

Knowre Math: Pre-Algebra Curriculum

Chapter 1 Integers

Lesson	Topic	NGSSS
1-1 Introduction to Integers	A) Integers	MAFS.6.NS.3.5, MAFS.6.NS.3.6.a, MAFS.6.NS.3.6.c, MAFS.6.NS.3.7.c
	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	MAFS.7.NS.1.1.a, MAFS.7.NS.1.1.b, MAFS.7.NS.1.1.c, MAFS.7.NS.1.1.d
	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	MAFS.7.NS.1.2.a, MAFS.7.NS.1.2.b, MAFS.7.NS.1.2.c, MAFS.7.EE.2.3
	B) Dividing Integers	
1-4 Order of Operations with Integers	A) Powers	MAFS.7.NS.1.2.a, MAFS.7.NS.1.2.c, MAFS.7.NS.1.3, MAFS.7.EE.2.3, MAFS.8.EE.1.1
	B) Order of Operations with Integers	
	C) Order of Operations with Absolute Value	

Chapter 2 Rational Numbers

Lesson	Topic	NGSSS
2-1 Prime Factorization	A) Prime and Composite Numbers	MAFS.6.NS.2.4, MAFS.6.EE.1.1
	B) Prime Factorization	
	C) Greatest Common Factors	
	D) Least Common Multiples	
2-2 Rational Numbers	A) Rational Numbers on a Number Line	MAFS.7.NS.1.2.d, MAFS.8.NS.1.1
	B) Equivalent Fractions	
	C) Writing Fractions as Decimals	
	D) Writing Decimals as Fractions	

Knowre Math: Pre-Algebra Curriculum

Chapter 2 Rational Numbers (cont...)

Lesson	Topic	NGSSS
2-3 Adding and Subtracting Fractions	A) Using Integer Rules to Add and Subtract Fractions with Common Denominators	MAFS.7.NS.1.1.d, MAFS.7.EE.2.3
	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	MAFS.7.NS.1.2.a, MAFS.7.NS.1.2.b, MAFS.7.NS.1.2.c, MAFS.7.EE.2.3
	B) Using Integer Rules to Divide Fractions	
	C) Complex Fractions	
2-5 Operations with Rational Numbers	A) Comparing Rational Numbers	MAFS.7.NS.1.3, MAFS.7.EE.2.3, MAFS.8.EE.1.1
	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	NGSSS
3-1 Variables and Expressions	A) Parts of Variable Expressions	MAFS.6.EE.1.2.a, MAFS.6.EE.1.2.b
	B) Writing Variable Expressions	
3-2 Operations and Variable Expressions	A) Omitting Multiplication Symbols with Variables	MAFS.7.EE.1.1, MAFS.7.EE.1.2
	B) Definition of Coefficient	
3-3 Properties of Numbers	A) Commutative Property	MAFS.7.EE.1.1, MAFS.7.EE.1.2
	B) Associative Property	
	C) Identity Property	
	D) Inverse Property	
	E) Distributive Property	
3-4 Order of Operations and Variable Expressions	A) Like Terms	MAFS.7.EE.1.1, MAFS.7.EE.1.2
	B) Evaluating Variable Expressions	

Knowre Math: Pre-Algebra Curriculum

Chapter 4 Exponents

Lesson	Topic	NGSSS
4-1 Exponent Properties	A) Zero Exponents	MAFS.7.EE.1.2, MAFS.8.EE.1.1
	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	MAFS.8.EE.1.3, MAFS.8.EE.1.4
	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	NGSSS
5-1 Equations and Solving One-Step Equations	A) Writing Equations	
	B) Solutions of Equations	
	C) Solving One-Step Equations	
5-2 Solving Multi-Step Equations	A) Solving Two-Step Equations	MAFS.7.EE.2.4.a, MAFS.8.EE.3.7.b
	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	MAFS.7.EE.2.4.a, MAFS.8.EE.3.7.b
	B) Solving Equations with Grouping Symbols	
	C) Solving Equations with Fraction Coefficients	
	D) Solving Equations with Both Fractions and Decimals	

Knowre Math: **Pre-Algebra** Curriculum

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

Lesson	Topic	NGSSS
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	
	B) Solutions of Inequalities	
	C) Solving One-Step Inequalities	
5-6 Solving Multi-Step Inequalities	A) Solving Two-Step Inequalities	MAFS.7.EE.2.4.b
	B) Solving Multi-Step Inequalities	
	C) Solving Inequalities with Variables on Both Sides	

Knowre Math: Pre-Algebra Curriculum

Chapter 6 Proportions and Percents

Lesson	Topic	NGSSS
6-1 Proportions	A) Defining Proportions	MAFS.7.RP.1.2.a, MAFS.7.RP.1.2.c, MAFS.7.RP.1.3
	B) Solving Proportions	
	C) Writing Proportions	
6-2 Rates and Conversions	A) Unit Rate	MAFS.7.RP.1.1
	B) Unit Conversion	
6-3 Similarity and Scale	A) Using Angle Measures to Identify Similar Triangles	MAFS.7.RP.1.3, MAFS.7.G.1.1
	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	MAFS.7.RP.1.3
	B) Percent Proportions	
	C) Percent Equations	
6-5 Percent Change	A) Amount of Change	MAFS.7.RP.1.3
	B) Percent Change	
6-6 Discount and Markup	A) Discount	MAFS.7.RP.1.3
	B) Markup	

Knowre Math: Pre-Algebra Curriculum

Chapter 7 Linear Functions

Lesson	Topic	NGSSS
7-1 Relations and Functions	A) Representing Relations in Different Forms	MAFS.8.F.1.1, MAFS.8.F.2.5
	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	MAFS.8.F.1.1, MAFS.8.F.1.3
	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	MAFS.7.RP.1.2.b, MAFS.7.RP.1.2.c, MAFS.7.RP.1.2.d, MAFS.8.EE.2.5, MAFS.8.EE.2.6, MAFS.8.F.2.4
	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	MAFS.8.EE.2.5, MAFS.8.EE.2.6, MAFS.8.F.1.2, MAFS.8.F.2.4
	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	MAFS.8.EE.2.6, MAFS.8.F.1.2, MAFS.8.F.1.3, MAFS.8.F.2.4
	B) Writing Equations in Slope-Intercept Form	
	C) Graphing Equations in Slope-Intercept Form	
	D) Solutions of Linear Equations	

Knowre Math: Pre-Algebra Curriculum

Chapter 8 Pythagorean Theorem

Lesson	Topic	NGSSS
8-1 Square and Cube Roots	A) Squaring Rational Numbers	MAFS.8.NS.1.2, MAFS.8.EE.1.2
	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	MAFS.8.NS.1.1, MAFS.8.NS.1.2, MAFS.8.EE.1.2
	B) Order of Operations with Roots	
	C) Solving Quadratic Equations with Square Roots	
8-3 Pythagorean Theorem	A) Right Triangles	MAFS.8.G.2.7
	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	MAFS.7.NS.1.1.c, MAFS.8.G.2.8
	B) Using the Pythagorean Theorem to Find Distance Between Points	
	C) The Distance Formula	

Knowre Math: Pre-Algebra Curriculum

Chapter 9 Geometry Basics and Angle Relationships

Lesson	Topic	NGSSS
9-1 Introduction to Geometry	A) Points	MAFS.4.G.1.1, MAFS.7.G.2.5
	B) Lines	
	C) Rays	
	D) Segments	
	E) Angles	
9-2 Angle Relationships	A) Complementary Angles	MAFS.7.G.2.5
	B) Supplementary Angles	
	C) Linear Pairs	
	D) Vertical Angles	
9-3 Parallel Lines and Angle Relationships	A) Parallel Lines	MAFS.8.G.1.5
	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	MAFS.8.G.1.5
	B) Interior and Exterior Angles of Triangles	
	C) Exterior Angles of a Triangle and Their Remote Interior Angles	

Knowre Math: Pre-Algebra Curriculum

Chapter 10 Transformations

Lesson	Topic	NGSSS
10-1 Translations	A) Transformation Statements	MAFS.8.G.1.1.a, MAFS.8.G.1.1.b, MAFS.8.G.1.1.c, MAFS.8.G.1.2, MAFS.8.G.1.3
	B) Describing Translations	
	C) Translation Functions	
10-2 Reflections	A) Naming the Vertices of a Reflected Preimage	MAFS.8.G.1.1.a, MAFS.8.G.1.1.b, MAFS.8.G.1.1.c, MAFS.8.G.1.2, MAFS.8.G.1.3
	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	MAFS.8.G.1.1.a, MAFS.8.G.1.1.b, MAFS.8.G.1.1.c, MAFS.8.G.1.2, MAFS.8.G.1.3
	B) Rotation about the Origin	
10-4 Dilations	A) Types of Dilations	MAFS.8.G.1.3, MAFS.8.G.1.4
	B) Scale Factor	
	C) Dilation about a Point	
	E) Dilation about the Origin	

Knowre Math: Pre-Algebra Curriculum

Chapter 11 Surface Area and Volume

Lesson	Topic	NGSSS
11-1 Circumference and Area of Circles	A) Parts of Circles	MAFS.7.G.2.4
	B) Relationship Between Radius and Diameter	
	C) Circumference	
	D) Areas of Circles	
11-2 Introduction to Solids	A) Bases of Solids	MAFS.7.G.1.3
	B) Naming Solids	
	C) Cross Sections of Solids	
11-3 Surface Area and Volume of Prisms and Cylinders	A) Lateral Faces of Prisms	MAFS.7.G.2.6, MAFS.8.G.3.9
	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	MAFS.7.G.2.6, MAFS.8.G.3.9
	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	

Knowre Math: Pre-Algebra Curriculum

Chapter 12 Probability and Statistics

Lesson	Topic	NGSSS
12-1 Introduction to Probability	A) Numbers that Represent Probability	MAFS.7.SP.3.5
	B) Possible Outcomes	
	C) Events	
	D) Favorable Outcomes	
	E) Likely and Unlikely Events	
12-2 Experimental Probability	A) Equation for Experimental Probability	MAFS.7.SP.3.6, MAFS.7.SP.3.7.b
	B) Experimental Probability of Single Event	
	C) Experimental Probability of Multiple Events	
12-3 Theoretical Probability	A) Equation for Theoretical Probability	MAFS.7.SP.3.7.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	MAFS.7.SP.3.8.b
	B) Tables and Outcomes of Compound Events	
	C) Using Multiplication to Count Outcomes	
12-5 Compound Probability	A) Probability Notation for Compound Events	MAFS.7.SP.3.8.a, MAFS.7.SP.3.8.b
	B) Probability of Compound Events	
12-6 Populations, Samples, and Inferences	A) Population	MAFS.7.SP.1.1, MAFS.7.SP.1.2
	B) Samples	
	C) Using Samples to Draw Conclusions	
	D) Using Samples to Make Predictions	