

New England Common Assessment Program

Grade 7 Expectations to MAC 2

NECP Grade Level Expectation for Grade 7	MAC 7
Number and Operation	
M(N&O)–7–1 Demonstrates conceptual understanding of rational numbers with respect to percents as a means of comparing the same or different parts of the whole when the wholes vary in magnitude (e.g., 8 girls in a classroom of 16 students compared to 8 girls in a classroom of 20 students, or 20% of 400 compared to 50% of 100); and percents as a way of expressing multiples of a number (e.g., 200% of 50) using models, explanations, or other representations* ; and demonstrates conceptual understanding of square roots of perfect squares, rates, and proportional reasoning.	5-5, 5-6, 5-8, 7-2, 7-2b, 7-3, 7-4, 7-4b, 7-5, 7-6, 7-7, 7-8a, 7-8, 8-1, 8-2, 11-1
M(N&O)–7–2 Demonstrates understanding of the relative magnitude of numbers by ordering, comparing, or identifying equivalent rational numbers across number formats , numbers with whole number bases and whole number exponents (e.g., 3^3 , 4^3), integers, absolute values, or numbers represented in scientific notation using number lines or equality and inequality symbols.	1-2, 1-9, 3-1, 3-2, 5-3, 5-4, 5-5, 5-6, 5-8
M(N&O)–7–3 Demonstrates conceptual understanding of operations with integers and whole number exponents (where the base is a whole number) using models, diagrams, or explanations.	1-2, 1-3, 1-9, 3-4a, 3-4, 3-5a, 3-5, 3-6, 3-7
M(N&O)–7–4 Accurately solves problems involving proportional reasoning; percents involving discounts, tax, or tips; and rates; and addition or subtraction of integers, raising numbers to whole number powers, and determining square roots of perfect square numbers and non-perfect square numbers. (IMPORTANT: <i>Applies the conventions of order of operations including parentheses, brackets, or exponents.</i>)	1-2, 1-3, 1-9, 3-4, 3-5, 7-2, 7-3, 7-3b, 7-4, 7-4b, 7-7, 7-8, 8-1, 8-1b, 8-2, 8-3, 8-4, 8-5, 8-6, 11-1, 11-2, 11-3
M(N&O)–7–6 Mentally calculates benchmark perfect squares and related square roots (e.g., 1^2 , 2^2 ... 12^2 , 15^2 , 20^2 , 25^2 , 100^2 , 1000^2); determines the part of a number using benchmark percents and related fractions (1%, 10%, 25%, $33\frac{1}{3}\%$, 50%, $66\frac{2}{3}\%$, 75%, and 100%) (e.g., 25% of 16; $33\frac{1}{3}\%$ of 330). (IMPORTANT: <i>Mental arithmetic should be imbedded instructionally throughout all strands.</i>)	7-5, 7-7, 8-1, 8-1b, 11-1, 11-2
M(N&O)–7–7 Makes estimates in a given situation (including tips, discounts, and tax) by identifying when estimation is appropriate, selecting the appropriate method of estimation, determining the level of accuracy needed given the situation, analyzing the effect of the estimation method on the accuracy of results, and evaluating the reasonableness of solutions appropriate to grade level GLEs across content strands. (IMPORTANT: <i>The intent of this GLE is to embed estimation throughout the instructional program, not to teach it as a separate unit.</i>)	3-6a, 6-1, 6-2, 6-3, 6-3b, 6-6, 8-1, 8-1b, 8-2, 11-2, 11-4, 11-7a, 12-2, Prerequisite Skills
M(N&O)–7–8 Applies properties of numbers (odd, even, remainders,	1-6, 3-4, 5-1a, 5-1, 6-

divisibility, and prime factorization) and field properties (commutative, associative, identity, distributive, <u>inverses</u>) to solve problems and to simplify computations , and demonstrates conceptual understanding of field properties as they apply to subsets of the real numbers (e.g., the set of whole numbers does not have additive inverses, the set of integers does not have multiplicative inverses).	5, Prerequisite Skills
Geometry and Measurement	
M(G&M)–7–1 Uses properties of angle relationships resulting from <u>two or three intersecting lines (adjacent angles, vertical angles, straight angles, or angle relationships formed by two non-parallel lines cut by a transversal), or two parallel lines cut by a transversal to solve problems.</u>	10-1, 10-3, 10-3b
M(G&M)–7–2 Applies theorems or relationships (triangle inequality or sum of the measures of interior angles of regular polygons) to solve problems.	10-3, 10-4, 10-5, 10-7, 11-3
M(G&M)–7–4 Applies the concepts of congruency by solving <u>problems on a coordinate plane involving reflections, translations, or rotations.</u>	10-8, 10-9, 10-9b
M(G&M)–7–5 Applies concepts of similarity by solving problems involving scaling up or down and their impact on angle measures, linear dimensions and <u>areas of polygons, and circles when the linear dimensions are multiplied by a constant factor.</u> Describes effects using models or explanations.	6-8, 7-1, 7-4, 7-4b, 10-6, 10-8b, 11-4, 11-6
M(G&M)–7–6 Demonstrates conceptual understanding of the area of circles or <u>the area or perimeter of composite figures (quadrilaterals, triangles, or parts of circles), and the surface area of rectangular prisms, or volume of rectangular prisms, triangular prisms, or cylinders</u> using models, formulas, or by solving related problems. Expresses all measures using appropriate units.	6-8, 11-6, 11-7a, 11-7, 12-1b, 12-2, 12-2b, 12-3, 12-4a, 12-4, 12-4b
M(G&M)–7–10 Demonstrates conceptual understanding of spatial reasoning and visualization by <u>sketching three-dimensional solids; and draws nets of rectangular and triangular prisms, cylinders, and pyramids and uses the nets as a technique for finding surface area.</u>	12-1a, 12-1, 12-1b, 12-4a, 12-4, 12-5
Functions and Algebra	
M(F&A)–7–1 Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, graphs, or in problem situations; and generalizes a linear relationship using words and symbols; generalizes a linear relationship to find a specific case; or writes an expression or equation using words or symbols to express the generalization of a nonlinear relationship.	1-7, 4-6a, 4-6, 4-7
M(F&A)–7–2 Demonstrates conceptual understanding of linear relationships ($y = kx$; $y = mx + b$) as a constant rate of change by <u>solving problems involving the relationship between slope and rate of change, by describing the meaning of slope in concrete situations, or informally determining the slope of a line from a table or graph; and distinguishes between constant and varying rates of change in concrete situations represented in tables or graphs; or describes how change in the value of one variable relates to change in the value of a second variable</u> in problem situations with constant rates of change.	4-6a, 4-6, 4-7
M(F&A)–7–3 Demonstrates conceptual understanding of algebraic expressions by using letters to represent unknown quantities to write	1-4, 4-1, 4-6

algebraic expressions (including those with whole number exponents or more than one variable); or by evaluating algebraic expressions (including those with whole number exponents or more than one variable); or by evaluating an expression within an equation (e.g., determine the value of y when $x = 4$ given $y = 5x^3 - 2$).	
M(F&A)–7–4 Demonstrates conceptual understanding of equality by showing equivalence between two expressions (<u>expressions consistent with the parameters of the left- and right-hand sides of the equations being solved at this grade level</u>) using models or different representations of the expressions, solving multi-step linear equations of the form $ax \pm b = c$ with $a \neq 0$, $ax \pm b = cx \pm d$ with $a, c \neq 0$, and $(x/a) \pm b = c$ with $a \neq 0$, where a, b, c and d are whole numbers; or by <u>translating a problem-solving situation into an equation consistent with the parameters of the type of equations being solved for this grade level</u> .	4-1, 4-2a, 4-2, 4-3, 4-4
Data, Statistics, and Probability	
M(DSP)–7–1 Interprets a given representation (circle graphs, scatter plots that represent discrete linear relationships, or histograms) to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems; (IMPORTANT: Analyzes data consistent with concepts and skills in M(DSP)–7–2.)	2-1, 2-2a, 2-2, 2-3, 2-5, 2-6, 2-6b, 2-7, 2-8, 10-2
M(DSP)–7–2 Analyzes patterns, trends, or distributions in data in a variety of contexts by solving problems using measures of central tendency (mean, median, or mode), dispersion (range or variation), or outliers to analyze situations to <u>determine their effect on mean, median, or mode</u> ; and <u>evaluates the sample from which the statistics were developed (bias)</u> .	2-3, 2-4, 2-4b, 2-6, 2-8, 8-3a, 8-3
M(DSP)–7–3 Identifies or describes representations or elements of representations that best display a given set of data or situation , consistent with the representations required in M(DSP)–7–1; and organizes and displays data using tables, line graphs, <u>scatter plots</u> , and <u>circle graphs</u> to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: Analyzes data consistent with concepts and skills in M(DSP)–6–2.)	2-1, 2-2a, 2-2, 2-3, 2-4, 2-5, 2-6, 2-6b, 2-7, 2-7b, 2-8, 10-2
M(DSP)–7–4 Uses counting techniques to solve problems in context involving combinations or <u>permutations</u> (e.g., How many different ways can eight students place first, second, and third in a race?) using a variety of strategies (e.g., organized lists, tables, tree diagrams, models, Fundamental Counting Principle, or others).	9-2, 9-3, 9-4, 9-5a, 9-5
M(DSP)–7–5 For a probability event in which the sample space may or may not contain equally likely outcomes, determines the experimental or theoretical probability of an event in a problem-solving situation; and predicts the theoretical probability of an event and tests the prediction through experiments and simulations; and <u>compares and contrasts theoretical and experimental probabilities</u> .	9-1, 9-2, 9-6, 9-6b, 9-7
M(DSP)–7–6 In response to a teacher or student generated question or hypothesis decides the most effective method (e.g., survey, observation, experimentation) to collect the data (numerical or	2-1, 2-4b, 2-7b, 8-3a

<p>categorical) necessary to answer the question; collects, organizes, and appropriately displays the data; analyzes the data to draw conclusions about the question or hypothesis being tested while <u>considering the limitations that could affect interpretations</u>; and when appropriate makes predictions; and asks new questions and makes connections to real world situations.</p> <p>(IMPORTANT: Analyzes data consistent with concepts and skills in M(DSP)-7-2.)</p>	
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