State of Iowa

DLM Math Integrated Assessment Model

Test Blueprint 2015-2016

In this document, the "blueprint" refers to required Essential Elements (EEs) and the requirements for coverage within each conceptual area. A general description of the content covered is provided for each grade.

The specific EEs available in each grade are listed in tables beginning on the next page. EEs are organized according to conceptual area.

Major Claims and Conceptual Areas in Mathematics

Major Claim	Conceptual Area	
1. Students demonstrate increasingly complex understanding of number sense.	M.C1.1	Understand number structures (counting, place value, fraction)
	M.C1.2	Compare, compose, and decompose numbers and sets
	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations
2. Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.1	Understand and use geometric properties of two-and three-dimensional shapes
	M.C2.2	Solve problems involving area, perimeter, and volume
3. Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.1	Understand and use measurement principles and units of measure
	M.C3.2	Represent and interpret data displays
4. Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.1	Use operations and models to solve problems
	M.C4.2	Understand patterns and functional thinking

Grade 3: Math Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.1	Understand number structures (counting, place value, fraction)	3.NBT.2	Demonstrate understanding of place value to tens.
			3 NBT.3	Count by tens using models such as objects, base ten blocks, or money.
	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	3.OA.4	Solve addition and subtraction problems when result is unknown, limited to operands and results within 20.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.2	Solve problems involving area, perimeter, and volume	3.G.2	Recognize that shapes can be partitioned into equal areas.
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.1	Understand and use measurement principles and units of measure	3.MD.1	Tell time to the hour on a digital clock.
			3.MD.4	Measure length of objects using standard tools, such as rulers, yardsticks, and meter sticks.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.1	Use operations and models to solve problems	3.OA.1-2	Use repeated addition to find the total number of objects and determine the sum.
	M.C4.2	Understand patterns and functional thinking	3.OA.9	Identify arithmetic patterns.

Grade 4: Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.1	Understand number structures (counting, place value, fraction)	4.NF.1-2	Identify models of one half (1/2) and one fourth (1/4).
			4.NF.3	Differentiate between whole and half.
	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	4.NBT.4	Add and subtract two-digit whole numbers.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.1	Understand and use geometric properties of two-and three-dimensional shapes	4.G.1	Recognize parallel lines and intersecting lines.
	M.C2.2	Solve problems involving area, perimeter, and volume	4.MD.3	Determine the area of a square or rectangle by counting units of measure (unit squares).
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.1	Understand and use measurement principles and units of measure	4.MD.2a	Tell time using a digital clock. Tell time to the nearest hour using an analog clock.
	M.C3.2		4.MD.2d	Identify coins (penny, nickel, dime, quarter) and their values.
	M.C3.2	Represent and interpret data displays	4.MD.4b	Interpret data from a picture or bar graph.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.1	Use operations and models to solve problems	4.OA.3	Solve one-step real-world problems using addition or subtraction within 100.
	M.C4.2	Understand patterns and functional thinking	4.OA.5	Use repeating patterns to make predictions.

Grade 5: Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.1	Understand number structures (counting, place value, fraction)	5.NF.1	Identify models of halves (1/2, 2/2) and fourths (1/4, 2/4, 3/4, 4/4).
	M.C1.2	Compare, compose, and decompose numbers and sets	5.NBT.1	Compare numbers up to 99 using base ten models.
	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	5.NBT.6-7	Illustrate the concept of division using fair and equal shares.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.1	Understand and use geometric properties of two-and three-dimensional shapes	5.G.1-4	Sort two-dimensional figures and identify the attributes (angles, number of sides, corners, color) they have in common.
			5.MD.3	Identify common three-dimensional shapes.
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.1	Understand and use measurement principles and units of measure	5.MD.1a	Tell time using an analog or digital clock to the half or quarter hour.
			5.MD.1b	Use standard units to measure weight and length of objects.
	M.C3.2	Represent and interpret data displays	5.MD.2	Represent and interpret data on a picture, line plot, or bar graph.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.2	Understand patterns and functional thinking	5.OA.3	Identify and extend numerical patterns.

Grade 6: Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.1	Understand number structures (counting, place value, fraction)	6.RP.1	Demonstrate a simple ratio relationship.
	M.C1.2	Compare, compose, and decompose numbers and sets	6.NS.1	Compare the relationships between two unit fractions.
	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	6.NS.2	Apply the concept of fair share and equal shares to divide.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.2	Solve problems involving area, perimeter, and volume	6.G.1	Solve real-world and mathematical problems about area using unit squares.
			6.G.2	Solve real-world and mathematical problems about volume using unit cubes.
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.2	Represent and interpret data displays	6.SP.5	Summarize data distributions shown in graphs or tables.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.1	Use operations and models to solve problems	6.EE.3	Apply the properties of addition to identify equivalent numerical expressions.
			6.EE.5-7	Match an equation to a real-world problem in which variables are used to represent numbers.

Grade 7: Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.1	Understand number structures (counting, place value, fraction)	7.NS.2.c-d	Express a fraction with a denominator of 10 as a decimal.
	M.C1.2	Compare, compose, and decompose numbers and sets	7.NS.3	Compare quantities represented as decimals in real world examples to tenths.
	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	7.NS.1	Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one.
			7.NS.2.a	Solve multiplication problems with products to 100.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.1	Understand and use geometric properties of two-and three-dimensional shapes	7.G.1	Match two similar geometric shapes that are proportional in size and in the same orientation.
	M.C2.2	Solve problems involving area, perimeter, and volume	7.G.4	Determine the perimeter of a rectangle by adding the measure of the sides.
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.2	Represent and interpret data displays	7.SP.3	Compare two sets of data within a single data display such as a picture graph, line plot, or bar graph.
			7.SP.5-7	Describe the probability of events occurring as possible or impossible.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.1	Use operations and models to solve problems	7.EE.1	Use the properties of operations as strategies to demonstrate that expressions are equivalent.

Grade 8: Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.1	Understand number structures (counting, place value, fraction)	8.NS.2a	Express a fraction with a denominator of 100 as a decimal.
	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	8.NS.1	Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.1	Understand and use geometric properties of two-and three-dimensional shapes	8.G.2	Identify shapes that are congruent.
	M.C2.2	Understand and use measurement principles and units of measure	8.G.9	Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter and area of rectangles and volume of rectangular prisms).
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.2	Represent and interpret data displays	8.SP.4	Construct a graph or table from given categorical data and compare data categorized in the graph or table.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.1	Use operations and models to solve problems	8.EE.7	Solve algebraic equations with one variable using addition and subtraction.
	M.C4.2	Understand patterns and functional thinking	8.EE.2	Identify a geometric sequence of whole numbers with a whole number common ratio.
			8.F.1-3	Given a function table containing at least 2 complete ordered pairs, identify a missing number that completes another ordered pair (limited to linear functions).
			8.F.4	Determine the values or rule of a function using a graph or a table.

High School: Grade 9

Essential Elements and minimum requirement for each student's assessment

Note: Grade 9 is an optional year.

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	N-CN.2.a	Use the commutative, associative, and distributive properties to add, subtract, and multiply whole numbers.
			N-CN.2.b	Solve real-world problems involving addition and subtraction of decimals, using models when needed.
			N-CN.2.c	Solve real-world problems involving multiplication of decimals and whole numbers, using models when needed.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.1	Understand and use geometric properties of two-and three-dimensional shapes	G-CO.1	Know the attributes of perpendicular lines, parallel lines, and line segments; angles, and circles.
			G-MG.1-3	Use properties of geometric shapes to describe real-life objects.
	M.C2.2	Understand and use measurement principles and units of measure	G-GPE.7	Find perimeter and area of squares and rectangles to solve real-world problems.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.1	Use operations and models to solve problems	A-SSE.1	Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.
			A-SSE.3	Solve simple algebraic equations with one variable using multiplication and division.

High School: Grade 10

Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	S-CP.1-5	Identify when events are independent or dependent.
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.1	Understand and use measurement principles and units of measure	N-Q.1-3	Express quantities to the appropriate precision of measurement.
	M.C3.2	Represent and interpret data displays	S-ID.1-2	Given data, construct a simple graph (table, line, pie, bar, or picture) and interpret the data.
			S-ID.4	Calculate the mean of a given data set (limit the number of data points to fewer than five).
	M.C4.1	Use operations and models to solve problems	A-CED.1	Create an equation involving one operation with one variable, and use it to solve real-world problems.
			A-CED.2-4	Solve one-step equalities.
	M.C42	Understand patterns and functional thinking	A.REI.10-12	Interpret the meaning of a point on the graph of a line.
			F.BF.1	Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.

High School: Grade 11

Essential Elements and minimum requirement for each student's assessment

Claim	Conceptual Area		EE	Description
Students can demonstrate increasingly complex understanding of number sense.	M.C1.3	Calculate accurately and efficiently using simple arithmetic operations	N-RN.1	Determine the value of a quantity that is squared or cubed.
			S-IC.1-2	Determine the likelihood of an event occurring when the outcomes are equally likely to occur.
Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.	M.C2.1	Understand and use geometric properties of two-and three-dimensional shapes	G-CO.6-8	Identify corresponding congruent and similar parts of shapes.
Students demonstrate increasingly complex understanding of measurement, data, and analytic procedures.	M.C3.2	Understand and use measurement principles and units of measure	S-ID.3	Interpret general trends on a graph or chart.
Students solve increasingly complex mathematical problems, making productive use of algebra and functions.	M.C4.2	Understand patterns and functional thinking	A-SSE.4	Determine the successive term in a geometric sequence given the common ration.
			F-BF.2	Determine an arithmetic sequence with whole numbers when provided a recursive rule.
			F.IF.1-3	Use the concept of function to solve problems.
			F-IF.4-6	Construct graphs that represent linear functions with different rates of change and interpret which is faster/lower, higher/lower, etc.