THIRD GRADE MATHEMATICS

GRADE LEVEL CONTENT EXPECTATIONS

3 MATH

v.12.05

NUMBER & OPERATIONS

ALGEBRA

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Welcome to Michigan's K-8 Grade Level Content Expectations

Purpose & Overview

In 2004, the Michigan Department of Education embraced the challenge of creating Grade Level Content Expectations in response to the federal No Child Left Behind Act of 2001. This act mandated the existence of a set of comprehensive state grade level assessments that are designed based on rigorous grade level content.

In this global economy, it is essential that Michigan students possess personal, social, occupational, civic, and quantitative literacy. Mastery of the knowledge and essential skills defined in Michigan's Grade Level Content Expectations will increase students' ability to be successful academically, contribute to the future businesses that employ them and the communities in which they choose to live.

The Grade Level Content Expectations build from the Michigan Curriculum Framework and its Teaching and Assessment Standards. Reflecting best practices and current research, they provide a set of clear and rigorous expectations for all students and provide teachers with clearly defined statements of what students should know and be able to do as they progress through school.

Why Create a 12.05 Version of the Expectations?

The Office of School Improvement is committed to creating the best possible product for educators. This commitment served as the impetus for the revision of the 6.04 edition that was previously released in June of 2004. This new version, v.12.05, refines and clarifies the original expectations, while preserving their essence and original intent. As education continues to evolve, it is important to remember that each curriculum document should be considered as a work in progress, and will continue to be refined to improve the quality.

The revision process greatly improved the continuity from one grade to the next, and better ensured coherence both in content and pedagogy. To obtain more specific details about the revisions, please refer to the addendum included in this document. The forward of the ***Across the Grades v.12.05*** companion document also clarifies the types of changes made. Educators can access the *Across the Grades* companion document by visiting the Michigan Department of Education Grade Level Content Expectations web page at www.michigan.gov/glce.

Assessment

The Grade Level Content Expectations document is intended to be a state assessment tool with the expectations written to convey expected performances by students. The Office of Assessment and Accountability was involved in the development of version 12.05 and has incorporated the changes in the construction of test and item specifications for the K-8 Michigan Education Assessment Program (MEAP) and MI-Access. This updated version will assist us in the creation of companion documents, content examples, and to guide program planners in focusing resources and energy.

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Curriculum

Using this document as a focal point in the school improvement process, schools and districts can generate conversations among stakeholders concerning current policies and practices to consider ways to improve and enhance student achievement. Together, stakeholders can use these expectations to guide curricular and instructional decisions, identify professional development needs, and assess student achievement.

Understanding the Organizational Structure

The expectations in this document are divided into strands with multiple domains within each, as shown below. The skills and content addressed in these expectations will in practice be woven together into a coherent, Mathematics curriculum. The domains in each mathematics strand are broader, more conceptual groupings. In several of the strands, the "domains" are similar to the "standards" in Principles and Standards for School Mathematics from the National Council of Teachers of Mathematics.

To allow for ease in referencing expectations, each expectation has been coded with a strand, domain, grade-level, and expectation number. For example, **M.UN.00.01** indicates:

M - Measurement strand

UN - Units & systems of measurement domain of the Measurement strand

00 - Kindergarten Expectation

01 - First Expectation in the Grade-Level view of the Measurement strand

Strand 1 Number & Operations	**Strand 2 Algebra**	**Strand 3 Measurement**	**Strand 4 Geometry**	**Strand 5 Data and Probability**
Domains				
Meaning, notation, place value, and comparisons (ME) Number relationships and meaning of operations (MR) Fluency with operations and estimation (FL)	Patterns, relations, functions, and change (PA) Representation (RP) Formulas, expressions, equations, and inequalities (RP)	Units and systems of measurement (UN) Techniques and formulas for measurement (TE) Problem solving involving measurement (PS)	Geometric shape, properties, and mathematical arguments (GS) Location and spatial relationships (LO) Spatial reasoning and geometric modeling (SR) Transformation and symmetry (TR)	Data representation (RE) Data interpretation and analysis (AN) Probability (PR)

Preparing Students for Academic Success

Within the hands of teachers, the Grade Level Content Expectations are converted into exciting and engaging learning for Michigan's students. As we use these expectations to develop units of instruction and plan instructional delivery, it is critical to keep in mind that content knowledge alone is not sufficient for academic success. Students must be able to apply knowledge in new situations, to solve problems by generating new ideas, and to make connections between what they learn in class to the world around them. The art of teaching is what makes the content of learning become a reality.

Through the collaborative efforts of Michigan educators and creation of professional learning communities, we can enable our young people to attain the highest standards, and thereby open doors for them to have fulfilling and successful lives.

NUMBER AND OPERATIONS

Understand and use number notation and place value

N.ME.03.01 Read and write numbers to 10,000 in both numerals and words, and relate them to the quantities they represent, e.g., relate numeral or written word to a display of dots or objects.

N.ME.03.02 *Identify the place value of a digit in a number, e.g., in 3,241, 2 is in the hundreds place. Recognize and use expanded notation for numbers using place value through 9,999, e.g., 2,517 is 2000+ 500+10+ 7; 4 hundreds and 2 ones is 402.**

N.ME.03.03 Compare and order numbers up to 10,000.

Count in steps, and understand even and odd numbers

N.ME.03.04 Count orally by 6's, 7's, 8's, and 9's starting with 0, making the connection between repeated addition and multiplication.

N.ME.03.05 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.

Add and subtract whole numbers

N.FL.03.06 *Add and subtract fluently two numbers through 999 with regrouping and through 9,999 without regrouping.**

N.FL.03.07 Estimate the sum and difference of two numbers with three digits (sums up to 1,000), and judge reasonableness of estimates.

N.FL.03.08 Use mental strategies to fluently add and subtract two-digit numbers.

Multiply and divide whole numbers

N.MR.03.09 Use multiplication and division fact families to understand the inverse relationship of these two operations, e.g., because $3 \times 8 = 24$, we know that $24 \div 8 = 3$ or $24 \div 3 = 8$; express a multiplication statement as an equivalent division statement.

N.MR.03.10 *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 to represent those situations.**

N.FL.03.11 Find products fluently up to 10×10; find related quotients using multiplication and division relationships.

N.MR.03.12 Find solutions to open sentences, such as $7 \times \square = 42$ or $12 \div \square = 4$, using the inverse relationship between multiplication and division.

N.FL.03.13 Mentally calculate simple products and quotients up to a three-digit number by a one-digit number involving multiples of 10, e.g., 500×6, or $400 \div 8$.

N.MR.03.14 *Solve division problems involving remainders, viewing the remainder as the "number left over"; interpret based on problem context, e.g., when we have 25 children with 4 children per group then there are 6 groups with 1 child left over.**

**revised expectations in italics*

Problem-solving with whole numbers

N.MR.03.15 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.

Understand simple fractions, relation to the whole, and addition and subtraction of fractions

N.ME.03.16 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."

N.ME.03.17 Recognize, name, and use equivalent fractions with denominators 2, 4, and 8, using strips as area models.

N.ME.03.18 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.

N.ME.03.19 Understand that any fraction can be written as a sum of unit fractions, e.g., $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$.

N.MR.03.20 Recognize that addition and subtraction of fractions with equal denominators can be modeled by joining or taking away segments on the number line.

Understand simple decimal fractions in relation to money

N.ME.03.21 *Understand and relate decimal fractions to fractional parts of a dollar, e.g., $\frac{1}{2}$ dollar = $0.50; $\frac{1}{4}$ dollar = $0.25.**

MEASUREMENT

Measure and use units for length, weight, temperature and time

M.UN.03.01 Know and use common units of measurements in length, weight, and time.

M.UN.03.02 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.

M.UN.03.03 Understand relationships between sizes of standard units, e.g., feet and inches, meters and centimeters.

M.UN.03.04 Know benchmark temperatures such as freezing (32°F, 0°C); boiling (212°F, 100°C); and compare temperatures to these, e.g., cooler, warmer.

Understand meaning of area and perimeter and apply in problems

M.UN.03.05 Know the definition of area and perimeter and calculate the perimeter of a square and rectangle given whole number side lengths.

M.UN.03.06 Use square units in calculating area by covering the region and counting the number of square units.

M.UN.03.07 Distinguish between units of length and area and choose a unit appropriate in the context.

M.UN.03.08 Visualize and describe the relative sizes of one square inch and one square centimeter.

**revised expectations in italics*

Estimate perimeter and area

M.TE.03.09 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.

Solve measurement problems

M.PS.03.10 Add and subtract lengths, weights, and times using mixed units within the same measurement system.

M.PS.03.11 Add and subtract money in dollars and cents.

M.PS.03.12 Solve applied problems involving money, length, and time.

M.PS.03.13 Solve contextual problems about perimeters of rectangles and areas of rectangular regions.

GEOMETRY

Recognize the basic elements of geometric objects

G.GS.03.01 Identify points, line segments, lines, and distance.

G.GS.03.02 Identify perpendicular lines and parallel lines in familiar shapes and in the classroom.

G.GS.03.03 Identify parallel faces of rectangular prisms in familiar shapes and in the classroom.

Name and explore properties of shapes

G.GS.03.04 Identify, describe, compare, and classify two-dimensional shapes, e.g., parallelogram, trapezoid, circle, rectangle, square, and rhombus, based on their component parts (angles, sides, vertices, line segment) and on the number of sides and vertices.

G.SR.03.05 Compose and decompose triangles and rectangles to form other familiar two-dimensional shapes, e.g., form a rectangle using two congruent right triangles, or decompose a parallelogram into a rectangle and two right triangles.

Explore and name three-dimensional solids

G.GS.03.06 Identify, describe, build, and classify familiar three-dimensional solids, e.g., cube, rectangular prism, sphere, pyramid, cone, based on their component parts (faces, surfaces, bases, edges, vertices).

G.SR.03.07 Represent front, top, and side views of solids built with cubes.

DATA AND PROBABILITY

Use bar graphs

D.RE.03.01 Read and interpret bar graphs in both horizontal and vertical forms.

D.RE.03.02 Read scales on the axes and identify the maximum, minimum, and range of values in a bar graph.

D.RE.03.03 Solve problems using information in bar graphs, including comparison of bar graphs.