

Comparison of the MLR and NECAP Expectations

Grade 6 Mathematics

Maine Learning Results	NECAP	Differences/Comments
A. Number	Number and Operations	
1. Students use factors and multiples.	<p>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></p> <p>M(N&O)–6–4 Accurately solves problems involving <u>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.</u></p>	The highlighted portion of the NECAP GLE relates to this MLR.
2. Students express fractions greater than 0 as decimals and compare positive numbers that are written as fractions and decimals and place them on the number line.	M(N&O)–6–2 Demonstrates understanding of the <u>relative magnitude of numbers by ordering or comparing 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) using number lines or equality and inequality symbols.</u>	The highlighted portion of the NECAP GLE relates to this MLR.
3. Students add, subtract, multiply, and divide numbers expressed as fractions and as decimals including mixed numbers.	M(N&O)–6–4 Accurately solves problems involving <u>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.</u>	<p>The highlighted portion of the NECAP GLE relates to this MLR.</p> <p>This GLE includes integers; integers are introduced in MLR A1 at grade 7.</p>
4. Students <i>understand</i> how to express relative quantities as percentages and as decimals and fractions.	M(N&O)–6–1 Demonstrates conceptual understanding of rational numbers with respect to <u>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%)</u> using models, explanations, or other representations*.	

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<p>5. Students multiply and divide decimals with up to three decimal places by tens, hundreds, and thousands.</p>	<p>M(N&O)–6–4 Accurately solves problems involving single or multiple operations on fractions (proper, improper, and mixed), or decimals; and <u>addition or subtraction of integers; percent of a whole; or problems involving greatest common factor or least common multiple.</u></p>	<p>The highlighted portion of the NECAP GLE relates to this MLR.</p>
<p>B. Data</p>	<p>Data, Statistics, and Probability/Geometry and Measurement</p>	
<p>1. Students convert within measurement systems.</p>	<p>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.</p>	
<p>2. Students read and <i>interpret</i> pie charts.</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>NECAP includes stem and leaf plots (assessed at grade 7 in MLRs).</p>
<p>3. Students find and compare the mean, median, mode, and range for sets of data.</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>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>Combinations and permutations are not explicitly addressed in the MLRs.</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></p>	<p>Probability is not assessed until grade 7 in the MLRs.</p>
<p>C. Geometry</p>	<p>Geometry and Measurement</p>	

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<p>1. Students represent solid figures in two dimensions.</p>	<p>M(G&M)–6–3 Uses properties or attributes (shape of bases, number of lateral faces, number of bases, <u>number of edges</u>, or <u>number of vertices</u>) to identify, compare, or describe three-dimensional shapes (rectangular prisms, triangular prisms, cylinders, spheres, pyramids, or cones).</p>	<p>Most of the content in the NECAP GLE is introduced at grade 5 in the MLRs.</p> <p>The GLEs do not explicitly mention representing solid figures in two dimensions.</p>
<p>2. Students find the perimeters and areas of geometric figures.</p>	<p>M(G&M)–6–6 <u>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 solving problems; and demonstrates understanding of the relationships of circle measures (radius to diameter and diameter to circumference) by solving related problems.</u> Expresses all measures using appropriate units</p>	
<p>3. Students find the volume and surface areas of right prisms with bases that are triangles and quadrilaterals.</p>	<p>M(G&M)–6–6 <u>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 solving problems; and demonstrates understanding of the relationships of circle measures (radius to diameter and diameter to circumference) by solving related problems.</u> Expresses all measures using appropriate units</p>	
<p>4. Students <i>understand</i> and use reflections, rotations, and translations to define and identify congruent plane figures.</p>	<p>M(G&M)–4–4 Demonstrates conceptual understanding of congruency by matching congruent figures using reflections, translations, or rotations (flips, slides, or turns), or as the result of composing or decomposing shapes using models or explanations.</p>	<p>NECAP G&M-4-4 (grade 4)</p>
<p>5. Students <i>understand</i> how to use proportional relationships to make indirect linear measurements and use scale drawings to make linear measurements.</p>	<p>M(G&M)–6–5 <u>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).</u> Describes effects using models or explanations.</p>	

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	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, <u>scalene</u> , <u>isosceles</u> , or equilateral) or quadrilaterals (rectangles, squares, rhombi, trapezoids, or parallelograms).	Much of the content in this GLE is introduced in MLRC1 at grade 4. Two of the vocabulary words in the GLE (equiangular and scalene) do not appear in the MLRs.
D. Algebra	Functions and Algebra	
1. Students <i>create</i> and <i>evaluate</i> simple expressions.	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>two or more of the four operations</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> .	
2. Students recognize and <i>solve</i> problems involving linear equations and recognize examples and non-examples of linear equations.	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> . 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 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.	

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<p>3. Students use tables, formulas, diagrams, and graphs to analyze relationships between quantities.</p>	<p>M(F&A)–6–1 Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, <u>graphs</u>, 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 <u>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 $2n + 1$)</u>.</p>	
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