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# Knowre Math:  **Grade 7** Curriculum

## Chapter 1 Integer Addition and Subtraction

| Lesson | Topic | CCSS |
|---|---|---|
| 1-1 Integers | A) Using Algebra Tiles to Model Integers | 6.NS.5, 6.NS.6.a, 6.NS.6.c |
| | B) Integers on a Number Line | |
| | C) Comparing and Ordering Integers | |
| | D) Absolute Value | |
| 1-2 Integer Addition with Tiles | A) Using Algebra Tiles to Model Addition of Integers with the Same Sign | 7.NS.1.a, 7.NS.1.b, 7.NS.1.d, 7.NS.3 |
| | B) Using Algebra Tiles to Model Addition of Integers with Different Signs | |
| 1-3 Integer Addition with Number Lines | A) Using Number Lines to Model Addition of Integers with Different Signs | 7.NS.1.b, 7.NS.1.d, 7.NS.3 |
| | B) Using Number Lines to Model Addition of Integers with the Same Sign | |
| 1-4 Single-Digit Integer Addition | A) Adding One-Digit Integers | 7.NS.1.b, 7.NS.1.d, 7.NS.3, 7.EE.3 |
| 1-5 Integer Subtraction with Tiles | A) Using Algebra Tiles to Model Subtraction of Positive Integers | 7.NS.1.c, 7.NS.1.d, 7.NS.3 |
| | B) Using Algebra Tiles to Model Subtraction of Integers with Different Signs | |
| | C) Using Algebra Tiles to Model Subtraction of Negative Integers | |
| 1-6 Single-Digit Integer Subtraction | A) Subtracting One-Digit Integers | 7.NS.1.c, 7.NS.1.d, 7.NS.3, 7.EE.3 |
| 1-7 Multi-Digit Integer Addition and Subtraction | A) Adding Multi-Digit Integers | 7.NS.1.a, 7.NS.1.b, 7.NS.1.c, 7.NS.1.d, 7.NS.3, 7.EE.3 |
| | B) Subtracting Multi-Digit Integers | |

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## Chapter 2 Integer Operations

| Lesson | Topic | CCSS |
|---|---|---|
| 2-1 Integer Multiplication | A) Patterns in Integer Multiplication | 7.NS.2.a, 7.NS.2.c, 7.NS.3, 7.EE.3 |
| | B) Multiplying Integers | |
| 2-2 Integer Division | A) Patterns in Integer Division | 7.NS.2.b, 7.NS.2.c, 7.NS.3, 7.EE.3 |
| | B) Dividing Integers | |
| 2-3 Exponents | A) Powers with Natural Exponents | 7.NS.2.a, 7.NS.2.c, 7.NS.3, 7.EE.3 |
| 2-4 Order of Operations | A) Order of Operations with Integers | 7.NS.1.d, 7.NS.2.a, 7.NS.2.c, 7.NS.3, 7.EE.3 |
| | B) Evaluating Expressions with Variables | |

## Chapter 3 Rational Numbers

| Lesson | Topic | CCSS |
|---|---|---|
| 3-1 GCF and LCM | A) Prime and Composite Numbers | 7.EE.3 |
| | B) Prime Factorization | |
| | C) Greatest Common Factors | |
| | D) Least Common Multiples | |
| 3-2 Equivalent Fractions | A) Equivalent Fractions | 7.NS.2.b, 7.EE.2, 7.EE.3 |
| 3-3 Converting Fractions and Decimals | A) Writing Fractions as Decimals | 7.NS.2.d, 7.EE.2, 7.EE.3 |
| | B) Writing Decimals as Fractions | |
| 3-4 Comparing and Ordering Rational Numbers | A) Rational Numbers on a Number Line | 7.EE.3 |
| | B) Comparing and Ordering Positive and Negative Decimals | |
| | C) Comparing and Ordering Positive and Negative Fractions | |
| 3-5 Adding and Subtracting Fractions | A) Using Integer Rules to Add and Subtract Fractions with Common Denominators | 7.NS.1.b, 7.NS.1.c, 7.NS.1.d, 7.NS.3, 7.EE.3 |
| | B) Using Integer Rules to Add and Subtract Fractions with Different Denominators | |
| 3-6 Multiplying and Dividing Fractions | A) Using Integer Rules to Multiply Fractions | 7.NS.2.a, 7.NS.2.b, 7.NS.2.c, 7.NS.3, 7.EE.3 |
| | B) Using Integer Rules to Divide Fractions | |
| 3-7 Operations with Rational Numbers | A) Comparing Rational Numbers | 7.NS.1.b, 7.NS.1.c, 7.NS.1.d, 7.NS.2.a, 7.NS.2.b, 7.NS.2.c, 7.NS.3, 7.EE.2, 7.EE.3 |
| | B) Adding and Subtracting Rational Numbers | |
| | C) Multiplying and Dividing Rational Numbers | |
| | D) Order of Operations and Rational Numbers | |

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## Chapter 4 Expressions and Properties

| Lesson | Topic | CCSS |
|---|---|---|
| 4-1 Representations of Algebraic Expressions | A) Parts of Variable Expressions | 7.EE.1 |
| | B) Using Algebra Tiles to Model Algebraic Expressions | |
| 4-2 Operations and Variable Expressions | A) Omitting Multiplication Symbols with Variables | 7.EE.1, 7.EE.2 |
| | B) Coefficients | |
| 4-3 Algebraic Expressions | A) Writing Variable Expressions | 7.EE.1, 7.EE.2 |
| 4-4 Properties of Numbers | A) Commutative Property | 7.EE.1, 7.EE.2 |
| | B) Associative Property | |
| | C) Identity Property | |
| | D) Inverse Property | |
| 4-5 Modeling the Distributive Property | A) Using Algebra Tiles to Multiply a Monomial and a Binomial | 7.EE.1 |
| | B) Using Tables to Multiply a Monomial and a Binomial | |
| 4-6 Distributive Property | A) Using the Distributive Property to Write Equivalent Expressions | 7.EE.1, 7.EE.2 |
| 4-7 Simplifying Algebraic Expressions | A) Using Algebra Tiles to Combine Like Terms | 7.EE.1, 7.EE.2 |
| | B) Simplifying Expressions with Like Terms | |

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## Chapter 5 Solving Equations

| Lesson | Topic | CCSS |
|---|---|---|
| 5-1 Equations | A) Identifying Equations and Expressions | 7.EE.4.a |
| | B) Writing Equations | |
| | C) Solutions of Equations | |
| 5-2 Introduction to Bar Models | A) Showing One-Step Equations with Bar Models | 7.EE.2, 7.EE.4.a |
| | B) Showing Two-Step Equations with Bar Models | |
| 5-3 Solving One-Step Equations with Bar Models | A) Solutions of One-Step Equations in Bar Models | 7.EE.4.a |
| | B) Using Bar Models to Solve One-Step Addition Equations | |
| | C) Using Bar Models to Solve One-Step Subtraction Equations | |
| | D) Using Bar Models to Solve One-Step Multiplication Equations | |
| 5-4 Solving One-Step Addition and Subtraction Equations | A) Inverse Operation of Addition | 7.EE.4.a |
| | B) Solving One-Step Equations with the Subtraction Property of Equality | |
| | C) Inverse Operation of Subtraction | |
| | D) Solving One-Step Equations with the Addition Property of Equality | |
| 5-5 Solving One-Step Multiplication and Division Equations | A) Inverse Operation of Multiplication | 7.EE.4.a |
| | B) Solving One-Step Equations with the Division Property of Equality | |
| | C) Inverse Operation of Division | |
| | D) Solving One-Step Equations with the Division Property of Equality | |
| 5-6 Solving Two-Step Equations | A) Solutions of Two-Step Equations in Bar Models | 7.EE.4.a |
| | B) Using Bar Models to Solve Two-Step Equations | |
| | C) Solving Two-Step Equations | |
| 5-7 Solving Multi-Step Equations with Bar Models | A) Using Bar Models to Solve Multi-Step Equations with Variables on Both Sides | 7.EE.4.a |
| | B) Using Bar Models to Solve Multi-Step Equations with the Distributive Property | |
| | C) Using Bar Models to Solve Multi-Step Equations with the Distributive Property and Variables on Both Sides | |

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## Chapter 5 Solving Equations (cont.)

| Lesson | Topic | CCSS |
|---|---|---|
| 5-8 Solving Multi-Step Equations | A) Solving Multi-Step Equations | 7.EE.4.a |
| | B) Solving Equations with Variables on Both Sides | |
| 5-9 Solving Equations with Rational Numbers | A) Solving Equations with Grouping Symbols in the Numerator | 7.EE.4.a |
| | B) Using the Multiplicative Inverse to Solve Equations | |
| | C) Solving Equations with Fractions | |
| | D) Solving Equations with Decimals | |

## Chapter 6 Solving Inequalities

| Lesson | Topic | CCSS |
|---|---|---|
| 6-1 Inequalities | A) Reading and Writing Inequalities | 7.EE.4.b |
| | B) Solutions of Inequalities | |
| | C) Graphs of Inequalities | |
| 6-2 Solving One-Step Addition and Subtraction Inequalities | A) Writing Inequalities | 7.EE.4.b |
| | B) Solutions of Inequalities | |
| | C) Solving One-Step Inequalities by Adding or Subtracting on Both Sides | |
| 6-3 Solving One-Step Multiplication and Division Inequalities | A) Solving One-Step Inequalities by Multiplying or Dividing Both Sides by a Positive Number | 7.EE.4.b |
| | B) Solving One-Step Inequalities by Multiplying or Dividing Both Sides by a Negative Number | |
| 6-4 Solving Multi-Step Inequalities | A) Solving Two-Step Inequalities | 7.EE.4.b |
| | B) Solving Multi-Step Inequalities | |
| | C) Solving Inequalities with Variables on Both Sides | |

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## Chapter 7 Ratio, Proportion, and Similarity

| Lesson | Topic | CCSS |
|---|---|---|
| 7-1 Unit Rates | A) Unit Rates | 7.RP.1, 7.RP.2.b, 7.RP.2.d |
| | B) Unit Rates from Tables and Graphs | |
| | C) Unit Rates to Find Values | |
| 7-2 Proportions | A) Defining Proportions | 7.RP.2.a, 7.RP.2.c, 7.RP.3 |
| | B) Solving Proportions | |
| | C) Writing Proportions | |
| 7-3 Rate Conversions | A) Converting Units Within a Measurement System | 7.RP.1, 7.RP.2.b, 7.RP.2.c, 7.RP.3 |
| | B) Converting Units Between Measurement Systems | |
| | C) Converting Rates | |
| 7-4 Similarity | A) Angle Measures in Similar Triangles | 7.RP.1. 7.RP.2.a, 7.RP.2.b, 7.RP.2.c, 7.RP.3 |
| | B) Side Lengths in Similar Figures | |
| 7-5 Scale | A) Determining Scale | 7.RP.2.b, 7.RP.2.c, 7.RP.3, 7.G.1 |
| | B) Using Scale | |

## Chapter 8 Percents

| Lesson | Topic | CCSS |
|---|---|---|
| 8-1 Fractions, Decimals, and Percents | A) Converting Between Fractions and Percents | 7.EE.3 |
| | B) Converting Between Decimals and Percents | |
| | C) Using Division to Convert Fractions to Percents | |
| 8-2 Proportions with Percents | A) Percent Proportions | 7.RP.2.c, 7.RP.3 |
| 8-3 Proportions with Equations | A) Percent Equations | 7.RP.2.c, 7.RP.3 |
| 8-4 Reasoning with Percents | A) Mental Math to Find a Percent of a Number | 7.NS.3, 7.EE.2, 7.EE.3 |
| | B) Estimating with Percents | |
| 8-5 Percent Change | A) Amount of Change | 7.EE.2 |
| | B) Percent Change | |
| 8-6 Discounts and Markups | A) Discount | 7.RP.3, 7.EE.2 |
| | B) Markup | |

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## Chapter 9 Graphs and Functions

| Lesson | Topic | CCSS |
|---|---|---|
| 9-1 Coordinate Plane | A) Identifying Quadrants and Axes of Coordinate Planes | 6.NS.6.b, 6.NS.6.c |
| | B) Graphing Points | |
| | C) Writing the Coordinates of Points | |
| | D) Identifying Quadrants and Axes from Coordinates | |
| 9-2 Relations | A) Representing Relations in Different Forms | 8.F.1 |
| | B) Input and Output | |
| 9-3 Domain and Range | A) Independent and Dependent Variables | 8.F.1 |
| | B) Domain and Range | |
| | C) Relations and Functions | |
| 9-4 Linear Functions | A) Graphs of Linear Functions | 6.EE.9 |
| | B) Using Linear Functions to Complete Tables | |
| | C) Graphing Linear Functions | |
| | D) Writing Linear Functions | |
| | E) Identifying Intercepts | |
| 9-5 Direct Variation Graphs | A) Graphs of Direct Variation | 7.RP.2.b, 7.RP.2.c, 7.RP.2.d |
| | B) Equations of Direct Variation | |
| 9-6 Direct Variation Tables and Equations | A) Tables of Direct Variation | 7.RP.2.b, 7.RP.2.c |
| | B) Direct Variation Equations and Coordinate Pairs | |

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## Chapter 10 Angles and Triangles

| Lesson | Topic | CCSS |
|---|---|---|
| 10-1 Points and Lines | A) Points | 4.G.1 |
| | B) Lines | |
| | C) Rays | |
| | D) Segments | |
| 10-2 Angles | A) Parts of Angles | 7.G.5 |
| | B) Naming Angles | |
| | C) Adjacent Angles | |
| | D) Angle Measures | |
| 10-3 Complementary and Supplementary Angles | A) Complementary Angles | 7.G.5 |
| | B) Supplementary Angles | |
| 10-4 Linear Pairs and Vertical Angles | A) Linear Pairs | 7.G.5 |
| | B) Vertical Angles | |
| 10-5 Lengths of Sides in Triangles | A) Relationship Among Side Lengths in a Triangle | 7.G.2 |
| | B) Possible Lengths of Longest or Shortest Sides in a Triangle | |
| 10-6 Angle Measures in Triangles | A) Sum of the Measure of Interior Angles of a Triangle | 7.G.2 |
| | B) Finding a Missing Angle Measure in a Triangle | |

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## Chapter 11 Area, Surface Area, and Volume

| Lesson | Topic | CCSS |
|---|---|---|
| 11-1 Area of Polygons | A) Areas of Triangles and Quadrilaterals | 7.G.6 |
| | B) Solving Area Equations to Find Missing Measurements | |
| 11-2 Circumference of Circles | A) Parts of Circles | 7.G.4 |
| | B) Relationship Between Radius and Diameter | |
| | C) Circumference | |
| 11-3 Area of Circles | A) Areas of Circles from Radius | 7.G.4 |
| | B) Areas of Circles from Diameter | |
| 11-4 Naming Three-Dimensional Solids | A) Bases of Solids | 7.G.3 |
| | B) Naming Solids | |
| | C) Cross Sections of Solids | |
| 11-5 Surface Area of Cylinders and Right Prisms | A) Lateral Faces of Prisms | 7.G.6 |
| | B) Surface Areas of Prisms | |
| | C) Surface Areas of Cylinders | |
| 11-6 Volume of Cylinders and Right Prisms | A) Volumes of Prisms | 7.G.6 |
| | B) Volumes of Cylinders | |
| 11-7 Surface Area of Right Pyramids | A) Lateral Faces of Pyramids | 7.G.6 |
| | B) Slant Height | |
| | C) Surface Areas of Pyramids | |
| 11-8 Volume of Pyramids and Cones | A) Volumes of Pyramids | 7.G.6 |
| | B) Volumes of Cones | |

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## Chapter 12 Probability

| Lesson | Topic | CCSS |
|---|---|---|
| 12-1 Outcomes | A) Numbers that Represent Probability | 7.SP.5 |
| | B) Possible Outcomes | |
| | C) Events | |
| | D) Favorable Outcomes | |
| | E) Likely and Unlikely Events | |
| 12-2 Experimental Probability | A) Equation for Experimental Probability | 7.SP.6, 7.SP.7.b |
| | B) Experimental Probability of Single Event | |
| | C) Experimental Probability of Multiple Events | |
| 12-3 Theoretical Probability | A) Equation for Theoretical Probability | 7.SP.6, 7.SP.7.a, 7.SP.7.b |
| | B) Theoretical Probability of Single Event | |
| | C) Theoretical Probability of Multiple Events | |
| 12-4 Compound Independent Events | A) Tree Diagrams and Outcomes of Independent Events | 7.SP.8.b, 7.SP.8.c |
| | B) Tables and Outcomes of Independent Events | |
| | C) Using Multiplication to Count Outcomes for Independent Events | |
| 12-5 Compound Dependent Events | A) Tree Diagrams and Outcomes of Dependent Events | 7.SP.8.b, 7.SP.8.c |
| | B) Using Multiplication to Count Outcomes for Dependent Events | |
| 12-6 Compound Probability | A) Probability Notation for Compound Events | 7.SP.7.a, 7.SP.8.a, 7.SP.8.b, 7.SP.8.c |
| | B) Probability of Independent Events | |
| | C) Probability of Dependent Events | |

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## Chapter 13 Data Analysis

| Lesson | Topic | CCSS |
|---|---|---|
| 13-1 Populations, Samples, and Bias | A) Population | 7.SP.1, 7.SP.2 |
| | B) Samples | |
| | C) Data Sets from Random Representative Samples | |
| 13-2 Making Inferences from Data | A) Samples and Conclusions | 7.SP.1, 7.SP.2 |
| | B) Samples and Predictions | |
| | C) Supporting Predictions and Conclusions | |
| 13-3 Measures of Center | A) Mean | 7.SP.4 |
| | B) Median | |
| | C) Mean and Median of Same Data Set | |
| 13-4 Measures of Variation | A) Range | 7.SP.1, 7.SP.3, 7.SP.4 |
| | B) MAD | |
| | C) Quartiles and IQR | |
| | D) Measures of Variation and Measures of Center | |
| 13-5 Comparative Inferences | A) Dot Plots and Measures of Center and Variability | 7.SP.1, 7.SP.2, 7.SP.3, 7.SP.4 |
| | B) Mean as a Multiple of MAD | |
| | C) Making Statements about Data Sets from Measures of Center and Variability | |