

New York Mathematics Core Curriculum	Boardworks Middle School Math Presentations
Grade 5	
Number Sense and Operations Strand	
<i>Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.</i>	
<i>Number Systems</i>	
5.N.1 Read and write whole numbers to millions	Place value Scientific notation
5.N.2 Compare and order numbers to millions	Ordering integers Ordering decimals Using negative numbers in context
5.N.3 Understand the place value structure of the base ten number system: 10 ones = 1 ten; 10 tens = 1 hundred; 10 hundreds = 1 thousand; 10 thousands = 1 ten thousand; 10 ten thousands = 1 hundred thousand; 10 hundred thousands = 1 million	Place value
5.N.4 Create equivalent fractions, given a fraction	Equivalent fractions
5.N.5 Compare and order fractions including unlike denominators (with and without the use of a number line) Note: Commonly used fractions such as those that might be indicated on ruler, measuring cup, etc.	Ordering fractions Equivalent fractions
5.N.6 Understand the concept of ratio	Ratio and rate
5.N.7 Express ratios in different forms	Ratio and rate
5.N.8 Read, write, and order decimals to thousandths	Place value Ordering decimals
5.N.9 Compare fractions using $<$, $>$, or $=$	Ordering fractions Inequalities
5.N.10 Compare decimals using $<$, $>$, or $=$	Ordering decimals Inequalities
5.N.11 Understand that percent means part of 100, and write percents as fractions and decimals	Introducing percentages Equivalent fractions, decimals and percentages
<i>Number Theory</i>	
5.N.12 Recognize that some numbers are only divisible by one and themselves (prime) and others have multiple divisors (composite)	Prime numbers

5.N.13 Calculate multiples of a whole number and the least common multiple of two numbers	Multiples and factors GCF and LCM
5.N.14 Identify the factors of a given number	Multiples and factors
5.N.15 Find the common factors and the greatest common factor of two numbers	Multiples and factors GCF and LCM
<i>Students will understand meanings of operations and procedures, and how they relate to one another.</i>	
<i>Operations</i>	
5.N.16 Use a variety of strategies to multiply three-digit by three-digit numbers Note: Multiplication by anything greater than a three digit multiplier/multiplicand should be done using technology.	Multiplying and dividing integers Mental multiplication Written methods for multiplication
5.N.17 Use a variety of strategies to divide three-digit numbers by one and two-digit numbers Note: Division by anything greater than a two-digit divisor should be done using technology.	Multiplying and dividing integers Divisibility Mental division Written methods for division
5.N.18 Evaluate an arithmetic expression using order of operations including multiplication, division, addition, subtraction and parentheses	Order of operations and PEMDAS
5.N.19 Simplify fractions to lowest terms	Adding and subtracting simple fractions Equivalent fractions
5.N.20 Convert improper fractions to mixed numbers, and mixed numbers to improper fractions	Adding and subtracting simple fractions Methods for adding and subtracting fractions
5.N.21 Use a variety of strategies to add and subtract fractions with like denominators	Adding and subtracting simple fractions Methods for adding and subtracting fractions
5.N.22 Add and subtract mixed numbers with like denominators	Adding and subtracting simple fractions Methods for adding and subtracting fractions
5.N.23 Use a variety of strategies to add, subtract, multiply, and divide decimals to thousandths	Multiplying and dividing by 0.1 and 0.01 Multiplying by numbers between 0 and 1 Written methods for addition and subtraction Written methods for multiplication Written methods for division Mental addition and subtraction Mental multiplication Mental division Mental math and place value Mental math puzzles

<i>Students will compute accurately and make reasonable estimates.</i>	
<i>Estimation</i>	
5.N.24 Round numbers to the nearest hundredth and up to 10,000	Rounding
5.N.25 Estimate sums and differences of fractions with like denominators	Adding and subtracting simple fractions Methods for adding and subtracting fractions
5.N.26 Estimate sums, differences, products, and quotients of decimals	Estimation and approximation
5.N.27 Justify the reasonableness of answers using estimation	Estimation and approximation Using a calculator Checking results
Algebra Strand	
<i>Students will represent and analyze algebraically a wide variety of problem solving situations.</i>	
<i>Variables and Expressions</i>	
5.A.1 Define and use appropriate terminology when referring to constants, variables, and algebraic expressions	Writing expressions
5.A.2 Translate simple verbal expressions into algebraic expressions	Writing expressions
<i>Students will perform algebraic procedures accurately.</i>	
<i>Variables and Expressions</i>	
5.A.3 Substitute assigned values into variable expressions and evaluate using order of operations	Substitution Order of operations and PEMDAS
<i>Equations and Inequalities</i>	
5.A.4 Solve simple one-step equations using basic whole-number facts	Solving simple equations
5.A.5 Solve and explain simple one-step equations using inverse operations involving whole numbers	Solving simple equations
5.A.6 Evaluate the perimeter formula for given input values	Perimeter Using formulas
<i>Students will recognize, use, and represent algebraically patterns, relations, and functions.</i>	
<i>Patterns, Relations, and Functions</i>	
5.A.7 Create and explain patterns and algebraic relationships (e.g., 2, 4, 6, 8...) algebraically: $2n$ (doubling)	Introducing sequences
5.A.8 Create algebraic or geometric patterns using concrete objects or visual drawings (e.g., rotate and shade geometric shapes)	Introducing sequences Sequences from geometrical patterns Tessellations
Geometry Strand	
<i>Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.</i>	
<i>Shapes</i>	
5.G.1 Calculate the perimeter of regular and irregular polygons	Perimeter Using formulas

<i>Students will identify and justify geometric relationships, formally and informally.</i>	
<i>Geometric Relationships</i>	
5.G.2 Identify pairs of similar triangles	Congruence
5.G.3 Identify the ratio of corresponding sides of similar triangles	Dilation Using scale factors
5.G.4 Classify quadrilaterals by properties of their angles and sides	Quadrilaterals
5.G.5 Know that the sum of the interior angles of a quadrilateral is 360 degrees	The sum of interior and exterior angles
5.G.6 Classify triangles by properties of their angles and sides	Triangles Angles in a triangle
5.G.7 Know that the sum of the interior angles of a triangle is 180 degrees	The sum of interior and exterior angles Angles in a triangle
5.G.8 Find a missing angle when given two angles of a triangle	Angles in a triangle
5.G.9 Identify pairs of congruent triangles	Congruence
5.G.10 Identify corresponding parts of congruent triangles	Congruence
<i>Students will apply transformations and symmetry to analyze problem solving situations.</i>	
<i>Transformational Geometry</i>	
5.G.11 Identify and draw lines of symmetry of basic geometric shapes	Reflection symmetry
<i>Students will apply coordinate geometry to analyze problem solving situations.</i>	
<i>Coordinate Geometry</i>	
5.G.12 Identify and plot points in the first quadrant	Introducing coordinates Reading and plotting graphs
5.G.13 Plot points to form basic geometric shapes (identify and classify)	Quadrilaterals on a coordinate grid
5.G.14 Calculate perimeter of basic geometric shapes drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths and parallel to the axes)	-
Measurement Strand	
<i>Students will determine what can be measured and how, using appropriate methods and formulas.</i>	
<i>Units of Measurement</i>	
5.M.1 Use a ruler to measure to the nearest inch, 1/2, 1/4, and 1/8 inch	-
5.M.2 Identify customary equivalent units of length	Customary unit conversions
5.M.3 Measure to the nearest centimeter	-
5.M.4 Identify equivalent metric units of length	Converting metric units
5.M.5 Convert measurement within a given system	Customary unit conversions Converting metric units
<i>Tools and Methods</i>	
5.M.6 Determine the tool and technique to measure with an appropriate level of precision: lengths and angles	Measuring angles

<i>Students will use units to give meaning to measurements.</i>	
<i>Units</i>	
5.M.7 Calculate elapsed time in hours and minutes	-
5.M.8 Measure and draw angles using a protractor	Measuring angles
<i>Students will develop strategies for estimating measurements.</i>	
<i>Estimation</i>	
5.M.9 Determine personal references for customary units of length (e.g., your pace is approximately 3 feet, your height is approximately 5 feet, etc.)	Estimating measurements
5.M.10 Determine personal references for metric units of length	Estimating measurements
5.M.11 Justify the reasonableness of estimates	Estimating measurements
Statistics and Probability Strand	
<i>Students will collect, organize, display, and analyze data.</i>	
<i>Collection of Data</i>	
5.S.1 Collect and record data from a variety of sources (e.g., newspapers, magazines, polls, charts, and surveys)	Collecting data
<i>Organization and Display of Data</i>	
5.S.2 Display data in a line graph to show an increase or decrease over time	Line graphs
<i>Analysis of Data</i>	
5.S.3 Calculate the mean for a given set of data and use to describe a set of data	Calculating the mean
<i>Students will make predictions that are based upon data analysis.</i>	
<i>Predictions from Data</i>	
5.S.4 Formulate conclusions and make predictions from graphs	Distance-time graphs Interpreting graphs Comparing data Reading and plotting graphs
<i>Students will understand and apply concepts of probability.</i>	
<i>Probability</i>	
5.S.5 List the possible outcomes for a single-event experiment	The language of probability Calculating probability part 1
5.S.6 Record experiment results using fractions/ratios	Experimental probability
5.S.7 Create a sample space and determine the probability of a single event, given a simple experiment (e.g., rolling a number cube)	Calculating probability part 1

Grade 6	
Number Sense and Operations Strand	
<i>Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.</i>	
<i>Number Systems</i>	
6.N.1 Read and write whole numbers to trillions	Place value Scientific notation
6.N.2 Define and identify the commutative and associative properties of addition and multiplication	Properties of numbers Adding and subtracting integers Adding and subtracting integers activities
6.N.3 Define and identify the distributive property of multiplication over addition	Properties of numbers Multiplying and dividing integers
6.N.4 Define and identify the identity and inverse properties of addition and multiplication	Properties of numbers Solving simple equations Inverse functions Adding and subtracting integers activities
6.N.5 Define and identify the zero property of multiplication	Properties of numbers
6.N.6 Understand the concept of rate	Ratio and rate
6.N.7 Express equivalent ratios as a proportion	Dividing in a given ratio Ratio and rate
6.N.8 Distinguish the difference between rate and ratio	Ratio and rate
6.N.9 Solve proportions using equivalent fractions	Equivalent fractions, decimals and percentages Equivalent fractions Dividing in a given ratio
6.N.10 Verify the proportionality using the product of the means equals the product of the extremes	-
6.N.11 Read, write, and identify percents of a whole (0% to 100%)	Introducing percentages Equivalent fractions, decimals and percentages Comparing proportions Calculating percentages mentally Calculating percentages on paper Calculating percentages with a calculator

6.N.12 Solve percent problems involving percent, rate, and base	Percentage change Percentages and inverse operations Comparing proportions
6.N.13 Define absolute value and determine the absolute value of rational numbers (including positive and negative)	Absolute value Ordering integers Using negative numbers in context
6.N.14 Locate rational numbers on a number line (including positive and negative)	Ordering integers Ordering fractions Ordering decimals Equivalent fractions, decimals and percentages
6.N.15 Order rational numbers (including positive and negative)	Ordering integers Ordering fractions Ordering decimals Equivalent fractions, decimals and percentages Using negative numbers in context
<i>Students will understand meanings of operations and procedures, and how they relate to one another.</i>	
<i>Operations</i>	
6.N.16 Add and subtract fractions with unlike denominators	Adding and subtracting simple fractions Methods for adding and subtracting fractions
6.N.17 Multiply and divide fractions with unlike denominators	Multiplying fractions Dividing by fractions
6.N.18 Add, subtract, multiply, and divide mixed numbers with unlike denominators	Methods for adding and subtracting fractions Multiplying fractions Dividing by fractions
6.N.19 Identify the multiplicative inverse (reciprocal) of a number	-
6.N.20 Represent fractions as terminating or repeating decimals	Fractions and decimals Equivalent fractions, decimals and percentages
6.N.21 Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100)	Equivalent fractions, decimals and percentages Fractions and decimals
6.N.22 Evaluate numerical expressions using order of operations (may include exponents of two and three)	Order of operations and PEMDAS
6.N.23 Represent repeated multiplication in exponential form	Powers
6.N.24 Represent exponential form as repeated multiplication	Powers

6.N.25 Evaluate expressions having exponents where the power is an exponent of one, two, or three	Powers
<i>Students will compute accurately and make reasonable estimates.</i>	
<i>Estimation</i>	
6.N.26 Estimate a percent of quantity (0% to 100%)	Calculating percentages mentally Introducing percentages
6.N.27 Justify the reasonableness of answers using estimation (including rounding)	Rounding Checking results Estimation and approximation Using a calculator
Algebra Strand	
<i>Students will represent and analyze algebraically a wide variety of problem solving situations.</i>	
<i>Variables and Expressions</i>	
6.A.1 Translate two-step verbal expressions into algebraic expressions	Writing expressions
<i>Students will perform algebraic procedures accurately.</i>	
<i>Variables and Expressions</i>	
6.A.2 Use substitution to evaluate algebraic expressions (may include exponents of one, two and three)	Substitution
<i>Equations and Inequalities</i>	
6.A.3 Translate two-step verbal sentences into algebraic equations	Writing expressions
6.A.4 Solve and explain two-step equations involving whole numbers using inverse operations	Solving simple equations
6.A.5 Solve simple proportions within context	Direct variations
6.A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.)	Introducing formulas Using formulas Circumference of a circle Area of a circle Area problems Area Volume
Geometry Strand	
<i>Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.</i>	
<i>Shapes</i>	
6.G.1 Calculate the length of corresponding sides of similar triangles, using proportional reasoning	Dilation Finding missing lengths

6.G.2 Determine the area of triangles and quadrilaterals (squares, rectangles, rhombi, and trapezoids) and develop formulas	Area Area problems Introducing formulas Using formulas
6.G.3 Use a variety of strategies to find the area of regular and irregular polygons	Area Area of irregular shapes Area problems Using formulas
6.G.4 Determine the volume of rectangular prisms by counting cubes and develop the formula	Volume
6.G.5 Identify radius, diameter, chords and central angles of a circle	Circles
6.G.6 Understand the relationship between the diameter and radius of a circle	Circles Circumference of a circle
6.G.7 Determine the area and circumference of a circle, using the appropriate formula	Circumference of a circle Area of a circle
6.G.8 Calculate the area of a sector of a circle, given the measure of a central angle and the radius of the circle	Area of a circle
6.G.9 Understand the relationship between the circumference and the diameter of a circle	Circumference of a circle
<i>Students will apply coordinate geometry to analyze problem solving situations.</i>	
<i>Coordinate Geometry</i>	
6.G.10 Identify and plot points in all four quadrants	Introducing coordinates Quadrilaterals on a coordinate grid
6.G.11 Calculate the area of basic polygons drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths)	-
Measurement Strand	
<i>Students will determine what can be measured and how, using appropriate methods and formulas.</i>	
<i>Units of Measurement</i>	
6.M.1 Measure capacity and calculate volume of a rectangular prism	Volume
6.M.2 Identify customary units of capacity (cups, pints, quarts, and gallons)	Customary unit conversions
6.M.3 Identify equivalent customary units of capacity (cups to pints, pints to quarts, and quarts to gallons)	Customary unit conversions
6.M.4 Identify metric units of capacity (liter and milliliter)	Converting metric units
6.M.5 Identify equivalent metric units of capacity (milliliter to liter and liter to milliliter)	Converting metric units
<i>Tools and Methods</i>	
6.M.6 Determine the tool and technique to measure with an appropriate level of precision: capacity	Volume

<i>Students will develop strategies for estimating measurements.</i>	
<i>Estimation</i>	
6.M.7 Estimate volume, area, and circumference (see figures identified in geometry strand)	Estimating measurements Circumference of a circle Volume
6.M.8 Justify the reasonableness of estimates	Estimating measurements
6.M.9 Determine personal references for capacity	Estimating measurements
Statistics and Probability Strand	
<i>Students will collect, organize, display, and analyze data.</i>	
<i>Collection of Data</i>	
6.S.1 Develop the concept of sampling when collecting data from a population and decide the best method to collect data for a particular question	Population and sampling Collecting data
<i>Organization and Display of Data</i>	
6.S.2 Record data in a frequency table	Organizing data Histograms
6.S.3 Construct Venn diagrams to sort data	Venn diagrams
6.S.4 Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram, or circle graph)	Appropriate graphs Line graphs Bar graphs Circle graphs Histograms
<i>Analysis of Data</i>	
6.S.5 Determine the mean, mode and median for a given set of data	Finding the mode Finding the median Calculating the mean
6.S.6 Determine the range for a given set of data	Finding the range
6.S.7 Read and interpret graphs	Reading and plotting graphs Interpreting graphs Distance-time graphs Comparing data Line graphs
<i>Students will make predictions that are based upon data analysis.</i>	
<i>Predictions from Data</i>	
6.S.8 Justify predictions made from data	Experimental probability

<i>Students will understand and apply concepts of probability.</i>	
<i>Probability</i>	
6.S.9 List possible outcomes for compound events	Probability diagrams
6.S.10 Determine the probability of dependent events	-
6.S.11 Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probability	Probability diagrams
Grade 7	
Number Sense and Operations Strand	
<i>Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.</i>	
<i>Number Systems</i>	
7.N.1 Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers)	Rational and irrational numbers Ordering integers
7.N.2 Recognize the difference between rational and irrational numbers (e.g., explore different approximations of π)	Rational and irrational numbers
7.N.3 Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers	Ordering decimals Ordering integers Ordering fractions Estimation and approximation
7.N.4 Develop the laws of exponents for multiplication and division	Powers
7.N.5 Write numbers in scientific notation	Scientific notation
7.N.6 Translate numbers from scientific notation into standard form	Scientific notation
7.N.7 Compare numbers written in scientific notation	Scientific notation
<i>Number Theory</i>	
7.N.8 Find the common factors and greatest common factor of two or more numbers	Multiples and factors GCF and LCM
7.N.9 Determine multiples and least common multiple of two or more numbers	Multiples and factors GCF and LCM
7.N.10 Determine the prime factorization of a given number and write in exponential form	Prime factorization
<i>Students will understand meanings of operations and procedures, and how they relate to one another.</i>	
<i>Operations</i>	
7.N.11 Simplify expressions using order of operations Note: Expressions may include absolute value and/or integral exponents greater than 0	Order of operations and PEMDAS

	Adding and subtracting integers Adding and subtracting integers activities Written methods for addition and subtraction Using negative numbers in context Mental addition and subtraction Multiplying and dividing integers Written methods for multiplication Mental multiplication Divisibility Written methods for division Mental division
7.N.12 Add, subtract, multiply, and divide integers	
	Adding and subtracting integers Adding and subtracting integers activities Written methods for addition and subtraction Mental addition and subtraction Using negative numbers in context
7.N.13 Add and subtract two integers (with and without the use of a number line)	
7.N.14 Develop a conceptual understanding of negative and zero exponents with a base of ten and relate to fractions and decimals (e.g., $10^{-2} = .01 = 1/100$)	Scientific notation
7.N.15 Recognize and state the value of the square root of a perfect square (up to 225)	Square and triangular numbers Square roots
7.N.16 Determine the square root of non-perfect squares using a calculator	Square roots
7.N.17 Classify irrational numbers as non-repeating/non-terminating decimals	Rational and irrational numbers
<i>Students will compute accurately and make reasonable estimates.</i>	
<i>Estimation</i>	
7.N.18 Identify the two consecutive whole numbers between which the square root of a non-perfect square whole number less than 225 lies (with and without the use of a number line)	Estimation and approximation Square roots
	Estimation and approximation Checking results Using a calculator
7.N.19 Justify the reasonableness of answers using estimation	
Algebra Strand	
<i>Students will represent and analyze algebraically a wide variety of problem solving situations.</i>	
<i>Variables and Expressions</i>	
7.A.1 Translate two-step verbal expressions into algebraic expressions	Writing expressions

<i>Students will perform algebraic procedures accurately.</i>	
<i>Variables and Expressions</i>	
	Writing expressions Solving simple equations Inverse functions Equations with variables on both sides Equations involving parentheses and division
7.A.2 Add and subtract monomials with exponents of one	
7.A.3 Identify a polynomial as an algebraic expression containing one or more terms	-
<i>Equations and Inequalities</i>	
	Combining like terms Properties of numbers Factoring expressions Equations with variables on both sides Transforming formulas Multiplying algebraic terms Solving simple equations Equations involving parentheses and division
7.A.4 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation	
7.A.5 Solve one-step inequalities (positive coefficients only) (See 7.G.10)	Integer solutions for inequalities Solving linear inequalities
7.A.6 Evaluate formulas for given input values (surface area, rate, and density problems)	Using formulas Surface area
<i>Students will recognize, use, and represent algebraically patterns, relations, and functions.</i>	
<i>Patterns, Relations, and Functions</i>	
	Graphs of functions The equation of a straight line Reading and plotting graphs Graphs of nonlinear functions Exploring nonlinear graphs
7.A.7 Draw the graphic representation of a pattern from an equation and Functions or from a table of data	
	Introducing sequences Sequences from geometrical patterns Describing and continuing sequences Generating sequences from flow charts Generating sequences and rules Finding the nth term Sequences from practical contexts Deriving formulas
7.A.8 Create algebraic patterns using charts/tables, graphs, equations, and expressions	

7.A.9 Build a pattern to develop a rule for determining the sum of the interior angles of polygons	Angles in polygons The sum of interior and exterior angles
7.A.10 Write an equation to represent a function from a table of values	Mapping functions
Geometry Strand	
<i>Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.</i>	
<i>Shapes</i>	
7.G.1 Calculate the radius or diameter, given the circumference or area of a circle	Circumference of a circle Area of a circle Transforming formulas
7.G.2 Calculate the volume of prisms and cylinders, using a given formula and a calculator	Volume Cylinders, cones and spheres Formulas for shapes
7.G.3 Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids)	Solid shapes 2D representations of 3D spaces Nets
7.G.4 Determine the surface area of prisms and cylinders, using a calculator and a variety of methods	Surface area Cylinders, cones and spheres
<i>Students will identify and justify geometric relationships, formally and informally.</i>	
<i>Geometric Relationships</i>	
7.G.5 Identify the right angle, hypotenuse, and legs of a right triangle	Identifying right triangles Triangles
7.G.6 Explore the relationship between the lengths of the three sides of a right triangle to develop the Pythagorean Theorem	Pythagorean Theorem
7.G.7 Find a missing angle when given angles of a quadrilateral	The sum of interior and exterior angles
7.G.8 Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle	Pythagorean Theorem Calculating sides of right triangles
7.G.9 Determine whether a given triangle is a right triangle by applying the Pythagorean Theorem and using a calculator	-
<i>Students will apply coordinate geometry to analyze problem solving situations.</i>	
<i>Coordinate Geometry</i>	
7.G.10 Graph the solution set of an inequality (positive coefficients only) on a number line (See 7.A.5)	Inequalities on a number line
Measurement Strand	
<i>Students will determine what can be measured and how, using appropriate methods and formulas.</i>	
<i>Units of Measurement</i>	
7.M.1 Calculate distance using a map scale	Scale drawings

7.M.2 Convert capacities and volumes within a given system	Customary unit conversions Converting metric units
7.M.3 Identify customary and metric units of mass	Customary unit conversions Converting metric units
7.M.4 Convert mass within a given system	Customary unit conversions Converting metric units
7.M.5 Calculate unit price using proportions	Ratio and rate
7.M.6 Compare unit prices	Ratio and rate
7.M.7 Convert money between different currencies with the use of an exchange rate table and a calculator	Conversion graphs
7.M.8 Draw central angles in a given circle using a protractor (circle graphs)	Circle graphs
<i>Tools and Methods</i>	
7.M.9 Determine the tool and technique to measure with an appropriate level of precision: mass	-
<i>Students will develop strategies for estimating measurements.</i>	
<i>Estimation</i>	
7.M.10 Identify the relationships between relative error and magnitude when dealing with large numbers (e.g., money, population)	-
7.M.11 Estimate surface area	Surface area
7.M.12 Determine personal references for customary /metric units of mass	Estimating measurements
7.M.13 Justify the reasonableness of the mass of an object	Estimating measurements
Statistics and Probability Strand	
<i>Students will collect, organize, display, and analyze data.</i>	
<i>Collection of Data</i>	
7.S.1 Identify and collect data using a variety of methods	Population and sampling Collecting data
<i>Organization and Display of Data</i>	
7.S.2 Display data in a circle graph	Circle graphs
7.S.3 Convert raw data into double bar graphs and double line graphs	Bar graphs Line graphs
<i>Analysis of Data</i>	
7.S.4 Calculate the range for a given set of data	Finding the range
7.S.5 Select the appropriate measure of central tendency	Finding the mode Finding the median Calculating the mean Calculating statistics

	Interpreting graphs Appropriate graphs Reading and plotting graphs Bar graphs Histograms Line graphs Circle graphs Distance-time graphs Comparing data
7.S.6 Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs or circle graph)	
<i>Students will make predictions that are based upon data analysis.</i>	
<i>Predictions from Data</i>	
7.S.7 Identify and explain misleading statistics and graphs	Misleading graphs
<i>Students will understand and apply concepts of probability.</i>	
<i>Probability</i>	
	Calculating probability part 1 Calculating probability part 2 Experimental probability Probability diagrams
7.S.8 Interpret data to provide the basis for predictions and to establish experimental probabilities	
7.S.9 Determine the validity of sampling methods to predict outcomes	Population and sampling
	Calculating probability part 1 Calculating probability part 2 Experimental probability Probability diagrams
7.S.10 Predict the outcome of an experiment	
7.S.11 Design and conduct an experiment to test predictions	-
7.S.12 Compare actual results to predicted results	Experimental probability
Grade 8	
Number Sense and Operations Strand	
<i>Students will understand meanings of operations and procedures, and how they relate to one another.</i>	
<i>Operations</i>	
8.N.1 Develop and apply the laws of exponents for multiplication and division	Powers
	Powers Nonlinear equations
8.N.2 Evaluate expressions with integral exponents	Nonlinear equations and spreadsheets

8.N.3 Read, write, and identify percents less than 1% and greater than 100%	Percentage change Calculating percentages mentally Equivalent fractions, decimals and percentages
8.N.4 Apply percents to: Tax, Percent increase/decrease, Simple interest, Sale price, Commission, Interest rates, Gratuities	Percentage change Calculating percentages mentally
<i>Students will compute accurately and make reasonable estimates.</i>	
<i>Estimation</i>	
8.N.5 Estimate a percent of quantity, given an application	Introducing percentages Calculating percentages mentally
8.N.6 Justify the reasonableness of answers using estimation	Estimation and approximation Using a calculator Checking results
Algebra Strand	
<i>Students will represent and analyze algebraically a wide variety of problem solving situations.</i>	
<i>Variables and Expressions</i>	
8.A.1 Translate verbal sentences into algebraic inequalities	Inequalities on a number line Solving linear inequalities
8.A.2 Write verbal expressions that match given mathematical expressions	Writing expressions
8.A.3 Describe a situation involving relationships that matches a given graph	Distance-time graphs Interpreting graphs Exploring nonlinear graphs Direct variations
8.A.4 Create a graph given a description or an expression for a situation involving a linear or nonlinear relationship	Graphs of nonlinear functions Exploring nonlinear graphs Interpreting graphs Graphs of functions Direct variations The equation of a straight line Conversion graphs
8.A.5 Use physical models to perform operations with polynomials	-

<i>Students will perform algebraic procedures accurately.</i>	
<i>Variables and Expressions</i>	
8.A.6 Multiply and divide monomials	Multiplying algebraic terms Dividing algebraic terms Solving simple equations Equations involving parentheses and division
8.A.7 Add and subtract polynomials (integer coefficients)	Nonlinear equations Nonlinear equations and spreadsheets
8.A.8 Multiply a binomial by a monomial or a binomial (integer coefficients)	Equations involving parentheses and division Factoring expressions Multiplying algebraic terms
8.A.9 Divide a polynomial by a monomial (integer coefficients) Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables.	Dividing algebraic terms
8.A.10 Factor algebraic expressions using the GCF	Factorizing expressions GCF and LCM
8.A.11 Factor a trinomial in the form $ax^2 + bx + c$; $a=1$ and c having no more than three sets of factors	Nonlinear equations
<i>Equations and Inequalities</i>	
8.A.12 Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines	Angles made with parallel lines Calculating angles
8.A.13 Solve multi-step inequalities and graph the solution set on a number line	Combined linear inequalities
8.A.14 Solve linear inequalities by combining like terms, using the distributive property, or moving variables to one side of the inequality (include multiplication or division of inequalities by a negative number)	Solving linear inequalities Combined linear inequalities Properties of numbers
<i>Students will recognize, use, and represent algebraically patterns, relations, and functions.</i>	
<i>Patterns, Relations, And Functions</i>	
8.A.15 Understand that numerical information can be represented in multiple ways: arithmetically, algebraically, and graphically	Writing expressions The equation of a straight line
8.A.16 Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line	Graphs of functions The equation of a straight line Direct variations
8.A.17 Define and use correct terminology when referring to function (domain and range)	Function notation and relations
8.A.18 Determine if a relation is a function	Function notation and relations

	Graphs of functions The equation of a straight line Direct variations Graphs of nonlinear functions Exploring nonlinear graphs
8.A.19 Interpret multiple representations using equation, table of values, and graph	
Geometry Strand	
<i>Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.</i>	
<i>Constructions</i>	
8.G.0 Construct the following, using a straight edge and compass: Segment congruent to a segment, Angle congruent to an angle, Perpendicular bisector, Angle bisector	Constructing lines and angles Drawing lines and angles
<i>Students will identify and justify geometric relationships, formally and informally.</i>	
<i>Geometric</i>	
8.G.1 Identify pairs of vertical angles as congruent	Calculating angles
<i>Relationships</i>	
8.G.2 Identify pairs of supplementary and complementary angles	Calculating angles
8.G.3 Calculate the missing angle in a supplementary or complementary pair	Calculating angles
8.G.4 Determine angle pair relationships when given two parallel lines cut by a transversal	Angles made with parallel lines
8.G.5 Calculate the missing angle measurements when given two parallel lines cut by a transversal	Angles made with parallel lines
8.G.6 Calculate the missing angle measurements when given two intersecting lines and an angle	Calculating angles
<i>Students will apply transformations and symmetry to analyze problem solving situations.</i>	
<i>Transformational Geometry</i>	
8.G.7 Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations)	Rotation Reflection Translation Dilation Finding missing lengths Combining transformations
8.G.8 Draw the image of a figure under rotations of 90 and 180 degrees	Rotation Rotational symmetry Combining transformations
8.G.9 Draw the image of a figure under a reflection over a given line	Reflection Reflection symmetry Combining transformations
8.G.10 Draw the image of a figure under a translation	Translation Combining transformations

8.G.11 Draw the image of a figure under a dilation	Dilation Finding missing lengths
8.G.12 Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation <i>Students will apply coordinate geometry to analyze problem solving situations.</i>	Rotation Reflection Translation Dilation Finding missing lengths Combining transformations
<i>Coordinate Geometry</i>	
8.G.13 Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change	The equation of a straight line Distance-time graphs Interpreting graphs Direct variations
8.G.14 Determine the y-intercept of a line from a graph and be able to explain the y-intercept	The equation of a straight line
8.G.15 Graph a line using a table of values	The equation of a straight line Graphs of functions Reading and plotting graphs Direct variations Graphs of nonlinear functions Exploring nonlinear graphs
8.G.16 Determine the equation of a line given the slope and the y-intercept	The equation of a straight line
8.G.17 Graph a line from an equation in slope-intercept form ($y = mx + b$)	The equation of a straight line Graphs of functions
8.G.18 Solve systems of equations graphically (only linear, integral solutions, $y = mx + b$ format, no vertical/horizontal lines)	Systems of linear equations
8.G.19 Graph the solution set of an inequality on a number line	Inequalities on a number line Combined linear inequalities
8.G.20 Distinguish between linear and nonlinear equations $ax^2 + bx + c$; $a=1$ (only graphically)	Graphs of nonlinear functions Exploring nonlinear graphs Graphs of functions
8.G.21 Recognize the characteristics of quadratics in tables, graphs, equations, and situations	Graphs of nonlinear functions Exploring nonlinear graphs

Measurement Strand	
<i>Students will determine what can be measured and how, using appropriate methods and formulas.</i>	
<i>Units of Measurement</i>	
8.M.1 Solve equations/proportions to convert to equivalent measurements within metric and customary measurement systems Note: Also allow Fahrenheit to Celsius and vice versa.	Customary unit conversions Converting metric units Using negative numbers in context Ratio and proportion problems Using scale factors