Approved 2013

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

Pacing: 25 days (includes 7 short sessions)

Mathematical Practices
Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning. *Practices in bold are to be emphasized in the unit.* **1. Make sense of problems and persevere in solving them.** 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. **6. Attend to precision.** **7. Look for and make use of structure.** 8. Look for and express regularity in repeated reasoning.
Standards Overview
Reason quantitatively and use units to solve problems. Interpret the structure of expressions, equations and inequalities Create equations and inequalities that describe numbers or relationships Understand solving equations and inequalities as a process of reasoning and explain the reasoning Solve equations and inequalities in one variable

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

Priority and Supporting **CCSS**	**Explanations and Examples***
N-Q 1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	In all problem situations the answer should be reported with appropriate units. In situations involving money, answers should be rounded to the nearest cent. When data sets involve large numbers (e.g. tables in which quantities are reported in the millions) the degree of precision in any calculation is limited by the degree of precision in the data. These ideas are introduced in the solution to contextual problems in Unit 2 and reinforced throughout the remainder of the course. .
N-Q 2. Define appropriate quantities for the purpose of descriptive modeling.	
N-Q 3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	
A-SSE 1. Interpret expressions that represent a quantity in terms of its context.* **a. Interpret parts of an expression, such as terms, factors, and coefficients.**	Understanding the order of operations is essential to unpacking the meaning of a complex algebraic expression and to develop a strategy for solving an equation.

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Priority and Supporting **CCSS**	**Explanations and Examples***
b. Interpret complicated expressions by viewing one or more of their parts as a single entity...	Using the commutative, associative and distributive properties enables students to find equivalent expressions, which are helpful in solving equations.
A-CED 1. (part) Create equations and inequalities in one variable and use them to solve problems. ***Include equations arising from linear ... functions***	Here are examples of where students can create equations and inequalities. a. (Two step equation) The bank charges a monthly fee of $2.25 for your Dad's checking account and an additional $1.25 for each transaction with his debit card, whether used at an ATM machine or by using the card to make a purchase. He noticed a transaction charge of $13.50 on this month's statement. He is trying to remember how many times he used the debit card. Can you use the information on the statement help him figure out how many transactions he made? b. (Equations which require using the distributive property) Jessica wanted to buy 7 small pizzas but she only had four, $2 off, coupons. So, she bought four with the discount and paid full price for the other three, and the bill came to $44.50. How much was each small pizza? c. (Inequality) The student council has set aside $6,000 to purchase

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Priority and Supporting **CCSS**	**Explanations and Examples***
	the shirts. (They plan to sell them later at double the price.) How many shirts can they buy at the price they found online if the shipping costs are $14?
A-CED 4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*	Begin with a familiar formula such as one for the perimeter of a rectangle: $p = 2l + 2w$. Consider this progression of problems: (a) Values for the variables *l* and *w* are given. We can find *p* by substituting for *l* and *w* and **evaluating the expression** on the right side. (b) Values for the variables *l* and *p* are given. We can find *w* by substituting for *l* and *p* and **solving the equation** for *w*. (c) We can find a formula for *w* in terms of *l* and *p*, by following the **same steps** as in (b) above to solve for *w*. This gives us a **general method** for finding *w* when the other variables are known. (Check this new formula by showing that it gives the correct value for *w* when the values of *l* and *p* from (b) are substituted.)

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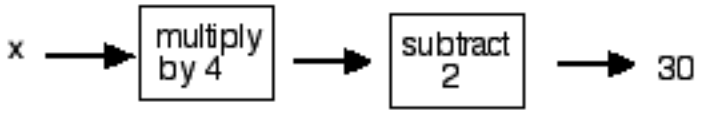
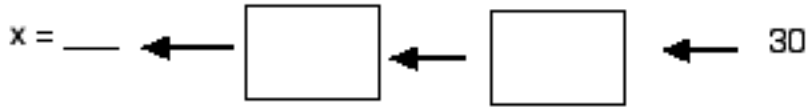
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

Priority and Supporting **CCSS**	**Explanations and Examples***
A-REI 1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	For two-step equations, flow charts may be used to help students "undo" the order of operations to find the value of a variable. For example, this flow chart may be used to solve the equation 4x – 2 = 30.   Then students learn to solve equations by performing the same operation (except for division by zero) on both sides of the equal sign. 4x – 2 = 30 +2 +2 4x / 4 = 32 / 4 x = 8 In solving multiple-step equations students should realize that there may be several valid solution paths. For example here are two approaches to the equation 3*(x + 5) – 4 =17.* ✓ 3(x + 5) – 4 = 17 3(x + 5) – 4 = 17
A-REI 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	

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*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

Priority and Supporting **CCSS**	**Explanations and Examples***
	✓ +4 +4 3x + 15 -4 = 17 ✓ 3(x + 5) = 21 3x + 11 = 17 ✓ 3x + 15 = 21 - 11 -11 ✓ -15 -15 ✓ 3x = 6 3x = 6 ✓ 3 3 3 3 ✓ X= 2 x= 2 ✓

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

Concepts What Students Need to Know	Skills What Students Need To Be Able To Do	Bloom's Taxonomy Levels
✓ Order of operations ✓ Expression vs. equation ✓ Inequality ✓ Associative property ✓ Commutative property ✓ Distributive property ✓ Inverse operations	Simplify (expression) Use (algebraic properties) Solve (linear equation or inequality, Variable only on one side) Model (with linear equation or inequality)	2 3 3 3

Essential Questions
What is an equation? What does equality mean? What is an inequality? How can we use linear equations and linear inequalities to solve real world problems? What is a solution set for a linear equation or linear inequality? How can models and technology aid in the solving of linear equations and linear inequalities?
Corresponding Big Ideas

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

To obtain a solution to an equation, no matter how complex, always involves the process of undoing the operations.

Standardized Assessment Correlations (State, College and Career)

CAPT through 2014, Smarter Balance assessment thereafter.

Vocabulary

Variable, algebraic expression, equation, open sentence, simplify, exponent, base, power, evaluate, additive inverse, properties of equalities (multiplicative identify, additive identity, associative, commutative, distributive), term, constant, coefficient, like terms, inverse operations, identity (x=x), solution,

Learning Activities

Topic	Section in Text MathMatters 1	CCSS
Real numbers • Classify numbers: natural, whole, integer, rational, irrational	3-4	N-RN3
Real number operations (review) • Simplify numerical expressions using order of operations, with an emphasis on fractions	3-1,3-2,3-3	A-SSE 1

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

Variable Expressions • Interpret parts of an expression, such as terms, factors, and coefficients. • Simplify by combining like terms • Associative Property • Commutative Property • Distributive Property • Simplify by using properties • Translate word sentences into variable expressions • Evaluate variable expressions involving the combination of like terms and distribution	3-5 3-4,5-5	A-SSE.1a A-SSE.1b A-SSE.2
Solve Multi-step Linear Equations • Define the use of inverse operations to solve equations • Justify steps using equality of numbers, properties from algebra • Rearrange formulas to highlight a quantity of interest. • Create and solve equations and inequalities to solve problems.	5-1,5-2,5-3,5-4 5-6 5-7	A-CED.1 A-CED.4 A-REI.1 A-REI.3

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 1: Expressions, Equations and Inequalities

Unit Assessments **The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.**
Mid unit test End-of-unit test Performance Task CAPT Practice Problems – See appendix

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Approved 2013

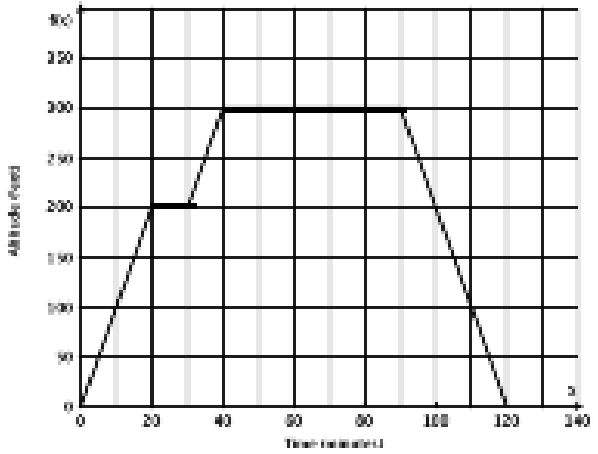
Integrated Math 1
Unit 2: Functions

Pacing: 11 days (include 4 short sessions)

Mathematical Practices
Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning. *Practices in bold are to be emphasized in the unit.* **1. Make sense of problems and persevere in solving them.** **2. Reason abstractly and quantitatively.** 3. Construct viable arguments and critique the reasoning of others. **4. Model with mathematics.** **5. Use appropriate tools strategically.** 6. Attend to precision. 7. Look for and make use of structure. **8. Look for and express regularity in repeated reasoning.**
Standards Overview
Create equations that describe numbers or relationships Represent and solve equations and inequalities graphically Understand the concept of a function and use function notation Interpret functions that arise in applications in terms of the context Analyze functions using different representations

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 2: Functions

Priority and Supporting **CCSS**	**Explanations and Examples***
A-CED 2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales	Students may collect data from water that is cooling using two thermometers, one measuring Celsius, the other Fahrenheit. From this they can create of the relationship and show that it can be modeled with a linear function.
A-REI 10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	The graph below shows the height of a hot air balloon as a function of time. Explain what the point (50, 300) on this graph represents.
	

Integrated Math 1
Unit 2: Functions

Priority and Supporting **CCSS**	**Explanations and Examples***
F-IF 1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*).	The domain of a function given by an algebraic expression, unless otherwise specified, is the largest possible domain. Mapping diagrams may be used to introduce the concepts of domain and range. The vertical line test may be used to determine whether a graph represents a function.
F-IF 2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Examples: Let f(x) = 10x – 5; find f(1/2), f(-6), f(a) If P(*t*) is the population of Tucson *t* years after 2000, interpret the statements P(0) = 487,000 and P(10)-P(9) = 5,900.

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*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 2: Functions

Priority and Supporting **CCSS**	**Explanations and Examples***
F-IF 4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities and sketch graphs showing key features given a verbal description of the relationship. ***Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative....****	Students may be given graphs to interpret or produce graphs given an expression or table for the function, by hand or using technology. Example: • It started raining lightly at 5am, then the rainfall became heavier at 7am. By 10am the storm was over, with a total rainfall of 3 inches. It didn't rain for the rest of the day. Sketch a possible graph for the number of inches of rain as a function of time, from midnight to midday.
F-IF 5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in factory, then the positive integers would be an appropriate domain for the function.**	Students may explain orally, or in written format, the existing relationships.
F-IF 9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Students may be asked to match graphs with tables or equations with which they may represent, and to explain their reasoning.

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*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 2: Functions

Concepts What Students Need to Know	Skills What Students Need To Be Able To Do	Bloom's Taxonomy Levels
✓ Independent variable	Determine (whether or not a relation is a function)	4
✓ Dependent variable		
✓ Ordered pair	Determine (range and domain of a function)	4
✓ Mapping Diagram		
✓ Table	Model (a real world situation with a function)	3
✓ Graph		
✓ Equation for a function	Evaluate (a function)	3
✓ Function notation	Represent a function (with table, graph, equation, mapping diagram)	3
✓ Domain		
✓ Range		
✓ Vertical Line test		
✓ Rate of change	Find (slope given two points)	1
✓ Constant additive change	Interpret (slope as rate of change)	2
✓ Slope	Determine (whether function is linear)	4
✓ x-intercept	Find (equation of a line)	1
✓ y-intercept	Model (linear function slope intercept form)	3
✓ slope-intercept form		
✓ Inequalities in two variables	Graph (linear function in slope intercept form)	3 3
	Interpret (parameters of linear function)	2
	Create linear (inequalities)	3
	Graph linear (inequalities)	3

Essential Questions

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 2: Functions

What is a function/linear function? What are the different ways that functions/linear functions may be represented? How can functions/linear functions be used to model and analyze real world situations, make predictions, and solve practical problems? What is the significance of a linear function's slope and y-intercept?
Corresponding Big Ideas
Functions are a mathematical way to describe relationships between two quantities that vary. Linear functions are characterized by a constant average rate of change (or constant additive change).
Standardized Assessment Correlations (State, College and Career)
CAPT through 2014, Smarter Balance assessment thereafter.

Unit Vocabulary
Function, independent and dependent variable, domain, range, relation, vertical line test, function notation, Intercepts, Intervals of increasing / decreasing / positive / negative/constant, input, output, ordered pairs, co-ordinate points, coordinate plane, axis, table of values, mapping, set, evaluate, function rule, slope, slope intercept form.

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 2: Functions

Learning Activities

Unit Assessments **The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.**		
	MathMatters 1	
Introduction to Functions • Determine whether a relation is a function given a relation expressed with a set, table or graph • Determine domain and range values for a variety of functions • Relate the domain of a function to its graph and where applicable, to the quantitative relationship it describes. • Use function notation to communicate pairings of input and output values • Evaluate functions for inputs in their domain • Understand that the graph of an equation in two variables is the set of all its solutions plotted on the coordinate plane • Interpret statements that use function notation in terms of a context.	7-1,7-2,7-3 7-4,7-5,7-6	F-IF.2 F-IF.1 A-REI.10

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1
Unit 2: Functions

End-of-Unit Test Performance Task Unit 2 assessment developed by LHS Algebra 1 teachers, found in the LHS network Math Folder. CAPT released items selected by their alignment to the unit content, are imbedded in the cumulative unit assessment. Other CAPT released items may be used for instructional purposes throughout the unit. See appendix.

Adapted from The Leadership and Learning Center "Rigorous Curriculum Design" model.
*Adapted from the Arizona Academic Content Standards.

Integrated Math 1

Unit 3: Systems of Linear Equations and Inequalities

Pacing: 10 days (includes 4 short sessions)

Mathematical Practices
Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning. *Practices in bold are to be emphasized in the unit.* **1. Make sense of problems and persevere in solving them.** 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. **5. Use appropriate tools strategically.** 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.
Standards Overview
Create equations that describe numbers or relationships Solve systems of equations Represent and solve equations and inequalities graphically

Integrated Math 1

Unit 3: Systems of Linear Equations and Inequalities

<table>
<tr><th>Priority and Supporting CCSS</th><th>Explanations and Examples*</th></tr>
<tr><td>A-CED 3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context...</td><td>Example: Given two sets of data that can be modeled with linear functions, find the intersection of the two trend lines, if it exists, and interpret the solution. For instance, if these trends continue, when will the women catch the men and what percentage of women will be earning $50,000 - $74,999?
<table>
<tr><th>Number of years since 2000</th><th>% of men earning $50,000 - $74,999</th><th>% of women earning $50,000 - $74,999</th></tr>
<tr><td>3</td><td>20.2</td><td>13.3</td></tr>
<tr><td>4</td><td>20.5</td><td>14.2</td></tr>
<tr><td>5</td><td>20.7</td><td>15.1</td></tr>
</table></td></tr>
<tr><td>A-REI 5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</td><td>Example:
Given that the sum of two numbers is 10 and their difference is 4, what are the numbers? Explain how your answer can be deduced from the fact that they two numbers, x and y, satisfy the equations $x + y = 10$ and $x – y = 4$.</td></tr>
</table>

Integrated Math 1

Unit 3: Systems of Linear Equations and Inequalities

Priority and Supporting **CCSS**	**Explanations and Examples***
A-REI 6. Solve systems of linear equations with graphs. Using equations in slope intercept form.	.The system solution methods can include but are not limited to graphical, elimination/linear combination, substitution, and modeling. Systems can be written algebraically or can be represented in context. Students may use graphing calculators, programs, or applets to model and find approximate solutions for systems of equations. Examples: Solve the system of equations: $y = -x + 11$ and $y = 3x - 5$. Your class is planning to raise money for a class trip to Washington, DC, by selling your own version of Connecticut Trail Mix. You find you can purchase a mixture of dried fruit for $3.25 per pound and a nut mixture for $5.50 per pound. The class plans to combine the dried fruit and nuts to make a mixture that costs $4.00 per pound, which will be sold at a higher price to make a profit. You anticipate you will need 180 pounds of trail mix. How many pounds of dried fruit and how many pounds of mixed nuts do you need?
A-REI 11. Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear ...functions.*	Students need to understand that numerical solution methods (data in a table used to approximate an algebraic function) and graphical solution methods may produce approximate solutions, and algebraic solution methods produce precise solutions that can be represented graphically or numerically. Students may use graphing calculators or programs to generate tables of values, graph, or solve a variety of functions.

Integrated Math 1

Unit 3: Systems of Linear Equations and Inequalities

Concepts What Students Need to Know	Skills What Students Need To Be Able To Do	Bloom's Taxonomy Levels
✓ Systems of linear equations ✓ Solution to a system of linear equations ✓ Graphing method ✓ Systems of linear inequalities graphing method	Solve (systems using graphs) Model (with systems of linear equations) Interpret (solution of systems of linear equations)	3 3 2

Essential Questions
What does the number of solutions (none, one or infinite) of a system of linear equations represent? What are the advantages and disadvantages of solving a system of linear equations graphically? What does the solution set of a system of linear inequalities represent?
Corresponding Big Ideas
A system of linear equations is an algebraic way to compare two equations that model a situation and find the breakeven point or choose the most efficient or economical plan. A system of linear equalities is a graphic way to compare two inequalities that model a situation and find the feasibility region.

Integrated Math 1

Unit 3: Systems of Linear Equations and Inequalities

Standardized Assessment Correlations (State, College and Career)
CAPT through 2014, Smarter Balance assessment thereafter.

Vocabulary
System of linear equations, system of linear inequalities, no solution, infinitely many solutions, scale, coordinate axes, labels, solutions, boundary, intersection

Learning Activities		
Topic	**Section in Text**	**CCSS**
Systems of Linear Equations • Find approximate/exact solution using graphing • Interpret solutions of systems (one solution, no solutions, infinitely many solutions) • Applications of Linear Systems	PH Algebra 1 7-1 7-4(graphing only)	CC.9-12.A.CED.3 CC.9-12.A.REI.6 CC.9-12.A.REI.5 CC9.12.A.REI.11
Systems of Linear Inequalities • Find approximate solution using graphing • Interpret solution of systems • Applications of Linear Inequality Systems	PH Algebra 1 7-5 7-6	CC.9-12.A.CED.3 CC9-12.A.REI.11 CC9-12.A.REI.12

Unit 3: Systems of Linear Equations and Inequalities

Unit Assessments
The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher. Performance Task End-of-Unit Test

Approved 2013

Integrated Math 1
Unit 4: Tools and Language of Geometry

Pacing: 9 days (2 short sessions)

Mathematical Practices

Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning.

Practices in bold are to be emphasized in the unit.
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Domain and Standards Overview

Experiment with transformations in the plane.
Make geometric constructions.
Use algebra to solve simple geometric based equations involving length and angle measure.

Integrated Math 1
Unit 4: Tools and Language of Geometry

Priority and Supporting **CCSS**	**Explanations and Examples**
G-CO1: Know precise definitions of angle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and distance along a line.	Understand basic (undefined) terms of geometry Identify segments, rays, parallel lines and planes Find lengths of segments and measures of angles, including the use of addition postulates
G-CO12: Make formal geometric constructions with a variety of tools and methods (compass and straight edge, string, reflective devices, paper folding, dynamic geometric software, etc.).	Use a compass and straight edge to construct congruent segments and congruent angles

Concepts **What Students Need to Know**	**Skills** **What Students Need To Be Able To Do**	**Bloom's Taxonomy** **Levels**
Undefined notions • Point • Line • Plane • Distance along a line	KNOW DESCRIBE	1 2
The four basic postulates relating points, lines and planes	UNDERSTAND	1
Precise definitions and symbols to identify: • Collinear	KNOW IDENTIFY	1

• Coplanar • Segment • Ray • Parallel lines • Angles • Skew Geometric Problems using addition postulates and the definitions of midpoint and bisect	SOLVE	3
Slope criteria for • Parallel lines • Perpendicular lines	STATE	1

Essential Questions
In what ways can congruence be useful? How can algebra be useful when expressing geometric properties? How can mathematical reasoning be supported? What is the appropriate labeling needed? How can perimeter/ circumference be found?
Corresponding Big Ideas

Integrated Math 1
Unit 4: Tools and Language of Geometry

Proving and modeling congruence provides a basis for modeling situations geometrically and algebraically.
Algebra can be used to efficiently and effectively describe and apply geometric properties to solve.
Differentiating between polygons by number of sides.
Measuring with protractor/ruler with accurate use.

Standardized Assessment Correlations
(State, College and Career)

Expectations for Learning (in development)
This information will be included as it is developed at the national level. CT is a governing member of the Smarter Balanced Assessment Consortium (SBAC) and has input into the development of the assessment.

Unit Vocabulary

point, line, plane, collinear, coplanar, segment, ray, opposite rays, parallel lines, skew lines, perpendicular, congruent, acute angle, obtuse angle, right angle, straight angle, faces, vertices, edges, perimeter, circumference, radius, diameter.

LEARNING ACTIVITIES

Integrated Math 1
Unit 4: Tools and Language of Geometry

Topic	Section in Text MathMatters 1	CCSS
Point, Line and Plane Segment, Ray, Parallel Lines and Planes Measure Segments and Angles Basic Constructions (copy segment and angle)	4-1	G-CO1
Polygons and polyhedra Classifying/naming Special triangles/quadrilaterals	4-2/4-3 4-2	
Measurement using protractor/ruler	2-3	
Perimeter/circumference	2-3/2-7	

Unit Assessments
The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.

Integrated Math 1
Unit 4: Tools and Language of Geometry

Unit test Performance task(s) Released CAPT IAs

Approved 2013

Integrated Math 1
Unit 5: Angles Formed by Lines

Pacing: 9 days (plus 2 shortened sessions)

Mathematical Practices

Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning.

Practices in bold are to be emphasized in the unit.
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Domain and Standards Overview

Understand solving equations as a process of reasoning and explain the reasoning.
Understand polygons and their special formulae for diagonals,# of sides and angle sum.
Make geometric constructions.

Integrated Math 1
Unit 5: Angles Formed by Lines

Essential Questions

Concepts **What Students Need to Know**	**Skills** **What Students Need To Be Able To Do**	**Bloom's Taxonomy** **Levels**
Properties of Congruence and equality	Identify (properties and laws)	1
Geometric Diagrams Definitions	Interpret Use (in order to solve equations)	3 and 5
Construction Tools	Identify (tools and methods)	1
Construction Methods	Use (tools and methods)	3

Priority and Supporting **CCSS**	**Explanations and Examples**

Integrated Math 1
Unit 5: Angles Formed by Lines

In what ways can congruence be useful?
Corresponding Big Ideas
Proving and applying congruence provides a basis for modeling situations geometrically.

Standardized Assessment Correlations (State, College and Career)
Expectations for Learning (in development) This information will be included as it is developed at the national level. CT is a governing member of the Smarter Balanced Assessment Consortium (SBAC) and has input into the development of the assessment.

Unit Vocabulary
Adjacent angles, complementary angles, supplementary angles, vertical angles, transitive property, distributive property, substitution property, property of equality, alternate interior angles, acute triangle, concave polygon, convex polygon, corresponding angles, polygon, regular polygon, sum of interior angles, right triangle, transversal,

Learning Activities

Integrated Math 1
Unit 5: Angles Formed by Lines

Topic	Section in Text MathMatters1	CCSS
Transversals and the angles they create	8-1	
• Polygons and the formulas for angle measure,sides,diagonals	8-3/8-4	
• Translations in the coordinate plane	8-5	
• Reflections over the x-axis and y-axis	8-6	

Unit Assessments
The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.

Integrated Math 1
Unit 5: Angles Formed by Lines

Unit 5 assessment developed by LHS Integrated Math 1 teachers, found in the LHS network Math Folder.
CAPT released items selected by alignment to the unit content, are imbedded in the cumulative unit assessment.
Other CAPT released items may be used for instructional purposes throughout the unit.

Approved 2013

Integrated Math 1
Unit 6: Congruent Triangles

Pacing: 9 days(2 shortened sessions)

Mathematical Practices

Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning.

Practices in bold are to be emphasized in the unit.

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. Model with mathematics.
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. Look for and express regularity in repeated reasoning.

Domain and Standards Overview

Use theorems involving similarity.
Understand congruence in terms of triangles and do algebra to prove.

Approved 2013

Integrated Math 1
Unit 6: Congruent Triangles

Priority and Supporting **CCSS**	**Explanations and Examples**
CC.9-12.G.CO.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	Recognize congruent polygons and their corresponding parts *Students may use geometric software to explore the effects of rigid motion on a figure(s).*
CC.9-12.G.CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions	Prove two triangles congruent using the SSS, SAS, and ASA postulates and AAS theorem. *Students may use geometric simulations (computer software or graphing calculator) to explore theorems about triangles.*
CC.9-12.G.CO.10 Prove theorems about triangles. Theorems include: base angles of isosceles triangles are congruent	Use and apply properties of isosceles triangles. *Students may use geometric simulations (computer software or graphing calculator) to explore theorems about triangles.*
CC.9-12.G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	

Concepts **What Students Need to Know**	**Skills** **What Students Need To Be Able To Do**	**Bloom's Taxonomy** **Level**

Integrated Math 1
Unit 6: Congruent Triangles

• the definition of congruence	KNOW	1
• two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent	SHOW	3
• the definition of congruence to decide if two given figures are congruent	USE	2
• how the criteria for triangle congruence (ASA, SAS, SSS, AAS) follow from the definition of congruence	EXPLAIN	5
• problems using congruence and similarity criteria for triangles	SOLVE	3
• relationships using congruence and similarity criteria for triangles	PROVE	5
• theorems about triangles, including o base angles of an isosceles triangle are congruent	PROVE	5

Essential Questions

Integrated Math 1
Unit 6: Congruent Triangles

In what ways can congruence be useful?
How might the features of one figure be useful when solving problems about a similar figure?

Corresponding Big Ideas

Proving and applying congruence provides a basis for modeling situations geometrically.
Similarity and the properties of similar triangles allow for the application of trigonometric ratios to real-world situations.

Standardized Assessment Correlations
(State, College and Career)

Expectations for Learning (in development)
This information will be included as it is developed at the national level. CT is a governing member of the Smarter Balanced Assessment Consortium (SBAC) and has input into the development of the assessment.

Unit Vocabulary

Integrated Math 1
Unit 6: Congruent Triangles

Congruence, corresponding sides, corresponding angles, SSS, SAS, ASA, AAS, triangle, side length, angle measure, input, output, coordinates, reflection symmetry, figure, base of an isosceles triangle, vertex angle, base angle, leg of an isosceles triangle, Pythagorean Theorem, square roots,

Learning Activities

Unit 3A and B: Congruent Figures and Triangles

Topic	Section in Text Ph Geometry	CCSS
Congruent Figures • recognize congruent figures and their corresponding parts	4.1 (A)	G-SRT5, G-CO6, G-CO7
SSS, SAS • prove two triangles congruent using the SSS and SAS Postulates	4.2 (B)	G-CO8, G-SRT5
ASA, AAS • prove two triangles congruent using the ASA Postulate and the AAS Theorems	4.3 (B)	G-CO8, G-SRT5
Pythagorean theorem	7-2	

Unit Assessments

The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.

Integrated Math 1
Unit 6: Congruent Triangles

Unit assessment developed by LHS Integrated Math 1 teachers, found in the LHS network Math Folder.

No CAPT released IAs correlate to this unit.

Approved 2013

Integrated Math 1
Unit 7: Relationships within Triangles

Pacing: 9 days + 2 Shortened sessions.

Mathematical Practices

Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning.

Practices in bold are to be emphasized in the unit.

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Domain and Standards Overview

Make geometric constructions
Prove geometric theorems
Understand and apply theorems about circles
Define trigonometric ratios and solve problems involving right triangles

Integrated Math 1
Unit 7: Relationships within Triangles

Priority and Supporting **CCSS**	**Explanations and Examples**
CC.9-12.G.CO.9 Prove theorems about lines and angles. Theorems include: points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	Use properties of perpendicular bisectors and angle bisectors *Students may use geometric simulations (computer software or graphing calculator) to explore theorems about lines and angles.*
CC.9-12.G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment.	Use a compass and straightedge to bisect segments and angles
CC.9-12.G.CO.10 Prove theorems about triangles. Theorems include: the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	Use properties of midsegments to solve problems Identify properties of medians and altitudes of a triangle. *Students may use geometric simulations (computer software or graphing calculator) to explore theorems about lines and angles.*
CC.9-12.G.C.3 Construct the inscribed and circumscribed circles of a triangle. **CC.9-12.G.CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.**	Identify properties of perpendicular bisectors and angle bisectors of a triangle; points of concurrency *Students may use geometric simulations (computer software or graphing calculator) to explore theorems about lines and angles.*
CC.9-12.G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applies problems (Triangle inequality theorem)	To use inequalities involving angles and sides of triangles *Students may use geometric simulations (computer software or graphing calculator) to explore theorems about lines and angles.*

Integrated Math 1
Unit 7: Relationships within Triangles

Concepts What Students Need to Know	Skills What Students Need To Be Able To Do	Bloom's Taxonomy Levels
• the terms inscribed, circumscribed, angle bisector and perpendicular bisector	DEFINE	2
• the inscribed circle whose center is the point of the intersection of the angle bisectors (the incenter)	CONSTRUCT	2
• the circumscribed circle whose center is the point of intersection of the perpendicular bisectors of each side of the triangle (the circumcenter)	CONSTRUCT	2
• geometric diagrams by identifying what can and cannot be assumed	INTERPRET	6
• theorems about lines and angles, including o points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints o points on the bisector of an angle are equidistant from the sides of the angle	PROVE	5
• theorems about triangles, including o the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length o the medians of a triangle meet at a point (the centroid) o the altitudes of a triangle meet at a point o the angle bisectors of a triangle meet at a point o perpendicular bisectors of a triangle meet at a point	PROVE	5

• the relative size of side lengths and angle measures in a triangle using the Triangle Inequality Theorem and Triangle Angle-Side Theorem (longest side opposite largest angle)	DETERMINE	3

Essential Questions
In what ways can congruence be useful? How can the properties of a circles, polygons, lines and angles be useful when solving geometric problems?
Corresponding Big Ideas
Proving and applying congruence provides a basis for modeling situations geometrically. The properties of polygons, lines and angles can be used to understand circles; the properties of circles can be used to solve problems involving polygons, lines and angles.

Standardized Assessment Correlations (State, College and Career)
<u>Expectations for Learning (in development)</u> This information will be included as it is developed at the national level. CT is a governing member of the Smarter Balanced Assessment Consortium (SBAC) and has input into the development of the assessment.

Integrated Math 1
Unit 7: Relationships within Triangles

Unit Vocabulary
Perpendicular bisector, midsegment, median, centroid, angle bisector, inscribe, circumscribe, circumcenter, incenter, distance from a point to a line, point of concurrency, orthocenter, altitude, construction, compass, straightedge, intersection, triangle inequality,altitude,

Learning Activities

Topic	Section in Text PH Geometry	CCSS
Bisectors in Triangles • Use properties of perpendicular bisectors and angle bisectors	5.2	G-CO9
Concurrent Lines, Medians and Altitudes • Identify properties of perpendicular bisectors and angle bisectors in a triangle including the properties of the points of concurrency (orthocenter, incenter) • To identify properties of medians and altitudes in a triangle including the properties of the point of concurrency of the medians (centroid/center of gravity)	5.3	G-CO10, G-C3
Midsegment of Triangles • Use properties of midsegments to solve problems	5.1	G-CO10

Integrated Math 1
Unit 7: Relationships within Triangles

Unit Assessments
The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.
Unit assessment developed by LHS Integrated Math 1 teachers, found in the LHS network Math Folder. **No CAPT released IAs correlate to this unit.**

Approved 2013

Integrated Math 1
Unit 8: Coordinate Geometry/Quadrilaterals

Pacing 6 Days and 2 shortened sessions for enrichment and reteaching

Mathematical Practices

Mathematical Practices #1 and #3 describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning.

Practices in bold are to be emphasized in the unit.
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Domain and Standards Overview

Use coordinates to prove simple geometric theorems algebraically.
Prove geometric theorems.

Integrated Math 1
Unit 8: Coordinate Geometry/Quadrilaterals

Priority and Supporting **CCSS**	**Explanations and Examples**
CC.9-12.G.GPE.4 Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle;	Find the distance between two points in the coordinate plane. Find the coordinates of the midpoint of a segment in the coordinate plane. Define and classify special types of quadrilaterals. Determine whether a quadrilateral is a parallelogram. Determine whether a parallelogram is a rectangle or rhombus. Name coordinates of special figures by using their properties.
CC.9-12.G.GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	
CC.9-12.G.GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*	
CC.9-12.G.CO.11 Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	Use relationships among sides and angles of parallelograms. Use relationships involving diagonals of parallelograms or transversals. Use properties of diagonals of rectangles and rhombuses. Prove theorems using figures in the coordinate plane.

Integrated Math 1
Unit 8: Coordinate Geometry/Quadrilaterals

Concepts What Students Need to Know	Skills What Students Need To Be Able To Do	Bloom's Taxonomy Levels
• precise definitions o angle o circle o perpendicular line o parallel line o line segment	KNOW	1
● Theorems about triangles	PROVE	5
● Theorems about parallelograms	PROVE	5

Essential Questions
How can algebra be useful when expressing geometric properties? In what ways can congruence be useful?
Corresponding Big Ideas
Algebra can be used to efficiently and effectively describe and apply geometric properties. Proving and applying congruence provides a basis for modeling situations geometrically.

Standardized Assessment Correlations (State, College and Career)
Expectations for Learning (in development) This information will be included as it is developed at the national level. CT is a governing member of the Smarter Balanced Assessment Consortium (SBAC) and has input into the development of the assessment.

Integrated Math 1
Unit 8: Coordinate Geometry/Quadrilaterals

Unit Vocabulary
Coordinates, coordinate plane, quadrilateral, parallelogram, rectangle, rhombus, square, kite, trapezoid, diagonal

Learning Activities

Topic	Section in Text	CCSS
Classify Quadrilaterals	6.1	G-GPE4
Properties of Parallelograms	6.2	G-CO11
Proving Parallelograms	6.3	G-CO11
Special Parallelograms	6.4	G-CO11
Trapezoids and Kites	6.5	

Unit Assessments **The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.**
Mid test, Unit test, Performance task(s)