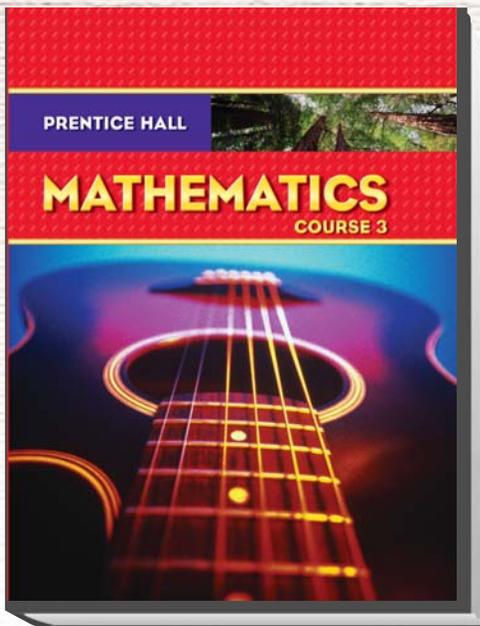


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C O R R E L A T E D T O
Alaska Standards and Grade Level Expectations
Grade 8



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Correlated to:
Alaska Standards and Grade Level Expectations for Math
(Grade 8)

Alaska Standards and Grade Level Expectations for Math	PAGE(S) WHERE TAUGHT (If submission is not a text, cite appropriate resource(s))
Content Standard A: Mathematical facts, concepts, principles, and theories	
Numeration: Understand and use numeration	
M1.3.1 Read, write, model, and order real numbers, explaining scientific notation, exponents, and percents.	
M1.3.2 Model counting in a different base system.	
M1.3.3 Translate between equivalent representations of the same number. Select a representation that is appropriate for the situation.	
M1.3.4 Describe and model the relationship of fractions to decimals, percents, ratios, and proportions.	
M1.3.5 Use, explain, and define the rules of divisibility, prime and composite numbers, multiples, and order of operations.	
M1.3.6 Use commutative, identity, associative, and distributive properties with variables.	
Understanding Numbers	
The student demonstrates understanding	
• of real numbers by	
[8] N-1 ordering real numbers (M1.3.1)	SE/TE: 9, 11-13, 62- 65, 212, 629
	TE: 50C
[8] N-2 distinguishing between a whole number in scientific notation and real numbers in standard form (M1.3.1)	SE/TE: 92-95
	TE: 50D
[8] N-3 converting between expanded notation (multiples of ten with exponents) and standard form (M1.3.3)	SE/TE: Course 1 p: 22-25
• of rational numbers (fractions, decimals, or percents including integers) by	
[8] N-4 identifying, describing, or illustrating equivalent representations (M1.3.4 & M3.3.5)	SE/TE: 92-95
	TE: 50C
[8] N-5 expressing products of numbers using exponents (M1.3.1 & M1.3.3)	SE/TE: 57-60
	TE: 50C
Understanding Meaning of Operations	
The student demonstrates conceptual understanding of mathematical operations by	
[8] N-6 using models, explanations, number lines, real-life situations, describing or illustrating the effects of arithmetic operations on rational numbers (percents) (M1.2.3)	SE/TE: 66-69, 71-77
	TE: 50C-50D
[8] N-7 using models, explanations, number lines, real-life situations, describing or illustrating the use of inverse operations (addition/subtraction or multiplication/division) (M1.2.3)	SE/TE: 21, 34

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Number Theory	
The student demonstrates conceptual understanding of number theory by	
[8] N-8 applying the rules for order of operations to rational numbers (M1.3.5)	SE/TE: 5-7, 86-89
	TE: 2C, 50D
[8] N-9 identifying or writing the prime factorization of a number using exponents (M1.3.5)	SE/TE: 52-56
	TE: 50C
[8] N-10 [using distributive property with real numbers L] (M1.3.6)	SE/TE: 4-6, 11, 28, 266-269, 272-273, 277, 577
	TE: 2C, 258C
Measurement: Select and use systems, units, and tools of measurement Numeration Performance Standards that apply to grades 7-8:	
Measurement Performance Standards that apply to grades 7-8:	
M2.3.1 Estimate and measure various dimensions to a specified degree of accuracy.	
M2.3.2 Estimate and convert measurements within the same system.	
M2.3.3 Use a variety of methods and tools to construct and compare plane figures.	
M2.3.4 Describe and apply the relationships between dimensions of geometric figures to solve problems using indirect measurement; describe and apply the concepts of rate and scale.	
M2.3.5 Apply information about time zones and elapsed time to solve problems.	
Measurable Attributes	
The student demonstrates understanding of measurable attributes by	
[8] MEA-1 converting measurements within the same system (English or metric) (M2.3.2)	SE/TE: 166-170
	TE: 158C
Measurement Techniques	
The student uses measurement techniques by	
[8] MEA-2 using scale drawings involving indirect measurement (determining the scale factor and applying it to find missing dimension) (M2.3.4)	SE/TE: 181-185, 187-200
	TE: 158C-158D
[8] MEA-3 [modeling the conversion within the same system L] (M2.3.2)	SE/TE: 166-170
	TE: 158C

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Estimation and Computation: Perform basic arithmetic functions, make reasoned estimates, and select and use appropriate methods or tools	
Estimation and Computation Performance Standards that apply to grades 7-8: M3.3.1 Apply, explain, and assess the appropriateness of a variety of estimation strategies including truncating and rounding to compatible numbers. M3.3.2 Apply basic operations efficiently and accurately, using estimation to check the reasonableness of results. M3.3.3 Add and subtract fractions, decimals, and percents. M3.3.4 Multiply and divide rational numbers in various forms including fractions, decimals, and percents. M3.3.5 Convert between equivalent fractions, decimals, percents, and proportions. Convert from exact to decimal representations of irrational numbers. M3.3.6 Solve problems using ratios and proportions.	
The student solves problems (including real-world situations) using estimation by	
[8] E&C-1 [applying and assessing the appropriateness of a variety of estimation strategies L] (M3.3.1)	SE/TE: Sample pages: 24, 80, 107, 116, 168, 169, 198, 214-217, 370, 381
Computation	
The student accurately solves problems (including real-world situations) involving	
[8] E&C-2 adding, subtracting, multiplying or dividing integers or positive rational numbers (M3.3.3 & M3.3.4)	SE/TE: 16-23, 66-69, 71-77
	TE: 2C-2D, 50C-50D
[8] E&C-3 percents and percentages (e.g., tax, discount) (M3.3.3 & M3.3.4)	SE/TE: 218-222, 224-227, 230-244
	TE: 208C-208D
[8] E&C-4 converting between equivalent fractions, decimals, or percents (M3.3.5)	SE/TE: 57-61
	TE: 50C
[8] E&C-5 ratio and proportion (M3.3.6)	SE/TE: 160-163, 172-179
	TE: 158C
Functions and Relationships: Represent, analyze, and use patterns, relations, and function	
Functions and Relationships Performance Standards that apply to grades 7-8: M4.3.1 Identify numeric and geometric patterns to find the next term and predict the nth term. M4.3.2 Identify and describe how a change in one variable in a function affects the remaining variables (e.g., how changing the length affects the area and volume of a rectangular prism). M4.3.3 Use a calculator to find a missing item in arithmetic and a geometric sequence; predict the graph of each function. M4.3.4 Translate among and use tables of ordered pairs, graphs on coordinate planes, and linear equations as tools to represent and analyze patterns. M4.3.5 Find the value of a variable by evaluating formulas and algebraic expressions for given values.	
Describing Patterns and Functions	
The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by	
[8] F&R-1 describing or extending patterns (linear), up to the nth term, represented in, tables, sequences, graphs, or in problem situations (M4.3.1)	SE/TE: 85, 91, 130, 149, 195, 287, 302, 323, 397, 431, 489, 512-517, 570

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[8] F&R-2 generalizing relationships (linear) using a table of ordered pairs, a graph, or an equation (M4.3.4)	SE/TE: 302, 539-543
	TE: 510D
[8] F&R-3 describing in words how a change in one variable in a formula affects the remaining variables (how changing the length affects the area of quadrilaterals or volume of a rectangular prism) (M4.3.2)	SE/TE: 80-85, 397
	TE: 50D
[8] F&R-4 [using a calculator as a tool when describing, extending, or representing patterns L] (M4.3.3)	SE/TE: 85, 517
Modeling and Solving Equations and Inequalities	
The student demonstrates algebraic thinking by	
[8] F&R-5 translating a written phrase to an algebraic expression (M4.3.5)	SE/TE: 4-8, 86-89, 265-269, 566-569, 571-573, 590
	TE: 2C, 50D, 258C, 558C-558D,
[8] F&R-6 solving or identifying solutions to two-step linear equations of the form $ax \pm b = c$, where a , b and c are rational numbers, and $a \neq 0$, translating a story problem into an equation of similar form, or translating a story problem into an equation of similar form and solving it (M4.3.5)	SE/TE: T55, 260-264, 271-280, 311
	TE: 258C
Geometry: Construct, transform, and analyze geometric figures	
Geometry Performance Standards that apply to grades 7-8: M5.3.1 Identify, classify, compare, and sketch regular and irregular polygons. M5.3.2 Model, identify, draw, and describe 3-dimensional figures including tetrahedrons, dodecahedrons, triangular prisms, and rectangular prisms. M5.3.3 Apply the properties of equality and proportionality to solve problems involving congruent or similar shapes. M5.3.4 Estimate and determine volume and surface areas of solid figures using manipulatives and formulas; estimate and find circumferences and areas of circles. M5.3.5 Draw and describe the results of transformations including translations (slides), rotations (turns), reflections (flips), and dilations (shrinking or enlarging). M5.3.6 Use coordinate geometry to represent and interpret relationships defined by equations and formulas including distance and midpoint. M5.3.7 Draw, measure, and construct geometric figures including perpendicular bisectors, polygons with given dimensions and angles, circles with given dimensions, perpendicular and parallel lines.	
Geometric Relationships	
The student demonstrates an understanding of geometric relationships by	
[8] G-1 [using the attributes and properties of regular polygons to sketch regular or irregular polygons L] (M5.3.1)	SE/TE: 315-316, 320

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[8] G-2 using the attributes and properties of solid figures (vertices, length and alignment of edges, shape and number of bases) to identify and describe cylinders and cones (M5.3.2)	SE/TE: 354-357
	TE: 352C
[8] G-3 using two-dimensional nets to create three-dimensional objects (prisms and cylinders) (M5.3.2)	SE/TE: 363-366
	TE: 352C
Transformation of Shapes	
The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by	
[8] G-4 using proportionality to solve real-world problems involving similar shapes (e.g., two real-world objects casting shadows) (M5.3.3)	SE/TE: 196-200
	TE: 158D
[8] G-5 identifying the results of applying transformations (translations, rotations, reflections, dilations) to figures on a coordinate plane (M5.3.5)	SE/TE: 136-150, 186-191
	TE: 104D, 158D
Perimeter, Area, and Volume	
The student solves problems (including real-world situations) by	
[8] G-6 determining the volume of right triangular prisms or cylinders (M5.3.4)	SE/TE: 379-387
	TE: 352D
[8] G-7 determining the surface area of cylinders or triangular prisms (M5.3.4)	SE/TE: 367-372
	TE: 352C-352D
[8] G-8 determining the circumference and area of a circle (M5.3.4)	SE/TE: 336-339
	TE: 300D
Position and Direction	
The student demonstrates understanding of position and direction by	
[8] G-9 graphing or identifying relationships of variables on a coordinate plane (e.g., length/width, area/diameter, cost/pound) (M5.3.6)	SE/TE: 124-128, 130-133
Construction	
The student demonstrates a conceptual understanding of geometric drawings or constructions by	
[8] G-10 [drawing, measuring, or constructing geometric figures (polygons, perpendicular bisectors, or perpendicular or parallel lines) L]	SE/TE: 125, 136-140, 142, 144 146, 148, 150, 341-344
	TE: 300D

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Statistics and Probability: Formulate questions, gather and interpret data, and make predictions	
Statistics and Probability Performance Standards that apply to grades 7-8: M6.3.1 Collect, analyze, and display data in a variety of visual displays including frequency distributions, circle graphs, box and whisker plots, stem and leaf plots, histograms, and scatter plots with and without technology. M6.3.2 Interpret and analyze information found in newspapers, magazines, and graphical displays. M6.3.3 Determine and justify a choice of mean, median, or mode as the best representation of data for a practical situation. M6.3.4 Make projections based on available data and evaluate whether or not inferences can be made given the parameters of the data. M6.3.5 Use tree diagrams and sample spaces to make predictions about independent events. M6.3.6 Design and conduct a simulation to study a problem and communicate the results.	
Data Display	
The student demonstrates an ability to classify and organize data by	
[8] S&P-1 [designing, collecting L], organizing, displaying, or explaining the classification of data in real-world problems (e.g., science or humanities, peers or community), using histograms, scatter plots, or box and whisker plots with appropriate scale [or with technology L] (M6.3.1)	SE/TE: 418-423, 438-448, 456-460
	TE: 410C-410D
Analysis and Central Tendency	
The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating, making predictions, or describing trends; or drawing, formulating, or justifying conclusions) by	
[8] S&P-2 using information from a variety of displays or analyzing the validity of statistical conclusions found in the media (M6.3.2)	SE/TE: 427-432, 444-447
	TE: 410C-410D
[8] S&P-3 determining or justifying a choice of range, mean, median, or mode as the best representation of data for a practical situation (M6.3.3)	SE/TE: 412-417
	TE: 410C
Probability	
The student demonstrates a conceptual understanding of probability and counting techniques by	
[8] S&P-4 determining or comparing the experimental and/or theoretical probability of simple events (M6.3.5)	SE/TE: 245-250, 370-473, 501
	TE: 208D, 468C-468D
[8] S&P-5 using a systematic approach to finding sample spaces or to making predictions about the probability of independent events and using the information to solve real-world problems (M6.3.5)	SE/TE: 475-479, 486-489

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	TE: 468C-468D
[8] S&P-6 [designing and conducting a simulation to study a problem and communicate the results L] (M6.3.6)	SE/TE: 480-485
	TE: 468C
Content Standards B, C, D, and E: Process skills and abilities	
Applying conceptual knowledge and skills designated in all strands of Content Standard A by problem solving, communicating, reasoning, and making connections	
Problem-Solving Performance Standards that apply to grades 7-8:	
M7.3.1 Analyze and summarize a problem using the relationships between the known facts and unknown information.	
M7.3.2 Select, modify, and apply a variety of problem-solving strategies including graphing, inductive and deductive reasoning, Venn diagrams, and spreadsheets. M7.3.3 Evaluate, interpret, and justify solutions to problems.	
Problem solving: Understand and be able to select and use a variety of problem-solving strategies	
The student demonstrates an ability to problem solve by	
[8] PS-1 selecting, modifying, and applying a variety of problem-solving strategies (e.g., inductive and deductive reasoning, Venn diagrams, making a simpler problem) and verifying the results (M7.3.2)	SE/TE: T46-T55, 279-280, 333-334, 385-386, 424-426, 454-455, 587-588
	TE: 410C
[8] PS-2 evaluating, interpreting, and justifying solutions to problems (M7.3.3)	SE/TE: 19, 55, 88, 89, 94, 116, 223, 226, 237, 240, 248, 269, 280, 281, 306, 333, 342, 391, 431, 436, 485
Communication Performance Standards that apply to grades 7-8:	
M8.3.1 Use math vocabulary, symbols, and notation to represent information in the problem.	
M8.3.2 Represent a problem numerically, graphically, and symbolically; translate among these alternative representations.	
M8.3.3 Use appropriate vocabulary, symbols, and technology to explain, justify, and defend mathematical solutions.	
Communication: Form and use appropriate methods to define and explain mathematical relationships	
The student communicates his or her mathematical thinking by	
[8] PS-3 representing mathematical problems numerically, graphically, and/or symbolically, translating among these alternative representations; or using appropriate vocabulary, symbols, or technology to explain, justify, and defend strategies and solutions (M8.3.1, M8.3.2, & M8.3.3)	SE/TE: Sample pages: 71, 135, 239, 379, 454, 518-521, 560, 561-565, 532, 533

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Reasoning Performance Standards that apply to grades 7-8: M9.3.1 Use informal deductive and inductive reasoning in both concrete and abstract contexts. M9.3.2 State counterexamples to disprove statements. M9.3.3 Justify and defend the validity of mathematical strategies and solutions using examples and counterexamples.	
Reasoning: Use logic and reason to solve mathematical problems	
The student demonstrates an ability to use logic and reason by	
[8] PS-4 generalizing from patterns of observations (inductive reasoning) about mathematical problems and testing using a logical verification (deductive reasoning); or justifying and defending the validity of mathematical strategies and solutions using examples and counterexamples (M9.3.1, M9.3.2, & M9.3.3)	SE/TE: Sample pages: 13, 56, 78, 83, 145, 193, 221, 238, 416, 455
Connections Performance Standards that apply to grades 7-8: M10.3.1 Apply mathematical skills and processes to science and humanities. M10.3.2 Apply mathematical skills and processes to situations with peers and community.	
Connections: Apply mathematical concepts and processes to situations within and outside of school	
The student understands and applies mathematical skills and processes across the content strands by	
[8] PS-5 using real-world contexts such as science, humanities, peers, community, and careers (M10.3.1 & M10.4.2)	SE/TE: T20-T21