

Oak Grove Curriculum Scope & Sequence

Algebra (Grade 8)

Updated 11.4.15

Unit Length	Unit / Skills <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ Summative Skills 	Instructional Strategies	Resources	Assessments <ul style="list-style-type: none"> ● Formative/Summative (F/S) ● Independent/Group (I/G)
2 weeks	Problem Solving <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ interpret points and continuous graphs, understand that a point conveys two pieces of information and that a continuous graph conveys trends ○ extend a tile pattern and how to generalize the geometric description of the pattern ○ use scatterplots as tools for organizing data and making predictions; the importance of carefully scaling the axes of a graph; the concepts of dependent and independent measurements (8.SP.2) ○ review what they learned in previous courses about proportional relationships using graphs and tables; compare rates in different representations of proportional relationships (8.EE.5) ○ investigate different strategies for solving proportions written as equivalent ratios (Preparation for 8.EE.7a-b) 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Poster paper ● Markers ● Index cards ● Sticky Dots ● Meter Sticks or Measuring tapes ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity(G-F) ● Teacher Made Assessment (I-S)
2-3 weeks	Simplifying with Variables <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ how to simplify an expression by combining like terms with algebra tiles (Preparation for 8.EE.7a-b) ○ find the perimeter of shapes formed with tiles and differentiate between the dimensions (length and width) of the tiles and the area ○ apply understanding of combining like terms to find the simplest expression to represent perimeter ○ represent, construct, and simplify negatives with algebra tiles ○ represent zero in multiple ways ○ build and simplify algebraic expressions using tiles ○ use different interpretations of “minus” to represent negatives with algebra tiles 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Algebra tiles ● Expression Mats ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)

	<ul style="list-style-type: none"> ○ build and simplify algebraic expressions using the tiles use Expression Comparison Mats to determine whether two expressions are the same or different ○ simplify algebraic expressions using algebra tiles and use an Expression Comparison Mat to determine which of two expressions is greater ○ solve equations for x and will strengthen their simplification skills (8.EE.7a-b) ○ solve equations for x and consider special types of solutions such as “all numbers” and “no solution.” ○ strengthen their simplification and recording skills 			
<p>3 weeks</p>	<p>Graphs and Equations</p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ identify the rule for a pattern and state it in words ○ find rules for patterns and write rules algebraically using symbolic notation ○ evaluate algebraic expressions to make predictions about a pattern (8.F.1-4) ○ graph data points from a pattern on the $x \rightarrow y$ coordinate plane ○ use graphing technology to graph data points and equations ○ differentiate between discrete and continuous graphs ○ use a graph to verify a prediction (8.F.1-4) ○ plot points from an $x \rightarrow y$ table and set up appropriate axes for a data set (8.F.1-4) ○ set up and complete a table, plot the points, and draw the graph using an appropriate scale given a linear equation or a contextual situation ○ graph decimal values (8.F.1-4) ○ create $x \rightarrow y$ tables, scale axes, plot points, and draw complete graphs given a linear or quadratic equation (8.F.1-4) ○ use graphs and rules to analyze a contextual situation with a limited domain ○ identify common errors in scaling and plotting points (8.F.4) ○ recognize that a solution is a value that makes an equation true (8.EE.7a-b) ○ solve equations while writing down their steps(8.EE.7a-b) ○ solve equations, including some equations that cannot be solved using algebra tiles; expand their idea of a solution to 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Graphing Calculators ● Algebra Tiles ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)

	<p>include its meaning in relation to real-world applications (8.EE.7b)</p> <ul style="list-style-type: none"> ○ use the Distributive Property to solve linear equations (8.EE.7b) 			
<p>2 - 3 weeks</p>	<p>Multiple Representations</p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ discover connections between all of the representations of a pattern: a graph, a table, a geometric presentation, and an equation; find different ways to represent the connections (8.F.2, 4) ○ write linear algebraic rules relating the figure number of a geometric pattern and its number of tiles ○ identify connections between the growth of a pattern and its linear equation (8.F.2, 4) ○ connect linear geometric patterns with patterns on a graph, specifically focusing on how a geometric pattern grows and how the size of Figure 0 can be determined from information on a graph (8.F.2, 4) ○ develop new connections between multiple representations of patterns and identify rules for these patterns using the $y = mx + b$ form of a linear equation ○ understand m as the pattern of growth and b as Figure 0 or the starting point of the pattern to write a rule from a graph and to create a pattern based on a linear rule (8.EE.6, 8.F.2, 4) ○ understand growth, Figure 0, and connections between multiple representations to situations where they are presented with disparate pieces of information and must generate a complete pattern (8.F.2, 4) ○ apply knowledge of m as the pattern of growth and b as Figure 0 or the starting value of a pattern to create graphs quickly without using an $x \rightarrow y$ table (8.F.2, 4) ○ move directly from one representation to another in the Representations of Patterns Web (8.F.2, 4) 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Graph paper ● Poster paper ● Markers or colored pencils ● Graphing Calculators ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)

2 weeks	<p><u>Systems of Equations</u></p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ solve two-variable linear equations for one variable (preparation for 8.EE.8b) ○ extend what we learned about solving equations with integer coefficients to equations that involve fractions and decimals ○ change fractional and decimal coefficients and constants to integers (8.EE.7b) ○ focus on systems of equations and examine the meaning of points of intersection (8.EE.8a) ○ develop an understanding of solving systems of equations through the lens of multiple representations; write rules and find intersections from contexts in word problems (8.EE.8c) ○ solve systems of equations algebraically when both equations are in $y = mx + b$ form (8.EE.8b-c) ○ solve systems of equations using the Equal Values Method when equations are not in y-form and to identify systems that represent the same line or parallel lines (that is, systems that have infinitely many solutions or no solution) (8.EE.8b-c) 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Algebra Tiles ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)
3 weeks	<p><u>Transformations and Similarity</u></p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ move a shape on a coordinate graph using rigid transformations – translations (slides), rotations (turns), and reflections (flips) (8.G.1a-c) ○ use different methods to transform shapes interchangeably, describe and complete transformations on a coordinate plane, and use coordinates to describe the position of objects in a plane (flat surface) (8.G.1a-c, 2, 3, 4) ○ extend their techniques from using integer expressions to record movement on a number line to using expressions to represent movement on the coordinate graph; identify whether a shape has been translated, rotated, or reflected (8.G.1a-c, 2, 3, 4) ○ perform and identify each type of transformation (translation, rotation, or reflection) in order to move shapes on a coordinate grid to create a unique drawing (8.G.3) ○ recognize that dilations by different numbers result in changes in shapes; compare shapes to determine similarity (8.G.3, 4) 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Tracing paper ● Graph paper ● Scissors ● Markers or Colored pencils ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)

	<ul style="list-style-type: none"> ○ develop an understanding of congruence and how it relates to similarity and use shapes to explore different scale factors (8.G.1a-c, 2, 4) ○ use sequences of transformations to show that two figures are similar or congruent (8.G.2, 4) ○ develop our understanding of ratio and similarity; identify actions that enlarge and reduce shapes, and use scale factors to find unknown side lengths (8.G.4) ○ recognize that equivalent fractions can be used to find missing parts of similar figures (8.G.4) 			
<p>3 weeks</p>	<p><u>Slope and Association</u></p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ construct and interpret circle graphs using central angles and percents ○ create scatter plots and identify whether there is a relationship between two sets of data ○ draw a line of best fit and use it to make predictions (8.SP.1) ○ develop our understanding of different associations and will consider the direction of an association ○ create and use scatterplots to make predictions, if possible, and identify when it is not possible to make predictions (8.SP.1, 2) ○ strengthen our knowledge of $y = mx + b$ and the relations of linear graphs and their equations ○ remember that for data to be linear, the data must have constant growth and that for a point to lie on the graph, it must make the equation true (8.EE.6, 8.F.3) ○ describe the rate of change of a line (slope) numerically, as the ratio between the vertical change and horizontal change (8.EE.6) ○ identify slopes from graphs, and recognize the effect of scaling on the steepness of a line (8.EE.6) ○ connect negative slope with decreasing rates of change and a slope of zero with no change ○ use slope to describe the average rate when the rate is not constant (8.EE.6) ○ write equations representing proportional relationships and connect the constant of proportionality to the slope of a graph to the unit rate (8.EE.5, 6) ○ use our understanding of $y = mx + b$ to write the equation for a line of best fit to represent scattered data that is roughly 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Yarn or String ● Colored pencils or Markers ● Poster Graph paper ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)

	<p>linear by calculating the slope from two points; use this equation and a graph to make and justify predictions</p> <ul style="list-style-type: none"> ○ interpret the slope and y-intercept of a best fit line in context (8.SP.3) ○ write the equation for a line of best fit to represent scattered data that is roughly linear ○ describe an association between two numerical variables using form, direction, strength, and outliers (8.SP.2, 3) ○ informally look for and describe associations between two <i>categorical</i> variables in two-way tables ○ develop understanding that association can be seen in table rows or in table columns (8.SP.4) 			
<p>2-3 weeks</p>	<p><u>Exponents and Functions</u></p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ recognize linear and nonlinear situations from tables and graphs (8.F.3) ○ calculate compound interest over different periods of time ○ recognize that compound interest is an example of multiplicative growth that is represented by a curve on a graph and with an exponent in an equation (preparation for 8.EE.1) ○ compare simple and compound interest, and identify each kind of interest in multiple representations (8.F.3) ○ simplify expressions written with positive exponents and will build understanding of writing numbers greater than one in scientific notation (8.EE.1, 3) ○ develop methods for simplifying expressions with positive exponents, and be able to recognize the difference between raising a single number to a power and raising a grouped quantity to a power (8.EE.1) ○ develop methods for simplifying expressions with positive exponents and learn what negative and zero exponents represent (8.EE.1) ○ compare and perform computations with numbers written in scientific notation; connect this to their work with simplifying exponent expressions (perform these calculations with and without a calculator) (8.EE.4) ○ determine which relationships are functions and which are not, using both a graph and a table ○ identify and describe functions (8.F.1, 3, 5) 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Graphing Calculators ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)

<p>3 weeks</p>	<p><u>Angles and Pythagorean Theorem</u></p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ establish facts about angles formed when parallel lines are cut by a transversal (8.G.5) ○ determine that the sum of the angles in any triangle is 180° (8.G.5) ○ determine that the exterior angle of a triangle is equal to the sum of the two remote angles (8.G.5) ○ investigate the AA criterion for similar triangles (8.G.5) ○ compare the side lengths of squares to see what combinations of side lengths will make triangles ○ identify patterns in the combinations that make right, acute, and obtuse triangles (preparation for 8.G.7) ○ identify the relationship between side lengths of a right triangle as the Pythagorean Theorem and apply that relationship to solve problems (8.G.6, 7) ○ understand the concept of square root and irrational number ○ find values of square roots by estimation, by using a calculator, and by using a graph (8.EE.2, 8.G.6) ○ distinguish rational numbers from irrational numbers ○ convert terminating and repeating decimals to fractions ○ use rational approximations of irrational numbers to compare the size of irrational numbers and locate them on a number line (8.NS.1, 2, 8.EE.2) ○ apply the Pythagorean Theorem to problems in a variety of two-dimensional, real-world contexts (8.G.7, 8) ○ use the Pythagorean Theorem to determine unknown lengths in real-world, three-dimensional problems (8.G.7) ○ explain a proof of the Pythagorean Theorem and its converse (8.G.6) ○ Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems (G-SRT.8) 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Tracing paper ● Rulers or Straight Edges ● Scissors ● Graphing Calculators ● Cardboard ● String ● Tape ● Envelopes ● Colored paper ● Blank paper ● CPM Resource Pages ● CPM online textbook 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)
<p>2 weeks</p>	<p><u>Surface Area and Volume</u></p> <ul style="list-style-type: none"> ● We are learning to... <ul style="list-style-type: none"> ○ find the volume of a cube given a side length and to find the side length when given the volume (8.EE.2) ○ find the surface area and volume of a cylinder and a rectangular prism, comparing the process and resulting volumes (8.G.9) ○ demonstrate that the volume of a cylinder is three times the volume of a cone with the same height and base, and 	<ul style="list-style-type: none"> ● Direct Instruction ● Teacher Modeling ● Whole Class Discussion ● Think-Pair-Share ● Teammates consult ● Pairs Check ● Gallery Walk 	<ul style="list-style-type: none"> ● Prism models ● Cylinder models ● Tape ● Poster paper ● Markers ● Paper plates ● Scissors ● Rulers 	<ul style="list-style-type: none"> ● Homework (I-F) ● Quiz(es) (I-F) ● Review Activity (G-F) ● Teacher Made Assessment (I-S)

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	<p>demonstrate that the volume of a prism is three times the volume of a pyramid with the same height and base (8.G.9)</p> <ul style="list-style-type: none">○ find the volume of a sphere and generalize the formula○ solve problems involving three-dimensional solids in real-world contexts (8.G.9)○ apply our knowledge of volume to create a cone with a maximum volume (8.G.9)		<ul style="list-style-type: none">● Protractors● Cardstock● Small Beans or Rice● CPM Resource Pages● CPM online textbook	
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