

# Knowre Math: Pre-Algebra Curriculum

## Chapter 1 Integers

Lesson	Topic	VA MSL
1-1 Introduction to Integers	A) Integers	7.1.e, 7.2
	B) Integers on a Number Line	
	C) Opposites	
	D) Absolute Value	
1-2 Adding and Subtracting Integers	A) Adding One-Digit Integers on a Number Line	
	B) Adding One-Digit Integers	
	C) Equivalent Addition and Subtraction Expressions	
	D) Subtracting One-Digit Integers	
	E) Adding Opposites	
	F) Adding Multiple-Digit Integers	
	G) Subtracting Multiple-Digit Integers	
1-3 Multiplying and Dividing Integers	A) Multiplying Integers	
	B) Dividing Integers	
1-4 Order of Operations with Integers	A) Powers	6.6.a, 6.6.b, 6.6.c, 7.2
	B) Order of Operations with Integers	
	C) Order of Operations with Absolute Value	

## Chapter 2 Rational Numbers

Lesson	Topic	VA MSL
2-1 Prime Factorization	A) Prime and Composite Numbers	
	B) Prime Factorization	
	C) Greatest Common Factors	
	D) Least Common Multiples	
2-2 Rational Numbers	A) Rational Numbers on a Number Line	7.1.c, 8.1
	B) Equivalent Fractions	
	C) Writing Fractions as Decimals	
	D) Writing Decimals as Fractions	

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## Chapter 2 Rational Numbers (cont...)

Lesson	Topic	VA MSL
2-3 Adding and Subtracting Fractions	A) Using Integer Rules to Add and Subtract Fractions with Common Denominators	
	B) Using Integer Rules to Add and Subtract Fractions with Different Denominators	
2-4 Multiplying and Dividing Fractions	A) Using Integer Rules to Multiply Fractions	
	B) Using Integer Rules to Divide Fractions	
	C) Complex Fractions	
2-5 Operations with Rational Numbers	A) Comparing Rational Numbers	7.1.c, 7.2
	B) Adding and Subtracting Rational Numbers	
	C) Multiplying and Dividing Rational Numbers	
	D) Order of Operations and Rational Numbers	

## Chapter 3 Basics of Algebra

Lesson	Topic	VA MSL
3-1 Variables and Expressions	A) Parts of Variable Expressions	
	B) Writing Variable Expressions	
3-2 Operations and Variable Expressions	A) Omitting Multiplication Symbols with Variables	8.14.b
	B) Definition of Coefficient	
3-3 Properties of Numbers	A) Commutative Property	8.14.b
	B) Associative Property	
	C) Identity Property	
	D) Inverse Property	
	E) Distributive Property	
3-4 Order of Operations and Variable Expressions	A) Like Terms	7.11, 8.14.a
	B) Evaluating Variable Expressions	

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## Chapter 4 Exponents

Lesson	Topic	VA MSL
4-1 Exponent Properties	A) Zero Exponents	7.1.a
	B) Negative Exponents	
	C) Product of Powers Property	
	D) Quotient of Powers Property	
4-2 GCF and LCM of Variable Expressions	A) GCF of Variable Expressions	
	B) LCM of Variable Expressions	
4-3 Fraction Operations with Variables	A) Adding and Subtracting Fractions with Variables	
	B) Multiplying Fractions with Variables	
	C) Dividing Fractions with Variables	
4-4 Scientific Notation	A) Defining Scientific Notation	7.1.b
	B) Writing Scientific Notation in Standard Form	
	C) Writing Numbers in Scientific Notation	
	D) Multiplying Numbers in Scientific Notation	
	E) Dividing Numbers in Scientific Notation	

## Chapter 5 Solving Equations and Inequalities

Lesson	Topic	VA MSL
5-1 Equations and Solving One-Step Equations	A) Writing Equations	8.14.a
	B) Solutions of Equations	
	C) Solving One-Step Equations	
5-2 Solving Multi-Step Equations	A) Solving Two-Step Equations	7.12
	B) Solving Multi-Step Equations	
	C) Solving Equations with Variables on Both Sides	
5-3 Solving Equations with Decimals and Fractions	A) Solving Equations with Decimal Coefficients	7.12
	B) Solving Equations with Grouping Symbols	
	C) Solving Equations with Fraction Coefficients	
	D) Solving Equations with Both Fractions and Decimals	

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## Chapter 5 Solving Equations and Inequalities (cont...)

<b>Lesson</b>	<b>Topic</b>	<b>VA MSL</b>
5-4 Writing and Graphing Inequalities	A) Writing Inequalities	
	B) Solutions of Inequalities	
	C) Graphs of Inequalities	
5-5 Solving One-Step Inequalities	A) Writing Inequalities	7.13
	B) Solutions of Inequalities	
	C) Solving One-Step Inequalities	
5-6 Solving Multi-Step Inequalities	A) Solving Two-Step Inequalities	7.13
	B) Solving Multi-Step Inequalities	
	C) Solving Inequalities with Variables on Both Sides	

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## Chapter 6 Proportions and Percents

Lesson	Topic	VA MSL
6-1 Proportions	A) Defining Proportions	7.3, 7.10.e
	B) Solving Proportions	
	C) Writing Proportions	
6-2 Rates and Conversions	A) Unit Rate	7.3, 8.1
	B) Unit Conversion	
6-3 Similarity and Scale	A) Using Angle Measures to Identify Similar Triangles	7.3, 7.5
	B) Ratios of Corresponding Side Lengths	
	C) Using Similar Figures to Write a Proportion	
	D) Using Similar Triangles to Find a Missing Side Length	
	E) Determining Scale	
	F) Using Scale	
6-4 Percent	A) Converting Between Fractions, Decimals, and Percents	7.3
	B) Percent Proportions	
	C) Percent Equations	
6-5 Percent Change	A) Amount of Change	7.3, 8.4
	B) Percent Change	
6-6 Discount and Markup	A) Discount	7.3, 8.4
	B) Markup	

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## Chapter 7 Linear Functions

Lesson	Topic	VA MSL
7-1 Relations and Functions	A) Representing Relations in Different Forms	7.10.c, 8.15.a, 8.15.b
	B) Input and Output	
	C) Independent and Dependent Variables	
	D) Domain and Range	
	E) Relations and Functions	
	F) Describing Graphs	
7-2 Linear Functions	A) Using a Linear Function to Complete a Table	7.10.a, 7.10.c, 7.10.e
	B) Graphing a Linear Function	
	C) Writing Linear Functions	
	D) Graphs of Linear Functions	
	E) Identifying Intercepts	
7-3 Direct Variation	A) Constant of Variation	7.10.a, 7.10.b, 7.10.e, 8.14.a
	B) Equations of Direct Variation	
	C) Graphs of Direct Variation	
	D) Finding the Value of x or y Given a Point	
7-4 Rate of Change and Slope	A) Rate of Change Equation	7.10.a
	B) Finding Rate of Change	
	C) Slopes of Lines	
	D) The Slope Formula	
	E) Finding the Slope From Points	
7-5 Slope-Intercept Form	A) Slope-Intercept Form	7.10.c, 7.10.d, 7.10.e
	B) Writing Equations in Slope-Intercept Form	
	C) Graphing Equations in Slope-Intercept Form	
	D) Solutions of Linear Equations	

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## Chapter 8 Pythagorean Theorem

Lesson	Topic	VA MSL
8-1 Square and Cube Roots	A) Squaring Rational Numbers	7.1.d, 8.1, 8.3.a, 8.3.b
	B) Perfect Squares	
	C) Square Roots of Perfect Squares	
	D) Estimating Square Roots	
	E) Cubing Rational Numbers	
	F) Perfect Cubes	
	G) Cube Roots of Perfect Cubes	
	H) Square Roots of Squares	
8-2 Rational and Irrational Numbers	A) Rational and Irrational Numbers	7.2, 8.1, 8.2, 8.3.a, 8.3.b
	B) Order of Operations with Roots	
	C) Solving Quadratic Equations with Square Roots	
8-3 Pythagorean Theorem	A) Right Triangles	8.9.b
	B) Writing the Pythagorean Theorem	
	C) Using the Pythagorean Theorem to Find Side Lengths	
8-4 Distance Between Points	A) Vertical and Horizontal Distance on the Coordinate Plane	
	B) Using the Pythagorean Theorem to Find Distance Between Points	
	C) The Distance Formula	

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## Chapter 9 Geometry Basics and Angle Relationships

Lesson	Topic	VA MSL
9-1 Introduction to Geometry	A) Points	8.5
	B) Lines	
	C) Rays	
	D) Segments	
	E) Angles	
9-2 Angle Relationships	A) Complementary Angles	8.5
	B) Supplementary Angles	
	C) Linear Pairs	
	D) Vertical Angles	
9-3 Parallel Lines and Angle Relationships	A) Parallel Lines	
	B) Transversals	
	C) Corresponding Angles	
	D) Alternate Interior Angles	
	E) Alternate Exterior Angles	
	F) Corresponding Angles and Parallel Lines	
	G) Alternate Interior Angles and Parallel Lines	
	H) Alternate Exterior Angles and Parallel Lines	
9-4 Angles of Triangles	A) Sum of the Interior Angles of a Triangle	5.13.b
	B) Interior and Exterior Angles of Triangles	
	C) Exterior Angles of a Triangle and Their Remote Interior Angles	



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## Chapter 10 Transformations

Lesson	Topic	VA MSL
10-1 Translations	A) Transformation Statements	7.7, 8.7.a
	B) Describing Translations	
	C) Translation Functions	
10-2 Reflections	A) Naming the Vertices of a Reflected Preimage	7.7, 8.7.a
	B) Lines of Reflection	
	C) Identifying Images	
	D) Reflecting in Horizontal and Vertical Lines	
	E) Reflecting in the x-axis and y-axis	
	F) Reflecting in $y=x$ and $y=-x$	
10-3 Rotations	A) Rotation about the Center of a Figure	5.14.a, 8.7.a
	B) Rotation about the Origin	
10-4 Dilations	A) Types of Dilations	8.7.a
	B) Scale Factor	
	C) Dilation about a Point	
	E) Dilation about the Origin	

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## Chapter 11 Surface Area and Volume

Lesson	Topic	VA MSL
11-1 Circumference and Area of Circles	A) Parts of Circles	8.10
	B) Relationship Between Radius and Diameter	
	C) Circumference	
	D) Areas of Circles	
11-2 Introduction to Solids	A) Bases of Solids	
	B) Naming Solids	
	C) Cross Sections of Solids	
11-3 Surface Area and Volume of Prisms and Cylinders	A) Lateral Faces of Prisms	7.4.a, 7.4.b, 8.6.a
	B) Lateral Area	
	C) Surface Areas of Prisms	
	D) Lateral Areas of Cylinders	
	E) Surface Areas of Cylinders	
	F) Volumes of Right Prisms and Cylinders	
11-4 Surface Area and Volume of Pyramids, Cones, and Spheres	A) Lateral Faces of Pyramids	7.4.a, 7.4.b, 8.6.a
	B) Slant Height	
	C) Lateral Areas of Right Pyramids	
	D) Surface Areas of Pyramids	
	E) Volumes of Right Pyramids and Cones	
	F) Volumes of Spheres	

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## Chapter 12 Probability and Statistics

Lesson	Topic	VA MSL
12-1 Introduction to Probability	A) Numbers that Represent Probability	3.14, 4.13.a, 4.13.b, 5.15
	B) Possible Outcomes	
	C) Events	
	D) Favorable Outcomes	
	E) Likely and Unlikely Events	
12-2 Experimental Probability	A) Equation for Experimental Probability	7.8.a, 7.8.b
	B) Experimental Probability of Single Event	
	C) Experimental Probability of Multiple Events	
12-3 Theoretical Probability	A) Equation for Theoretical Probability	7.8.a
	B) Theoretical Probability of Single Event	
	C) Theoretical Probability of Multiple Events	
12-4 Compound Events	A) Tree Diagrams and Outcomes of Compound Events	
	B) Tables and Outcomes of Compound Events	
	C) Using Multiplication to Count Outcomes	
12-5 Compound Probability	A) Probability Notation for Compound Events	7.8.a
	B) Probability of Compound Events	
12-6 Populations, Samples, and Inferences	A) Population	
	B) Samples	
	C) Using Samples to Draw Conclusions	
	D) Using Samples to Make Predictions	