

MATH TOPICS

GRADE 5

WHOLE NUMBERS

- Read, write, estimate and round multi-digit numbers past 1,000,000
- Multiply multi-digit numbers
- Divide numbers up to four digits by a digit divisor

FRACTIONS AND MIXED NUMBERS

- Find the least common denominator between two fractions
- Add and subtract fractions and mixed numbers with unlike denominators
- Multiply proper and improper fractions and mixed numbers by fractions
- Divide fractions by whole numbers
- Divide whole numbers by fractions
- Divide fractions by fractions

DECIMALS

- Comparing and rounding decimals to thousandths
- Rewriting decimals as fractions and mixed numbers
- Multiplying and dividing decimals by whole numbers
- Multiply decimals to hundredths by decimals to hundredths
- Divide whole numbers by decimals
- Divide decimals to thousandths by decimals to hundredths

RATIO

- Comparing amounts and expressing it in ratio form
- Finding equivalent ratios
- Comparing three quantities
- Simplifying ratios

PERCENT

- Expressing fractions with a denominator of 10 or 100 as percent
- Expressing decimals as percent
- Finding percent of a number (what is 64% of 240)
- Expressing a fraction with a denominator other than 10 or 100 as a percent
- Expressing partial percent (8.25%) as a fraction
- Finding percentage of a whole (what percent of students like...)
- Finding percent of change (increase by 30%, decrease by 20%)



GEOMETRY

Angles

- Angles on a line
- Angles at a point
- Vertical angles

Triangles and quadrilaterals

- Classifying triangles
- Angle measures of a triangle
- Right, isosceles, and equilateral triangles
- Triangle inequalities
- Parallelogram, rhombus and trapezoid

Area of a triangle

- Identifying base and height of a triangle
- Finding the area of a triangle
- Given the area and the height or base, find the height or base (missing number)
- Find the area of a triangle, given its points on the coordinate plane



Three dimensional shapes

- Prisms and pyramids
- Cylinders, spheres and cones

Surface area and volume

- Nets and surface area
- Understanding and measuring volume
- Volume of a rectangular prism
- Volume of liquid in a rectangular prism
- Cross section of solids
- Volume of prisms other than rectangular, including composite prisms

GRAPHS AND PROBABILITY

- Making and interpreting double bar graphs
- Graphing points on a coordinate plane
- Graphing an equation
- Combinations
- Theoretical probability
- Experimental probability
- Collecting and tabulating data
- Making and interpreting dot plots
- Making, interpreting and comparing histograms, including outliers

ALGEBRA

- Using letters in place of numbers
- Writing algebraic expressions
- Evaluating algebraic expressions
- Simplifying algebraic expressions
- Expanding algebraic expressions
- Factoring algebraic expressions
- Solving algebraic equations
- Writing linear equations
- Writing simple inequalities
- Representing inequalities on a number line

GRADE 6

WHOLE NUMBERS OPERATIONS

- Divide multi-digit whole numbers by multi digit whole numbers
- Estimate quotients of multi-digit whole numbers
- Even/Odd addition and multiplication rules
- Divisibility rules for 3 and 9
- Finding factors, multiples, greatest common factors and least common multiple of two numbers
- Euclidean Algorithm
- Long Division Algorithm
- Understanding the relationship between addition/subtraction, multiplication/division, addition/multiplication, and division/subtraction
- Order of operations
- Exponential notation
- Interpreting square root of a perfect square
- Interpreting cube and cube roots of perfect cubes

FRACTIONS, DECIMALS AND PERCENT

- Convert between a fraction, decimal and percent
- Find percentage of a whole
- Find whole given percent and part
- Divide whole number by a fraction
- Divide fraction by a fraction
- Dividing fractions by a mixed numbers and mixed numbers by fractions
- Multiplying decimals by decimals
- Convert decimal division into whole number division using fractions or mental math
- Divide decimals by decimals (up to thousandths)

RATIOS, RATES AND UNIT RATES

- Writing and interpreting ratio relationships
- Evaluating and generating equivalent ratios
- Representing associated ratios in fraction form
- Generating and interpreting ratio tables

- Comparing ratios
- Representing ratios with an equation
- Plotting ratios on a double number line and the coordinate plane
- Transforming ratios to rates and unit rates
- Comparing unit rates across tables, graphs and equations
- Use ratios to convert units of length, weight and capacity
- Find the rate, time or distance given the other two values

RATIONAL NUMBERS

- Plotting positive and negative numbers on a number line
- Finding and interpreting absolute value-magnitude and distance
- Plotting rational numbers (fractions and decimals) on a number line
- Ordering and comparing integers and other rational numbers
- Ordering and comparing absolute value

EXPRESSIONS, EQUATIONS AND INEQUALITIES

- Writing and reading expressions using variables (letters in place of numbers)
- Writing and evaluating addition, subtraction and division expressions including ones with fractional coefficients
- Writing, expanding and evaluating multiplication expressions including ones with fractional coefficients
- Factoring and distributing expressions
- Writing and evaluating expressions with exponents
- Writing, interpreting and graphing inequality statements
- Understanding true and false number sentences
- Finding solutions to make equations true
- Solving one, two and multi-step problems using all operations
- Expanding and Simplifying expressions involving two variables

GEOMETRY

- Area of parallelogram using formula $A=bh$
- Area of triangle using formula $A= \frac{1}{2}bh$
- Area of polygons using composition and decomposition
- Determine the formula for the area of a regular polygon
- Find the circumference of a circle using a radius or diameter
- Find the distance around composite figures that include semicircles or quadrants
- Find the area of a circle, semicircle or quadrant
- Find the area of composite shapes including circles, semicircles or quadrants
- Volume with fractional edge lengths
- Formula for volume of a rectangular prism
- Using nets to represent 3-D figures and find surface area
- Finding surface area for a 3-D figure using formulas
- Finding the volume and surface area of a cylinder, cone or sphere

THE COORDINATE PLANE

- Locating and graphing points on the coordinate plane
- Determining the axis of each coordinate based on its position (x axis first, y axis second)
- Determining which quadrant a point lies in
- Symmetry across the coordinate plane
- Drawing a coordinate plane with a number scale other than 1:1
- Finding the distance between two points or the length of a horizontal or vertical line
- Finding the perimeter and area of polygons on the coordinate plane
- Drawing polygons in the coordinate plane

STATISTICS

- Posing statistical questions
- Displaying a data distribution with dot plots, histograms, and box plots and stem and leaf plots
- Interpreting and describing distribution using mean, mean absolute deviation, median, interquartile range and mode
- Comparing data distribution and variability in a data distribution
- Connecting graphical representations and numerical summaries
- Understanding random sampling methods
- Making inferences about populations



GRADE 7

RATIOS AND PROPORTIONAL RELATIONSHIPS

- Identifying proportional and non-proportional relationships in tables and graphs
- Representing proportional relationships with equations and graphs, including those involving fractions
- Interpreting graphs of proportional relationships
- Understanding inverse proportion
- Understanding functions and relations
- Representing functions algebraically, with a table of values, and with graphs
- Understanding linear and non-linear functions
- Comparing two functions
- Ratios of fractions and their unit rates
- Finding equivalent ratios given the total quantity
- Relating scaled drawings to ratios and rates and computing actual lengths and areas from scale drawings
- Creating a scale drawing
- Changing the scale of a drawing

PERCENT

- Part of a whole as a percent
- Comparing quantities with percent
- Percent increase and decrease
- Markup/Markdown problems
- Simple interest, tax, commissions, fees and other real-world percent applications

RATIONAL NUMBERS AND THE REAL NUMBER SYSTEM

- Opposite quantities combine to make zero
- Develop rules for multiplying signed numbers
- Converting between fractions and decimals using equivalent fractions or long division
- Applying the properties of operations to add, subtract, multiply and divide rational numbers
- Introducing irrational numbers, the real number system and significant digits

INTEGER EXPONENTS AND SCIENTIFIC NOTATION

- Exponential notation
- Multiplication and division of numbers in exponential form
- Numbers in exponential form raised to a power
- Numbers raised to the zeroth power
- Negative exponents and the laws of exponents
- Prime factorization in exponential notation
- Scientific notation-addition, subtraction, multiplication and division

ALGEBRA

- Writing, evaluating and finding equivalent expressions with rational numbers
- Use properties of operations to generate equivalent expressions
- Use identity and inverse to write equivalent expressions
- Solving equations using algebra and if-then moves
- Solving linear equations with one variable and two variables
- Identifying linear equations with one solution, no solutions or infinite solutions
- Finding and interpreting slopes and y-intercept of lines
- Writing and graphing linear equations
- Solving systems of linear equations using algebraic methods and graphing
- Determining inconsistent and dependent systems of linear equations
- Properties of inequalities
- Solving inequalities and graphing solutions to inequalities

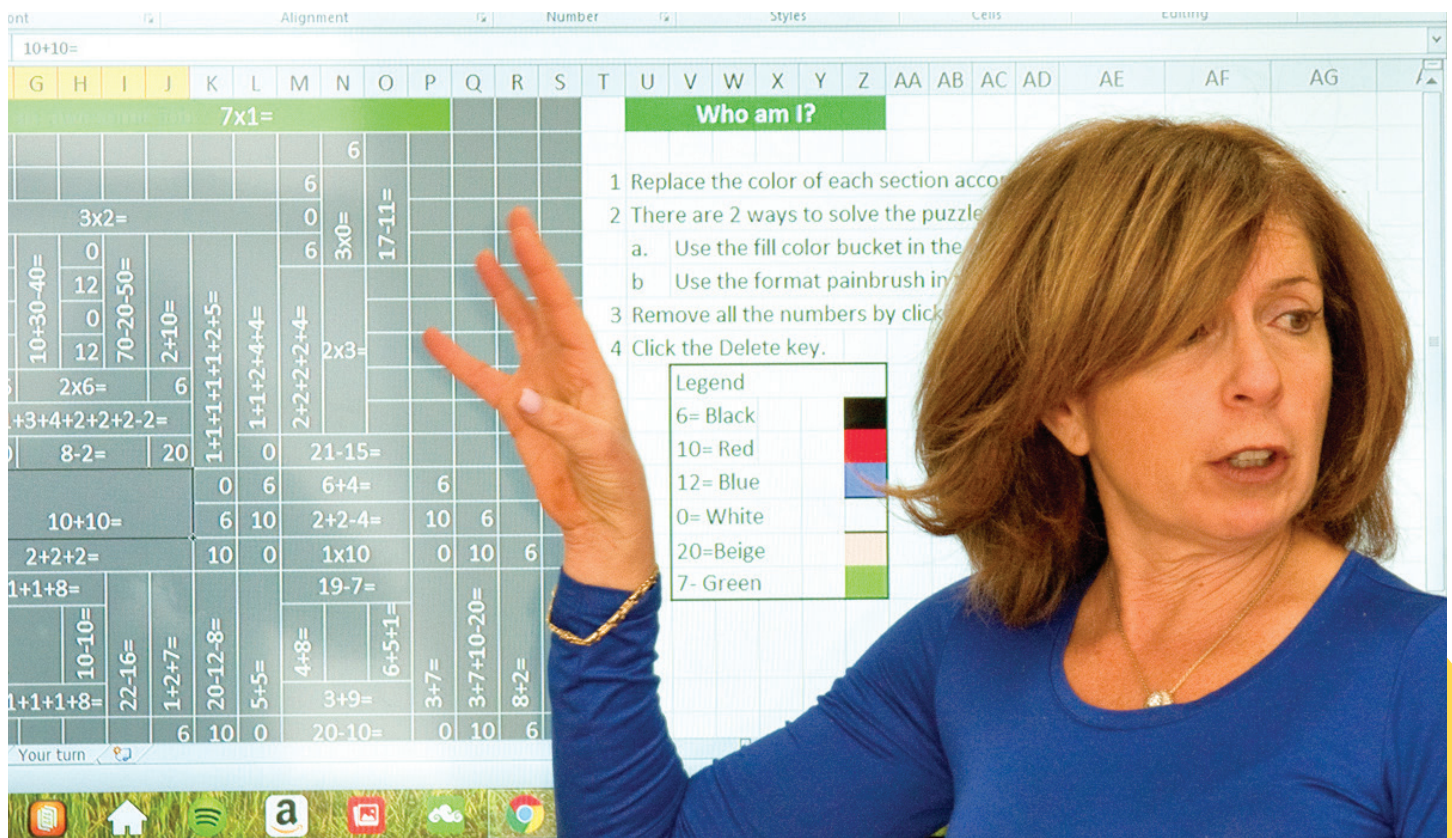
STATISTICS AND PROBABILITY

- Chance experiments with equally and not equally likely outcomes
- Calculating probability of single and compound events
- Using tree diagrams to represent a sample space and calculate probabilities
- Theoretical probability vs. estimated probability
- Conducting a simulation to estimate probability
- Random sampling, sampling variability and estimating population characteristics

GEOMETRY

- Area of a circle
- Solving problems involving area and circumference
- Solving problems involving composite area and unknown area in the coordinate plane
- Complementary, supplementary, adjacent, alternate interior, alternate exterior and corresponding angles
- Angles that share a vertex and interior/exterior angles

- Solving for unknown angles using equations
- Identical triangles
- Unique triangles-three sides, two sides and included angles, two angles and a given side, two sides and a non-included angle
- Understanding the Pythagorean theorem
- Understanding the distance formula
- Slicing a right rectangular prism or pyramid with a plane
- Slicing on an angle
- Area problems with circular regions
- Surface area
- Volume of right prisms and composite 3-D objects
- Translations, reflections, rotations and dilations
- Comparing geometric transformations
- Understanding and applying congruent and similar figures and relating them to geometric transformations



GRADE 8

INTEGER EXPONENTS AND SCIENTIFIC NOTATION

- Exponential notation
- Multiplication of numbers in exponential form
- Numbers in exponential form raised to a power
- Numbers raised to the zeroth power
- Negative exponents and the laws of exponents
- Scientific notation-addition, subtraction, multiplication and division
- Comparing numbers in scientific notation

GEOMETRY

- Translations, reflections, rotations, and dilations
- Understanding congruence and similarity
- Corresponding, alternate interior and alternate exterior angles
- Angle sum of a triangle and finding missing interior or exterior angles
- Pythagorean theorem and its converse
- Volume of cones, cylinders, spheres and composite solids

LINEAR EQUATIONS

- Solving linear equations with one variable and two variables
- Identifying linear equations with one solution, no solutions or infinite solutions
- Finding and interpreting slopes and y-intercept of lines
- Writing and graphing linear equations
- Solving systems of linear equations using algebraic methods and graphing

FUNCTIONS

- Linear functions and proportionality
- Graphs and equations of functions-linear and non-linear
- Interpreting rate of change and initial value
- Increasing and decreasing functions

STATISTICS AND PROBABILITY

- Scatter plots and patterns in scatter plots
- Summarizing bivariate categorical data in a two-way table
- Association between categorical variables
- Linear and non-linear models in a data context

THE REAL NUMBER SYSTEM

- Square and cube roots
- Solving equations with radicals
- Finite and infinite decimals
- Decimal expansion of fractions, irrational numbers and pi.

8th grade accelerated math track follows the high school Algebra I curriculum and takes the Algebra I regent at the end of 8th grade.