

New England Common Assessment Program

Grade 6 Expectations to MAC 1

NECAP Grade Level Expectation for Grade 6	MAC 1
Number and Operation	
M(N&O)–6–1 Demonstrates conceptual understanding of rational numbers with respect to ratios (comparison of two whole numbers by division a/b , $a : b$, and $a \div b$, where $b \neq 0$); and rates (e.g., a out of b , 25%) using models, explanations, or other representations.	10-1 , 10-1b, 10-2, 10-4, 10-5, 10-6, 11-1
M(N&O)–6–2 Demonstrates understanding of the relative magnitude of numbers by ordering or comparing <u>numbers with whole number bases and whole number exponents (e.g., 3^3, 4^3), integers, or rational numbers within and across number formats (fractions, decimals, or whole number percents from 1- 100)</u> using number lines or <u>equality and inequality symbols.</u>	1-4, 3-2 , 3-3, 5-5 , 8-1 , 10-6
M(N&O)–6–3 Demonstrates conceptual understanding of mathematical operations by <u>describing or illustrating the meaning of a power by representing the relationship between the base (whole number) and the exponent (whole number) (e.g., 3^3, 4^3); and the effect on the magnitude of a whole number when multiplying or dividing it by a whole number, decimal, or fraction;</u> addition and subtraction of <u>positive fractions and integers;</u> and <u>multiplication and division of fractions and decimals.</u>	1-4 , 1-5, 4-1a , 4-1 , 4-2a , 4-2 , 4-3 , 4-4a , 4-4 , 6-2, 6-3 , 6-4a, 6-4 , 6-5 , 6-6 , 7-1, 7-2a , 7-2 , 7-3 , 7-4a , 7-4 , 7-5 , 8-2 , 8-3 , Prerequisite Skills
M(N&O)–6–4 Accurately solves problems involving single or multiple operations on fractions (proper, improper, and mixed), or decimals; and addition or subtraction of integers; percent of a whole; or problems involving greatest common factor or least common multiple. (IMPORTANT: <i>Applies the conventions of order of operations with and without parentheses.</i>)	1-5 , 3-4 , 3-5 , 3-5b, 4-1 , 4-2 , 4-3 , 4-4 , 4-4b, 4-5, 4-6, 5-1 , 5-4 , 6-2 , 6-2b, 6-3 , 6-4 , 6-5 , 6-6 , 7-1 , 7-2 , 7-3 , 7-4 , 7-5 , 7-6a, 7-6, 8-2 , 8-3 , 10-7 , 10-8a, 10-8
M(N&O)–6–6 Mentally calculates change back from \$5.00, \$10.00, \$20.00, \$50.00, and \$100.00; multiplies a two-digit whole number by a one-digit number whole number (e.g., 45×5), two-digit whole numbers that are multiples of ten (e.g., 50×60), a three-digit whole number that is a multiple of 100 by a two- or three-digit number which is a multiple of 10 or 100, respectively (e.g., 400×50 , 400×600); divides 3- and 4-digit multiples of powers of ten by their compatible factors (e.g., $360 \div 6$; $360 \div 60$; $3600 \div 6$; $3600 \div 60$; $3600 \div 600$; $360 \div 12$; $360 \div 120$; $3600 \div 12$; $3600 \div 120$; $3600 \div 1200$); and determines the part of a whole number using benchmark percents (1%, 10%, 25%, 50%, and 75%). (IMPORTANT: <i>The intent of this GLE is to embed mental arithmetic throughout the instructional program, not to teach it as a separate unit.</i>)	3-5, 3-5b, 9-1, 10-6, 10-7 , 10-8 , Prerequisite Skills
M(N&O)–6–7 Makes estimates in a given situation 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 <u>grade level GLEs</u> across content strands. (IMPORTANT: <i>The intent of this GLE is to embed estimation throughout</i>	1-1, 2-2a, 3-4 , 3-5, 3-5b, 4-1, 4-2, 4-3, 4-4, 4-4b, 4-5, 6-2 , 6-2b, 6-3, 6-5, 7-1 , 7-2, 7-3, 7-5, 10-8 , 14-5, Prerequisite Skills

<i>the instructional program, not to teach it as a separate unit.)</i>	
M(N&O)–6–8 Applies properties of numbers (odd, even, remainders , divisibility, and prime factorization) and field properties (commutative, associative, identity [<u>including the multiplicative property of one, e.g., $1 = 2/2$ and $2/2 \times 3/4 = 6/8$, so $3/4 = 6/8$</u>], distributive, and additive inverses) to solve problems and to simplify computations.	1-2, 1-3 , 5-2, 8-2, 8-3, 9-1
Geometry and Measurement	
M(G&M)–6–1 Uses properties or attributes of angles (right, acute, or obtuse) or sides (number of congruent sides, parallelism, or perpendicularity) to identify, describe, classify, or distinguish among different types of triangles (right, acute, obtuse, equiangular , scalene , isosceles , or equilateral) or quadrilaterals (rectangles, squares, rhombi, trapezoids, or parallelograms).	13-1, 13-3, 13-4 , 13-4b , 14-2b
M(G&M)–6–3 Uses properties or attributes (shape of bases, number of lateral faces, number of bases, number of edges , or number of vertices) to identify, compare, or describe three-dimensional shapes (rectangular prisms, triangular prisms, cylinders, spheres, pyramids, or cones).	14-4 , 14-4b
M(G&M)–6–4 Demonstrates conceptual understanding of congruency by <u>predicting and describing the transformational steps (reflections, translations, and rotations) needed to show congruence (including the degree of rotation) and as the result of composing and decomposing two- and three-dimensional objects using models or explanations</u> ; and using line and rotational symmetry to demonstrate congruent parts within a shape.	13-5 , 13-5b , 13-6 , 13-6b, 14-2a, 14-2, 14-3, 14-6a, 14-6
M(G&M)–6–5 Demonstrates conceptual understanding of similarity by describing the proportional effect on the linear dimensions of polygons or circles when scaling up or down while preserving the angles of polygons, or by solving related problems (including applying scales on maps). Describes effects using models or explanations.	10-3 , 13-6
M(G&M)–6–6 Demonstrates conceptual understanding of perimeter of polygons, the area of quadrilaterals or triangles , and the volume of rectangular prisms by using models, formulas, or by <u>solving problems</u> ; and demonstrates understanding of the relationships of circle measures (radius to diameter and diameter to circumference) by <u>solving related problems</u> . Expresses all measures using appropriate units.	1-8 , 4-5 , 4-6 , 12-1a , 12-1b , 14-1 , 14-2 , 14-2b , 14-3 , 14-5
M(G&M)–6–7 Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands. Benchmarks in Appendix B.	12-1 , 12-2 , 12-3a , 12-3 , 12-4 , 12-5 , 12-6
Functions and Algebra	
M(F&A)–6–1 Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, graphs , or in problem situations; or writes a rule in words or symbols for finding specific cases of a linear relationship; or <u>writes a rule in words or symbols for finding specific cases of a nonlinear relationship</u> ; and writes an expression or equation using words or symbols to express the generalization of a linear relationship (e.g., twice the term number plus 1 or $2n + 1$).	7-6 , 8-6, 9-6a , 9-6 , 9-7
M(F&A)–6–2 Demonstrates conceptual understanding of linear relationships ($y = kx$; $y = mx + b$) as a constant rate of change by constructing or interpreting graphs of real occurrences and describing the	8-6, 9-7

<p>slope of linear relationships (faster, slower, greater, or smaller) in a variety of problem situations; and describes how change in the value of one variable relates to change in the value of a second variable in problem situations with constant rates of change.</p>	
<p>M(F&A)–6–3 Demonstrates conceptual understanding of algebraic expressions by using letters to represent unknown quantities to write linear algebraic expressions involving <u>any of the four operations and consistent with order of operations expected at this grade level</u>; or by evaluating linear algebraic expressions (<u>including those with more than one variable</u>); or by <u>evaluating an expression within an equation (e.g., determine the value of y when $x = 4$ given $y = 3x - 2$)</u>.</p>	<p>1-6, 8-6, 9-6a, 9-6, 9-7</p>
<p>M(F&A)–6–4 Demonstrates conceptual understanding of equality by showing equivalence between two expressions using models or different representations of the expressions (expressions consistent with the parameters of <u>M(F&A)–6–3</u>), <u>solving multi-step linear equations of the form $ax \pm b = c$, where a, b, and c are whole numbers with $a \neq 0$</u>.</p>	<p>9-2a, 9-2, 9-3a, 9-3, 9-4, 9-5</p>
<p>Data, Statistics, and Probability</p>	
<p>M(DSP)–6–1 Interprets a given representation (circle graphs, line graphs, or <u>stem-and-leaf plots</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: <i>Analyzes data consistent with concepts and skills in M(DSP)–6–2.</i>)</p>	<p>2-1, 2-2a, 2-2, 2-3, 2-4, 2-5, 2-7b</p>
<p>M(DSP)–6–2 Analyzes patterns, trends or distributions in data in a variety of contexts by determining or using measures of central tendency (mean, median, or mode) or <u>dispersion (range)</u> to analyze situations, or to solve problems.</p>	<p>2-6, 2-6b, 2-7</p>
<p>M(DSP)–6–3 Organizes and displays data using tables, line graphs, or <u>stem-and-leaf plots</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: <i>Analyzes data consistent with concepts and skills in M(DSP)–6–2.</i>)</p>	<p>2-1, 2-2, 2-2b, 2-3, 2-5</p>
<p>M(DSP)–6–4 Uses counting techniques to solve problems in context involving combinations or simple permutations using a variety of strategies (e.g., organized lists, tables, tree diagrams, models, <u>Fundamental Counting Principle</u>, or others).</p>	<p>11-1b, 11-2, 11-5a</p>
<p>M(DSP)–6–5 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 <u>event in a problem-solving situation</u>; and predicts the theoretical probability of an event and tests the prediction through experiments and <u>simulations</u>; and <u>designs fair games</u>.</p>	<p>11-1a, 11-1, 11-1b, 11-2, 11-5a, 11-5</p>
<p>M(DSP)–6–6 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 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, and when appropriate makes predictions; and asks new questions and makes connections to real world situations. (IMPORTANT: <i>Analyzes data consistent with concepts and skills in</i></p>	<p>2-2, 2-2b, 2-4, 11-3a, 11-3</p>

$M(DSP)-6-2.)$	
----------------	--