Saxon *Algebra 1/2*, *Algebra 1*, and *Algebra 2* Scope and Sequence

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Arithmetic			
Whole Numbers			
Know place values through hundred trillions	•		
Read and write whole numbers in words and digits	•		
Write whole numbers in expanded notation	•		
Round whole numbers	•	•	
Order whole numbers on a number line	•		
Operations with Whole Numbers			
Add whole numbers	•	•	
Subtract whole numbers	•	•	
Multiply whole numbers	•	•	
Divide whole numbers	•	•	
Fractions			
Understand fractions	•		
Convert fractions to decimal numbers	•		
Convert fractions to percents	•		
Add fractions	•	•	
Add mixed numbers	•	•	
Subtract fractions	•	•	
Subtract mixed numbers	•	•	
Multiply fractions	•	•	
Multiply fractions by whole numbers	•		
Find fractional parts of numbers	•		
Multiply mixed numbers	•	•	
Solve mixed number problems	•		
Divide fractions	•	•	
Divide mixed numbers	•	•	
Reduce and expand fractions	•		
Decimal Numbers			
Understand decimal numbers			
Read decimal numbers through millionths	•		
Order decimal numbers on the number line	•	•	
Understand repeating decimal numbers	•		
Round decimal numbers	•		
Round repeating decimal numbers	•	•	•
Convert decimal numbers to fractions	•		
Convert decimal number to percents	•		
Add and subtract decimal numbers	•	•	
Multiply and divide decimal numbers	•	•	
Estimate with decimal numbers	•		
Understand and use scientific notation			

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
For large and small numbers	•	•	•
With addition of exponents	•	•	•
In multiplication	•	•	•
In division		•	•
In approximating			•
On a scientific calculator			•
In ideal gas law problems			•
Roman Numerals			
Know Roman numerals through thousands	•		
Graphs			
Graphs of Data			
Interpret and construct bar graphs	•		
Interpret and construct broken-line graphs	•		
Interpret and construct pie graphs	•		
Graphs on the Coordinate Plane			
Define *axes*, *coordinates*, *quadrants*, and *origin*	•	•	
Recognize and plot ordered pairs	•	•	
Use the distance formula			•
Graph linear equations			
Equation of a line	•	•	•
By substitution	•	•	
To solve systems of equations		•	•
Finding slopes	•	•	•
Slope formula	•	•	•
y-intercept		•	•
Vertical and horizontal lines	•	•	
Parallel lines		•	•
Perpendicular lines			•
Using slope-intercept form		•	•
Given two ordered pairs		•	•
Given slope		•	•
Given experimental data			•
Consistent, inconsistent, and dependent		•	•
Graph circles, ellipses, hyperbolas, and parabolas	•	•	•
Number Sets			
Sets			
Use set notation	•	•	•
Distinguish between finite and infinite		•	
Understand set membership		•	
Represent subsets of the real numbers symbolically		•	•
Find intersections and unions of sets			•
Use Venn diagrams			•

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Identify subsets	•	•	
Real Numbers			
Classify the real numbers			
Natural (counting) numbers and whole numbers	•	•	•
Integers, rational numbers, and irrational numbers	•	•	•
Prime and composite numbers	•	•	
On the number line	•		•
Compute sums, products, differences, and quotients of decimal numbers	•	•	
Perform operations with integers			
Addition	•	•	•
Subtraction	•	•	•
Multiplication	•	•	•
Division	•	•	•
Symbols of inclusion			
Absolute value	•	•	•
Identifying negative numbers	•	•	
Opposites with multiple signs	•	•	
Within order of operations	•	•	•
Parentheses	•	•	•
Parentheses, braces, and brackets	•	•	•
Understand elementary number theory			
Divisibility rules	•		
Prime and composite numbers	•	•	
Multiples	•		
Find least common multiples	•	•	
Find reciprocals	•	•	•
Find greatest common factors	•	•	
Understand inverse operations	•	•	
Use base 2			
Conversion between base 2 and base 10	•		
Addition in base 2 and base 10	•		
Know the properties of real numbers			
Chart of properties		•	
Commutative property of addition and multiplication	•	•	•
Associative property of addition and multiplication	•	•	
Distributive property	•	•	•
Additive inverse	•	•	
Multiplicative inverse	•	•	
Additive identity		•	
Multiplicative identity	•	•	
Multiplicative property			
Of zero		•	

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Of –1	•	•	
Of 1	•	•	
Of equality	•	•	•
Additive property			
Of zero		•	
Of equality	•	•	•
Complex Numbers			
Understand imaginary numbers			•
Use the standard form for complex numbers			•
Add complex numbers			•
Multiply complex numbers			•
Divide complex numbers			•
Multiply complex conjugates			•
Find complex roots of quadratic equations			•
Measurement			
English Measurement			
Know U.S. Customary units of length	•	•	
Read rulers to nearest $\frac{1}{16}$ of an inch	•		
Metric Measurement			
Know the metric units of length	•		
Read metric rulers	•		
Know the metric units of volume	•		•
Conversion by Unit Multipliers			
Convert within English system			
in./ft, ft/yd, ft/mi	•	•	•
Multiple unit multipliers	•	•	•
Volume	•	•	•
Area	•	•	•
Rate			•
Convert within metric system			
cm/m, km/m	•	•	•
Multiple unit multipliers	•	•	•
Volume	•	•	•
Convert between English and metric units			
Length		•	•
Area		•	
Volume		•	
Ratio, Proportion, Percent, and Rate			
Ratio			
Solve ratio word problems	•	•	•
Express rates as ratios	•		
Compare unit prices	•		

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Recognize implied ratios	•		
Solve rate problems	•	•	
Solve advanced ratio problems involving totals	•	•	•
Use the ideal gas laws			•
Proportion			
Cross multiply to solve proportions	•	•	
Use scale factors on geometric shapes			•
Use proportions with chemical compounds			•
Percent			
Find percents of numbers	•	•	•
Change percents to decimal numbers and to fractions	•		
Use the percent equation	•	•	•
Solve percent word problems	•	•	•
Use fractional percents	•		
Use percents in chemical weight problems			•
Visualize percents using diagrams	•	•	•
Use percents greater than one hundred	•	•	•
Solve percent increase/decrease problems	•	•	•
Rate			
Change rates using multipliers			•
Solve uniform motion problems		•	•
Solve boat-in-the-river problems			•
Exponents			
Know order of operations with exponents	•	•	•
Evaluate expressions with exponents	•	•	•
Simplify powers of fractions	•	•	•
Simplify powers of signed numbers	•		•
Know the product theorem for exponents	•	•	•
Evaluate powers of negative bases	•	•	•
Use negative exponents	•	•	•
Solve equations with exponents	•	•	•
Use zero as an exponent	•	•	
Know the quotient rule for exponents		•	
Know the power theorem for exponents		•	•
Use the y^x calculator key		•	
Understand exponential increase and decrease		•	•
Understand and use fractional exponents			•
Simplify a sum raised to a power			•
Use exponents on a scientific calculator			•
Use variables as exponents	•		•
Factor expressions with exponents			•
Roots			
Find square roots, cube roots, and fourth roots	•	•	

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Know order of operations with roots	•	•	
Evaluate expressions with roots	•	•	
Take roots of fractions	•		
Estimate higher-order roots	•		
Take roots of negative numbers	•	•	•
Know the product of square roots rule		•	•
Add radical expressions		•	•
Multiply radical expressions		•	•
Find roots of large numbers		•	
Solve radical equations		•	•
Know the quotient theorem for roots		•	•
Rationalize denominators			•
Simplify roots of roots			•
Convert roots to fractional exponents			•
Use Euler's notation			•
Evaluate roots with a scientific calculator			•
Statistics and Probability			
Probability			
Use counting techniques to compute probability			
Simple probability	•	•	•
Independent events	•	•	•
Product of probabilities	•	•	•
Find permutations	•		•
Statistics			
Use and construct stem-and-leaf plots	•	•	•
Use and construct histograms	•	•	
Use and construct box-and-whisker plots	•	•	
Compute measures of central tendency	•	•	•
Understand normal curves			•
Compute standard deviation			•
Find averages			
Of several numbers	•		
Overall	•	•	
Weighted		•	
Expressions			
Simplifying Expressions			
Combine like terms			
Simple	•	•	•
With exponents	•	•	•
With negative exponents		•	•
Simplify exponential expressions			
With exponentials and radicals/power rule	•	•	•

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
With fractional exponents			•
With variable exponents	•		•
With fractional base	•		
With signed numbers			
Explanation	•	•	•
Evaluation with signed numbers	•	•	•
Multiplication and division		•	•
With negative signs/positive or negative exponents	•		•
Distributive property and negative exponents		•	
Evaluate expressions with substitution			
For variables	•	•	•
With symbols of inclusion		•	•
With signed numbers	•	•	•
With signed numbers and symbols of inclusion		•	•
Simplify expressions using			
Distributive property	•	•	•
Order of operations	•	•	
With fractions	•	•	
With symbols of inclusion	•	•	
Reduce expressions by common factor	•	•	•
Find the least common multiple of expressions		•	•
Find the greatest common factor of expressions		•	
Simplify radical expressions			
Addition		•	•
Multiplication		•	•
Using conjugates			•
Fractional exponents			•
Simplify polynomial expressions			
Monomials	•	•	•
Binomials	•	•	•
Difference of two squares		•	•
Sum and difference of two cubes		•	•
Trinomials	•	•	•
Simple factoring		•	•
Common factors		•	•
Common factor sums		•	
Lead coefficients greater than one		•	•
Degrees of polynomials	•	•	•
Addition of polynomials	•	•	•
Multiplication of polynomials	•	•	•
Division of polynomials			
Simple	•	•	•
Missing term in dividend		•	•

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
With two variables			•
Factoring by grouping		•	
Simplify rational expressions		•	•
Multiplication		•	•
Addition		•	•
Factoring			
Before multiplication		•	•
Before addition		•	•
Division		•	•
Denominators			
Factoring		•	•
Rationalizing			
By multiplication by radical		•	•
Using conjugates			•
Simplify complex fractions	•	•	•
Denominator-numerator same-quantity rule		•	•
Multiplicative property of equality		•	•
Additive property of equality		•	
Advanced		•	•
Simplify complex numbers			•
Addition of like terms			•
Euler's notation			•
Using conjugate of the denominator			•
Multiple step			•
Multiplication			•
Division			•
Equations			
Simplifying and Solving Equations			
Define equations and basic rules			
Simple	•	•	•
Conditional	•	•	•
Equivalent	•	•	•
Addition and subtraction rules	•	•	•
Multiplication and division rules	•	•	•
Use the fractional-part-of-a-number equation	•	•	•
Solve abstract equations		•	•
Use the decimal-part-of-a-number equation	•	•	•
Solve equations with mixed numbers	•	•	•
Solve equations using least common multiple			•
Use the percent equation	•	•	•
Solve multiple-step equations			
Using two rules	•	•	•
Format	•	•	•

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Variables on each side of equals sign	•	•	•
Two-step	•	•	•
Multiple terms	•	•	•
Multivariable abstract		•	•
Advanced			•
Solve equations that have negative coefficients	•	•	
Solve equations that have symbols of inclusion		•	
Solve equations using distributive property		•	•
Translate word phrases into algebraic expressions	•	•	•
Translate word sentences into algebraic equations	•	•	•
Solve equations involving variation			
Direct and inverse		•	•
Squared		•	
As ratio			•
Joint and combined			•
Solve rational equations	•	•	•
Solve radical equations		•	•
Linear Equations			
Find linear equations to fit experimental data			•
Find equations of lines			
Using slope-intercept form		•	•
Given two points		•	•
Parallel to given lines		•	•
With given slopes		•	•
Finding slopes		•	•
Perpendicular to given lines			•
Horizontal and vertical lines		•	•
Slope formula	•	•	•
Distance formula		•	•
Graph linear equations			
Simple	•	•	•
Rearranging before graphing		•	•
For solution		•	•
Slope-intercept method		•	•
Solve two equations in two unknowns			
Substituting			
For variable		•	•
One variable for another variable		•	•
Advanced			•
Rearranging before substitution		•	
Subscripted variables		•	•
With fractions and decimal numbers		•	•
Using linear combination (elimination)			

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
With angular relationship			•
Elimination of a variable		•	•
Subscripted variables		•	•
With fractions and decimal numbers		•	•
By graphing			
Simple		•	•
With fractions and decimals numbers			•
Consistent, inconsistent, and dependent equations		•	•
Solve three equations in three unknowns			•
Quadratic Equations			
Solve by factoring	•	•	•
Use difference of two squares theorem		•	•
Complete the square		•	•
Use the quadratic formula		•	•
Identify lead coefficients			•
Use discriminants			•
Other Types of Equations			
Solve logarithmic equations			•
Solve exponential equations			•
Solve exponential growth problems		•	•
Find compound interest with calculator		•	•
Find roots of equations		•	
Lead coefficients of completing the square			•
Complex roots			•
Using quadratic formula		•	•
Irrational roots			•
Discriminants			•
Solve equations with applications			
Simple and compound interest	•	•	•
Markup and markdown	•		•
Commission and profit	•		
Coin problems		•	•
Chemical mixture problems			•
Age problems			•
Explore nonlinear equations			
Circles and ellipses			•
Parabolas	•	•	•
Hyperbolas			•
Solve systems of equations			
Using elimination and substitution			•
By completing the square			•

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Algebraic Skills			
Understanding Functions			
Define *domain*, *range*, *independent variable*, and *dependent variable*		•	•
Use function notation	•	•	•
Use the vertical line test		•	•
Represent functions as ordered pairs		•	•
Manipulating and Evaluating Functions			
Multiply functions			•
Add functions			•
Graph and evaluate exponential functions			•
Evaluate trigonometric functions	•		•
Trigonometry and Logarithms			
Trigonometry			
Define and use *sine*, *cosine*, and *tangent*	•		•
Evaluate trigonometric and inverse trigonometric functions with a scientific calculator			•
Solve right triangles			•
Use trigonometry to work with vectors			
Addition			•
Negative			•
Force vectors at a point			•
Logarithms			
Solve logarithmic equations			•
Know the laws of logarithms			•
Find logarithms with a scientific calculator			•
Find antilogarithms with a scientific calculator			•
Lines, Points, Segments, and Planes			
Identify lines			
Intersecting		•	•
Parallel	•	•	•
Transversals	•		•
In space			•
Skew			•
Perpendicular bisectors	•		•
Identify points and find distances between points	•	•	•
Identify segments	•	•	•
Characteristics		•	
Proportional			•
Bisectors	•		•
Identify planes and planes in space	•	•	•

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Angles			
Identify vertices of angles	•	•	•
Identify kinds of angles			
Right, acute, straight, and obtuse angles	•	•	•
Complementary and supplementary angles	•		•
Adjacent angles	•		•
Vertical angles			•
Reflex angles			•
Corresponding interior and exterior angles	•		•
Alternate interior and exterior angles	•		•
Remote interior angles			•
Measure angles with a protractor	•		
Use inscribed angles			•
Construct angle bisectors	•		
Find the sum of the angles in a polygon			•
Use angles with vectors			
To find rectangular coordinates			•
To change from rectangular to polar form			•
Addition			•
Negative			•
Force at point			•
Define negative angles on the coordinate plane			•
Use angles in circles to form major and minor arcs	•		•
Polygons			
Classify polygons			
Convex and concave	•	•	•
Equilateral and equiangular	•	•	•
By number of sides			
Triangles	•	•	•
Quadrilaterals	•	•	•
Inscribed		•	•
Squares	•	•	•
Trapezoids	•	•	•
Parallelograms	•	•	•
Rhombuses	•	•	•
Rectangles	•	•	•
Pentagons	•	•	•
Hexagons	•	•	•
Understand congruence of polygons	•		•
Understand regularity of polygons	•	•	•
Translate, rotate, and reflect polygons	•	•	•
Recognize symmetry of polygons	•		

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Identify vertices of polygons	•	•	•
Draw diagonals of polygons	•	•	•
Circles			
Identify parts of circles			
Radii and diameters	•	•	•
Chords	•		•
Arcs, sectors, and central angles	•		•
Secants and tangents			•
Draw circumscribed and inscribed circles			•
Use degree measures	•	•	•
Triangles			
Classify triangles			
Right, obtuse, acute, scalene, isosceles, and equilateral	•	•	•
30º-60º-90º	•		•
45º-45º-90º	•		•
Prove congruence of triangles	•		•
Find measures of angles	•	•	•
Solve similar triangle problems			
Two triangles	•		•
Overlapping triangles			•
Geometric Solids			
Identify cylinders and prisms	•	•	
Identify circular and right circular cones	•	•	
Identify rectangular and square pyramids	•	•	
Identify spheres	•	•	
Perimeter and Circumference			
Compute perimeters of shapes	•	•	•
Define π	•	•	•
Compute circumferences			
Circles	•	•	•
Semicircles	•	•	•
Area			
Find areas of polygons			
Rectangles and squares	•	•	
Triangles	•	•	•
Parallelograms and trapezoids	•	•	•
Find areas of complex shapes			
Made of two or more polygons	•	•	•
Made of polygons and semicircles	•	•	•
As differences	•		
Find areas of circles, sectors, and semicircles	•	•	•
Surface Area and Volume			
Find surface areas of geometric solids			

	Saxon *Algebra 1/2*	Saxon *Algebra 1*	Saxon *Algebra 2*
Right circular cylinders	•	•	•
Triangular prisms and rectangular pyramids	•	•	•
Circular cones	•	•	•
Spheres		•	•
Complex shapes as the base	•	•	•
Find volumes of geometric solids			
Right cylinders and prisms	•	•	•
Complex shapes as the base	•	•	
Cones, pyramids, and spheres	•	•	•
Constructions			
Copy angles using compass and straight edge	•		•
Construct perpendicular bisectors	•		•
Construct triangles and rectangles	•		•
Construct angle bisectors	•		•
Copy line segments	•		•
Postulates			
Understand Euclid's postulates			•
Pythagorean Theorem			
Find side lengths	•	•	•
Graph points to find distance		•	•
Prove the Pythagorean theorem	•		•
Proofs			
Prove theorems about lines			•
Prove theorems about angles			•
Prove theorems about circles			•
Prove theorems about parallelograms			•
Prove theorems about rhombuses			•
Prove theorems about isosceles trapezoids			•
Prove theorems about triangles			•