

Michigan Grades 2–7 Mathematics Standards and Group Consensus DOK Values

Level	Description	DOK
N	Number & Operations	2
N.ME	Meaning, notation, place value, and comparisons	2
N.ME.1	Count to 1000 by 1's, 10's, and 100's starting from any number in the sequence.	1
N.ME.2	Read and write numbers to 1000 in numerals and words, and relate them to the quantities they represent.	2
N.ME.3	Compare and order numbers to 1000; use the symbols $>$ and $<$.	2
N.ME.4	Recognize, name, and represent commonly used unit fractions with denominators 12 or less; model $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ by folding strips	2
N.ME.5	Recognize, name, and write commonly used fractions:	1
N.ME.6	Place 0 and halves on the number line; relate to a ruler	1
N.ME.7	For unit fractions from $\frac{1}{12}$ to $\frac{1}{2}$, understand the inverse relationship between the size of a unit fraction and the size of the denominator; compare unit fractions from $\frac{1}{12}$ to $\frac{1}{2}$.	2
N.ME.8	Recognize that fractions such as $\frac{2}{2}$, $\frac{3}{3}$, and $\frac{4}{4}$ are equal to the whole (one).	1
N.FL	Fluency with operations and estimation	2
N.FL.1	Decompose 100 into addition pairs.	2
N.FL.2	Add fluently two numbers up to two digits each, using strategies including formal algorithms; subtract fluently two numbers up to two digits each.	1
N.FL.3	Estimate and calculate the sum of two numbers with three digits that do not require regrouping.	2
N.FL.4	Develop strategies for fluently multiplying numbers up to 5×5 .	3
N.MR	Number relationships and meaning or operations	2
N.MR.1	Find the distance between numbers on the number line.	1
N.MR.2	Find missing values in open sentences; use relationship between addition and subtraction.	2
N.MR.3	Given a contextual situation that involves addition and subtraction for numbers up to two digits: model using objects or pictures, explain in words, record using numbers and symbols; solve.	3
N.MR.4	Understand multiplication as the result of counting the total number of objects in a set of equal groups.	1
N.MR.5	Represent multiplication using area and array models.	2
N.MR.6	Understand division (\div) as another way of expressing multiplication, using fact families within the 5×5 multiplication table; emphasize that division “undoes” multiplication.	2
N.MR.7	Given a simple situation involving groups of equal size or of sharing equally, represent with objects, words, and symbols; solve.	2
M	Measurement	2
M.UN	Units and systems or measurement	2
M.UN.1	Measure lengths in meters, centimeters, inches, feet, and yards approximating to the nearest whole unit and using abbreviations: cm, m, in, ft, yd.	1
M.UN.2	Measure area using non-standard units to the nearest whole unit.	2
M.UN.3	Using both A.M. and P.M., tell and write time from the clock face in 5 minute intervals, and from digital clocks to the minute; include reading time: 9:15 as nine-fifteen and 9:50	2

Table 4.12

*Group Consensus**MI Mathematics Grade 2, Mathematics, Grade 2*

	as nine-fifty. Interpret time both as minutes after the hour and minutes be	
M.UN.4	Use the concept of duration of time.	2
M.UN.5	Read and write amounts of money using decimal notations.	1
M.UN.6	Read temperature using the scale on a thermometer in degrees Fahrenheit.	1
M.TE	Techniques and formulas for measurement	2
M.TE.1	Find the area of a rectangle with whole number side lengths by covering with unit squares and counting, or by using a grid of unit squares; write the area as a product.	2
M.PS	Problem solving involving measurement	2
M.PS.1	Compare lengths; add and subtract lengths (no conversion of units).	1
M.PS.2	Add and subtract money in mixed units.	2
M.PS.3	Solve simple word problems involving length and money.	2
G	Geometry	2
G.GS	Geometric shape, properties, and mathematical arguments	2
G.GS.1	Identify, describe, and compare familiar two-dimensional and three-dimensional shapes, such as triangles, rectangles, squares, circles, semi-circles, spheres, rectangular prisms.	2
G.GS.2	Explore and predict the results of putting together and taking apart two-dimensional and three-dimensional shapes.	3
G.GS.3	Draw rectangles and triangles, and compute perimeters by adding lengths of sides, recognizing the meaning of perimeter.	2
G.GS.4	Distinguish between curves and straight lines and between curved surfaces and flat surfaces.	1
G.SR	Spatial reasoning and geometric modeling	3
G.SR.1	Classify familiar plane and solid objects by common attributes such as shape, size, color, roundness or number of corners and explain which attributes are being used for classification.	3
G.TR	Transformation and symmetry	1
G.TR.1	Recognize that shapes that have been slid, turned or flipped are the same shape.	1
G.LO	Location and spatial relationships	2
G.LO.1	Find and name locations using simple coordinate systems such as maps and first quadrant grids.	2
D	Data & Probability	2
D.RE	Data representation	2
D.RE.1	Make pictographs using a scale representation, using scales where symbols equal more than one.	2
D.RE.2	Read and interpret pictographs with scales, using scale factors of 2 and 3.	2
D.RE.3	Solve problems using information in pictographs; include scales such as “each case represents 2 apples.”; avoid half cases.	2

Table 4.12
 Group Consensus
 MI Mathematics Grade3, Mathematics, Grade 3

Level	Description	DOK
N	Number & Operations	2
N.ME	Meaning, notation, place value, and comparisons	1
N.ME.1	Read and write numbers to 10,000 in both numerals and words, and relate them to the quantities they represent.	1
N.ME.2	Recognize and use expanded notation for numbers using place value to 10,000s place identify the place value of a digit in a number.	1
N.ME.3	Compare and order numbers up to 10,000.	1
N.ME.4	Know that even numbers end in 0, 2, 4, 6, or 8; name a whole number quantity that can be shared in two equal groups or grouped into pairs with no remainders; recognize even numbers as multiples of 2. Know that odd numbers end in 1, 3, 5, 7, or 9, and work with patterns involving even and odd numbers.	1
N.ME.5	Understand that fractions may represent a portion of a whole unit that has been partitioned into parts of equal area or length; use the terms “numerator” and “denominator.”	1
N.ME.6	Recognize, name and use equivalent fractions with denominators 2, 4, and 8, using strips as area models.	2
N.ME.7	Place fractions with denominators of 2, 4, and 8 on the number line; relate the number line to a ruler; compare and order up to three fractions with denominators 2, 4, and 8.	2
N.ME.8	Understand that any fraction can be written as a sum of unit fractions.	1
N.ME.9	Understand the meaning of \$0.50 and \$0.25 related to money.	1
N.FL	Fluency with operations and estimation	1
N.FL.1	Add and subtract fluently two numbers: up to and including two-digit numbers with regrouping and up to four-digit numbers without regrouping.	1
N.FL.2	Estimate the sum and difference of two numbers with three digits (sums up to 1000), and judge reasonableness of estimates.	2
N.FL.3	Find products fluently up to 10×10 ; find related quotients using multiplication and division relationships.	1
N.MR	Number relationships and meaning or operations	2
N.MR.1	Use multiplication and division fact families to understand the inverse relationship of these two operations; express a multiplication statement as an equivalent division statement.	2
N.MR.2	Recognize situations that can be solved using multiplication and division including finding “How many groups?” and “How many in a group?” and write mathematical statements for those situations.	2
N.MR.3	Find solutions to open sentences, such as $7 \times _ = 42$ or $12 \div _ = 4$, using the inverse relationship between multiplication and division.	2
N.MR.4	Solve simple division problems involving remainders, viewing remainder as the “number left over” (less than the divisor); interpret based on problem context.	2
N.MR.5	Given problems that use any one of the four operations with appropriate numbers, represent with objects, words, (including “product” and “quotient”), and mathematical statements; solve.	2
N.MR.6	Recognize that addition and subtraction of fractions with equal denominators can be modeled by joining or taking away segments on the number line.	2
M	Measurement	1

Table 4.12

*Group Consensus**MI Mathematics Grade3, Mathematics, Grade 3*

M.UN	Units and systems of measurement	1
M.UN.1	Know and use common units of measurements in length, weight and time.	1
M.UN.2	Measure in mixed units within the same measurement system for length, weight and time: feet and inches, meters and centimeters, kilograms and grams, pounds and ounces, liters and milliliters, hours and minutes, minutes and seconds, years and months.	1
M.UN.3	Understand relationships between sizes of standard units.	2
M.UN.4	Know benchmark temperatures such as freezing (32°F, 0°C); boiling (212°F, 100°C); and compare temperatures to these.	1
M.UN.5	Know the definition of area and perimeter and calculate the perimeter of a square and rectangle given whole number side lengths.	1
M.UN.6	Use square units in calculating area by covering the region and counting the number of square units.	1
M.UN.7	Distinguish between units of length and area and choose a unit appropriate in the context.	1
M.UN.8	Visualize and describe the relative sizes of one square inch and one square centimeter.	1
M.TE	Techniques and formulas for measurement	2
M.TE.1	Estimate the perimeter of a square and rectangle in inches and centimeters; estimate the area of a square and rectangle in square inches and square centimeters.	2
M.PS	Problem solving involving measurement	2
M.PS.1	Add and subtract lengths, weights and times using mixed units, within the same measurement system.	2
M.PS.2	Add and subtract money in dollars and cents.	1
M.PS.3	Solve applied problems involving money, length and time.	2
M.PS.4	Solve contextual problems about perimeters of rectangles and areas of rectangular regions.	2
G	Geometry	2
G.GS	Geometric shape, properties, and mathematical arguments	1
G.GS.1	Identify points, line segments, lines and distance.	1
G.GS.2	Identify perpendicular lines and parallel lines in familiar shapes and in the classroom.	1
G.GS.3	Identify parallel faces of rectangular prisms, in familiar shapes and in the classroom.	1
G.GS.4	Identify, describe, compare and classify two-dimensional shapes based on their component parts (angles, sides, vertices, line segment) and the number of sides and vertices.	2
G.GS.5	Identify, describe, build and classify familiar three-dimensional solids based on their component parts (faces, surfaces, bases, edges, vertices).	3
G.SR	Spatial reasoning and geometric modeling	2
G.SR.1	Compose and decompose triangles and rectangles to form other familiar two-dimensional shapes.	2
G.SR.2	Represent front, top, and side views of solids built with cubes.	2
D	Data & Probability	2
D.RE	Data representation	2
D.RE.1	Read and interpret bar graphs, in both horizontal and vertical forms.	2
D.RE.2	Read scales on the axes and identify the maximum, minimum, and range of values in a bar graph.	2
D.RE.3	Solve problems using information in bar graphs, including comparison of bar graphs.	2

Table 5.12
Group Consensus
MI Mathematics Grade 4, Mathematics, Grade 4

Level	Description	DOK
N	Number & Operations	2
N.ME	Meaning, notation, place value, and comparisons	1
N.ME.1	Read and write numbers to 1,000,000; relate them to the quantities they represent; compare and order.	1
N.ME.2	Compose and decompose numbers using place value to 1,000,000's.	1
N.ME.3	Understand the magnitude of numbers up to 1,000,000; recognize the place value's of numbers, and the relationship of each place value to the place to its right.	1
N.ME.4	Find all factors of a whole number up to 50, and list factor pairs.	2
N.ME.5	List the first ten multiples of a given one-digit whole number; determine if a whole number is a multiple of a given one-digit whole number, and if a one-digit number is a factor of a given whole number.	2
N.ME.6	Multiply two-digit numbers by 2, 3, 4, and 5, using the distributive property.	2
N.ME.7	Read and interpret decimals up to two decimal places; relate to money and place value decomposition.	1
N.ME.8	Know that terminating decimals represent fractions whose denominators are 10, 10 x 10, 10 x 10 x 10, etc.	1
N.ME.9	Locate tenths and hundredths on a number line.	1
N.ME.10	Read, write, interpret, and compare decimals up to two decimal places.	2
N.ME.11	Understand fractions as parts of a set of objects.	1
N.MR	Number relationships and meaning or operations	2
N.MR.1	Know that some numbers, including 2, 3, 5, 7, and 11 have exactly two factors (1 and the number itself) and are called prime numbers.	1
N.MR.2	Solve problems about factors and multiples.	2
N.MR.3	Use the relationship between multiplication and division to simplify computations and check results.	1
N.MR.4	Write tenths and hundredths in decimal and fraction forms, and know the decimal equivalents for halves and fourths.	1
N.MR.5	Explain why equivalent fractions are equal, using models such as fraction strips or the number line, for fractions with denominators of 12 or less, or equal to 100.	2
N.MR.6	Locate and compare fractions on the number line, including improper fractions and mixed numbers with denominators of 12 or less.	2
N.MR.7	Understand the relationships among halves, fourths and eighths and among thirds, sixths and twelfths.	1
N.MR.8	Know that fractions of the form m/n , where m is greater than n , are greater than 1 and are called improper fractions; locate improper fractions on the number line; express as mixed numbers.	1
N.MR.9	Write improper fractions as mixed numbers, and understand that a mixed number represents the number of "wholes" and the part of a whole remaining.	1
N.MR.10	Compare and order up to three fractions with denominators 2, 4, and 8, and 3, 6, and 12, including improper fractions and mixed numbers.	2
N.MR.11	Add and subtract fractions less than 1 with denominators 12 or less and including 100, in cases where the denominators are equal or when one denominator is a multiple of the other.	2

Table 5.12
Group Consensus
MI Mathematics Grade 4, Mathematics, Grade 4

N.MR.12	Solve for the unknown in equations such as: $\frac{1}{8} + x = \frac{5}{8}$ or $\frac{3}{4} - y = \frac{1}{2}$.	2
N.MR.13	Multiply fractions by whole numbers, using repeated addition and area or array models.	2
N.MR.14	Use mathematical statements to represent problems that use addition and subtraction of decimals with up to two-digits; solve.	2
N.MR.15	Solve applied problems using the four basic arithmetic operations, for appropriate fractions, decimals, and whole numbers.	2
N.FL	Fluency with operations and estimation	2
N.FL.1	Add and subtract whole numbers fluently.	1
N.FL.2	Multiply fluently any whole number by a one-digit number, and a three-digit number by a two-digit number; for two-digit by one-digit multiplication, use distributive property to develop meaning for the algorithm.	2
N.FL.3	Divide numbers up to four-digits by one-digit numbers and by 10.	1
N.FL.4	Find unknowns in equations such as	2
N.FL.5	Solve applied problems involving whole number multiplication and division.	2
N.FL.6	Solve fraction problems involving sums and differences for fractions where one denominator is a multiple of the other (denominators 2 through 12, and 100).	2
N.FL.7	Add and subtract decimals up to two decimal places.	1
N.FL.8	Multiply and divide decimals up to two decimal places by a one-digit whole number where the result is a terminating decimal.	1
N.FL.9	Estimate the answers to calculations involving addition, subtraction, or multiplication.	2
N.FL.10	Know when approximation is appropriate and use it to check the reasonableness of answers; be familiar with common place-value errors in calculations.	2
N.FL.11	Make appropriate estimations & calculations	2
M	Measurement	2
M.UN	Units and systems of measurement	2
M.UN.1	Measure using common tools and select appropriate units of measure.	1
M.UN.2	Measure and compare integer temperatures in degrees.	1
M.UN.3	Give answers to a reasonable degree of precision in the context of a given problem.	2
M.UN.4	Solve contextual problems about perimeter and area of squares and rectangles in compound shapes.	2
M.UN.5	Solve contextual problems about surface area.	2
M.TE	Techniques and formulas for measurement	2
M.TE.1	Measure surface area of cubes and rectangular prisms by covering and counting area of the faces.	2
M.TE.2	Carry out the following conversions from one unit of measure to a larger or smaller unit of measure: meters to centimeters, kilograms to grams, liters to milliliters, hours to minutes, minutes to seconds, years to months, weeks to days, feet to inches, ounces to pounds (using numbers that involve only simple calculations.)	1
M.TE.3	Know and understand the formulas for perimeter and area of a square and a rectangle; calculate the perimeters and areas of these shapes and combinations of these shapes using the formulas.	2
M.TE.4	Find one dimension of a rectangle given the other dimension and its perimeter or area.	2
M.TE.5	Find the side of a square given its perimeter or area.	1

Table 5.12
Group Consensus
MI Mathematics Grade 4, Mathematics, Grade 4

M.TE.6	Identify right angles and compare angles to right angles.	1
G	Geometry	2
G.GS	Geometric shape, properties, and mathematical arguments	2
G.GS.1	Identify and draw perpendicular, parallel, and intersecting lines using a ruler and a tool or object with a square (90°) corner.	1
G.GS.2	Identify basic geometric shapes, including isosceles, equilateral and right triangles, and use their properties to solve problems.	2
G.SR	Spatial reasoning and geometric modeling	1
G.SR.1	Identify and count the faces, edges, and vertices of basic three-dimensional geometric solids including cubes, rectangular prisms, and pyramids; describe the shape of their faces.	1
G.TR	Transformation and symmetry	1
G.TR.1	Recognize plane figures that have line symmetry.	1
G.TR.2	Recognize rigid motion transformations (flips, slides, turns) of a two-dimensional object.	1
D	Data & Probability	2
D.RE	Data representation	2
D.RE.1	Construct tables and bar graphs from given data.	2
D.RE.2	Order a given set of data, find the median, and specify the range of values.	2
D.RE.3	Solve problems using data presented in tables and bar graphs; read bar graphs showing two data sets.	2

Table 6.12
 Group Consensus
 MI Mathematics Grade 5, Mathematics, Grade 5

Level	Description	DOK
N	Number & Operations	1
N.ME	Meaning, notation, place value, and comparisons	1
N.ME.1	Understand the relative magnitude of ones, tenths, and hundredths and the relationship of each place value to the place to its right.	1
N.ME.2	Understand percentages as parts out of 100, use % notation, and express a part of a whole as a percentage.	1
N.ME.3	Understand a fraction as a statement of division using simple fractions and pictures to represent.	1
N.ME.4	Given two fractions, express them as equivalent fractions with a common denominator, but not necessarily a least common denominator.	1
N.ME.5	Express ratios in several ways, given applied situations; recognize and find equivalent ratios.	2
N.FL	Fluency with operations and estimation	2
N.FL.1	Multiply a multi-digit number by a two-digit number; recognize and be able to explain common computational errors such as not accounting for place value.	2
N.FL.2	Divide fluently up to a four-digit number by a two-digit number.	1
N.FL.3	Divide a fraction by a whole number and a whole number by a fraction, using simple unit fractions.	1
N.FL.4	Add and subtract fractions with unlike denominators of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 100, using the common denominator that is the product of the denominators of the 2 fractions.	1
N.FL.5	Given an applied situation involving addition and subtraction of fractions, write mathematical statements describing the situation.	2
N.FL.6	Solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness; use examples involving money.	2
N.MR	Number relationships and meaning or operations	1
N.MR.1	Understand the meaning of division of whole numbers, with and without remainders; relate division to fractions and to repeated subtraction.	1
N.MR.2	Relate division of whole numbers with remainders to the form $a = bq + r$.	1
N.MR.3	Write mathematical statements involving division for given situations.	2
N.MR.4	Solve applied problems involving multiplication and division of whole numbers.	2
N.MR.5	Find the prime factorization of numbers between 1 and 50, express in exponential notation, and understand that every whole number can be expressed as a product of primes.	2
N.MR.6	Find the product of two unit fractions with small denominators using area model.	1
N.MR.7	Multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, and 1000; identify patterns.	1
N.MR.8	Multiply one-digit and two-digit whole numbers by decimals up to two decimal places.	1
N.MR.9	Solve word problems that involve finding sums and differences of fractions with unlike denominators, using knowledge of equivalent fractions.	2
N.MR.1 0	Solve for the unknown in such equations as: $1/4 + x = 7/12$.	2
N.MR.1	Express fractions and decimals as percentages, and vice versa.	1

Table 6.12
Group Consensus
MI Mathematics Grade 5, Mathematics, Grade 5

1		
M	Measurement	2
M.UN	Units and systems of measurement	1
M.UN.1	Recognize the equivalence of 1 liter, 1000 ml and 1000 cm ³ and include conversions among liters, milliliters, and cubic centimeters.	1
M.UN.2	Know the units of measure of volume: cubic centimeter, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations: cm ³ , m ³ , in ³ , ft ³ , yd ³ .	1
M.UN.3	Compare the relative sizes of one cubic inch to one cubic foot, and one cubic centimeter to one cubic meter.	1
M.UN.4	Convert measurements of length, weight, area, volume, and time within a given system, using easily manipulated numbers.	1
M.PS	Problem solving involving measurement	2
M.PS.1	Represent relationships between areas of rectangles, triangles and parallelograms using models.	2
M.PS.2	Solve applied problems about the volumes of rectangular prisms using multiplication and division and using the appropriate units.	2
M.TE	Techniques and formulas for measurement	2
M.TE.1	Understand and know how to use the area formula of a triangle: $A = 1/2(bh)$ (where b is length of the base and h is the height), and represent using models and manipulatives.	2
M.TE.2	Understand and know how to use the area formula for a parallelogram: $A = bh$, and represent using models and manipulatives.	2
G	Geometry	2
G.GS	Geometric shape, properties, and mathematical arguments	2
G.GS.1	Measure angles with a protractor and classify them as acute, right, obtuse or straight.	1
G.GS.2	Identify and name angles on a straight line and vertical angles.	1
G.GS.3	Find unknown angles in problems involving angles on a straight line, angles surrounding a point and vertical angles.	2
G.GS.4	Know that angles on a straight line add up to 180° and angles surrounding a point add up to 360°; justify informally by “surrounding” a point with angles.	1
G.GS.5	Understand why the sum of the interior angles of a triangle is 180° and the sum of the interior angles of a quadrilateral is 360°, and use these properties to solve problems.	2
G.GS.6	Find unknown angles using the properties of: triangles, including right, isosceles, and equilateral triangles; parallelograms, including rectangles and rhombuses; and trapezoids.	2
G.TR	Transformation and symmetry	1
G.TR.1	Associate an angle with a certain amount of turning; know that angles are measured in degrees; understand that 90°, 180°, 270°, and 360° are associated, respectively, with 1/4, 1/2, 3/4, and full turns.	1
D	Data & Probability	2
D.RE	Data representation	2
D.RE.1	Read and interpret line graphs, and solve problems based on line graphs, time graphs, and problems with two or three line graphs on same axes, comparing different data.	2
D.RE.2	Construct line graphs from tables of data; include axis labels and scale.	2
D.AN	Data interpretation and analysis	2
D.AN.1	Given a set of data, find and interpret the mean (using the concept of fair share) and	2

Table 6.12
Group Consensus
MI Mathematics Grade 5, Mathematics, Grade 5

	mode.	
D.AN.2	Solve multi-step problems involving means.	2

Table 7.12
 Group Consensus
 MI Mathematics Grade 6, Mathematics, Grade 6

Level	Description	DOK
N	Number & Operations	1
N.ME	Meaning, notation, place value, and comparisons	1
N.ME.1	Order rational numbers and place them on the number line.	1
N.ME.2	Represent rational numbers as fractions or terminating decimals when possible, and translate between these representations.	1
N.ME.3	Understand that a fraction or a negative fraction is a quotient of two integers.	1
N.ME.4	Find equivalent ratios by scaling up or scaling down.	1
N.ME.5	Understand and use integer exponents, excluding powers of negative numbers; express numbers in scientific notation.	1
N.ME.6	Locate negative rational numbers (including integers) on the number line; know that numbers and their negatives add to 0, and are on opposite sides and at equal distance from 0 on a number line.	1
N.ME.7	Understand that rational numbers are quotients of integers (non-zero denominators).	1
N.ME.8	Understand that 0 is an integer that is neither negative nor positive.	1
N.ME.9	Know that the absolute value of a number is the value of the number, ignoring the sign; or is the distance of the number from 0.	1
N.FL	Fluency with operations and estimation	2
N.FL.1	Given an applied situation involving dividing fractions, write a mathematical statement to represent the situation.	2
N.FL.2	Multiply and divide any two fractions, including mixed numbers, fluently.	1
N.FL.3	Add, subtract, multiply, and divide integers between -10 and 10; use number line and strip models for addition and subtraction.	1
N.FL.4	Add, subtract, multiply and divide positive rational numbers fluently.	1
N.FL.5	Calculate part of a number given the percentage and the number.	1
N.FL.6	Solve word problems involving percentages in such contexts as sales taxes and tips, and involving positive rational numbers.	2
N.FL.7	For applied situations, estimate the answers to calculations involving operations with rational numbers.	2
N.FL.8	Solve applied problems that use the four operations with appropriate decimal numbers.	2
N.MR	Number relationships and meaning or operations	1
N.MR.1	Understand division of fractions as the inverse of multiplication.	1
N.MR.2	Solve for the unknown in equations such as: $1/4 \div _ = 1$, $3/4 \div _ = 1/4$, and $1/2 = 1 \times _$.	2
N.MR.3	Understand integer subtraction as the inverse of integer addition; add and subtract integers, using integers from 10 to -10.	1
A	Algebra	2
A.PA	Patterns, relations, functions, and change	2
A.PA.1	Solve applied problems involving rates, including speed.	2
A.PA.2	Graph and write equations for linear functions of the form $y = mx$ and solve related problems.	2
A.FO	Formulas, expressions, equations, and inequities	1
A.FO.1	Use letters, with units, to represent quantities in a variety of contexts.	1
A.FO.2	Distinguish between an algebraic expression and an equation.	1
A.FO.3	Use standard conventions for writing algebraic expressions.	1

Table 7.12
Group Consensus
MI Mathematics Grade 6, Mathematics, Grade 6

A.FO.4	Represent information given in words using algebraic expressions and equations.	2
A.FO.5	Simplify expressions of the first degree by combining like terms, and evaluate using specific values.	2
A.FO.6	Relate simple linear equations with integer coefficients to particular contexts.	2
A.FO.7	Understand that adding or subtracting the same number to both sides of an equation creates a new equation that has the same solution.	1
A.FO.8	Understand that multiplying or dividing both sides of an equation by the same non-zero number creates a new equation that has the same solutions.	1
A.FO.9	Solve equations of the form $ax + b = c$, by hand for positive integer coefficients less than 20, using calculators otherwise, and interpret the results.	2
A.RP	Representation	1
A.RP.1	Understand that graphs and tables can suggest relationships between quantities.	1
A.RP.2	Represent simple relationships between quantities.	2
A.RP.3	Plot ordered pairs of integers and use ordered pairs of integers to identify points in all four quadrants of the coordinate plane.	1
M	Measurement	2
M.UN	Units and systems or measurement	1
M.UN.1	Convert between basic units of measurement within a single measurement system.	1
M.PS	Problem solving involving measurement	2
M.PS.1	Draw patterns (of faces) for a cube and rectangular prism that, when cut, will cover the solid exactly (nets).	2
M.TE	Techniques and formulas for measurement	2
M.TE.1	Compute the volume and surface area of cubes and rectangular prisms given the lengths of their sides, using formulas.	2
G	Geometry	2
G.GS	Geometric shape, properties, and mathematical arguments	2
G.GS.1	Understand and apply basic properties of lines, angles, and triangles, including: <ul style="list-style-type: none"> • triangle inequality, • relationships of vertical angles, complementary angles, supplementary angles, • congruence of corresponding and alternate interior angles when parallel lines are cut by a transversal, and that such congruencies imply parallel lines • locate interior and exterior angles of any triangle and use the property that a exterior angle of a triangle is equal to the sum of the remote (opposite) interior angles • know that the sum of the exterior angles of a convex polygon is 360 degrees 	2
G.GS.2	Understand that for polygons, congruence means corresponding sides and angles have equal measures.	1
G.TR	Transformation and symmetry	2
G.TR.1	Understand the basic rigid motions in the plane (reflections, rotations, translations), relate these to congruence, and apply them to solve problems.	2
G.TR.2	Understand and use simple compositions of basic rigid transformations.	2
D	Data & Probability	2
D.PR	Probability	2
D.PR.1	Express probabilities as fractions, decimals or percentages between 0 and 1; know that 0 probability means an event will not occur, and that probability 1 means an event will	1

Table 7.12
Group Consensus
MI Mathematics Grade 6, Mathematics, Grade 6

	occur.	
D.PR.2	Compute probabilities of events from simple experiments with equally likely outcomes by listing all possibilities and finding the fraction that meets given conditions.	2

Table 7.12
 Group Consensus
 MI Mathematics Grade 7, Mathematics, Grade 7

Level	Description	DOK
N	Number & Operations	2
N.ME	Meaning, notation, place value, and comparisons	2
N.ME.1	Understand derived quantities such as density, velocity, and weighted averages.	2
N.FL	Fluency with operations and estimation	2
N.FL.1	Solve problems involving derived quantities.	2
N.FL.2	Calculate rates of change, including speed.	2
N.FL.3	Solve simple proportion problems using such methods as unit rate, scaling, finding equivalent fractions, and solving the proportion equation $a/b = c/d$; know how to see patterns about proportional situations in tables.	2
N.FL.4	Solve problems involving operations with integers.	2
N.FL.5	Add, subtract, multiply and divide negative rational numbers.	1
N.FL.6	Estimate results of computations with rational numbers.	2
N.MR	Number relationships and meaning or operations	2
N.MR.1	Convert ratio quantities between different systems of units, such as feet per second to miles per hour.	2
N.MR.2	Understand the concept of square root and cube root, and estimate using calculators.	2
A	Algebra	2
A.PA	Patterns, relations, functions, and change	2
A.PA.1	Recognize when information given in a table, graph or formula suggests a proportional or linear relationship.	1
A.PA.2	Given a directly proportional or linear situation, graph and interpret the slope and intercept(s) in terms of the original situation; evaluate $y = kx$ for specific x values, given k .	2
A.PA.3	For directly proportional or linear situations, solve applied problems using graphs and equations.	2
A.PA.4	Understand and use directly proportional relationships of the form $y = mx$, and distinguish from linear relationships of the form $y = mx + b$, b non-zero; understand that in a directly proportional relationship between two quantities one quantity is a const	2
A.PA.5	Calculate the slope from the graph of a linear function as the ratio of “rise/run” for a pair of points on the graph, and express the answer as a fraction and a decimal; understand that linear functions have slope that is a constant rate of change.	2
A.PA.6	Represent linear functions in the form $y = x + b$, $y = mx$, and $y = mx + b$, and graph, interpreting slope and y -intercept.	2
A.PA.7	Recognize inversely proportional relationships in contextual situations; know that quantities are inversely proportional if their product is constant, and that an inversely proportional relationship is of the form $y = k/x$ where k is some non-zero number.	2
A.PA.8	Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.	2
A.RP	Representation	2
A.RP.1	Represent directly proportional and linear relationships using verbal descriptions, tables, graphs and formulas, and translate among these representations.	2
A.RP.2	Know that the graph of $y = k/x$ is not a line; know its shape, and know that it crosses	1

Table 7.12
Group Consensus
MI Mathematics Grade 7, Mathematics, Grade 7

	neither the x nor the y-axis.	
A.FO	Formulas, expressions, equations, and inequities	2
A.FO.1	Know that the solution to a linear equation corresponds to the point at which its graph crosses the x-axis.	1
A.FO.2	Add, subtract and multiply simple algebraic expressions of the first degree, and justify using properties of real numbers.	2
A.FO.3	From applied situations, generate and solve linear equations of the form $ax + b = c$ and $ax + b = cx + d$, and interpret solutions.	2
G	Geometry	2
G.SR	Spatial reasoning and geometric modeling	1
G.SR.1	Use a ruler and other tools to draw squares, rectangles, triangles and parallelograms with specified dimensions.	1
G.TR	Transformation and symmetry	2
G.TR.1	Understand that in similar polygons, corresponding angles are congruent and the ratios of corresponding sides are equal; understand the concepts of similar figures and scale factor.	2
G.TR.2	Solve problems about similar figures and scale drawings.	2
G.TR.3	Show that two triangles are similar using the criteria: corresponding angles are congruent (AAA similarity); the ratios of two pairs of corresponding sides are equal and the included angles are congruent (SAS similarity); ratios of all pairs of correspond	2
G.TR.4	Understand and use the fact that when two triangles are similar with scale factor of r , their areas are related by a factor of r^2 .	2
D	Data & Probability	2
D.RE	Data representation	3
D.RE.1	Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.	3
D.AN	Data interpretation and analysis	2
D.AN.1	Create and interpret scatter plots and use an estimated line of best fit to answer questions about the data.	2
D.AN.2	Calculate and interpret relative frequencies and cumulative frequencies for given data sets.	2
D.AN.3	Find and interpret the median, quartiles, and interquartile range of a given set of data.	2

