8th Grade Pre-Algebra Textbook Alignment
Revised 4/28/2010

September

Lesson Number & Name	GLCE Code & Skill	Vocabulary/Supplemental Resources
#1	**N.MR.08.10** Calculate weighted averages such as course grades, consumer price indices, and sports ratings.	Utilize syllabus for calculating weighted averages and/or newspapers for consumer price indices and sports ratings.
#2	**D.AN.08.01** Determine which measure of central tendency (mean, median, mode) best represents a data set, eg., salaries, home prices, for answering certain questions; justify the choice made.	Pre-Algebra textbook section 5-8 p.238.
12-5 Misleading Statistics	**D.AN.08.02** Recognize practices of collecting and displaying data that may bias the presentation or analysis.	Misleading Graphs, Misleading Scales

Pre-Algebra Chapter 3

Lesson Number & Name	GLCE Code & Skill	Vocabulary/Supplemental Resources
3-1 Distributive Property	**Use as an introduction to 3-3.**	Equivalent expressions Distributive Property
3-3 Solving Equations by Adding or Subtracting	**A.FO.08.10** Understand that to solve the equation f(x) = g(x) means to find all values of x for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x^2 + 2 = 4x + 2$, but 1 is not a solution). Note: Focus on the meaning of the solution to an equation...p 110, "How is solving an equation similar to keeping a scale balanced?"	Inverse Operation, Equivalent Equations, Subtraction and Addition Property of Equality
3-4 Solving Equations by Multiplying or Dividing	**A.FO.08.10** Understand that to solve the equation f(x) = g(x) means to find all values of x for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x^2 + 2 = 4x + 2$, but 1 is not a solution).	Division and Multiplication Property of Equality
3-5 Solving Two-Step Equations	**A.FO.08.10** Understand that to solve the equation f(x) = g(x) means to find all values of x for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x^2 + 2 = 4x + 2$, but 1 is not a solution).	Two-Step Equation

October

Pre-Algebra Chapter 4

Lesson Number & Name	GLCE Code & Skill	Vocabulary/ Supplemental Resources
4-2 Powers and Exponents	**N.ME.08.02** Understand meanings for zero and negative integer exponents.	Power, Exponent
4-7 Negative Exponents	**N.ME.08.02** Understand meanings for zero and negative integer exponents.	Reciprocal

Pre-Algebra Chapter 6

Lesson Number & Name	GLCE Code & Skill	Vocabulary/Supplemental Resources
6-1 Ratios and Rates	**N.FL.08.11** Solve problems involving ratio units, such as miles per hour, dollars per pound, or persons per square mile.	
6-7 Using Percent Equations	**N.MR.08.07** Understand percent increase and percent decrease in both sum and product form, (i.e., 3% increase of a quantity x is x + .03x = 1.03x). **N.MR.08.08** Solve problems involving percent increases and decreases. **N.FL.08.09** Solve problems involving compounded interest or multiple discounts.	Percent Equation Discount Simple Interest
6-8 Percent of Change	**N.MR.08.07** Understand percent increase and percent decrease in both sum and product form, (i.e., 3% increase of a quantity x is x + .03x = 1.03x). **N.MR.08.08** Solve problems involving percent increases and decreases. **N.FL.08.09** Solve problems involving compounded interest or multiple discounts.	Percent of Increase and Decrease
6-9P Probability and Predictions	**D.PR.08.03** Compute relative frequencies from a table of experimental results for a repeated event. Interpret the results using relationship of probability to relative frequency. **D.PR.08.05** Find and/or compare the theoretical probability, the experimental probability, and/or the relative frequency of a given event.	Sample Unbiased Random Algebra Activity: "Taking a Survey" p. 309
12-6 Counting Outcomes	**D.PR.08.04** Apply the Basic Counting Principle to find total number of outcomes possible for independent and dependent events, and calculate the probabilities using organized lists or tree diagrams.	Tree Diagram, Fundamental Counting Principle *Algebra Activity: "Probability and Pascal's Triangle" p.640
12-9 Probability of Compound Events	**D.PR.08.06** Understand the difference between independent and dependent events, and recognize common misconceptions involving probability, e.g., Alice rolls a 6 on a die three times in a row; she is just as likely to roll a 6 on the fourth roll as she was on any previous roll.	Compound Events, Independent Events, Dependent Events, Mutually Exclusive Events *Algebra Activity: "Simulations" p.656-657

8ᵗʰ Grade Pre-Algebra Textbook Alignment

Pre-Algebra Chapter 7

Lesson Number & Name	GLCE Code & Skill	Vocabulary/Supplemental Resources
7-1 Solving Equations with Variables on Each Side	**Foundation for rest of Ch.7.**	*Before 7-1, Algebra Activity: "Equations with Variables on Each Side" p.328-329.
7-2 Solving Equations with Grouping Symbols	**Foundation for rest of Ch.7**	Null, Empty Set, grouping symbols, identity, dimensions.
7-3 Inequalities	**Supports A.FO.08.12** Solve linear inequalities in one and two variables, and graph the solution sets.	Inequality, Open and Closed Circles, Inequality Symbols
7-4 Solving Inequalities by Adding or Subtracting	**A.FO.08.12** Solve linear inequalities in one and two variables, and graph the solution sets.	Addition and Subtraction Properties
7-5 Solving Inequalities by Multiplying or Dividing	**A.FO.08.12** Solve linear inequalities in one and two variables, and graph the solution sets.	Multiplication and Division Properties
7-6 Solving Multi-Step Inequalities	**A.FO.08.12** Solve linear inequalities in one and two variables, and graph the solution sets.	

November

Pre-Algebra Chapter 8

Lesson Number and Name	GLCE Code and Skill	Vocabulary and Supplemental Resources
8-1 Functions	**A.RP.08.01** Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships ($y = k/x$); cubics ($y = ax^3$); roots ($y =$ square root of x); and exponentials ($y = a^x$, $a > 0$); using tables, graphs, and equations.* **A.RP.08.04** Use the vertical line test to determine if a graph represents a function in one variable.	Function, Domain, Range, Vertical Line Test *Graphing Calculator Investigation: "Function Tables". p.374
Algebra 4-6 Functions	**A.FO.08.10** Understand that to solve the equation f(x) = g(x) means to find all values of x for which the equation is true, i.e. determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x^2 + 2 = 4x + 2$, but 1 is not a solution).	p.227 in Algebra textbook Examples 3,4 and 5.
8-2 Linear Equations in Two Variables	**A.RP.08.01** Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships ($y = k/x$); cubics ($y = ax^3$); roots ($y =$ square root of x); and exponentials ($y = a^x$, $a > 0$); using tables, graphs, and equations.	Linear Equation
8-3 Graphing Linear Equations using Intercepts	**A.RP.08.01** Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships ($y = k/x$); cubics ($y = ax^3$); roots ($y =$ square root of x); and exponentials ($y = a^x$, $a > 0$); using tables, graphs, and equations.	x-intercept, y-intercept *Algebra Activity: "It's All Downhill". p.386
8-9 Solving Systems of Equations	**A.FO.08.11** Solve simultaneous linear equations in two variables by graphing, by substitution, and by linear combination; estimate solutions using graphs; include examples with no solutions and infinitely many solutions. **A.FO.08.13** Set up and solve applied problems involving simultaneous linear equations and linear inequalities.	System of Equations, Substitution, Solutions to Systems of Equations
8-10 Graphing Inequalities	**A.FO.08.12** Solve linear inequalities in one and two variables, and graph the solution sets. **A.FO.08.13** Set up and solve applied problems involving simultaneous linear equations and linear inequalities.	Boundary, Half Plane *Graphing Calculator Investigation: "Graphing Inequalities". P.423

December

Pre-Algebra Chapter 9

Lesson Number and Name	GLCE Code and Skill	Vocabulary/ Supplemental Resources
9-1 Square and Square Roots	**N.ME.08.01** Understand the meaning of a square root of a number and its connection to the square whose area is the number; understand the meaning of a cube root and its connection to the volume of a cube. **N.FL.08.05** Estimate and solve problems with square roots and cube roots using calculators. **N.FL.08.06** Find square roots of perfect squares and approximate the square roots of non-perfect squares by locating between consecutive integers, (i.e., √130 is between 11 and 12).	Perfect Square, Square Root, Radical Sign

9-2 The Real Number System	**N.ME.08.03** Understand that in decimal form, rational numbers either terminate or eventually repeat, and that calculators truncate or round repeating decimals; locate rational numbers on the number line; know fractions forms of common repeating decimals, e.g., $0.\overline{1} = \frac{1}{9}$; $0.\overline{3} = \frac{1}{3}$. **N.ME.08.04** Understand that irrational numbers are those that cannot be expressed as the quotient of two integers, and cannot be represented by terminating or repeating decimals; approximate the position of familiar irrational numbers, e.g., √2, √3, π, on the number line. **N.FL.08.05** Estimate and solve problems with square roots and cube roots using calculators. **N.FL.08.06** Find square roots of perfect squares and approximate the square roots of non-perfect squares by locating between consecutive integers, (i.e., √130 is between 11 and 12).	Irrational Numbers, Real Numbers, Rational Numbers, Whole Numbers, Integers, Natural Numbers, Classification of Numbers
9-5 The Pythagorean Theorem	**N.FL.08.05** Estimate and solve problems with square roots and cube roots using calculators. **G.GS.08.01** Understand at least one proof of the Pythagorean Theorem; use the Pythagorean Theorem and its converse to solve applied problems including perimeter, area, and volume problems.	Legs, Hypotenuse, Pythagorean Theorem, Right Triangle, Converse *Algebra Activity: "Graphing Irrational Numbers" p.465
9-5P	**G.GS.08.01** Understand at least one proof of the Pythagorean Theorem; use the Pythagorean Theorem and its converse to solve applied problems including perimeter, area, and volume problems.	
9-5F	**G.LO.08.02** Find the distance between two points on the coordinate plane using the distance formula; recognize that the distance formula is an application of the Pythagorean Theorem.	
9-6 The Distance and Midpoint Formula	**N.FL.08.05** Estimate and solve problems with square roots and cube roots using calculators. **G.LO.08.02** Find the distance between two points on the coordinate plane using the distance formula; recognize that the distance formula is an application of the Pythagorean Theorem.	Distance Formula, Midpoint and Midpoint Formula

By the end of the first semester you must be done through Chapter 9.

Pre-Algebra Chapter 10

Lesson Number and Name	GLCE Code and Skill	Vocabulary/Supplemental Resources
10-3 Transformations on the Coordinate Plane	**G.TR.08.10** Understand and use reflective and rotational symmetries of two-dimensional shapes and relate them to transformations to solve problems.	*Preview Algebra Activity for 10-3: "Symmetry" p.505 Transformation, Translation, Reflection, Line of Symmetry, Rotation, Clockwise, Counterclockwise *Algebra Activity: "Dilations" p.512
10-3F	**G.TR.08.09** Understand the definition of a dilation from a point in the plane, and relate it to the definition of similar polygons.	
10-3P	**G.TR.08.10** Understand and use reflective and rotational symmetries of two-dimensional shapes and relate them to transformations to solve problems.	
10-5 Area: Parallelograms, Triangles and Trapezoids	**G.SR.08.04** Find area and perimeter of complex figures by sub-dividing them into basic shapes (quadrilaterals, triangles, circles). **G.SR.08.05** Solve applied problems involving areas of triangles, quadrilaterals, and circles.	*Preview Algebra Activity: "Area and Geoboards" p.518-519 Base, Altitude, Area of Parallelogram, Area of Triangle, Area of Trapezoid
10-5P	**G.SR.08.04** Find area and perimeter of complex figures by sub-dividing them into basic shapes (quadrilaterals, triangles, circles). **G.SR.08.05** Solve applied problems involving areas of triangles, quadrilaterals, and circles.	
10-7 Circumference and Area: Circles	**A.PA.08.03** Recognize basic functions in problem context, e.g., area of a circle is πr^2, volume of a sphere is $4/3\pi r^3$, and represent them using tables, graphs, and formulas. **G.SR.08.03** Understand the definition of a circle; know and use the formulas for circumference and area of a circle to solve problems. **G.SR.08.05** Solve applied problems involving areas of triangles, quadrilaterals, and circles.	Circle, Diameter, Center, Circumference, Radius, Pi, Circumference of a Circle, Area of a Circle
10-8 Area: Irregular Figures	**G.SR.08.04** Find area and perimeter of complex figures by sub-dividing them into basic shapes (quadrilaterals, triangles, circles).	

Pre-Algebra Chapter 11

Lesson Number and Name	GLCE Code and Skill	Vocabulary/Supplemental Resources
11-1 Three Dimensional figures	**G.SR.08.08** Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets; use such two-dimensional representations to help solve problems.	*Preview Geometry Activity: "Building a Three-Dimensional Figure" p.554-555 Plane, Solid, Polyhedron, Edge, Vertex, Face, Prism, Base, Pyramid, Skew Lines

Lesson	GLCE Code and Skill	Vocabulary/Supplemental Resources
11-1P	**G.SR.08.08** Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets; use such two-dimensional representations to help solve problems.	
11-2 Volume: Prisms and Cylinders	**N.ME.08.01** Understand the meaning of a square root of a number and its connection to the square whose area is the number; understand the meaning of a cube root and its connection to the volume of a cube. **G.SR.08.06** Know the volume formulas for generalized cylinders ((area of base) x height), generalized cones and pyramids (1/3 (area of base) x height), and spheres (4/3(radius)^3) and apply them to solve problems.	*Preview Geometry Activity: "Volume" p.562] Volume, Cylinder, Volume of a Prism, Volume of a Cylinder
11-2P	**G.SR.08.06** Know the volume formulas for generalized cylinders ((area of base) x height), generalized cones and pyramids (1/3(area of base) x height), and spheres (4/3(radius)^3) and apply them to solve problems.	
11-3 Volume: Pyramids and Cones	**G.SR.08.06** Know the volume formulas for generalized cylinders ((area of base) x height), generalized cones and pyramids (1/3(area of base) x height), and spheres (4/3(radius)^3) and apply them to solve problems.	Pyramid, Volume of a Pyramid, Cone, Volume of a Cone
11-4 Surface Area: Prisms and Cylinders	**G.SR.08.07** Understand the concept of surface area, and find the surface area of prisms, cones, spheres, pyramids, and cylinders. **G.SR.08.08** Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets; use such two-dimensional representations to help solve problems.	Surface Area, Surface Area Formulas
11-5 Surface Area: Pyramids and Cones	**G.SR.08.07** Understand the concept of surface area, and find the surface area of prisms, cones, spheres, pyramids, and cylinders. **G.SR.08.08** Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets; use such two-dimensional representations to help solve problems.	Lateral Face, Slant Height, Lateral Area, Surface Area of a Cone

Pre-Algebra 13-1 to 13-4 and Algebra (8-1, 8-2 as needed), 8-7, 8-8

Lesson Number and Name	GLCE Code and Skill	Vocabulary/Supplemental Resources
13-1 Polynomials	Teach 13-1, 13-2, 13-3, 13-4 as foundational work for Algebra 8-7 and 8-8.	Polynomial, Binomial, Trinomial, Degree *Algebra Activity: "Modeling Polynomials with Algebra Tiles" p.673
13-2 Adding Polynomials		
13-3 Subtracting Polynomials		
13-4 Multiplying a Polynomial by a Monomial		*Preview Algebra Activity: "Modeling Multiplication" p.682 Product
Algebra 8-7	**A.FO.08.07** Recognize and apply the common formulas: $(a+b)^2 = a^2+2ab+b^2$, $(a-b)^2=a^2-2ab+b^2$, $(a+b)(a-b) = a^2-b^2$; represent geometrically.	
Algebra 8-8	**A.FO.08.07** Recognize and apply the common formulas: $(a+b)^2 = a^2+2ab+b^2$, $(a-b)^2=a^2-2ab+b^2$, $(a+b)(a-b) = a^2-b^2$; represent geometrically.	

Algebra Chapter 9

Lesson Number & Name	GLCE Code & Skill	Vocabulary/Supplemental Resources
Algebra 9-1 Factors and Greatest Common Factors	**A.FO.08.08** Factor simple quadratic expressions with integer coefficients, i.e. x^2+6x+9, x^2+2x-3 and x^2-4; solve simple quadratic equations, i.e. $x^2=16$ or $x^2=5$ (by taking square roots); $x^2-x-6=0$, $x^2-2x=15$ (by factoring); verify solutions by evaluation.	2 days to cover
Algebra 9-2 Factoring Using the Distributive Property	**A.FO.08.08** Factor simple quadratic expressions with integer coefficients, i.e. x^2+6x+9, x^2+2x-3 and x^2-4; solve simple quadratic equations, i.e. $x^2=16$ or $x^2=5$ (by taking square roots); $x^2-x-6=0$, $x^2-2x=15$ (by factoring); verify solutions by evaluation.	2 days to cover
Algebra 9-3 Factoring Trinomials: $x^2 + bx + c$	**A.FO.08.08** Factor simple quadratic expressions with integer coefficients, i.e. x^2+6x+9, x^2+2x-3 and x^2-4; solve simple quadratic equations, i.e. $x^2=16$ or $x^2=5$ (by taking square roots); $x^2-x-6=0$, $x^2-2x=15$ (by factoring); verify solutions by evaluation.	2 days to cover
Algebra 9-4 Factoring Trinomials: $ax^2 + bx + c$	**A.FO.08.08** Factor simple quadratic expressions with integer coefficients, i.e. x^2+6x+9, x^2+2x-3 and x^2-4; solve simple quadratic equations, i.e. $x^2=16$ or $x^2=5$ (by taking square roots); $x^2-x-6=0$, $x^2-2x=15$ (by factoring); verify solutions by evaluation.	3 days to cover Focus on **simple** quadratic expressions! Day 1: Focus on p.496 Ex. 1a and supplement. Skip Ex. 1b. Day 2: Focus on p.496 Ex. 2 and supplement. Day 3: Focus on a simplified p.497 Ex.4. Use examples

		like p.496 Ex. 1a but equal to zero.
Algebra 9-5 Factoring Differences of Squares	**A.FO.08.08** Factor simple quadratic expressions with integer coefficients, i.e. x^2+6x+9, x^2+2x-3 and x^2-4; solve simple quadratic equations, i.e. $x^2=16$ or $x^2=5$ (by taking square roots); $x^2-x-6=0$, $x^2-2x=15$ (by factoring); verify solutions by evaluation.	1 day to cover p.502 Ex.1a and supplement and perfect square terms i.e.: $9x^2 - 121$ $4x^2 - 49$
Algebra 9-6 Perfect Squares and Factoring	**A.FO.08.08** Factor simple quadratic expressions with integer coefficients, i.e. x^2+6x+9, x^2+2x-3 and x^2-4; solve simple quadratic equations, i.e. $x^2=16$ or $x^2=5$ (by taking square roots); $x^2-x-6=0$, $x^2-2x=15$ (by factoring); verify solutions by evaluation.	1 day to cover p.509 Ex. 1a and 1b using the "perfect square trinomial" approach. **Avoid "prime" answer examples and problems**.

Quiz over Algebra 9-1 and 9-2, Quiz over Algebra 9-3 and 9-4 (Example 1a), Test over 9-1 to 9-6

Pre-Algebra 13-5 ,13-6 and Algebra 10-1, 10-2, 10-3, 10-4

Lesson Number & Name	GLCE Code & Skill	Vocabulary/Supplemental Resources
13-5 Linear and Nonlinear Functions	**A.RP.08.01** Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships ($y = k/x$); cubics ($y = ax^3$); roots ($y = \sqrt{x}$); and exponentials ($y = a^x$, $a > 0$); using tables, graphs, and equations.	Linear Function, Nonlinear Function, Quadratic Function, Cubic Function, Exponential Function, Inverse Variation Function
13-6 Graphing quadratic and Cubic Functions	**A.RP.08.01** Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships ($y = k/x$); cubics ($y = ax^3$); roots ($y = \sqrt{x}$); and exponentials ($y = a^x$, $a > 0$); using tables, graphs, and equations. **A.RP.08.06** Graph factorable quadratic functions, finding where the graph intersects the x-axis and the coordinates of the vertex; use words "parabola" and "roots"; include functions in vertex form and those with leading coefficient –1, (i.e., $y = x^2 - 36$, $y = (x - 2)^2 - 9$; $y = -x^2$; $y = -(x - 3)^2$).	*Graphing Calculator Investigation: "Families of Quadratic Functions" p.697
Algebra 10-1 Graphing Quadratic Functions	**A.FO.08.09** Solve applied problems involving simple quadratic equations.	Graphing Calculator Investigation: "Families of quadratic Graphs" p.531
Algebra 10-2 Solving Quadratic Equations by Graphing	**A.FO.08.09** Solve applied problems involving simple quadratic equations.	
Algebra Graphing Calculator Investigation p.545	**A.RP.08.05** Relate quadratic functions in factored form and vertex form to their graphs, and vice versa; in particular, note that solutions of a quadratic equation are the x-intercepts of the corresponding quadratic function.	Graphing Calculator Investigation p.545 which covers vertex form.
Algebra 10-4 Solving Quadratic Equations by Using the Quadratic Formula	**A.RP.08.05** Relate quadratic functions in factored form and vertex form to their graphs, and vice versa; in particular, note that solutions of a quadratic equation are the x-intercepts of the corresponding quadratic function.	

No Quiz for 13-5, 13-6, Algebra 10-1, 10-2
Test over 13-5, 13-6, Algebra 10-1, 10-2
Big Quiz over Algebra 10-3 and 10-4
**Option: On Re-Test day have kids do Activity Worksheet p.281 and 284 (copied back-to-back) to re-introduce and refresh Algebra 5-1 and Pre-Algebra 8-1 to 8-10 concepts.
**Or the option above could be used after the Algebra 10-3 and 10-4 Quiz.

*Note on the <u>Pre-Test, Test and Re-Test</u> for #12 and #13, that we need to draw a t-chart for the students and provide the value's of x that give the "repeated" value for y for the parabola.

<u>Optional?</u>
Algebra Ch.5

Algebra 5-2 Slope and Direct Variation	**A.PA.08.02** For basic functions, i.e. simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others.	
Algebra 5-3 Slope-Intercept Form	**A.PA.08.02** For basic functions, i.e. simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others.	Graphing Calculator p.278 Example 1and Example 2 (For advancement try Example 3).
Algebra 5-4 Writing equations in Slope-Intercept Form	**A.PA.08.02** For basic functions, i.e. simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others.	Focus on writing equations from standard form to slope-intercept form.
Algebra 5-5 Writing Equations in Point-Slope Form (Time Permitting)	**A.PA.08.02** For basic functions, i.e. simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others.	