

Knowre Math: **Grade 8** Curriculum

Chapter 1 Rational Number Operations

Lesson	Topic	NGSSS
1. Adding and Subtracting Integers	A) Adding One-Digit Integers	MAFS.7.NS.1.1.a
	B) Subtracting One-Digit Integers	MAFS.7.NS.1.1.b
	C) Adding Multi-Digit Integers	MAFS.7.NS.1.1.c
	D) Subtracting Multi-Digit Integers	MAFS.7.NS.1.1.d
2. Multiplying and Dividing Integers	A) Multiplying Integers	MAFS.7.NS.1.2.a
	B) Dividing Integers	MAFS.7.NS.1.2.b MAFS.7.NS.1.2.c MAFS.7.NS.1.2.d
3. Adding and Subtracting Fractions	A) Using Integer Rules to Add and Subtract Fractions with Common Denominators	MAFS.7.NS.1.1.d
	B) Using Integer Rules to Add and Subtract Fractions with Different Denominators	
4. Multiplying and Dividing Fractions	A) Using Integer Rules to Multiply Fractions	MAFS.7.NS.1.2.d
	B) Using Integer Rules to Divide Fractions	
	C) Complex Fractions	
5. Order of Operations	A) Order of Operations with Integers	MAFS.7.NS.1.3
	B) Order of Operations with Rational Numbers	

Chapter 2 Solving Equations and Inequalities

Lesson	Topic	NGSSS
1. Simplifying Expressions	A) Parts of Variable Expressions	MAFS.7.EE.1.1
	B) Like Terms	MAFS.7.EE.1.2
	C) Multiplying Monomials without Exponent Properties	
	D) Distributive Property	
2. One- and Two-Step Equations	A) Solutions of One-Variable Equations	MAFS.8.EE.3.7.a
	B) Bar Models to Solve One- and Two-Step Equations	
	C) Solving One-Step Equations	
	D) Solving Two-Step Equations	
3. Multi-Step Equations	A) Using Bar Models to Solve Multi-Step Equations with Variables on Both Sides	MAFS.8.EE.3.7.a

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	B) Using Bar Models to Solve Multi-Step Equations with the Distributive Property	MAFS.8.EE.3.7.b
	C) Solving Multi-Step Equations	
	D) Solving Equations with Variables on Both Sides	
4. Equations with Rational Numbers	A) Solving Equations with Grouping Symbols in the Numerator	MAFS.8.EE.3.7.a MAFS.8.EE.3.7.b
	B) Solving Equations with Fractions	
	C) Solving Equations with Decimals	
5. Multi-Step Equations with Zero, One, or Many Solutions	A) Using Bar Models to Solve Equations with Zero, One, or Many Solutions	MAFS.8.EE.3.7.a MAFS.8.EE.3.7.b
	B) Identifying Solutions of Equations as Zero, One, or Many	
	C) Solving Equations with Zero, One, or Many Solutions	
6. One- and Two-Step Inequalities	A) Solutions of One-Variable Inequalities	MAFS.7.EE.2.4.b
	B) Solving One-Step Inequalities	
	C) Solving Two-Step Inequalities	
7. Multi-Step Inequalities	A) Solving Multi-Step Inequalities	MAFS.7.EE.2.4.b
	B) Inequalities with Zero, Many, or Infinite Solutions	
	C) Graphing Solutions of Multi-Step Inequalities	

Chapter 3 Relations and Linear Functions

Lesson	Topic	NGSSS
1. Input and Output	A) Representing Relations in Different Forms	MAFS.8.F.1.1
	B) Input and Output	
2. Relations and Functions	A) Independent and Dependent Variables	MAFS.8.F.1.1
	B) Domain and Range	MAFS.8.F.1.2
	C) Relations and Functions	
3. Describing Functions	A) Using Graphs to Describe Functions	MAFS.8.F.1.2
	B) Using Tables to Describe Functions	MAFS.8.F.2.5
4. Graphs of Linear Functions	A) Graphs of Linear Functions	MAFS.8.F.1.1
	B) Using Linear Functions to Complete Tables	MAFS.8.F.1.3
	C) Graphing Linear Functions	
	D) Solutions of Linear Functions	

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	E) Identifying Intercepts	
5. Rules for Linear Equations	A) Writing Rules from Tables	MAFS.8.F.1.1
	B) Converting Between Linear Equations and Rules	MAFS.8.F.1.3
	C) Writing Linear Equations from Tables	MAFS.8.F.2.4
6. Direct Variation	A) Constant of Variation	MAFS.8.EE.2.5
	B) Equations of Direct Variation	MAFS.8.F.1.1
	C) Graphs of Direct Variation	MAFS.8.F.2.4
	D) Direct Variation to Determine Missing Value	

Chapter 4 Linear Functions and Systems

Lesson	Topic	NGSSS
1. Start Value and Rate of Change	A) Units and Rate of Change	MAFS.8.EE.2.5
	B) Rate of Change Equation	MAFS.8.F.2.4
	C) Finding Rate of Change	
2. Slope Formula	A) Classifying Slopes	MAFS.8.EE.2.5
	B) Slope as Rise Over Run	MAFS.8.EE.2.6
	C) Slope of a Line Between Two Points	MAFS.8.F.2.4
3. Slope-Intercept Form	A) Understanding Equations in Slope-Intercept Form	MAFS.8.EE.2.6
	B) Identifying Slopes and y-Intercepts from Equations in Slope-Intercept Form	MAFS.8.F.1.2
	C) Using Slopes and y-Intercepts to Write Equations in Slope-Intercept Form	MAFS.8.F.1.3
	D) Converting Equations to Slope-Intercept Form	MAFS.8.F.2.4
4. Writing and Graphing Equations in Slope-Intercept Form	A) Using Graphs to Write Equations in Slope-Intercept Form	MAFS.8.EE.2.6
	B) Using Slopes and y-Intercepts to Graph Linear Functions	MAFS.8.F.1.2
	C) Using Points and Slopes to Write Equations in Slope-Intercept Form	MAFS.8.F.1.3
	D) Using Two Points to Write Equations in Slope-Intercept Form	MAFS.8.F.2.4
	E) Graphing Functions by Converting to Slope-Intercept Form	
	A) Graphs of Systems of Equations	MAFS.8.EE.3.8.a

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5. Solutions of Systems of Equations	B) Solutions of Systems of Linear Equations	MAFS.8.EE.3.8.b
	C) Graphs of Systems of Equations and the Number of Solutions	MAFS.8.EE.3.8.c
6. Graphing to Solve Systems of Equations	A) Graphing Systems of Linear Equations	MAFS.8.EE.3.8.a
	B) Graphing to Solve Systems of Linear Equations	MAFS.8.EE.3.8.b MAFS.8.EE.3.8.c
7. Substitution to Solve Systems of Equations	A) Substitution to Solve Systems of Equations that Are Solved for the Same Variable	MAFS.8.EE.3.8.b
	B) Substitution to Solve Systems of Equations that are Solved for Different Variables	MAFS.8.EE.3.8.c

Chapter 5 Exponent Properties

Lesson	Topic	NGSSS
1. Exponents	A) Powers with Natural Exponents	
2. Integer Exponents	A) Expressions to the Zero Power	MAFS.8.EE.1.1
	B) Expressions with Negative Exponents	
3. Product of Powers Property	A) Using the Product of Powers Property to Multiply Expressions with a Single Base	MAFS.8.EE.1.1
	B) Using the Product of Powers Property to Multiply Expressions with Multiple Bases	
4. Quotient of Powers Property	A) Using the Quotient of Powers Property to Simplify Expressions with a Single Base	MAFS.8.EE.1.1
	B) Using the Quotient of Powers Property to Simplify Expressions with Multiple Bases	
5. Products and Quotients of Powers to Simplify Expressions	A) GCF of Expressions with Variables	MAFS.8.EE.1.1
	B) Simplifying Fractions of that Contain Variables	
	C) Multiplying and Dividing Expressions that Contain Variables	
6. Power of a Power Property	A) Expanding Expressions to Show the Power of a Power Property	MAFS.8.EE.1.1
	B) Simplifying Expressions with the Power of a Power Property	
7. Power of a Product and Quotient Properties	A) Expanding Expressions to Show the Power of a Product Property	MAFS.8.EE.1.1
	B) Simplifying Expressions with the Power of a Product Property	

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	C) Expanding Expressions to Show the Power of a Quotient Property	
	D) Simplifying Expressions with the Power of a Quotient Property	

Chapter 6 Rational Numbers

Lesson	Topic	NGSSS
1. Scientific Notation and Standard Form	A) Defining Scientific Notation	MAFS.8.EE.1.3
	B) Writing Scientific Notation in Standard Form	
	C) Writing Numbers in Scientific Notation	
2. Operations with Scientific Notation	A) Adding and Subtracting Numbers in Scientific Notation	MAFS.8.EE.1.3
	B) Multiplying Numbers in Scientific Notation	MAFS.8.EE.1.4
	C) Dividing Numbers in Scientific Notation	
3. Repeating Decimals and Fractions	A) Repeating Decimals	MAFS.8.NS.1.1
	B) Subtracting Repeating Decimals	
	C) Multiplying Repeating Decimals by Powers of Ten	
	D) Writing Repeating Decimals as Fractions	
4. Square Roots	A) Perfect Square Numbers	MAFS.8.EE.1.2
	B) Square Roots of Perfect Squares	
	C) Finding the Integers a Square Root Lies Between	
5. Cube Roots and Order of Operations	A) Cubing Rational Numbers	MAFS.8.EE.1.2
	B) Perfect Cubes	
	C) Cube Roots of Perfect Cubes	
	D) Square or Cube Roots of Squares and Cubes	
	E) Square Roots and the Order of Operations	

Chapter 7 Number Sets and the Pythagorean Theorem

Lesson	Topic	NGSSS
1. Rational and Irrational Numbers	A) Rational and Irrational Numbers	MAFS.8.NS.1.1
	B) Ordering Real Numbers	MAFS.8.NS.1.2
	C) Approximating Square Roots	
2. Solving Equations with Squared Variables	A) Solving Quadratic Equations with Square Roots	MAFS.8.EE.1.2

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3. Pythagorean Theorem	A) Right Triangles	MAFS.8.G.2.6
	B) Writing the Pythagorean Theorem	MAFS.8.G.2.7
	C) Using the Pythagorean Theorem to Find Side Lengths	
	D) Using the Inverse of the Pythagorean Theorem	
4. Distance Between Points	A) Vertical and Horizontal Distance on the Coordinate Plane	MAFS.8.G.2.7 MAFS.8.G.2.8
	B) Using the Pythagorean Theorem to Find Distance Between Points	
	C) The Distance Formula	

Chapter 8 Angles and Triangles

Lesson	Topic	NGSSS
1. Parallel Lines and Angle Relationships	A) Parallel Lines and Transversals	MAFS.8.G.1.5
	B) Identifying Corresponding, Alternate Exterior, and Alternate Interior Angles	
	C) Parallel Lines and Angle Relationships and Measures	
2. Angles of Triangles	A) Sum of the Measure of Interior Angles of a Triangle	MAFS.8.G.1.5
	B) Finding a Missing Angle Measure in a Triangle	
3. Classifying Triangles	A) Classifying Triangle by Their Angles	MAFS.8.G.1.5
	B) Classifying Triangles by Their Sides	
4. Angle and Side Relationships in a Triangle	A) Using Angle Measures to Order the Side Lengths of Triangles	MAFS.8.G.1.5
	B) Using Side Lengths to Order the Angles Measures of Triangles	
5. Interior and Exterior Angles of Triangles	A) Interior and Exterior Angles of Triangles	MAFS.8.G.1.5
	B) Exterior Angles of a Triangle and Their Remote Interior Angles	
6. Angles of Polygons	A) Diagonals of Polygons	MAFS.8.G.1.5
	B) Concave and Convex Polygons	
	C) Sum of the Measure of Interior Angles of a Convex Polygon	

Chapter 9 Transformations

Lesson	Topic	NGSSS
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1. Introduction to Transformations	A) Transformation Statements	MAFS.8.G.1.1.a
	B) Describing Translations	MAFS.8.G.1.3
2. Translations	A) Writing Translation Functions	MAFS.8.G.1.1.a
	B) Translations with Translation Functions	MAFS.8.G.1.1.b MAFS.8.G.1.1.c MAFS.8.G.1.2 MAFS.8.G.1.3
3. Reflections	A) Naming the Vertices of a Reflected Preimage	MAFS.8.G.1.1.a
	B) Lines of Reflection	MAFS.8.G.1.1. MAFS.8.G.1.1.c
	C) Identifying Images	MAFS.8.G.1.2
	D) Reflecting in Horizontal and Vertical Lines	MAFS.8.G.1.3
	E) Reflecting in the x-axis and y-axis	
	F) Reflecting in $y=x$ and $y=-x$	
4. Rotational Symmetry	A) Lines of Symmetry	MAFS.8.G.1.1.a
	B) Relationship Between Lines of Symmetry and Rotational Symmetry	MAFS.8.G.1.1.b MAFS.8.G.1.3
5. Rotations	A) Rotation about the Center of a Figure	MAFS.8.G.1.1.a
	B) Rotation about the Origin	MAFS.8.G.1.1.b MAFS.8.G.1.1.c MAFS.8.G.1.2 MAFS.8.G.1.3 MAFS.8.G.1.4
6. Dilations	A) Types of Dilations	MAFS.8.G.1.3
	B) Scale Factor	MAFS.8.G.1.4
	C) Dilation about a Point	
	E) Dilation about the Origin	

Chapter 10 Volume

Lesson	Topic	NGSSS
1. Volume of Cylinders and Prisms	A) Volumes of Prisms	MAFS.8.G.3.9
	B) Volumes of Cylinders	

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2. Volume of Pyramids and Cones	A) Volumes of Pyramids	MAFS.8.G.3.9
	B) Volumes of Cones	
3. Volume of Spheres	A) Volumes of Spheres	MAFS.8.G.3.9

Chapter 11 Scatter Plots

Lesson	Topic	NGSSS
1. Reading Scatter Plots	A) Scatter Plots	MAFS.8.SP.1.1
	B) Meanings of Points in Scatter Plots	
	C) Patterns in Scatter Plots	
2. Lines of Fit	A) Scatter Plots of Linear and Nonlinear Data	MAFS.8.SP.1.1
	B) Lines of Fit	MAFS.8.SP.1.2
	C) The Meaning of Numbers in Lines of Fit	MAFS.8.SP.1.3
3. Predicting with Lines of Fit	A) Making Predictions with Lines of Fit	MAFS.8.SP.1.1
	B) Observed and Predicted Values	MAFS.8.SP.1.2 MAFS.8.SP.1.3

Chapter 12 Frequency Tables

Lesson	Topic	
1. Two-Way Tables	A) Parts of Two-Way Tables	MAFS.8.SP.1.4
	B) Reading Two-Way Tables	
	C) Finding Missing Joint and Marginal Frequencies	
2. Relative Frequency Tables	A) Identifying Relative Frequency Tables	MAFS.8.SP.1.4
	B) Calculating Relative Frequencies	
	C) Reading Relative Frequency Tables	
	D) Finding Missing Relative Frequencies	
3. Conditional Frequency Tables	A) Identifying Conditional Relative Frequency Tables	MAFS.8.SP.1.4
	B) Calculating Conditional Relative Frequencies	
	C) Reading Conditional Relative Frequency Tables	
	D) Completing and Understanding Conditional Relative Frequency Tables	