geometric sequence	0706.3.1 Perform basic operations on linear expressions (including grouping, order of operations, exponents, simplifying and expanding). (EE.7.1; EE.7.3) Simplifying Expressions Guiding Question(s): What properties and conventions must be understood in order to simplify and evaluate algebraic expressions? What are some strategies that can be used to generalize patterns?	Glencoe Tennessee Math Connects Course 2: Chapter 1 Lessons: 1C (Pg. 33 – 37); 1D ( 38-41); 2B (Pg. 44 – 49); 2C (p. 50) Chapter 3 4A(p. 176-180) • 5 Minute Check • Spiral Review (Pg. 37) • H.O.T. Problems (Pg. 37, 49) • Test Practice (Pg. 37, 49) • Hands-on Activity Tools & Resources: Variables and Expressions p. 81 • Quick Review Math Handbook • Foldables • Chapter Resource Masters (Leveled Worksheets, Explore Worksheets, Reading/Writing Math)	<ul> <li>Ticket Out the Door Pg. 49</li> <li>Stop and Reflect Pg. 48</li> <li>Mid Chapter Check Pg. 51</li> <li>Problem Solving Investigation Pg 100 -101</li> <li>Chapter Study Guide and Review Pg. 66</li> <li>Chapter Quiz - Chapter Resource Masters</li> <li>Practice Chapter Test Pg. 68</li> <li>Chapter Test - Chapter Resource Masters</li> <li>Mastering TCAP Workbook</li> <li>Preparing for Standardized Tests Pg. 69</li> <li>Self Check Quiz</li> </ul> TCAP Practice Item(s): Evaluate f + (2f - j) <sup>2</sup> when f = 5 and j = 4 a1 b. 14 c. 41 d. 89 Which equation best describes the relationship between x and y shown in the table below?	Intervention: <ul> <li>Stanford Math: 90 min./wk</li> <li>Destination Math</li> <li>Response to Intervention Reteach Worksheet –Chapter Resource Masters</li> </ul> Discuss how to choose a letter to represent a variable quantity and that using the first letter of a word can help them remember what the variable stands for. You may also have students write definitions of the new vocabulary terms from the lesson. Enrichment: <ul> <li>Stanford Math</li> <li>Enrichment Masters – Chapter Resource Masters</li> <li>Destination Math</li> <li>Differentiated Instruction Options Pg. 48 (Teacher's Edition)</li> </ul> <li>Challenge students to produce original complex problems and solve. Allow them to share them with classmates and explain how to evaluate them.</li>	<ul> <li>Teacher's Edition CD Rom</li> <li>Graphing Calculators</li> <li>Destination Math</li> <li>Publisher's Website: connectED.mcgraw-hill.com</li> <li>NCTM Website: http://illuminations.nctm.org</li> <li>www.internet4classrooms.c om</li> <li>www.education.ti.com</li> <li>Interactive Manipulatives: http://nlvm.usu.edu/</li> <li>STEM Resources: http://nlvm.usu.edu/</li> <li>STEM Resources: http://www.stemresources.c om/</li> <li>Informational Math Site (PowerPoints/Games</li> <li>http://jc-schools.net/index.html</li> <li>www.softschools.com</li> <li>Examview Pro</li> <li>www.brightstorm.c om</li> <li>http://exchange.sm arttech.com</li> <li>www.discoveryeduc ation.com</li> </ul>

## Subject <u>Pre-algebra</u> Grade 7

GLE 0706.2.2 (NS.7.1, NS.7.1.d, NS.7.2.a, NS.7.2.c) Understand and work with the properties of and operations on the system of rational numbers. GLE 0706.2.5 (NS.7.1) Understand and work with squares, cubes, square roots and cube roots.

Knowledge and Skills	Checks for Understanding & Guiding Question(s)	Resources & Instructional Practices	Assessments	Differentiated Instruction	Technology & Additional Web-based Resources
WEEK 5 SPI 0706.2.2 Compare rational numbers using appropriate inequality symbols. (NS.7.1) Vocabulary Rational numbers, common denominator, least common denominator (LCD), square roots, cube root, greater than, less than	<ul> <li>0706.2.1 Understand that the set of rational numbers includes any number that can be written as a ratio of two integers in which the denominator is not zero. (NS.7.1)</li> <li>Representing Rational Numbers Lesson Plan Rational and Irrational Numbers Game</li> <li>0706.2.2 Develop and analyze algorithms and compute efficiently with integers and rational numbers. NS.7.1)</li> <li>0706.2.3 Recognize that rational numbers satisfy the commutative and associative laws of addition and multiplication and the distributive law. (NS.7.1)</li> <li>0706.2.9 Efficiently compare and order rational numbers and roots of perfect squares/cubes</li> <li>Square &amp; Cubed Roots PowerPoint</li> <li>0706.2.11 Estimate square/cube roots and use calculators to find approximations.</li> <li>Estimating Square Roots Slideshow</li> <li>Guiding Question(s):</li> <li>How can the number line be used to compare rational numbers?</li> <li>.</li> </ul>	<ul> <li>Glencoe Tennessee Math Connects</li> <li>Course 2: Chapter 1 Lessons: 3A (Pg. 52), 3B (Pg. 53 – 56), 3C (Pg. 57 – 61)</li> <li>Chapter 3 Lessons: 1A (Pg. 127); 1C (Pg. 133 – 138)</li> <li>Impact Math Unit B, Inv. 2 pp. 34-37</li> <li>5 Minute Check</li> <li>H.O.T. Problems (Pg. 56, 60, 138)</li> <li>Test Practice Pg. 56, 60, 138</li> <li>Hands on Activity Tools (See TE)</li> <li>Quick Review Math Handbook</li> <li>Foldables</li> <li>Chapter Resource Masters (Leveled Worksheets, Explore Worksheets, Reading/Writing Math)</li> <li>Class Activity: Use index cards with rational numbers greater than or equal to zero. Students will draw two or more cards at random and compare numbers using =, &lt;, and &gt;.</li> <li>Class Activity: Students will record numbers as instructed on index cards. The teacher will call on groups of two to five students. Students will arrange themselves in ascending or descending order and display their cards for the class to see.</li> </ul>	• Ticket Out the Door - Pg. 60 • Are You Ready For The Chapter? - Pg. 126 • Stop and Reflect - Pg. 61, 137 • Mid Chapter Check - Pg.157 • Chap. Study Guide and Review - Pg. 67 191 • Chapter Quiz –Chapter Resource Master • Practice Chapter Test - Pg. 68, 194 • Chapter Test -Ch. Resource Master • Mastering TCAP Workbook • Self Check Quiz • Test Practice - Pg. 71 <b>TCAP Practice Item(s):</b> 1. Which value of <b>X</b> makes this inequality <u>true</u> ? X $\ge$ 1.6 a. 8/5 b. 11/7 b. 13/9 c. 17/11 2. The fraction $\frac{5}{6}$ is found between which pair of fractions on a number line? A. $\frac{1}{4}$ and $\frac{1}{8}$ B. $\frac{1}{3}$ and $\frac{4}{9}$ C. $\frac{11}{12}$ and $\frac{31}{36}$ D. $\frac{7}{12}$ and $\frac{17}{18}$	Intervention: • Stanford Math: 90 min./wk • Destination Math • Response to Intervention Pg. 126A (Teacher's Edition) • Are You Ready For The Chapter? Chapter 3 Pg. 126 • Reteach Master – Chapter Resource Masters • Differentiated Instruction Options 127c (Teacher's Ed) Enrichment: • Stanford Math • Enrichment Master – Chapter Resource Masters • Destination Math • Differentiated Instruction Options 127c (Teacher's Ed) • Are You Ready For The Chapter – Apply/Enrichment Section • Chapter Project Have students describe an effective strategy for comparing and ordering rational numbers	<ul> <li>Teacher's Edition CD Rom</li> <li>Graphing Calculators</li> <li>Destination Math</li> <li>Publisher's Website: connectED.mcgraw-hill.com</li> <li>NCTM Website: http://illuminations.nctm.org</li> <li>www.internet4classrooms.com</li> <li>www.tnelc.org</li> <li>www.education.ti.com</li> <li>Interactive Manipulatives: http://nlvm.usu.edu/</li> <li>STEM Resources: http://lwww.stemresources.com/</li> <li>Informational Math Site (PowerPoints/Games http://jc-schools.net/index.html</li> <li>www.softschools.com</li> <li>Examview Pro</li> <li>www.brightstorm.com</li> <li>http://exchange.smartt ech.com</li> <li>www.discoveryeducatio n.com</li> </ul>

Common Core Standards (see p. 13)

# Subject <u>Pre-algebra</u> Grade 7

GLE 0706.2.1 (NS.7.1) Extend understandings of addition, subtraction, multiplication and division to integers.

WEEK 6         0776 2.2 Develop and analyze         General encases Main Connects         0776 2.2 Develop and analyze         General encases Main Connects         0776 2.2 Develop and analyze         118 connects         118 connects	Knowledge and Skills	Checks for Understanding & Guiding Question(s)	Resources & Instructional Practices	Assessments	Differentiated Instruction	Technology & Additional Web- based Resources
A. 2       C. 6         B. 4       D. 8    • Chapter Project Have students describe situations in which integer addition/subtraction are used. Ask them to explain how to find the sum or difference.	WEEK 6 SPI 0706.2.5 Solve contextual problems that involve operations with integers. (NS.7.1, NS.7.2, NS.7.2.c, NS.7.2.d) Integers, Rational & Irrational Numbers Integer and Number line Activity Integer Operations on TI-73 Vocabulary Zero pair, opposites, additive inverse	<ul> <li>0706.2.2 Develop and analyze algorithms and compute efficiently with integers and rational numbers. (NS.7.1)</li> <li>Math Algorithms</li> <li>0706.2.4 Understand that a and –a are additive inverses and are located the same distance from zero on the number line; relate distance from zero to absolute value. (NS.7.7.1.a, NS.7.1.b)</li> <li>Additive Inverse and Absolute Value Video Additive Inverse Absolute Value Slideshow</li> <li>0706.2.5 Understand that – (–a) = a for any number a. (NS.7.7.1.a)</li> <li>Algebra Intro for Kids</li> <li>0706.2.6 Use the number line to demonstrate addition and subtraction with integers. (NS.7.1, NS.7.1.c)</li> <li>Guiding Question(s):</li> <li>When are negative numbers used and why are they important?</li> </ul>	Glencoe Tennessee Math Connects           Course 2:           Chapter 2 Lessons: 2A (Pg. 86 –           87); 2B (Pg. 88 – 92); 2C (Pg. 93 –           94); 2D (Pg. 95 – 98); 3B (Pg.102 –           103); 3C (Pg. 104 – 108); 3D (Pg.           109 – 113)           •         5 Minute Check           •         Spiral Reviews           (Pg. 92, 98, 108)           •         H.O.T. Problems           (Pg. 92, 98, 108, 113)           •         Test Practice (Pg. 92, 98, 108, 113)           •         Test Practice (Pg. 92, 98, 108, 113)           •         Hands on Activity Tools           Multiplying Integers using         Manipulatives p. 85           •         Quick Review Math           Handbook         Foldables           •         Chapter Resource Masters (Leveled Worksheets, Explore Worksheets, Reading/Writing Math)	<ul> <li>Are You Ready For The Chapter? Pg. 74</li> <li>Stop and Reflect Pg. 98 and Pg. 113</li> <li>Mid Chapter Check Pg. 99</li> <li>Problem Solving Investigation Pg 100 - 101</li> <li>Chapter Study Guide and Review Pg. 116 - 119</li> <li>Chapter Quizzes (Chapter Resource Masters)</li> <li>Practice Chapter Test Pg. 120</li> <li>Chapter Test (Chapter Resource Masters)</li> <li>Preparing for Standardized Test Pg. 121</li> <li>Test Practice Pg. 122 - 123</li> <li>Mastering TCAP Workbook</li> <li>Self Check Quiz</li> </ul> <b>TCAP Practice Item(s):</b> The temperature in Chicago was -3°F at 8 a.m. The temperature then decreased 7°F by 4 p.m. What was the temperature in Chicago at 4 p.m.? A15°F B9°F <b>C-5°F</b> D1°F During a golf match, Marcus shot 4 under par while his opponent Briana shot 2 over par? By how many shots was Marcus's score better than Briana's? A. 2 C. 6 B. 4 D. 8	Intervention: <ul> <li>Stanford Math: 90 min./wk</li> <li>Destination Math</li> <li>Response to Intervention Pg. 74A (T E)</li> <li>Are You Ready For The Chapter? Pg. 74</li> <li>Enrichment Masters –(Chapter Resource Masters)</li> <li>Differentiated Instruction Options Pg. 86c – 86d (Teacher's Edition) Pg. 100c – 100d (Teacher's Ed)</li> </ul> Use place value blocks and charts to model all four operations. Have students construct word problems that fit the problems modeled using the four operations and solve these problems. For review, model integer operations using two-color counters. Also, model integer addition and subtraction using number lines. Enrichment: <ul> <li>Impact Math Unit A Inv. 2 pp. 7-9</li> <li>Stanford Mathematics</li> <li>Are You Ready For the Chapter? Apply Section/Enrichment( Masters Chapter Resource Masters)</li> <li>Destination Math</li> <li>Differentiated Instruction Options Pg. 86c – 86d (Teacher's Edition) Pg. 100c – 100d (Teacher's Edition) For the value the secribe situations in which integer addition/subtraction are used. Ask them to explain how to find the sum or difference.</li></ul>	<ul> <li>Teacher's Edition CD Rom</li> <li>Graphing Calculators</li> <li>Destination Math</li> <li>Publisher's Website: connectED.mcgraw-hill.com</li> <li>NCTM Website: http://illuminations.nctm.org</li> <li>www.internet4classrooms.co m</li> <li>www.education.ti.com</li> <li>Interactive Manipulatives: http://nlvm.usu.edu/</li> <li>STEM Resources: http://nlvm.usu.edu/</li> <li>STEM Resources: http://www.stemresources.co m/</li> <li>Informational Math Site (PowerPoints/Games http://jc-</li> <li>schools.net/index.html</li> <li>www.softschools.com</li> <li>Examview Pro</li> <li>www.brightstorm.co m</li> <li>http://exchange.sm arttech.com</li> <li>www.discoveryeduca tion.com</li> </ul>

Common Core Standards (see p. 13)

# Common Core Focus Standards

The remainder of this quarter will address the Ratio and Proportion and Expressions and Equations CCSS focus standards for seventh grade mathematics. In preparation for the CRA assessments tasks and lessons have been included in this nine week period and the second nine weeks period to prepare students.

Common Core Standards (see p. 13)

## Weeks 7 – 9

## Focus Standard 1: Analyze proportional relationships and use them to solve real-world and mathematical problems.

7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. 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.

#### Common Core Sample Task: <u>Buses Task: Distance-time graph describing a bus journey</u> <u>Buses Task: Answers</u>

#### 7.RP.2 Recognize and represent proportional relationships between quantities.

- 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.
- b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number (n) of items purchased at a constant price (p), the relationship between the total cost and the number of items can be expressed as t = pn.
- d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

#### **Common Core Sample Lessons:**

Estimating: Counting Trees <a href="http://www.map.mathshell.org/materials/lessons.php?taskid=422&subpage=problem">http://www.map.mathshell.org/materials/lessons.php?taskid=422&subpage=problem</a>

Checking Proportionality: http://www.purplemath.com/modules/ratio3.htm

7RP.3 Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.* 

#### **Common Core Sample Lesson:**

#### Increasing and Decreasing Quantities by a Percent

http://www.map.mathshell.org/materials/lessons.php?taskid=210&subpage=concept

## Focus Standard 2: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

**7.EE.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. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 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.

#### Common Core Sample Task: Discounted Books

http://www.illustrativemathematics.org/illustrations/478

#### **Additional Lessons:**

Simplifying Algebraic Expressions Using Properties Students will simplify algebraic expressions using the identity properties of addition and multiplication, the commutative and associative properties of addition and multiplication, and the distributive property of multiplication over addition.

Simplifying Numerical Expressions Using the Order of Operations Students will simplify numerical expressions using the correct order of operations.

7.EE.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 px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of then operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
- b. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. 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.

## **Common Core Sample Lessons:**

- Steps to Solving Equations: http://www.map.mathshell.org/materials/lessons.php?taskid=431&subpage=concept
- Equations for Model Real World Problems: http://www.uen.org/Lessonplan/preview.cgi?LPid=23388

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- Expressions, Equations, and Inequalities: http://mdk12.org/scripts/vsc/generate\_objective\_pdf.pl?ca=Mathematics&gr=7&obj=1B1b
- Creating and Solving Equations: <u>http://www.mathplayground.com/MTV/mathtv15.html</u>

#### Additional Tasks for further practice Fencing Task A12: http://www.map.mathshell.org/materials/tasks.php?taskid=369&subpage=apprentice

Taxi Cabs (p.11-12) http://www.map.mathshell.org/materials/tests/ms\_1\_test.pdf

Expressions and Equations (several short tasks) http://www.map.mathshell.org/materials/tasks.php?taskid=399&subpage=novice

## Subject <u>Pre-algebra</u> Grade 7

GLE 0706.3.3 Understand the concept of function as a rule that assigns to a given input one and only one number (the output). GLE 0706.3.8 (EE.7.4) Use a variety of strategies to efficiently solve linear equations and inequalities.

Knowledge and Skills	Checks for	Resources & Instructional Practices	Assessments	Differentiated Instruction	Technology & Additional Web-
	Understanding & Guiding				based Resources
	Question(s)				
WEEK 9 SPI 0706.3.6 (EE.7.4.a) Solve linear equations with rational coefficients symbolically or graphically. Equation Game Interactive Solving Two-Step Equations Lesson Vocabulary Equation, equivalent equations, inequality, coefficient, formula, multiplicative inverse, reciprocal, two-step equation, solution set	Guiding Question(s) How do inverse operations help with solving linear equations?	Glencoe Tennessee Math Connects Course 2: Chapter 4 Lessons: 1A (Pg. 202 -203); 1B (Pg. 204-205); 1C (Pg. 206 – 207); 1D (Pg. 208 – 211); 2A (Pg. 214); 2B (Pg. 215-219); 2C (Pg. 220); 2D (Pg. 221-226); 3A (Pg. 228-229); 3B (Pg. 230-234) Impact Math Unit J, Inv. 4 pp. 164-166 4C (Pg.249-253) • 5 Minute Check • Spiral Reviews (Pg. 226, 234 all except #39; 239, 248 #40-43) • H.O.T. Problems (Pg. 213, 219, 225, 234, 248, 253) • Test Practice (Pg. 213, 219, 226, 234, 239, 248 (#35-37), 253) • Hands on Activity Tools: Hands-on Project p. 90 & Using manipulative to solve two-step equations p. 91 • Quick Review Math Handbook • Foldables • Chapter Resource Masters (Leveled Worksheets, Explore Worksheets, Reading/Writing Math)	<ul> <li>Are You Ready For The Chapter? Pg. 200</li> <li>Ticket Out the Door Pg. 219, 239</li> <li>Stop and Reflect Pg. 213, 226, 239</li> <li>Mid Chapter Check 227</li> <li>Problem Solving Investigation Pg 202-203</li> <li>Chapter Study Guide and Review Pg. 254 - 257</li> <li>Chapter Quiz – Chapter Resource Masters</li> <li>Practice Chapter Test Pg. 258</li> <li>Chapter Test – Chapter Resource Masters</li> <li>Practice Chapter Test Pg. 258</li> <li>Chapter Test – Chapter Resource Masters</li> <li>Mastering TCAP Workbook</li> <li>Test Practice</li> <li>Preparing for Standardized Tests Pg. 259</li> <li>Self Check Quiz</li> </ul> <b>TCAP Practice Item(s):</b> What value of p makes this equation true? <ul> <li>4/5 p - 8 = 20</li> <li>A. 9 3/5</li> <li>B. 22 2/5</li> <li>C. 33</li> <li>D. 35</li> </ul>	Intervention: Stanford Math: 90 min/wk Destination Math Are You Ready For The Chapter? Pg. 200 Response To Intervention Pg. 200A Differentiated Instruction Options Pg. 201c, 214c, 228c (Teacher's Ed) Reteach Master (Chapter Resource Masters) Enrichment: Stanford Math Destination Math Are You Ready For The Chapter? Pg. 200 Enrichment Masters (Chapter Resource Masters) Differentiated Instruction Options Pg. 201c, 214c, 228c (Teacher's Ed) Differentiated Instruction Options Pg. 201c, 214c, 228c (Teacher's Ed) Chapter Projects Lesson: Solving a Linear Equation Graphically Allow students to work through the problem	<ul> <li>Teacher's Edition CD Rom</li> <li>Graphing Calculators</li> <li>Destination Math</li> <li>Publisher's Website: connectED.mcgraw-hill.com</li> <li>NCTM Website: http://illuminations.nctm.org</li> <li>www.internet4classrooms.com</li> <li>www.tnelc.org</li> <li>www.education.ti.com</li> <li>Interactive Manipulatives: http://nlvm.usu.edu/</li> <li>STEM Resources: http://nlvm.usu.edu/</li> <li>STEM Resources: http://jc-schools.net/index.html</li> <li>www.softschools.com</li> <li>Examview Pro</li> <li>www.brightstorm.com</li> <li>www.discoveryeducation.com</li> <li>http://exchange.smartt ech.com</li> </ul>

Subject <u>Pre-algebra</u> Grade 7

#### Common Core State Standards Crosswalk Correlations

NS.7.1 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 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.

NS.7.1.a Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.

NS.7.1.b Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q 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.NS.7.2.c Apply properties of operations as strategies to multiply and divide rational numbers.

NS.7.1.d Apply properties of operations as strategies to add and subtract rational numbers.

NS.7.2 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

NS.7.2.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 (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

NS.7.3 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 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.)

**7.EE.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. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 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.

EE.7.4 Solve real-life and mathematical problems using numerical and algebraic expressions and equations. 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.

SP.7.6 Investigate chance processes and develop, use, and evaluate probability models. 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. 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.

SP.7.7 Investigate chance processes and develop, use, and evaluate probability models. 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.

RP.7.2.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.

Common Core Standards (see p. 13)

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