

Problem Solving Strand		
<i>Students will build new mathematical knowledge through problem solving.</i>		
8.PS.1	Use a variety of strategies to understand new mathematical content and to develop more efficient methods	Used throughout the text
8.PS.2	Construct appropriate extensions to problem situations	Used throughout the text, specifically in Problem Solving feature
8.PS.3	Understand and demonstrate how written symbols represent mathematical ideas	Used throughout the text
<i>Students will solve problems that arise in mathematics and in other contexts.</i>		
8.PS.4	Observe patterns and formulate generalizations	Used throughout the text, for example 2.1, 6.7, 11.1
8.PS.5	Make conjectures from generalizations	Used throughout the text, for example 2.6, 6.8, 9.4
8.PS.6	Represent problem situations verbally, numerically, algebraically, and graphically	Used throughout the text
<i>Students will apply and adapt a variety of appropriate strategies to solve problems.</i>		
8.PS.7	Understand that there is no one right way to solve mathematical problems but that different methods have advantages and disadvantages	Used throughout the text, specifically in Problem Solving feature
8.PS.8	Understand how to break a complex problem into simpler parts or use a similar problem type to solve a problem	Used throughout the text, specifically in Problem Solving feature
8.PS.9	Work backwards from a solution	Used throughout the text, specifically in Problem Solving feature
8.PS.10	Use proportionality to model problems	6.1, 6.2, 6.3
8.PS.11	Work in collaboration with others to solve problems	Used throughout the text, specifically in Math Labs
<i>Students will monitor and reflect on the process of mathematical problem solving.</i>		
8.PS.12	Interpret solutions within the given constraints of a problem	Used throughout the text, specifically in Cumulative Problem Solving feature
8.PS.13	Set expectations and limits for possible solutions	Used throughout the text, specifically in Cumulative Problem Solving feature
8.PS.14	Determine information required to solve the problem	Used throughout the text, specifically in Cumulative Problem Solving feature
8.PS.15	Choose methods for obtaining required information	Used throughout the text, specifically in Math Labs and Cumulative Problem Solving feature
8.PS.16	Justify solution methods through logical argument	Used throughout the text, specifically in Problem Solving feature and Cumulative Problem Solving feature
8.PS.17	Evaluate the efficiency of different representations of a problem	Used throughout the text, specifically in Problem Solving feature, Math Labs, and Cumulative Problem Solving feature

Reasoning and Proof Strand		
<i>Students will recognize reasoning and proof as fundamental aspects of mathematics.</i>		
8.RP.1	Recognize that mathematical ideas can be supported by a variety of strategies	Used throughout the text, specifically in Cumulative Problem Solving feature
<i>Students will make and investigate mathematical conjectures.</i>		
8.RP.2	Use mathematical strategies to reach a conclusion	Used throughout the text, specifically in Problem Solving feature and Cumulative Problem Solving feature
8.RP.3	Evaluate conjectures by distinguishing relevant from irrelevant information to reach a conclusion or make appropriate estimates	Used throughout the text, specifically in Cumulative Problem Solving feature
<i>Students will develop and evaluate mathematical arguments and proofs.</i>		
8.RP.4	Provide supportive arguments for conjectures	Used throughout the text
8.RP.5	Develop, verify, and explain an argument, using appropriate mathematical ideas and language	Used throughout the text
<i>Students will select and use various types of reasoning and methods of proof.</i>		
8.RP.6	Support an argument by using a systematic approach to test more than one case	Used throughout the text, specifically in Math Labs
8.RP.7	Devise ways to verify results, or use counterexamples to refute incorrect statements	Used throughout the text, specifically in Math Labs
8.RP.8	Apply inductive reasoning in making and supporting mathematical conjectures	Used throughout the text, specifically in Math Labs, and lesson 11.1

Communication Strand		
<i>Students will organize and consolidate their mathematical thinking through communication.</i>		
8.CM.1	Provide a correct, complete, coherent, and clear rationale for thought process used in problem solving	Used throughout the text
8.CM.2	Provide an organized argument which explains rationale for strategy selection	Used throughout the text
8.CM.3	Organize and accurately label work	Used throughout the text
<i>Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.</i>		
8.CM.4	Share organized mathematical ideas through the manipulation of objects, numerical tables, drawings, pictures, charts, graphs, tables, diagrams, models and symbols in written and verbal form	Used throughout the text, specifically in Cumulative Problem Solving feature and Math Labs
8.CM.5	Answer clarifying questions from others	Used throughout the text, specifically in Math Labs
<i>Students will analyze and evaluate the mathematical thinking and strategies of others.</i>		
8.CM.6	Analyze mathematical solutions shared by others	Used throughout the text, specifically in Math Labs
8.CM.7	Compare strategies used and solutions found by others in relation to their own work	Used throughout the text, specifically in Cumulative Problem Solving feature and Math Labs
8.CM.8	Formulate mathematical questions that elicit, extend, or challenge strategies, solutions, and/or conjectures of others	Used throughout the text, specifically in Cumulative Problem Solving feature and Math Labs
<i>Students will use the language of mathematics to express mathematical ideas precisely.</i>		
8.CM.9	Increase their use of mathematical vocabulary and language when communicating with others	Used throughout the text, specifically in Think and Discuss in Lesson Assessment
8.CM.10	Use appropriate language, representations, and terminology when describing objects, relationships, mathematical solutions, and rationale	Used throughout the text, specifically in Lesson Assessments and Cumulative Problem Solving feature
8.CM.11	Draw conclusions about mathematical ideas through decoding, comprehension, and interpretation of mathematical visuals, symbols, and technical writing	Used throughout the text, specifically in Lesson Assessments and Cumulative Problem Solving feature

Connections Strand		
<i>Students will recognize and use connections among mathematical ideas.</i>		
8.CN.1	Understand and make connections among multiple representations of the same mathematical idea	Used throughout the text
8.CN.2	Recognize connections between subsets of mathematical ideas	Used throughout the text, specifically in Cumulative Problem Solving feature
8.CN.3	Connect and apply a variety of strategies to solve problems	Used throughout the text, for example
<i>Students will understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</i>		
8.CN.4	Model situations mathematically, using representations to draw conclusions and formulate new situations	Used throughout the text, specifically in Cumulative Problem Solving feature
8.CN.5	Understand how concepts, procedures, and mathematical results in one area of mathematics can be used to solve problems in other areas of mathematics	Used throughout the text, specifically in Cumulative Problem Solving feature
<i>Students will recognize and apply mathematics in contexts outside of mathematics.</i>		
8.CN.6	Recognize and provide examples of the presence of mathematics in their daily lives	Used throughout the text, specifically in Cumulative Problem Solving feature and Math Labs
8.CN.7	Apply mathematical ideas to problem situations that develop outside of mathematics	Used throughout the text, specifically in Cumulative Problem Solving feature and Problem Solving feature
8.CN.8	Investigate the presence of mathematics in careers and areas of interest	Used throughout the text, specifically in Cumulative Problem Solving feature
8.CN.9	Recognize and apply mathematics to other disciplines, areas of interest, and societal issues	Used throughout the text, specifically in Cumulative Problem Solving feature and Problem Solving feature

Representation Strand		
<i>Students will create and use representations to organize, record, and communicate mathematical ideas.</i>		
8.R.1	Use physical objects, drawings, charts, tables, graphs, symbols, equations, and objects created using technology as representations	Used throughout the text
8.R.2	Explain, describe, and defend mathematical ideas using representations	Used throughout the text
8.R.3	Recognize, compare, and use an array of representational forms	Used throughout the text
8.R.4	Explain how different representations express the same relationship	Used throughout the text
8.R.5	Use standard and non-standard representations with accuracy and detail	Used throughout the text
<i>Students will select, apply, and translate among mathematical representations to solve problems.</i>		
8.R.6	Use representations to explore problem situations	Used throughout the text, specifically in Problem Solving feature and Cumulative Problem Solving feature
8.R.7	Investigate relationships between different representations and their impact on a given problem	Used throughout the text, specifically in Cumulative Problem Solving feature
8.R.8	Use representation as a tool for exploring and understanding mathematical ideas	Used throughout the text, specifically in Cumulative Problem Solving feature
<i>Students will use representations to model and interpret physical, social, and mathematical phenomena.</i>		
8.R.9	Use mathematics to show and understand physical phenomena (e.g., make and interpret scale drawings of figures or scale models of objects)	Used throughout the text, specifically in Math Labs and Lesson 11.4
8.R.10	Use mathematics to show and understand social phenomena (e.g., determine profit from sale of yearbooks)	Used throughout the text, specifically in Cumulative Problem Solving feature
8.R.11	Use mathematics to show and understand mathematical phenomena (e.g., use tables, graphs, and equations to show a pattern underlying a function)	Used throughout the text, specifically in Cumulative Problem Solving feature and Math Labs

Number Sense and Operations Strand

Students will understand meanings of operations and procedures, and how they relate to one another.

Operations

8.N.1	Develop and apply the laws of exponents for multiplication and division	10.1, 10.2
8.N.2	Evaluate expressions with integral exponents	1.3, 10.2
8.N.3	Read, write, and identify percents less than 1% and greater than 100%	7.1
8.N.4	Apply percents to: Tax Percent increase/decrease Simple interest Sale price Commission Interest rates Gratuities	7.2, 7.4, 7.5, 7.6

Students will compute accurately and make reasonable estimates.

Estimation

8.N.5	Estimate a percent of quantity, given an application	7.3
8.N.6	Justify the reasonableness of answers using estimation	1.5, 1.7

Algebra Strand		
Students will represent and analyze algebraically a wide variety of problem solving situations.		
<i>Variables and Expressions</i>		
8.A.1	Translate verbal sentences into algebraic inequalities	5.7, 5.8
8.A.2	Write verbal expressions that match given mathematical expressions	1.3
8.A.3	Describe a situation involving relationships that matches a given graph	8.2, 8.3, 8.4
8.A.4	Create a graph given a description or an expression for a situation involving a linear or nonlinear relationship	8.2, 8.3, 8.4
8.A.5	Use physical models to perform operations with polynomials	Covered in <i>Cord Algebra: Mathematics in Context</i>
Students will perform algebraic procedures accurately.		
<i>Variables and Expressions</i>		
8.A.6	Multiply and divide monomials	Covered in <i>Cord Algebra: Mathematics in Context</i>
8.A.7	Add and subtract polynomials (integer coefficients)	Covered in <i>Cord Algebra: Mathematics in Context</i>
8.A.8	Multiply a binomial by a monomial or a binomial (integer coefficients)	Covered in <i>Cord Algebra: Mathematics in Context</i>
8.A.9	Divide a polynomial by a monomial (integer coefficients) <i>Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables.</i>	Covered in <i>Cord Algebra: Mathematics in Context</i>
8.A.10	Factor algebraic expressions using the GCF	Covered in <i>Cord Algebra: Mathematics in Context</i>
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	Covered in <i>Cord Algebra: Mathematics in Context</i>
<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	Covered in <i>Cord Geometry: Mathematics in Context</i>
8.A.13	Solve multi-step inequalities and graph the solution set on a number line	5.7, 5.8
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)	5.7, 5.8
Students will recognize, use, and represent algebraically patterns, relations, and functions.		
<i>Patterns, Relations, and Functions</i>		
8.A.15	Understand that numerical information can be represented in multiple ways: arithmetically, algebraically, and graphically	Used throughout the text, for example 4.1, 5.7, 6.2, 8.2, 11.1
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	8.2, 8.3, 8.4
8.A.17	Define and use correct terminology when referring to function (domain and range)	8.7
8.A.18	Determine if a relation is a function	8.7
8.A.19	Interpret multiple representations using equation, table of values, and graph	8.2, 8.3, 8.4, 8.6, 8.7, 11.1

Geometry Strand		
Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.		
<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	Chapter 9 Lab Activity 2
Students will identify and justify geometric relationships, formally and informally.		
<i>Geometric Relationships</i>		
8.G.1	Identify pairs of vertical angles as congruent	Covered in <i>Cord Geometry: Mathematics in Context</i>
8.G.2	Identify pairs of supplementary and complementary angles	9.2
8.G.3	Calculate the missing angle in a supplementary or complementary pair	Covered in <i>Cord Geometry: Mathematics in Context</i>
8.G.4	Determine angle pair relationships when given two parallel lines cut by a transversal	Covered in <i>Cord Geometry: Mathematics in Context</i>
8.G.5	Calculate the missing angle measurements when given two parallel lines cut by a transversal	Covered in <i>Cord Geometry: Mathematics in Context</i>
8.G.6	Calculate the missing angle measurements when given two intersecting lines and an angle	Covered in <i>Cord Geometry: Mathematics in Context</i>
Students will apply transformations and symmetry to analyze problem solving situations.		
<i>Transformational Geometry</i>		
8.G.7	Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations)	9.6, 9.7, 9.8, 11.3
8.G.8	Draw the image of a figure under rotations of 90 and 180 degrees	9.8
8.G.9	Draw the image of a figure under a reflection over a given line	9.7
8.G.10	Draw the image of a figure under a translation	9.6
8.G.11	Draw the image of a figure under a dilation	11.3
8.G.12	Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation	9.6, 9.7, 9.8, 11.3
Students will apply coordinate geometry to analyze problem solving situations.		
<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	8.3
8.G.14	Determine the y-intercept of a line from a graph and be able to explain the y-intercept	8.4
8.G.15	Graph a line using a table of values	8.2
8.G.16	Determine the equation of a line given the slope and the y-intercept	8.4
8.G.17	Graph a line from an equation in slope-intercept form ($y = mx + b$)	8.4
8.G.18	Solve systems of equations graphically (only linear, integral solutions, $y = mx + b$ format, no vertical/horizontal lines)	8.5
8.G.19	Graph the solution set of an inequality on a number line	5.7, 5.8
8.G.20	Distinguish between linear and nonlinear equations $ax^2 + bx + c; a=1$ (only graphically)	Covered in <i>Cord Algebra: Mathematics in Context</i>
8.G.21	Recognize the characteristics of quadratics in tables, graphs, equations, and situations	Covered in <i>Cord Algebra: Mathematics in Context</i>

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 <i>Note: Also allow Fahrenheit to Celsius and vice versa.</i>	6.2, 10.4