Academic Systems® Algebra

Scope and Sequence

Academic Systems® Prealgebra

Standard Course Topics

- Topic FI Whole Numbers
- Topic F2 Proportional Reasoning I
- Topic F3 Proportional Reasoning II
- Topic F4 Signed Numbers
- Topic F5 Geometry
- Topic F6 Interpreting Data

Additional Topics Available

- Topic 1 Real Numbers
- Topic 2 Solving Linear Equations & Inequalities
- Topic 3 Introduction to Graphing
- Topic 6 Exponents & Polynomials

Academic Systems Prealgebra

Lesson	Concept	Objectives	Hours
Topic F1: Whole Numbers			
F1.1 Whole Numbers I	Adding and Subtracting	a) Number line and ordering symbols b) Place value c) Adding whole numbers d) Subtracting whole numbers e) Solving x ± a = b f) Applications	2 hours
	Multiplying and Dividing	a) Multiplying whole numbers b) Dividing whole numbers c) Prime factorization d) Solving ax = b e) Applications	2 hours
	Rounding and Divisibility	a) Rounding and estimating b) Divisibility c) Applications	3 hours
	Explore	a) Magic Squares b) Working with 11 c) How many Soda Cans?	1 hour
		Lesson Total	6-8 hours
F1.2 Whole Numbers II	Exponential Notation	a) Base b) Exponent c) Roots d) Applications	3 hours
	Order of Operations	a) Grouping symbols b) Order of operations c) Distributive property and other properties of whole numbers d) Combining similar terms e) Applications	2 hours
	Explore	a) Double Double b) The Four 4's Game	1 hour
		Lesson Total	4-6 hours
Topic F2: Proportional Reasoning I			
F2.1 Fractions I	Equivalent Fractions	a) Fraction notation b) Equivalent fractions (with larger or smaller denominators) c) Simplify fractions (reducing to lowest terms) d) Greatest common factor (GCF) e) Applications	3 hours
	Multiplying and Dividing	a) Mixed numerals and improper fractions b) Multiplying fractions c) Finding reciprocals d) Dividing fractions e) Solving px = q f) Applications	2 hours
	Explore	a) Daily Fractions b) Fractions and Triangles	1 hour
		Lesson Total	4-6 hours
F2.2 Fractions II	Common Denominators	a) Least common multiple (LCM) b) Common denominators c) Least common denominator (LCD) d) Ordering fractions e) Applications	2 hours
	Adding and Subtracting	a) Fractions with the same denominators b) Fractions with different denominators c) Mixed numerals d) Order of operations e) Properties of rational numbers f) Combining similar terms g) Solving x ± p = q h) Applications	3 hours
	Explore	a) Stock Prices b) A Survey	1 hour
		Lesson Total	4-6 hours

Lesson		Concept	Objectives	Hours
F2.3	Decimals I	Notation	a) Place value b) Ordering decimals c) Rounding and estimating d) Applications	2 hours
		Converting	a) Converting decimals to fractions b) Converting fractions to decimals c) Irrational numbers d) Applications	3 hours
		Explore	a) Using Decimals to Compare Data b) The Dewey Decimal System	1 hour
			Lesson Total	4-6 hours
F2.4	Decimals II	Adding and Subtracting	a) Adding decimals b) Subtracting decimals c) Combining similar terms d) Solving $x \pm r = s$ e) Applications	2 hours
		Multiplying and Dividing	a) Multiplying decimals b) Dividing decimals c) Multiplying and dividing by powers of 10 d) Converting fractions to decimals e) Irrational numbers f) Order of operations g) Properties of real numbers h) Solving $rx = s$ i) Applications	3 hours
		Explore	a) A Calculator Game b) A Target Game	1 hour
			Lesson Total	4-6 hours
Topic F3: Proportional Reasoning II				
F3.1	Ratio and Proportion	Ratios	a) Notation b) Equivalent ratios c) Rates d) Applications	2 hours
		Proportions	a) Setting up a proportion b) Solving a proportion c) Similar triangles d) Applications	3 hours
		Explore	a) Inverting Ratios b) Similar Figures	1 hour
				4-6 hours
F3.2	Percent	Definition	a) Percent as a fraction b) Percent as a decimal c) “Benchmark” percents d) Applications	2 hours
		Converting	a) Converting among fractions, decimals and percents b) Percent increase and decrease c) Applications	3 hours
		Solving Percent Problems	a) Setting up and solving proportions b) Setting up and solving other equations c) Applications	3 hours
		Explore	a) A Survey b) Computing Tips c) A Percent Question	1 hour
			Lesson Total	6-8 hours
Topic F4: Signed Numbers				
F4.1	Signed Numbers I	Adding	a) Signed numbers b) Ordering signed numbers c) Absolute value d) Adding signed numbers e) Applications	2 hours
		Subtracting	a) Subtracting signed numbers b) Solving $x \pm a = b$ c) Applications	3 hours
		Explore	a) Tracking Temperatures b) Efficient Calculating	1 hour
			Lesson Total	4-6 hours

Lesson	Concept	Objectives	Hours
F4.2 Signed Numbers II	Multiplying and Dividing	a) Multiplying signed numbers b) Dividing signed numbers c) Solving ax = b d) Applications	2 hours
	Combining Operations	a) Order of operations b) Distributive property and other properties of real numbers c) Combining similar terms d) Applications	3 hours
	Explore	a) Ups and Downs b) 2's and 4's	1 hour
		Lesson Total	4-6 hours
Topic F5: Geometry			
F5.1 Geometry I	Geometric Figures	a) Point, line, line segment, ray b) Polygons c) Measuring angles d) Angles: acute, right, obtuse, straight e) Relationships between angles: complementary, supplementary, adjacent, vertical f) Applications	3 hours
	Explore	a) Tiling with Polygons b) What's the Sum?	1 hour
		Lesson Total	4 hours
F5.2 Geometry II	Perimeter and Area	a) Perimeter of a polygon b) Area of a polygon c) Area of a rectangle, square, parallelogram, triangle, trapezoid d) Circumference of a circle e) Area of a circle f) Perimeter and area of composite figures g) Applications	2 hours
	Surface Area and Volume	a) Surface area of a solid b) Volume of a solid c) Surface area and volume of a rectangular prism d) Surface area and volume of a cylinder e) Volume of a cone f) Volume of a sphere g) Composite figures h) Applications	3 hours
	Explore	a) Don't Fence Me In b) Why π? c) Packaging Products	1 hour
		Lesson Total	4-6 hours
F5.3 Geometry III	Triangles and Parallelograms	a) Angle sum of a triangle b) Congruent triangles c) Isosceles and equilateral triangles d) Right triangles e) The Pythagorean Theorem f) Parallel lines and transversals g) Properties of parallelograms h) Applications	2 hours
	Similar Polygons	a) Similar polygons b) Similar triangles c) Applications	3 hours
	Explore	a) Congruent Triangles b) Door to Door	1 hour
		Lesson Total	4-6 hours

Academic Systems Prealgebra

Lesson		Concept	Objectives	Hours
Topic F6: Interpreting Data				
F6.1	Units of Measurement	US/English Units	a) Measures: length, weight, time, volume b) Converting from one unit to another c) Adding and subtracting measurements d) Applications	2 hours
		The Metric System	a) The metric system: length, mass, volume b) Fahrenheit and Celsius scales c) Converting between US and metric units d) Applications	3 hours
		Explore	a) Sizing it Up b) Choosing Units	1 hour
			Lesson Total	4-6 hours
F6.2	Interpreting Graphs	Data and Graphs	a) Reading data from graphs b) Graphing data c) Pictographs d) Bar graphs e) Circle graphs f) Line graphs g) Applications	2 hours
		Explore	a) Collecting and Picturing Data b) Graphs in the News	1 hour
			Lesson Total	2-3 hours
F6.3	Introduction to Statistics	Statistical Measures	a) Mean b) Median c) Mode d) Box-and-whisker plots e) Applications	2 hours
		Explore	a) Collecting Data b) Where's the Middle?	1 hour
			Lesson Total	2-3 hours
Topic 1: Real Numbers				
1.1	The Real Numbers	Number Line and Notation	a) Sets b) Subsets of real numbers: natural numbers, integers, rational, irrational c) Graphing real numbers on a number line d) Ordering symbols: =, <, >, ≤, ≥ e) The absolute value of a real number f) Grouping symbols g) Exponents	2 hours
			Lesson Total	2 hours
1.2	Factoring and Fractions	The GCF and LCM	a) Prime factors b) Greatest common factor c) Least common multiple	1 hour
		Fractions	a) Reducing to lowest terms b) Multiplication and division c) Addition and subtraction	1 hour
		Explore	a) Exploring Greatest Common Factor	1 hour
			Lesson Total	3 hours
1.3	Arithmetic of Numbers	Operations on Numbers	a) Addition b) Subtraction c) Multiplication d) Division e) Order of operations f) Commutative law g) Associative law h) Distributive law i) Additive and multiplicative identities j) Inverses	1 hour
		Explore	a) Exploring Operations on Numbers	1 hour
			Lesson Total	2 hours
Topic 2: Solving Linear Equations and Inequalities				
2.1	Algebraic Expressions	Simplifying Expressions	a) Constants and variables b) Terms and coefficients c) Combining like or similar terms d) Parentheses e) Evaluating expressions f) Formulas: Substitution	2 hours
			Lesson Total	2 hours

Lesson		Concept	Objectives	Hours
2.2	Solving Linear Equations	Solving Equations I	a) Recognizing a linear equation b) The addition and subtraction principles for solving a linear equation c) The multiplication and division principles for solving a linear equation d) Combining the principles	2 hours
		Solving Equations II	a) Equations with fractions as coefficients b) Equations with no solutions or infinitely many solutions c) Formulas: Solving for a particular unknown	1 hour
			Lesson Total	3 hours
2.3	Problem Solving	Number and Age	a) Translating words into algebraic expressions b) Number problems c) Age problems	2 hours
		Geometry	a) Geometry problems	2 hours
			Lesson Total	4 hours
2.4	Linear Inequalities	Solving Inequalities	a) Recognizing solutions of linear inequalities b) Graphing solutions of inequalities in one variable c) The addition and subtraction principles for solving a linear inequality d) The multiplication and division principles for solving a linear inequality e) Combining the addition, subtraction, multiplication, and division principles f) Solving problems using inequalities	2 hours
			Lesson Total	2 hours
Topic 3: Introduction to Graphing				
3.1	Introduction to Graphing	Plotting Points	a) The xy-plane b) The x-axis and y-axis c) The origin d) Ordered pairs e) The x-coordinate (abscissa), the y-coordinate (ordinate) f) Plotting ordered pairs of numbers g) Labeling the four quadrants h) Determining the quadrant in which a point lies i) The signs of the coordinates in each quadrant	1 hour
		Rise and Run	a) Subscript notation b) Geometric interpretation of rise and run c) Algebraic definition of rise and run	1 hour
		The Distance Formula	a) Pythagorean Theorem b) The distance formula c) The equation of a circle	0.5 hours
		Explore	a) Plotting Points	0.5 hours
			Lesson Total	3 hours
Topic 6: Exponents and Polynomials				
6.1	Exponents	Properties of Exponents	a) Definition of exponent, power, and base b) Multiplication property c) Division property d) Powers raised to powers e) Products raised to powers f) Quotients raised to powers g) The zero exponent	2 hours
			Lesson Total	2 hours
6.2	Polynomial Operations I	Adding and Subtracting	a) Definition of polynomial, term, and coefficient b) Evaluating a polynomial c) The degree of a term and a polynomial d) Writing the terms of a polynomial in descending order e) Definition of a monomial, binomial, and trinomial f) Recognizing like or similar terms g) Combining like or similar terms h) Polynomial addition i) Polynomial subtraction	2 hours
		Multiplying and Dividing	a) Multiplying a monomial by a monomial b) Multiplying a polynomial by a monomial c) Dividing a monomial by a monomial d) Dividing a polynomial by a monomial	2 hours
			Lesson Total	4 hours