

Crosswalk: Common Core Clusters to Curriculum Topic Study Guides

This document provides a comprehensive yet not exhaustive alignment between the clusters within the Common Core State Standards for Mathematics and the Curriculum Topic Study Guides.

Choosing a CTS Study Guide depends on many factors including: grade level and grade span of those participating in the study; alignment to a particular sub topic or concept within a Common Core Standard in the Cluster; and the purpose of the study.

The specificity of the mathematics concepts of Common Core Standards, especially at the high school level, results in an alignment that focuses on big ideas in the standards.

Three crosswalks are included in this document:

- Content Clusters Grouped by Grade Level pp. 1-9
- Standards for Mathematical Practice p. 10
- Content Clusters grouped by Domain and Clusters pp. 11- 21

Grade Level Crosswalk

Kindergarten

Common Core Clusters	Curriculum Topic Study
K Counting and Cardinality	
• Know number names and the count sequence.	Counting p.116; Numbers and Number Systems p. 128
• Count to tell the number of objects.	Counting p.116; Number Sense p.127
• Compare numbers.	Comparing and Ordering Numbers p. 114; Numbers and Number Systems p. 128
K Operations and Algebraic Thinking	
• Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Facts p. 120; Expressions and Equations p. 136
K Number and Operations in Base Ten	
• Work with numbers 11–19 to gain foundations for place value.	Number Sense p. 127; Numbers and Number Systems p. 128; Place Value p. 130;
K Measurement and Data	
• Describe and compare measurable attributes.	Length p. 171; Time, Temperature, Weight and Capacity p. 176; Measurement Tools p. 173
• Classify objects and count the number of objects in categories.	Sorting and Classifying p. 162; Counting p. 116; Comparing and Ordering p. 114
K Geometry	
• Identify and describe shapes.	Two and Three Dimensional Geometry p. 148, 149, 150; Geometric Shapes p. 158
• Analyze, compare, create, and compose shapes.	Two and Three Dimensional Geometry p. 148, 149, 150; Geometric Modeling p.154; Geometric Relationships p. 157

Grade 1

Common Core Clusters	Curriculum Topic Study
G1 Operations and Algebraic Thinking	
<ul style="list-style-type: none"> • Represent and solve problems involving addition and subtraction. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
<ul style="list-style-type: none"> • Understand and apply properties of operations and the relationship between addition and subtraction. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
<ul style="list-style-type: none"> • Add and subtract within 20. 	Addition and Subtraction of Whole Numbers p. 112; Counting p. 116; Facts p. 120
<ul style="list-style-type: none"> • Work with addition and subtraction equations. 	Equivalence p. 194; Expressions and Equations p. 136
G1 Number and Operations in Base Ten	
<ul style="list-style-type: none"> • Extend the counting sequence. 	Counting p. 116; Numbers and Number Systems p. 128; Number Sense p. 127
<ul style="list-style-type: none"> • Understand place value. 	Place Value p. 130; Comparing and Ordering Numbers p. 114; Numbers and Number Systems p. 128
<ul style="list-style-type: none"> • Use place value understanding and properties of operations to add and subtract. 	Addition and Subtraction p.111; Place Value p. 130; Properties of Operations p.131
G1 Measurement and Data	
<ul style="list-style-type: none"> • Measure lengths indirectly and by iterating length units. 	Length p. 171; Measurement Tools p. 173
<ul style="list-style-type: none"> • Tell and write time. 	Time, Temperature, Weight and Capacity p. 176
<ul style="list-style-type: none"> • Represent and interpret data. 	Line Graphs, Bar Graphs, and Histograms p.179; Graphic Representation 196; Summarizing Data p. 187
G1 Geometry	
<ul style="list-style-type: none"> • Reason with shapes and their attributes. 	Fractions p. 121; Two and Three Dimensional Geometry p. 148, 149, 150; Geometric Relationships p. 157

Grade 2

Common Core Clusters	Curriculum Topic Study
G2 Operations and Algebraic Thinking	
<ul style="list-style-type: none"> • Represent and solve problems involving addition and subtraction. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
<ul style="list-style-type: none"> • Add and subtract within 20. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Facts p. 120
<ul style="list-style-type: none"> • Work with equal groups of objects to gain foundations for multiplication. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions

	and Equations p. 136
G2 Number and Operations in Base Ten	
• Understand place value.	Place Value p. 130; Comparing and Ordering Numbers p. 114; Numbers and Number Systems p. 128
• Use place value understanding and properties of operations to add and subtract.	Addition and Subtraction p.111; Place Value p. 130; Properties of Operations p.131
G2 Measurement and Data	
• Measure and estimate lengths in standard units.	Length p. 171; Measurement Tools p. 173,
• Relate addition and subtraction to length.	Addition and Subtraction p. 111; Length p. 171
• Work with time and money.	Time, Temperature, Weight and Capacity p. 176
• Represent and interpret data.	Length p. 171; Line Graphs, Bar Graphs, and Histograms p.179; Graphic Representation 196; Summarizing Data p. 187
G2 Geometry	
• Reason with shapes and their attributes.	Circles p. 151; Fractions p. 121; Geometric Relationships p. 157; Two and Three Dimensional Geometry p. 148, 149, 150; Quadrilaterals p. 161

Grade 3

Common Core Clusters	Curriculum Topic Study
G3 Operations and Algebraic Thinking	
• Represent and solve problems involving multiplication and division.	Computation and Operations p. 115; Expressions and Equations p. 136; Facts p. 120; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
• Understand properties of multiplication and the relationship between multiplication and division.	Facts p. 120; Properties of Operations p. 131; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
• Multiply and divide within 100.	Computation and Operations p. 115; Facts p. 120; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
• Solve problems involving the four operations, and identify and explain patterns in arithmetic.	Computation and Operations p. 115; Expressions and Equations p. 136; Numeric Patterns p.141; Properties of Operations p. 131
G3 Number and Operations in Base Ten	
• Use place value understanding and properties of operations to perform multi-digit arithmetic.	Computation and Operations p. 115; Place Value p. 130; Properties of Operations p. 131
G3 Number and Operations—Fractions	
• Develop understanding of fractions as numbers.	Comparing and Ordering p. 114; Fractions p. 121; Rational Numbers p. 133
G3 Measurement and Data	
• Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	Estimation p. 195; Time, Temperature, Weight and Capacity p. 176
• Represent and interpret data.	Length p. 171; Line Graphs, Bar Graphs, and Histograms p.179; Graphic Representation 196; Summarizing Data p. 187

• Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	Area p. 169
• Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	Perimeter, Area and Volume p. 175
G3 Geometry	
• Reason with shapes and their attributes.	Fractions p. 121; Geometric Relationships p. 157; Two and Three Dimensional Geometry p. 148, 149, 150; Quadrilaterals p. 161

Grade 4

Common Core Clusters	Curriculum Topic Study
G4 Operations and Algebraic Thinking	
• Use the four operations with whole numbers to solve problems.	Computation and Operations p. 115; Expressions and Equations p. 136
• Gain familiarity with factors and multiples.	Factors and Multiples p. 119
• Generate and analyze patterns.	Geometric Patterns; Numeric Patterns p. 141; Patterns, Relations and Functions p. 142
G4 Number and Operations in Base Ten	
• Generalize place value understanding for multidigit whole numbers.	Comparing and Ordering; Computation and Operations p. 115; Place Value p. 130; Numbers and Number Systems p. 128;
• Use place value understanding and properties of operations to perform multi-digit arithmetic.	Computation and Operations p. 115; Place Value p. 130; Properties of Operations p. 131
G4 Number and Operations—Fractions	
• Extend understanding of fraction equivalence and ordering.	Comparing and Ordering p. 114; Fractions p. 121;
• Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	Computation and Operations p. 115; Fractions p. 121
• Understand decimal notation for fractions, and compare decimal fractions.	Comparing and Ordering p. 114; Fractions p. 121; Fractions, Decimals and Percents p. 122
G4 Measurement and Data	
• Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	Customary Measurement p. 170; Measurement Systems p. 172; Metric System p. 174; Time, Temperature, Weight and Capacity p. 176
• Represent and interpret data.	Line Plots, Stem and Leaf Plots, Box Plots, and Histograms p. 180
• Geometric measurement: understand concepts of angle and measure angles.	Angle Measurement p. 168; Two-Dimensional Geometry p. 148
G4 Geometry	
• Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	Transformations and Symmetry p. 164; Two-Dimensional Geometry p. 148

Grade 5

Common Core Clusters	Curriculum Topic Study
G5 Operations and Algebraic Thinking	
• Write and interpret numerical expressions.	Computation and Operations p. 115; Expressions and Equations p. 136
• Analyze patterns and relationships.	Numeric Patterns p. 141; Patterns, Relations and

	Functions p. 142
G5 Number and Operations in Base Ten	
• Understand the place value system.	Comparing and Ordering p. 114; Numbers and Number Systems p. 128; Place Value p. 130
• Perform operations with multi-digit whole numbers and with decimals to hundredths.	Computation and Operations p. 115; Decimals pg. 117; Properties of Operations p. 131
G5 Number and Operations—Fractions	
• Use equivalent fractions as a strategy to add and subtract fractions.	Addition and Subtractions p. 111; Computation and Operations p. 115; Fractions p. 121
• Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Computation and Operations p. 115; Fractions p. 121; Multiplication and Division
G5 Measurement and Data	
• Convert like measurement units within a given measurement system.	Customary Measurement p. 170; Measurement Systems p. 172; Metric System p. 174
• Represent and interpret data.	Line Plots, Stem and Leaf Plots, Box Plots, and Histograms p. 180
• Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	Formulas p. 137; Perimeter, Area, and Volume p. 175; Volume p. 177
G5 Geometry	
• Graph points on the coordinate plane to solve real-world and mathematical problems.	Coordinate Geometry p. 153; Graphic Representation p. 196
• Classify two-dimensional figures into categories based on their properties.	Geometric Relationships p. 157; Sorting and Classifying p. 162, Two-Dimensional Geometry p. 148

Grade 6

Common Core Clusters	Curriculum Topic Study
G6 Ratios and Proportional Relationships	
• Understand ratio concepts and use ratio reasoning to solve problems.	Proportionality p. 198; Rates of Change p. 144; Ratio and Proportions p. 133
G6 The Number System	
• Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	Computation and Operations p. 115; Fractions p.121; Multiplication and Division p. 125
• Compute fluently with multi-digit numbers and find common factors and multiples.	Computation and Operations p. 115; Factors and Multiples p. 119
• Apply and extend previous understandings of numbers to the system of rational numbers.	Numbers and Number Systems p. 128; Rational Numbers 133
G6 Expressions and Equations	
• Apply and extend previous understandings of arithmetic to algebraic expressions.	Expressions and Equations p. 136; Integers p. 123; Properties of Operations p. 131; Symbolic Representation p. 145; Variables p. 146
• Reason about and solve one-variable equations and inequalities.	Expressions and Equations p. 136; Patterns, Relations and Functions p. 142; Symbolic Representation p. 145
• Represent and analyze quantitative relationships between dependent and independent variables.	Linear Relationships p. 139; Patterns, Relations and Functions p. 142; Rates of Change p. 144
G6 Geometry	
• Solve real-world and mathematical problems	Coordinate Geometry p. 153; Formulas p. 137;

involving area, surface area, and volume.	Perimeter, Area and Volume p. 175
G6 Statistics and Probability	
• Develop understanding of statistical variability.	Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187
• Summarize and describe distributions.	Line Plots, Stem and Leaf Plots, Box Plots, and Histograms p. 180; Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187

Grade 7

Common Core Clusters	Curriculum Topic Study
G7 Ratios and Proportional Relationships	
• Analyze proportional relationships and use them to solve real-world and mathematical problems.	Proportionality p. 198; Rates of Change p. 144; Ratio and Proportions p. 133
G7 The Number System	
• Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	Computation and Operations p. 115; Fractions p.121; Rational Numbers p. 133
G7 Expressions and Equations	
• Use properties of operations to generate equivalent expressions.	Expressions and Equations p. 136; Properties of Operations p. 131;
• Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	Expressions and Equations p. 136; Properties of Operations p. 131, Rational Numbers p. 133
G7 Geometry	
• Draw, construct and describe geometrical figures and describe the relationships between them.	Two-Dimensional Geometry p. 148; Geometric Relationships p. 157
• Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	Angle Measurement p. 168; Perimeter, Area and Volume p. 175
G7 Statistics and Probability	
• Use random sampling to draw inferences about a population.	Sampling p. 183; Statistical Reasoning p. 186; Summarizing Data p. 187
• Draw informal comparative inferences about two populations.	Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187
• Investigate chance processes and develop, use, and evaluate probability models.	Probability p. 182

Grade 8

Common Core Clusters	Curriculum Topic Study
G8 The Number System	
• Know that there are numbers that are not rational, and approximate them by rational numbers.	Numbers and Number Systems p. 128; Rational Numbers p. 133
G8 Expressions and Equations	
• Work with radicals and integer exponents.	Integers p. 123; Exponents p. 118; Large and Small Numbers p. 12
• Understand the connections between proportional relationships, lines, and linear equations.	Linear Relationships p. 139; Proportionality p. 198; Rates of Change p. 144
• Analyze and solve linear equations and pairs of	Expressions and Equations p. 136; Linear

simultaneous linear equations.	Relationships; Patterns, Relations and Functions p. 142
G8 Functions	
• Define, evaluate, and compare functions.	Functions p. 138; Relationships; Patterns, Relations and Functions p. 142
• Use functions to model relationships between quantities.	Algebraic Modeling p. 135; Functions p. 138; Relationships; Patterns, Relations and Functions p. 142
G8 Geometry	
• Understand congruence and similarity using physical models, transparencies, or geometry software.	Congruence and Similarity p. 152; Transformations and Symmetry p. 164; Angle Measurement p. 168
• Understand and apply the Pythagorean Theorem.	Geometric Relationships p. 157, Geometric Theorems p. 159
• Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.	Formulas p. 137; Volume p. 177
G8 Statistics and Probability	
• Investigate patterns of association in bivariate data.	Algebraic Modeling; Scatterplots and Correlation p. 184

High School

High School: Number and Quantity	
Common Core Clusters	Curriculum Topic Study
HS The Real Number System	
• Extend the properties of exponents to rational exponents	Exponents p. 118; Expressions and Equations p. 136;
• Use properties of rational and irrational numbers.	Numbers and Number Systems p. 128; Properties of Operations p. 131; Rational Numbers p. 133
HS Quantities	
• Reason quantitatively and use units to solve problems	Number Sense p. 127
HS The Complex Number System	
• Perform arithmetic operations with complex numbers	Numbers and Number Systems p. 128
• Represent complex numbers and their operations on the complex plane	Numbers and Number Systems p. 128; Quadratics p. 143
• Use complex numbers in polynomial identities and equations	Numbers and Number Systems p. 128; Quadratics p. 143
HS Vector and Matrix Quantities	
• Represent and model with vector quantities.	Matrices and Vectors p. 197
• Perform operations on vectors.	Matrices and Vectors p. 197
• Perform operations on matrices and use matrices in applications.	Matrices and Vectors p. 197
HS: Algebra	
HS Seeing Structure in Expressions	
• Interpret the structure of expressions	Expressions and Equations p. 136
• Write expressions in equivalent forms to solve problems	Expressions and Equations p. 136; Quadratics p. 143
HS Arithmetic with Polynomials and Rational Functions	

• Perform arithmetic operations on polynomials	Expressions and Equations p. 136; Quadratics p. 143
• Understand the relationship between zeros and factors of polynomials	Expressions and Equations p. 136; Quadratics p. 143
• Use polynomial identities to solve problems	Expressions and Equations p. 136
• Rewrite rational expressions	Expressions and Equations p. 136
HS Creating Equations	
• Create equations that describe numbers or relationships	Algebraic Modeling p. 135; Expressions and Equations p. 136; Formulas p. 137; Functions p. 138
HS Reasoning with Equations and Inequalities	
• Understand solving equations as a process of reasoning and explain the reasoning	Expressions and Equations p. 136
• Solve equations and inequalities in one variable	Expressions and Equations p. 136; Patterns, Relations and Functions p. 142
• Solve systems of equations	Expressions and Equations p. 136; Linear Relationships p. 139
• Represent and solve equations and inequalities graphically	Expressions and Equations p. 136; Graphic Representation p. 196
HS Functions	
HS Interpreting Functions	
• Understand the concept of a function and use function notation	Functions p. 138
• Interpret functions that arise in applications in terms of the context	Functions p. 138
• Analyze functions using different representations	Functions p. 138; Graphic Representation p. 196, Symbolic Representation p. 145
HS Building Functions	
• Build a function that models a relationship between two quantities	Algebraic Modeling p. 135; Functions p. 138
• Build new functions from existing functions	Functions p. 138
HS Linear, Quadratic, and Exponential Models	
• Construct and compare linear and exponential models and solve problems	Algebraic Modeling p. 135; Functions p. 138
• Interpret expressions for functions in terms of the situation they model	Algebraic Modeling p. 135; Functions p. 138
HS Trigonometric Functions	
• Extend the domain of trigonometric functions using the unit circle	Trigonometry p. 166
• Model periodic phenomena with trigonometric functions	Trigonometry p. 166
• Prove and apply trigonometric identities	Trigonometry p. 166
HS Modeling	
Note: Making mathematical models is a Standard for Mathematical Practice	Modeling p. 203
HS Geometry	
HS Congruence	
• Experiment with transformations in the plane	Transformations and Symmetry p. 164
• Understand congruence in terms of rigid motions	Congruence and Similarity p. 152; Transformations and Symmetry p. 164
• Prove geometric theorems	Geometric Theorems p. 159; Conjecture, Proof and Justification p. 201
• Make geometric constructions	Two and Three Dimensional Geometry p. 150

HS Similarity, Right Triangles, and Trigonometry	
• Understand similarity in terms of similarity transformations	Congruence and Similarity p. 152; Transformations and Symmetry p. 164
• Prove theorems involving similarity	Congruence and Similarity p. 152; Conjecture, Proof and Justification p. 20; Geometric Theorems p. 159
• Define trigonometric ratios and solve problems involving right triangles	Triangles p. 165; Trigonometry p. 166
• Apply trigonometry to general triangles	Triangles p. 165; Trigonometry p. 166
HS Circles	
• Understand and apply theorems about circles	Circles p. 151
• Find arc lengths and areas of sectors of circles	Circles p. 151
HS Expressing Geometric Properties with Equations	
• Translate between the geometric description and the equation for a conic section	Geometric Modeling p. 154
• Use coordinates to prove simple geometric theorems algebraically	Coordinate Geometry p. 153
HS Geometric Measurement and Dimension	
• Explain volume formulas and use them to solve problems	Formulas p. 137; Volume p. 177
• Visualize relationships between two dimensional and three-dimensional objects	Two and Three Dimensional Geometry p. 150, Spatial Visualization p. 163
HS Modeling with Geometry	
• Apply geometric concepts in modeling situations	Geometric Modeling p. 154
High School: Statistics and Probability	
HS Interpreting Categorical and Quantitative Data	
• Summarize, represent, and interpret data on a single count or measurement variable	Line Plots, Stem and Leaf Plots, Box Plots and Histograms p. 180; Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187
• Summarize, represent, and interpret data on two categorical and quantitative variables	Measures of Center and Spread p. 181; Scatterplots and Correlation p. 184; Statistical Reasoning p. 186; Summarizing Data p. 187
• Interpret linear models	Scatterplots and Correlation p. 184; Algebraic Modeling p. 135
HS Making Inferences and Justifying Conclusions	
• Understand and evaluate random processes underlying statistical experiments	Sampling p. 183; Simulations p. 185; Statistical Reasoning p. 186
• Make inferences and justify conclusions from sample surveys, experiments and observational studies	Sampling p. 183; Simulations p. 185; Statistical Reasoning p. 186
HS Conditional Probability and the Rules of Probability	
• Understand independence and conditional probability and use them to interpret data	Probability p. 182
• Use the rules of probability to compute probabilities of compound events in a uniform probability model	Probability p. 182
HS Using Probability to Make Decisions	
• Calculate expected values and use them to solve problems	Probability p. 182
• Use probability to evaluate outcomes of decisions	Probability p. 182

Standards for Mathematical Practice Crosswalk

Number and Operations related Domains and Clusters

Common Core Standards	Curriculum Topic Study
1. Make sense of problems and persevere in solving them.	Problem Solving p. 204
2. Reason abstractly and quantitatively.	Conjecture, Proof and Justification p. 201; Number Sense 127; Reasoning p. 205
3. Construct viable arguments and critique the reasoning of others	Conjecture, Proof and Justification p. 201
4. Model with mathematics.	Modeling p. 203; Representations p. 206
5. Use appropriate tools strategically.	Measurement Tools p. 173; Representations p. 206; Technology p. 207
6. Attend to precision.	Communication p. 200; Estimation p. 195
7. Look for and make use of structure.	Reasoning p. 205; Conjecture, Proof and Justification p. 201
8. Look for and express regularity in repeated reasoning.	Reasoning p. 205; Conjecture, Proof and Justification p. 201

Domain and Cluster Crosswalk

Number and Operations related Domains and Clusters

Common Core Domain and Grade Level Clusters	Curriculum Topic Study
K Counting and Cardinality	
• Know number names and the count sequence.	Counting p.116; Numbers and Number Systems p. 128
• Count to tell the number of objects.	Counting p.116; Number Sense p.127
• Compare numbers.	Comparing and Ordering Numbers p. 114; Numbers and Number Systems p. 128
K Operations and Algebraic Thinking	
• Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Facts p. 120; Expressions and Equations p. 136
G1 Operations and Algebraic Thinking	
• Represent and solve problems involving addition and subtraction.	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
• Understand and apply properties of operations and the relationship between addition and subtraction.	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
• Add and subtract within 20.	Addition and Subtraction of Whole Numbers p. 112; Counting p. 116; Facts p. 120
• Work with addition and subtraction equations.	Equivalence p. 194; Expressions and Equations p. 136
G2 Operations and Algebraic Thinking	
• Represent and solve problems involving addition and subtraction.	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
• Add and subtract within 20.	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Facts p. 120
• Work with equal groups of objects to gain foundations for multiplication.	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
G3 Operations and Algebraic Thinking	
• Represent and solve problems involving multiplication and division.	Computation and Operations p. 115; Expressions and Equations p. 136; Facts p. 120; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
• Understand properties of multiplication and the relationship between multiplication and division.	Facts p. 120; Properties of Operations p. 131; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
• Multiply and divide within 100.	Computation and Operations p. 115; Facts p. 120; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
• Solve problems involving the four operations, and identify and explain patterns in arithmetic.	Computation and Operations p. 115; Expressions and Equations p. 136; Numeric Patterns p.141;

	Properties of Operations p. 131
G4 Operations and Algebraic Thinking	
• Use the four operations with whole numbers to solve problems.	Computation and Operations p. 115; Expressions and Equations p. 136
• Gain familiarity with factors and multiples.	Factors and Multiples p. 119
• Generate and analyze patterns.	Geometric Patterns; Numeric Patterns p. 141; Patterns, Relations and Functions p. 142
G5 Operations and Algebraic Thinking	
• Write and interpret numerical expressions.	Computation and Operations p. 115; Expressions and Equations p. 136
• Analyze patterns and relationships.	Numeric Patterns p. 141; Patterns, Relations and Functions p. 142
K Number and Operations in Base Ten	
• Work with numbers 11–19 to gain foundations for place value.	Number Sense p. 127; Numbers and Number Systems p. 128; Place Value p. 130;
G1 Number and Operations in Base Ten	
• Extend the counting sequence.	Counting p. 116; Numbers and Number Systems p. 128; Number Sense p. 127
• Understand place value.	Place Value p. 130; Comparing and Ordering Numbers p. 114; Numbers and Number Systems p. 128
• Use place value understanding and properties of operations to add and subtract.	Addition and Subtraction p.111; Place Value p. 130; Properties of Operations p.131
G2 Number and Operations in Base Ten	
• Understand place value.	Place Value p. 130; Comparing and Ordering Numbers p. 114; Numbers and Number Systems p. 128
• Use place value understanding and properties of operations to add and subtract.	Addition and Subtraction p.111; Place Value p. 130; Properties of Operations p.131
G3 Number and Operations—Fractions	
• Develop understanding of fractions as numbers.	Comparing and Ordering p. 114; Fractions p. 121; Rational Numbers p. 133
G4 Number and Operations—Fractions	
• Extend understanding of fraction equivalence and ordering.	Comparing and Ordering p. 114; Fractions p. 121;
• Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	Computation and Operations p. 115; Fractions p. 121
• Understand decimal notation for fractions, and compare decimal fractions.	Comparing and Ordering p. 114; Fractions p. 121; Fractions, Decimals and Percents p. 122
G5 Number and Operations—Fractions	
• Use equivalent fractions as a strategy to add and subtract fractions.	Addition and Subtractions p. 111; Computation and Operations p. 115; Fractions p. 121
• Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Computation and Operations p. 115; Fractions p. 121; Multiplication and Division
G6 Ratios and Proportional Relationships	
• Understand ratio concepts and use ratio reasoning to solve problems.	Proportionality p. 198; Rates of Change p. 144; Ratio and Proportions p. 133
G7 Ratios and Proportional Relationships	
• Analyze proportional relationships and use them to solve real-world and mathematical problems.	Proportionality p. 198; Rates of Change p. 144; Ratio and Proportions p. 133

G6 The Number System	
• Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	Computation and Operations p. 115; Fractions p.121; Multiplication and Division p. 125
• Compute fluently with multi-digit numbers and find common factors and multiples.	Computation and Operations p. 115; Factors and Multiples p. 119
• Apply and extend previous understandings of numbers to the system of rational numbers.	Numbers and Number Systems p. 128; Rational Numbers 133
G7 The Number System	
• Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	Computation and Operations p. 115; Fractions p.121; Rational Numbers p. 133
G8 The Number System	
• Know that there are numbers that are not rational, and approximate them by rational numbers.	Numbers and Number Systems p. 128; Rational Numbers p. 133
Common Core Clusters	Curriculum Topic Study
HS The Real Number System	
• Extend the properties of exponents to rational exponents	Exponents p. 118; Expressions and Equations p. 136;
• Use properties of rational and irrational numbers.	Numbers and Number Systems p. 128; Properties of Operations p. 131; Rational Numbers p. 133
HS Quantities	
• Reason quantitatively and use units to solve problems	Number Sense p. 127
HS The Complex Number System	
• Perform arithmetic operations with complex numbers	Numbers and Number Systems p. 128
• Represent complex numbers and their operations on the complex plane	Numbers and Number Systems p. 128; Quadratics p. 143
• Use complex numbers in polynomial identities and equations	Numbers and Number Systems p. 128; Quadratics p. 143
HS Vector and Matrix Quantities	
• Represent and model with vector quantities.	Matrices and Vectors p. 197
• Perform operations on vectors.	Matrices and Vectors p. 197
• Perform operations on matrices and use matrices in applications.	Matrices and Vectors p. 197

Algebra related Domains and Clusters

Common Core Domain and Grade Level Clusters	Curriculum Topic Study
K Operations and Algebraic Thinking	
<ul style="list-style-type: none"> Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Facts p. 120; Expressions and Equations p. 136
G1 Operations and Algebraic Thinking	
<ul style="list-style-type: none"> Represent and solve problems involving addition and subtraction. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
<ul style="list-style-type: none"> Understand and apply properties of operations and the relationship between addition and subtraction. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
<ul style="list-style-type: none"> Add and subtract within 20. 	Addition and Subtraction of Whole Numbers p. 112; Counting p. 116; Facts p. 120
<ul style="list-style-type: none"> Work with addition and subtraction equations. 	Equivalence p. 194; Expressions and Equations p. 136
G2 Operations and Algebraic Thinking	
<ul style="list-style-type: none"> Represent and solve problems involving addition and subtraction. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
<ul style="list-style-type: none"> Add and subtract within 20. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Facts p. 120
<ul style="list-style-type: none"> Work with equal groups of objects to gain foundations for multiplication. 	Addition and Subtraction p. 111; Addition and Subtraction of Whole Numbers p. 112; Computation and Operations p. 115; Expressions and Equations p. 136
G3 Operations and Algebraic Thinking	
<ul style="list-style-type: none"> Represent and solve problems involving multiplication and division. 	Computation and Operations p. 115; Expressions and Equations p. 136; Facts p. 120; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
<ul style="list-style-type: none"> Understand properties of multiplication and the relationship between multiplication and division. 	Facts p. 120; Properties of Operations p. 131; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
<ul style="list-style-type: none"> Multiply and divide within 100. 	Computation and Operations p. 115; Facts p. 120; Multiplication and Division p. 125, Multiplication and Division of Whole Numbers p. 126
<ul style="list-style-type: none"> Solve problems involving the four operations, and identify and explain patterns in arithmetic. 	Computation and Operations p. 115; Expressions and Equations p. 136; Numeric Patterns p.141; Properties of Operations p. 131
G4 Operations and Algebraic Thinking	
<ul style="list-style-type: none"> Use the four operations with whole numbers to solve problems. 	Computation and Operations p. 115; Expressions and Equations p. 136
<ul style="list-style-type: none"> Gain familiarity with factors and multiples. 	Factors and Multiples p. 119
<ul style="list-style-type: none"> Generate and analyze patterns. 	Geometric Patterns; Numeric Patterns p. 141;

	Patterns, Relations and Functions p. 142
G5 Operations and Algebraic Thinking	
• Write and interpret numerical expressions.	Computation and Operations p. 115; Expressions and Equations p. 136
• Analyze patterns and relationships.	Numeric Patterns p. 141; Patterns, Relations and Functions p. 142
G6 Expressions and Equations	
• Apply and extend previous understandings of arithmetic to algebraic expressions.	Expressions and Equations p. 136; Integers p. 123; Properties of Operations p. 131; Symbolic Representation p. 145; Variables p. 146
• Reason about and solve one-variable equations and inequalities.	Expressions and Equations p. 136; Patterns, Relations and Functions p. 142; Symbolic Representation p. 145
• Represent and analyze quantitative relationships between dependent and independent variables.	Linear Relationships p. 139; Patterns, Relations and Functions p. 142; Rates of Change p. 144
G7 Expressions and Equations	
• Use properties of operations to generate equivalent expressions.	Expressions and Equations p. 136; Properties of Operations p. 131;
• Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	Expressions and Equations p. 136; Properties of Operations p. 131, Rational Numbers p. 133
G8 Expressions and Equations	
• Work with radicals and integer exponents.	Integers p. 123; Exponents p. 118; Large and Small Numbers p. 12
• Understand the connections between proportional relationships, lines, and linear equations.	Linear Relationships p. 139; Proportionality p. 198; Rates of Change p. 144
• Analyze and solve linear equations and pairs of simultaneous linear equations.	Expressions and Equations p. 136; Linear Relationships; Patterns, Relations and Functions p. 142
HS Seeing Structure in Expressions	
• Interpret the structure of expressions	Expressions and Equations p. 136
• Write expressions in equivalent forms to solve problems	Expressions and Equations p. 136; Quadratics p. 143
G8 Functions	
• Define, evaluate, and compare functions.	Functions p. 138; Relationships; Patterns, Relations and Functions p. 142
• Use functions to model relationships between quantities.	Algebraic Modeling p. 135; Functions p. 138; Relationships; Patterns, Relations and Functions p. 142
HS Arithmetic with Polynomials and Rational Functions	
• Perform arithmetic operations on polynomials	Expressions and Equations p. 136; Quadratics p. 143
• Understand the relationship between zeros and factors of polynomials	Expressions and Equations p. 136; Quadratics p. 143
• Use polynomial identities to solve problems	Expressions and Equations p. 136
• Rewrite rational expressions	Expressions and Equations p. 136
HS Creating Equations	
• Create equations that describe numbers or relationships	Algebraic Modeling p. 135; Expressions and Equations p. 136; Formulas p. 137; Functions p. 138
HS Reasoning with Equations and Inequalities	

• Understand solving equations as a process of reasoning and explain the reasoning	Expressions and Equations p. 136
• Solve equations and inequalities in one variable	Expressions and Equations p. 136; Patterns, Relations and Functions p. 142
• Solve systems of equations	Expressions and Equations p. 136; Linear Relationships p. 139
• Represent and solve equations and inequalities graphically	Expressions and Equations p. 136; Graphic Representation p. 196
HS Functions	
HS Interpreting Functions	
• Understand the concept of a function and use function notation	Functions p. 138
• Interpret functions that arise in applications in terms of the context	Functions p. 138
• Analyze functions using different representations	Functions p. 138; Graphic Representation p. 196, Symbolic Representation p. 145
HS Building Functions	
• Build a function that models a relationship between two quantities	Algebraic Modeling p. 135; Functions p. 138
• Build new functions from existing functions	Functions p. 138
HS Linear, Quadratic, and Exponential Models	
• Construct and compare linear and exponential models and solve problems	Algebraic Modeling p. 135; Functions p. 138
• Interpret expressions for functions in terms of the situation they model	Algebraic Modeling p. 135; Functions p. 138
HS Trigonometric Functions	
• Extend the domain of trigonometric functions using the unit circle	Trigonometry p. 166
• Model periodic phenomena with trigonometric functions	Trigonometry p. 166
• Prove and apply trigonometric identities	Trigonometry p. 166
HS Modeling	
Note: Making mathematical models is a Standard for Mathematical Practice	Modeling p. 203

Measurement and Data related Domains and Clusters

Common Core Domain and Grade Level Clusters	Curriculum Topic Study
K Measurement and Data	
• Describe and compare measurable attributes.	Length p. 171; Time, Temperature, Weight and Capacity p. 176; Measurement Tools p. 173
• Classify objects and count the number of objects in categories.	Sorting and Classifying p. 162; Counting p. 116; Comparing and Ordering p. 114
G1 Measurement and Data	
• Measure lengths indirectly and by iterating length units.	Length p. 171; Measurement Tools p. 173
• Tell and write time.	Time, Temperature, Weight and Capacity p. 176
• Represent and interpret data.	Line Graphs, Bar Graphs, and Histograms p.179; Graphic Representation 196; Summarizing Data p. 187
G2 Measurement and Data	
• Measure and estimate lengths in standard units.	Length p. 171; Measurement Tools p. 173,
• Relate addition and subtraction to length.	Addition and Subtraction p. 111; Length p. 171
• Work with time and money.	Time, Temperature, Weight and Capacity p. 176
• Represent and interpret data.	Length p. 171; Line Graphs, Bar Graphs, and Histograms p.179; Graphic Representation 196; Summarizing Data p. 187
G3 Measurement and Data	
• Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	Estimation p. 195; Time, Temperature, Weight and Capacity p. 176
• Represent and interpret data.	Length p. 171; Line Graphs, Bar Graphs, and Histograms p.179; Graphic Representation 196; Summarizing Data p. 187
• Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	Area p. 169
• Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	Perimeter, Are and Volume p. 175
G4 Measurement and Data	
• Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	Customary Measurement p. 170; Measurement Systems p. 172; Metric System p. 174; Time, Temperature, Weight and Capacity p. 176
• Represent and interpret data.	Line Plots, Stem and Leaf Plots, Box Plots, and Histograms p. 180
• Geometric measurement: understand concepts of angle and measure angles.	Angle Measurement p. 168; Two-Dimensional Geometry p. 148
G5 Measurement and Data	
• Convert like measurement units within a given measurement system.	Customary Measurement p. 170; Measurement Systems p. 172; Metric System p. 174
• Represent and interpret data.	Line Plots, Stem and Leaf Plots, Box Plots, and Histograms p. 180

<ul style="list-style-type: none">• Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	Formulas p. 137; Perimeter, Area, and Volume p. 175; Volume p. 177
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Geometry Related Domains and Clusters

Common Core Domain and Grade Level Clusters	Curriculum Topic Study
K Geometry	
• Identify and describe shapes.	Two and Three Dimensional Geometry p. 148, 149, 150; Geometric Shapes p. 158
• Analyze, compare, create, and compose shapes.	Two and Three Dimensional Geometry p. 148, 149, 150; Geometric Modeling p.154; Geometric Relationships p. 157
G1 Geometry	
• Reason with shapes and their attributes.	Fractions p. 121; Two and Three Dimensional Geometry p. 148, 149, 150; Geometric Relationships p. 157
G2 Geometry	
• Reason with shapes and their attributes.	Circles p. 151; Fractions p. 121; Geometric Relationships p. 157; Two and Three Dimensional Geometry p. 148, 149, 150; Quadrilaterals p. 161
G3 Geometry	
• Reason with shapes and their attributes.	Fractions p. 121; Geometric Relationships p. 157; Two and Three Dimensional Geometry p. 148, 149, 150; Quadrilaterals p. 161
G4 Geometry	
• Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	Transformations and Symmetry p. 164; Two-Dimensional Geometry p. 148
G5 Geometry	
• Graph points on the coordinate plane to solve real-world and mathematical problems.	Coordinate Geometry p. 153; Graphic Representation p. 196
• Classify two-dimensional figures into categories based on their properties.	Geometric Relationships p. 157; Sorting and Classifying p. 162, Two-Dimensional Geometry p. 148
G6 Geometry	
• Solve real-world and mathematical problems involving area, surface area, and volume.	Coordinate Geometry p. 153; Formulas p. 137; Perimeter, Area and Volume p. 175
G7 Geometry	
• Draw, construct and describe geometrical figures and describe the relationships between them.	Two-Dimensional Geometry p. 148; Geometric Relationships p. 157
• Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	Angle Measurement p. 168; Perimeter, Area and Volume p. 175
G8 Geometry	
• Understand congruence and similarity using physical models, transparencies, or geometry software.	Congruence and Similarity p. 152; Transformations and Symmetry p. 164; Angle Measurement p. 168
• Understand and apply the Pythagorean Theorem.	Geometric Relationships p. 157, Geometric Theorems p. 159
• Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.	Formulas p. 137; Volume p. 177
HS Geometry	
HS Congruence	

• Experiment with transformations in the plane	Transformations and Symmetry p. 164
• Understand congruence in terms of rigid motions	Congruence and Similarity p. 152; Transformations and Symmetry p. 164
• Prove geometric theorems	Geometric Theorems p. 159; Conjecture, Proof and Justification p. 201
• Make geometric constructions	Two and Three Dimensional Geometry p. 150
HS Similarity, Right Triangles, and Trigonometry	
• Understand similarity in terms of similarity transformations	Congruence and Similarity p. 152; Transformations and Symmetry p. 164
• Prove theorems involving similarity	Congruence and Similarity p. 152; Conjecture, Proof and Justification p. 20; Geometric Theorems p. 159
• Define trigonometric ratios and solve problems involving right triangles	Triangles p. 165; Trigonometry p. 166
• Apply trigonometry to general triangles	Triangles p. 165; Trigonometry p. 166
HS Circles	
• Understand and apply theorems about circles	Circles p. 151
• Find arc lengths and areas of sectors of circles	Circles p. 151
HS Expressing Geometric Properties with Equations	
• Translate between the geometric description and the equation for a conic section	Geometric Modeling p. 154
• Use coordinates to prove simple geometric theorems algebraically	Coordinate Geometry p. 153
HS Geometric Measurement and Dimension	
• Explain volume formulas and use them to solve problems	Formulas p. 137; Volume p. 177
• Visualize relationships between two dimensional and three-dimensional objects	Two and Three Dimensional Geometry p. 150, Spatial Visualization p. 163
HS Modeling with Geometry	
• Apply geometric concepts in modeling situations	Geometric Modeling p. 154

Statistics and Probability related Domains and Clusters

Common Core Domain and Grade Level Clusters	Curriculum Topic Study
G6 Statistics and Probability	
• Develop understanding of statistical variability.	Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187
• Summarize and describe distributions.	Line Plots, Stem and Leaf Plots, Box Plots, and Histograms p. 180; Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187
G7 Statistics and Probability	
• Use random sampling to draw inferences about a population.	Sampling p. 183; Statistical Reasoning p. 186; Summarizing Data p. 187
• Draw informal comparative inferences about two populations.	Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187
• Investigate chance processes and develop, use, and evaluate probability models.	Probability p. 182
G8 Statistics and Probability	
• Investigate patterns of association in bivariate data.	Algebraic Modeling; Scatterplots and Correlation p. 184
High School: Statistics and Probability	
HS Interpreting Categorical and Quantitative Data	
• Summarize, represent, and interpret data on a single count or measurement variable	Line Plots, Stem and Leaf Plots, Box Plots and Histograms p. 180; Measures of Center and Spread p. 181; Statistical Reasoning p. 186; Summarizing Data p. 187
• Summarize, represent, and interpret data on two categorical and quantitative variables	Measures of Center and Spread p. 181; Scatterplots and Correlation p. 184; Statistical Reasoning p. 186; Summarizing Data p. 187
• Interpret linear models	Scatterplots and Correlation p. 184; Algebraic Modeling p. 135
HS Making Inferences and Justifying Conclusions	
• Understand and evaluate random processes underlying statistical experiments	Sampling p. 183; Simulations p. 185; Statistical Reasoning p. 186
• Make inferences and justify conclusions from sample surveys, experiments and observational studies	Sampling p. 183; Simulations p. 185; Statistical Reasoning p. 186
HS Conditional Probability and the Rules of Probability	
• Understand independence and conditional probability and use them to interpret data	Probability p. 182
• Use the rules of probability to compute probabilities of compound events in a uniform probability model	Probability p. 182
HS Using Probability to Make Decisions	
• Calculate expected values and use them to solve problems	Probability p. 182
• Use probability to evaluate outcomes of decisions	Probability p. 182