

<p>B.8.2 Perform and explain operations on rational numbers (add, subtract, multiply, divide, raise to a power, extract a root, take opposites and reciprocals, determine absolute value)</p>	<p>Adding and subtracting integers Adding and subtracting integers activities Multiplying and dividing integers Multiplying by numbers between 0 and 1 Multiplying and dividing by 0.1 and 0.01 Adding and subtracting simple fractions Methods for adding and subtracting fractions Finding a fraction of an amount Multiplying fractions Dividing by fractions Powers Square and triangular numbers Square roots Cubes and cube roots Absolute value Mental addition and subtraction Mental multiplication Mental division Written methods for addition and subtraction Written methods for multiplication Written methods for division</p>
<p>B.8.3 Generate and explain equivalencies among fractions, decimals, and percents</p>	<p>Equivalent fractions Fractions and decimals Equivalent fractions, decimals and percentages Introducing percentages</p>
<p>B.8.4 Express order relationships among rational numbers using appropriate symbols ($>$, $<$, \geq, \leq, \neq)</p>	<p>Inequalities Square roots</p>

B.8.5 Apply proportional thinking in a variety of problem situations that include, but are not limited to	
- ratios and proportions (e.g., rates, scale drawings, similarity)	Ratio and rate Dividing in a given ratio Direct proportion Using scale factors Ratio and proportion problems Congruence Scale drawings Finding missing lengths
- percents, including those greater than 100 and less than one (e.g., discounts, rate of increase or decrease, sales tax)	Comparing proportions Percentage change Percentages and inverse operations Calculating percentages mentally Calculating percentages on paper Calculating percentages with a calculator
B.8.6 Model and solve problems involving number-theory concepts such as	
- prime and composite numbers	Prime numbers Prime factorization
- divisibility and remainders	Divisibility Multiples and factors
- greatest common factors	GCF and LCM Multiples and factors
- least common multiples	GCF and LCM Multiples and factors
B.8.7 In problem-solving situations, select and use appropriate computational procedures with rational numbers such as	
- calculating mentally	Calculating percentages mentally Mental addition and subtraction Mental multiplication Mental division Mental math and place value Multiplying by numbers between 0 and 1 Mental math puzzles
- estimating	Estimation and approximation

- creating, using, and explaining algorithms	Written methods for addition and subtraction Written methods for multiplication Written methods for division
- using technology (e.g., scientific calculators, spreadsheets)	Using a calculator Nonlinear equations and spreadsheets
Mathematics, Standard C: Geometry	
C.8.1 Describe special and complex two- and three-dimensional figures (e.g., rhombus, polyhedron, cylinder) and their component parts (e.g., base, altitude, and slant height) by:	
- naming, defining, and giving examples	Triangles Quadrilaterals Polygons Circles Solid shapes
- comparing, sorting, and classifying them	Triangles Quadrilaterals Polygons Solid shapes
- identifying and contrasting their properties (e.g., symmetrical, isosceles, regular)	Triangles Quadrilaterals Polygons Solid shapes
- drawing and constructing physical models to specifications	Constructing triangles Drawing lines and angles Constructing lines and angles Constructing nets 2-D representations of 3-D shapes
- explaining how these figures are related to objects in the environment	-
C.8.2 Identify and use relationships among the component parts of special and complex two- and three-dimensional figures (e.g., parallel sides, congruent faces).	Parallel and perpendicular lines Congruence
C.8.3 Identify three-dimensional shapes from two-dimensional perspectives and draw two-dimensional sketches of three-dimensional objects preserving their significant features	Views of 3-D shapes Nets 2-D representations of 3-D shapes

C.8.4 Perform transformations on two-dimensional figures and describe and analyze the effects of the transformations on the figures	Reflection Rotation Translation Dilation Combining transformations
C.8.5 Locate objects using the rectangular coordinate system	Introducing coordinates Quadrilaterals on a coordinate grid Reading and plotting graphs
Mathematics, Standard D: Measurement	
D.8.1 Identify and describe attributes in situations where they are not directly or easily measurable (e.g., distance, area of an irregular figure, likelihood of occurrence)	Area of irregular shapes Perimeter Volume
D.8.2 Demonstrate understanding of basic measurement facts, principles, and techniques including the following	
- approximate comparisons between metric and US Customary units (e.g., a liter and a quart are about the same; a kilometer is about six-tenths of a mile)	Converting metric units Customary unit conversions Estimating measurements
- knowledge that direct measurement produces approximate, not exact, measures	-
- the use of smaller units to produce more precise measures	Reading scales Ordering decimals
D.8.3 Determine measurement directly using standard units (metric and US Customary) with these suggested degrees of accuracy	
- lengths to the nearest mm or 1/16 of an inch	-
- weight (mass) to the nearest 0.1 g or 0.5 ounce	-
- liquid capacity to the nearest ml	-
- angles to the nearest degree	Drawing lines and angles Measuring angles
- temperature to the nearest C or F	Using negative numbers in context Reading scales
- elapsed time to the nearest second	-
D.8.4 Determine measurements indirectly using	
- estimation	Estimating measurements
- conversion of units within a system (e.g., quarts to cups, millimeters to centimeters)	Converting metric units Customary unit conversions

- ratio and proportion (e.g., similarity, scale drawings)	Finding missing lengths Scale drawings Using scale factors
- geometric formulas to derive lengths, areas, volumes of common figures (e.g., perimeter, circumference, surface area)	Perimeter Area Area problems Volume Surface area Using formulas Circumference of a circle Area of a circle Cylinders, cones and spheres Formulas for shapes
- the Pythagorean relationship	Pythagorean Theorem Pythagorean triples Calculating sides of right triangles
- geometric relationships and properties for angle size (e.g., parallel lines and transversals; sum of angles of a triangle; vertical angles)	Parallel and perpendicular lines Angles made with parallel lines Calculating angles Angles in a triangle The sum of interior and exterior angles Angles in polygons
Mathematics, Standard E: Statistics and Probability	
E.8.1 Work with data in the context of real-world situations by:	
- formulating questions that lead to data collection and analysis	Collecting data
- designing and conducting a statistical investigation	Population and sampling Collecting data
- using technology to generate displays, summary statistics, and presentations	-
E.8.2 Organize and display data from statistical investigations using:	
- appropriate tables, graphs, and/or charts (e.g., circle, bar or line for multiple sets of data)	Appropriate graphs Collecting data Circle graphs Bar graphs Line graphs Histograms

- appropriate plots (e.g., line, stem-and-leaf, box, scatter)	Appropriate graphs Scatter plots Quartiles and box plots
E.8.3 Extract, interpret, and analyze information from organized and displayed data by using:	
- frequency and distribution, including mode and range	Finding the mode Finding the range Comparing data
- central tendencies of data (mean and median)	Calculating the mean Finding the median Calculating statistics
- indicators of dispersion (e.g., outliers)	Calculating statistics
E.8.4 Use the results of data analysis to:	
- make predictions	Writing a statistical report
- develop convincing arguments	Writing a statistical report
- draw conclusions	Writing a statistical report Calculating statistics Comparing data
E.8.5 Compare several sets of data to generate, test, and, as the data dictate, confirm or deny hypotheses	-
E.8.6 Evaluate presentations and statistical analyses from a variety of sources for:	
- credibility of the source	-
- techniques of collection, organization, and presentation of data	Population and sampling Collecting data
- missing or incorrect data	Misleading graphs
- inferences	Collecting data
- possible sources of bias	Population and sampling Collecting data
E.8.7 Determine the likelihood of occurrence of simple events by:	
- using a variety of strategies to identify possible outcomes (e.g., lists, tables, tree diagrams)	Probability diagrams
- conducting an experiment	Experimental probability
- designing and conducting simulations	Experimental probability
- applying theoretical notions of probability (e.g., that four equally likely events have a 25% chance of happening)	The language of probability Calculating probability part 1

Mathematics, Standard F: Algebraic Relationships	
F.8.1 Work with algebraic expressions in a variety of ways, including	
- using appropriate symbolism, including exponents and variables	Writing expressions Introducing formulas Powers
- evaluating expressions through numerical substitution	Substitution
- generating equivalent expressions	Writing expressions Combining like terms Multiplying algebraic terms Dividing algebraic terms Factoring expressions
- adding and subtracting expressions	Solving simple equations Equations involving parentheses and division
F.8.2 Work with linear and nonlinear patterns and relationships in a variety of ways, including	
- representing them with tables, with graphs, and with algebraic expressions, equations, and inequalities	Mapping functions Graphs of functions Generating sequences and rules Sequences from practical contexts The equation of a straight line Direct variations Nonlinear equations Nonlinear equations and spreadsheets Graphs of nonlinear functions Exploring nonlinear graphs Deriving formulas Conversion graphs
- describing and interpreting their graphical representations (e.g., slope, rate of change, intercepts)	Direct variations The equation of a straight line
- using them as models of real-world phenomena	Sequences from practical contexts Deriving formulas Conversion graphs
- describing a real-world phenomenon that a given graph might represent	Interpreting graphs Distance-time graphs Conversion graphs

<p>F.8.3 Recognize, describe, and analyze functional relationships by generalizing a rule that characterizes the pattern of change among variables. These functional relationships include exponential growth and decay (e.g., cell division, depreciation)</p>	<p>Mapping functions Graphs of functions The equation of a straight line Generating sequences and rules Sequences from practical contexts Exploring nonlinear graphs Direct variations</p>
<p>F.8.4 Use linear equations and inequalities in a variety of ways, including</p>	
<p>- writing them to represent problem situations and to express generalizations</p>	<p>Writing expressions Introducing formulas Inequalities on a number line Solving linear inequalities</p>
<p>- solving them by different methods (e.g., informally, graphically, with formal properties, with technology)</p>	<p>Solving simple equations Equations with variables on both sides Equations involving parentheses and division The equation of a straight line Inequalities on a number line Integer solutions for inequalities Solving linear inequalities Combined linear inequalities Inequalities and regions Systems of linear equations</p>
<p>- writing and evaluating formulas (including solving for a specified variable)</p>	<p>Introducing formulas Using formulas Transforming formulas Deriving formulas</p>
<p>- using them to record and describe solution strategies</p>	<p>Inequalities on a number line Combined linear inequalities Writing expressions Introducing formulas Deriving formulas</p>

F.8.5 Recognize and use generalized properties and relations, including	
- additive and multiplicative property of equations and inequalities	Properties of numbers
- commutativity and associativity of addition and multiplication	Properties of numbers
- distributive property	Properties of numbers
- inverses and identities for addition and multiplication	Properties of numbers Inverse functions Mental math puzzles
- transitive property	-