Alaska Grade Level Expectations

Grade 7

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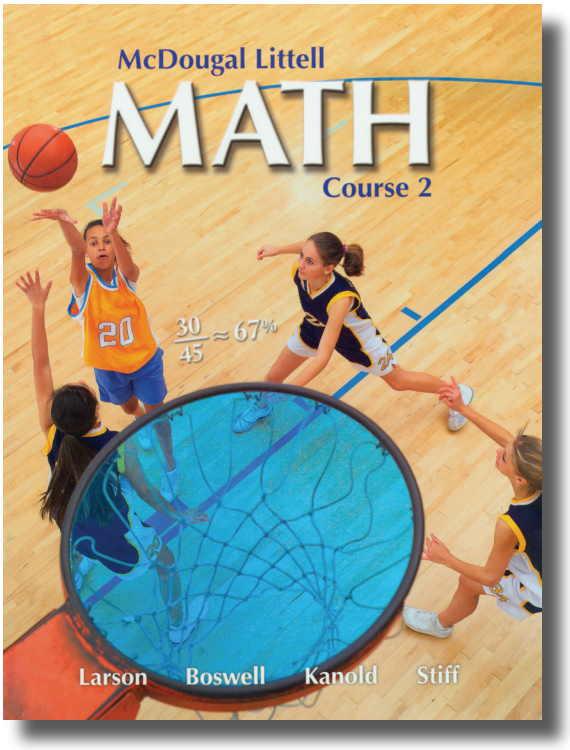

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MATH

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Alaska
Grade Level Expectations
Mathematics, Grade 7

UNDERSTANDING NUMBERS

The student demonstrates understanding

of rational numbers (*fractions, decimals, percents, or integers*) by

[7] N-1 ordering rational numbers (**M1.3.1**)

[7] N-2 [modeling (*place value blocks*) or identifying place value positions of whole numbers and decimals ***L***] (**M1.3.2**)

[7] N-3 converting between expanded notation (*multiples of ten*) and standard form for decimal numbers (**M1.3.3**)

of positive fractions, decimals, or percents by

[7] N-4 identifying or representing equivalents of numbers (**M1.3.4, M3.3.5**)

UNDERSTANDING MEANING OF OPERATIONS

The student demonstrates conceptual understanding of mathematical operations by

[7] N-5 using models, explanations, number lines, real-life situations, describing or illustrating the effects of arithmetic operations on rational numbers (*fractions, decimals*) (**M1.2.3**)

NUMBER THEORY

The student demonstrates conceptual understanding of number theory by

[7] N-6 using commutative, [associative ***L***], inverse, or identity properties with rational numbers (**M1.3.6**)

[7] N-7 applying rules of divisibility to whole numbers (**M1.3.5**)

[7] N-8 identifying prime and composite numbers (**M1.3.5**)

[7] N-9 [using distributive property with rational numbers ***L***] (**M1.3.6**)

MEASURABLE ATTRIBUTES

The student demonstrates understanding of measurable attributes by

[7] MEA-1 [estimating length to the nearest sixteenth of an inch or millimeter, volume to the nearest cubic centimeter or milliliter or angle to the nearest 30 degrees ***L***] (**M2.3.1**)

[7] MEA-2 identifying or using equivalent English (*square inches, square feet, square yards*) or metric systems (*square centimeters, square meters*) (**M2.3.2**)

MEASUREMENT TECHNIQUES

The student uses measurement techniques by

[7] MEA-3 applying a given scale factor to find missing dimensions of similar figures (**M2.3.4**)

[7] MEA-4 measuring various dimensions to one-sixteenth of an inch or millimeter (**M2.3.1**)

[7] MEA-5 accurately measuring a given angles using a protractor to the nearest plus or minus 2 degrees (**M2.3.1**)

[7] MEA-6 solving real-world problems involving elapsed time between world time zones (**M2.3.5**)

ESTIMATION

The student solves problems (**including real-world situations*****) *using estimation by***

[7] E&C-1 identifying or using [a variety of ***L***] strategies, including truncating, rounding, front-end estimation, compatible numbers, to check for reasonableness of solutions (**M3.3.1**)

[7] E&C 2 [comparing results of different strategies ***L***] (**M3.3.1**)

COMPUTATION

The student accurately solves problems (**including real-world situations*****) *involving***

[7] E&C-3 adding or subtracting fractions or mixed numbers with unlike denominators, or decimals to the thousandths place (**M3.3.3**)

[7] E&C-4 multiplying or dividing decimals to hundredths, or multiplying or dividing by powers of ten, or multiplying or dividing fractions or mixed numbers (**M3.3.4**)

[7] E&C-5 converting between equivalent fractions, terminating decimals, or percents (*10% = 1/10 = 0.1*) (**M3.3.5**)

[7] E&C-6 solving proportions using a given scale (**M3.3.6**)

DESCRIBING PATTERNS AND FUNCTIONS

The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by

[7] F&R-1 describing or extending patterns (*linear*), up to ten terms, represented in tables, sequences, or in problem situations (**M4.3.1**)

[7] F&R-2 generalizing relationships (*linear*) using a table of ordered pairs, a function, or an equation (**M4.3.4**)

[7] 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 a quadrilateral*) (**M4.3.2**)

[7] F&R-4 [using a calculator as a tool when describing, extending, or representing patterns ***L***] (**M4.3.3**)

MODELING AND SOLVING EQUATIONS AND INEQUALITIES

The student demonstrates algebraic thinking by

[7] F&R-5 evaluating algebraic expressions (**M4.3.5**)

[7] F&R-6 solving or identifying solutions to one-step linear equations of the form $x \pm a=b$ or $ax=b$, where a and b are whole numbers, 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**)

GEOMETRIC RELATIONSHIPS

The student demonstrates an understanding of geometric relationships by

[7] G-1 using the attributes and properties of polygons (*diagonals, number of sides and angles*) to identify and classify regular or irregular polygons (**M5.3.1**)

[7] G-2 using the attributes and properties of prisms (*vertices, length and alignment of edges, shape and number of bases, shape of faces*) to identify and describe triangular or rectangular pyramids (**M5.3.2**)

TRANSFORMATION OF SHAPES

The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by

[7] G-3 using a scale factor to solve problems involving similar shapes (e.g., *scale drawings, maps*) (**M5.3.3**)

[7] G-4 [drawing or describing the results of applying transformations such as translations, rotations, reflections, or dilations to figures ***L***] (**M5.3.5**)

PERIMETER, AREA, AND VOLUME

The student solves problems (**including real-world situations*****) by***

[7] G-5 determining the volume of cubes and rectangular prisms (**M5.3.4**)

[7] G-6 determining the surface area of rectangular prisms (**M5.3.4**)

[7] G-7 determining the circumference of a circle (**M5.3.4**)

POSITION AND DIRECTION

The student demonstrates understanding of position and direction by

[7] G-8 graphing or identifying values of variables on a coordinate grid (**M5.3.6**)

CONSTRUCTION

The student demonstrates a conceptual understanding of geometric drawings or constructions by

[7] G-9 [drawing or measuring polygons with given dimensions and angles or circles with given dimensions ***L***] (**M5.3.7**)

DATA DISPLAY

The student demonstrates an ability to classify and organize data by

[7] S&P-1 [collecting, ***L***] displaying, organizing, or explaining the classification of data in real-world problems (e.g., *science or humanities, peers or community*), using circle graphs, frequency distributions, stem and leaf, [or scatter plots ***L***] with appropriate scale (**M6.3.1**)

ANALYSIS AND CENTRAL TENDENCY

The student demonstrates an ability to analyze data (*comparing, explaining, interpreting, evaluating or making predictions; or drawing or justifying conclusions*) by

[7] S&P-2 using information from a variety of displays (e.g., a*s found in graphical displays in newspapers and magazines*) (**M6.3.2**)

[7] S&P-3 determining range, mean, median, or mode (**M6.3.3**)

PROBABILITY

The student demonstrates a conceptual understanding of probability and counting techniques by

[7] S&P-4 determining the [experimental ***L***] and theoretical probability of a simple event (**M6.3.5**)

[7] S&P-5 using a systematic approach to finding sample spaces or to making predictions about the probability of independent events (**M6.3.5**)

[7] S&P-6 [designing and conducting a simulation to study a problem and communicate the results ***L***] (**M6.3.6**)

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

[7] PS-1 selecting, modifying, and applying a variety of problem-solving strategies (e.g., *working backwards, drawing a picture, Venn diagrams and verifying the results*) (**M7.3.2**)

[7] PS-2 evaluating, interpreting, and justifying solutions to problems (**M7.3.3**)

COMMUNICATION: Form and use appropriate methods to define and explain mathematical relationships

The student communicates his or her mathematical thinking by

[7] PS-3 representing mathematical problems numerically, graphically, and/or symbolically; or using appropriate vocabulary, symbols, or technology to explain, justify, and defend strategies and solutions (**M8.3.1, M8.3.2, M8.3.3**)

REASONING: Use logic and reason to solve mathematical problems

The student demonstrates an ability to use logic and reason by

[7] PS-4 using informal deductive and inductive reasoning in concrete contexts or stating counterexamples to disprove statements; or justifying and defending the validity of mathematical strategies and solutions using examples (**M9.3.1, M9.3.2, M9.3.3**)

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

[7] PS-5 using real-world contexts such as science, humanities, peers, and community (**M10.3.1, M10.3.2**)