

NUMBERS AND OPERATIONS

<i>Describe situations in which opposite quantities combine to make 0.</i>
<i>Apply properties of operations as strategies to add and subtract rational numbers.</i>
<i>Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</i>
<i>Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</i>
<i>Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</i>
<i>Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</i>
<i>Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</i>

Recognize, read, and write numbers to twelve digits.	m
Recognize, read, and write integers.	D
Recognize, read, and write rational numbers.	M
Identify least common denominators, greatest common factor of two or more numbers.	m
Recognize, read, and write decimals to thousandths and beyond.	m
Identify equivalent decimals and inequalities.	m
Rename decimals as fractions and fractions as decimals.	m
Round numbers to nearest billionth, round repeating decimals.	m
Recognize, read, and write Roman numerals.	D
Recognize, read, and write Irrational numbers.	D
Recognize, read, and write Real Numbers.	M
Identify prime and composite numbers.	m

Grade 7

I=Introduce

D=Develop

I/D=Intro/Dev

M=Mastery

m=maintain

DATE COMPLETED

Identify opposites of any number.	M
Identify a "Set."	D
Use signs of equality and inequality, =, ≠, <, >.	M
Use signs of equality and inequality ≤, ≥.	I
Compare and order decimals, fractions, combinations of decimals and fractions, percentages.	m
In terms of set notation, identify elements.	M
In terms of set notation: identify subsets, domain and range.	I
Recognize, read, and write place value to the right of the decimal place through six digits and beyond.	m
Round numbers to the nearest cent.	m
Perform operations using whole numbers and integers: estimating addition, subtraction, multiplication,	m
Add: Compute with regrouping: negative numbers.	M
Add: Compute with regrouping: using mental math.	D
Subtract: Compute with regrouping: with negative numbers and using mental math.	D
Multiply: check by division with negative numbers.	I
Multiply: check by division with associative property, and product of prime numbers.	m
Multiply: check by division with distributive property.	M
Multiply: check by division with mental math.	D
Divide: check by multiplication with dollars and cents.	m
Divide: check by multiplication with negative numbers.	I
Divide: check by multiplication using mental math.	D
Calculate using exponents/roots.	D
Recognize, read, and write numbers using expanded notation.	m
Fractions, decimals, percents: calculate equal parts of a whole, equivalent fractions, simplest form, mixed numbers, proper and improper fractions, ratios, inequalities, reciprocals, least common denominator, and greatest common factor.	m
Fractions, decimals, percents: addition by estimation, unlike denominators, mixed numbers, improper/proper fractions, decimal alignment.	m
Add fractions, decimals, percents by combining fractions, decimals and/or whole numbers.	M
Add, subtract, multiply, divide fractions, decimals, percents with negative numbers.	I
Add, subtract, multiply, divide fractions, decimals, percents using mental math.	D
Subtract fractions, decimals, percents using estimation, unlike denominators, mixed numbers,	m
Multiply fractions, decimals, percents: using estimation, with fractions: fraction times fraction, whole	m
Multiply: decimal placement, decimal times decimal.	M
Multiply: combinations of fractions, decimals and/or whole numbers.	M
Divide fractions, decimals, percents: estimation, with dollars and cents, with fractions (fraction/fraction),	m

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Recognize division by zero as impossible.	I
Divide: combination of fractions, decimals, and/or whole numbers.	M
Apply the correct order of operations.	M
Solve problems involving: percent less than, greater than 100%.	M
Solve problems involving percent of increase or decrease.	D
Solve problems involving simple interest.	M
Solve problems involving compound interest.	I
Solve problems involving mark up/down, commission/profit.	M
Solve problems involving unit pricing.	m

ALGEBRA

<i>Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</i>
<i>Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</i>
<i>Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</i>
<i>Represent proportional relationships by equations.</i>
<i>Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1,r) where r is the unit rate.</i>

EXPRESSIONS AND EQUATIONS

<i>Use properties of operations to generate equivalent expressions.</i>
<i>Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</i>
<i>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</i>
<i>Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</i>

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Read, write, and solve algebraic word problems.	I
Solve inequalities using: additive property of inequality; multiplicative property of inequality, absolute value of inequality.	I
Factor polynomials using greatest common factor.	I
Explore linear relationships with and without technology by identifying coordinates and graphing.	M
Solve problems by graphing three points or identifying the slope intercept.	I
Explore linear relationships symbolically by using the distance formula.	I
Discuss/analyze change by measuring and comparing quantities; using tables and graphs; using equations with constant rate of change and nonlinear relationships	D

MEASUREMENT & DATA

Use manipulatives materials to model concepts of measurement.	D
Compare and/or order objects using appropriate units of U.S. customary system with length: 1/8, 1/16.	m
Make conversions within U.S. customary system.	m
Compare and/or order objects using appropriate units of the metric system: millimeter, centimeter, decimeter, meter; dekameter, hectometer; kilometer; milliliter, liter, kiloleter; gram, kilogram; conversions within system; temperature in Celsius.	M
Recognize, read, and write time schedules.	D
Recognize, read, and write time zones.	m

GEOMETRY

<i>Draw construct, and describe geometrical figures and describe the relationships between them.</i>	
<i>Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</i>	
Define, compare, demonstrate, and calculate: perimeter, area (of square, rectangle, triangle, parallelogram, trapezoid), circumference, volume.	m
Calculate the area of a circle.	M
Calculate the surface area of a prism.	D
Explain and construct scale drawings.	m
Investigate and predict the result of slide and turn.	M
Investigate and predict the result of flip.	D

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Describe, model, draw and classify lines that are straight, intersecting, parallel, perpendicular; rays and segments; angle vertex; acute, obtuse, straight and congruent angles.	m
Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	M
Identify corresponding, alternate interior/exterior, vertical and bisector angles.	I
Identify triangles: isosceles, scalene, acute, obtuse, equilateral and right.	M
Identify right Triangle parts: hypotenuse and leg, Pythagorean Theorem, 30-60-90, 45-45-90.	I
Identify triangles: base/height (altitude).	m
Identify quadrilaterals: parallelograms, rhombuses, trapezoids; pentagons, hexagons, octagons.	m
Identify quadrilaterals: heptagons, nine-sided and beyond convex, concave.	D
Identify parts of circles: center, chord, diameter, Pi, radius.	m
Identify degrees, arc of a circle, inscribed circles.	M
Identify irregular shapes.	M
Identify solid figures: prisms (triangular, rectangular); pyramid; symmetry, congruency.	m
Identify complex prisms (with multi-sided bases).	D
Construct convincing arguments and proofs to solve problems using geometric figures and patterns using diagrams.	m
Draw logical conclusions and communicate reasoning: using technology; formulate, develop, and communicate logical arguments; develop and solve problems using geometric relationships, using models and using technology.	D

STATISTICS AND PROBABILITY

Collect and describe data using random samplings*.	D
Organize and construct data by identifying, drawing, labeling and analyzing tables.	D
Analyze data via circle graph.	M
Analyze and create Venn diagram.	D
Identify and label dependent and independent variables.	m
Read, calculate, and interpret data: mean, median, mode, range.	m
Read, calculate, and interpret data: quartiles.	I
Calculate probability: single event; permutations, combinations.	D
Calculate probability: independent events, dependent events.	I
Format questions: Conduct experiments/surveys.	D
Demonstrate data collection methods.	D
Design data collection methods.	D
Make inferences: draw conclusions, communicate results, make predictions.	D

PROBLEM SOLVING

Analyze and plan a problem determining the appropriate strategy by: drawing pictures, creating original problems, determining if information is sufficient to solve, relating to an easier problem, using tables, charts, graphs, and diagrams, trial and error, working backwards, sorting classifying and using patterns, estimation, choosing correct operation.	D
Solve fraction and decimal word problems, word problems with two statements of equality, distance=rate X time.	D
<i>Check reasonableness of solution.</i>	D
Understand patterns and relationships by observing, comparing and creating; sorting and classifying by characteristics; predicting what comes next and identifying the missing element; distinguishing between growing and repeating patterns; representing information numerically, graphically, and verbally; discussing analyzing change.	D
