

Math 4 Overview - Course 4154

Content Area: **Math**
Course(s): **MATH-4**
Time Period:
Length: **Full Year**
Status: **Published**

Cover Page

EAST BRUNSWICK PUBLIC SCHOOLS

East Brunswick New Jersey

Superintendent of Schools

Dr. Victor P. Valeski

Mathematics

Math 4 - Course Number: 4154

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Dr. Manjit K. Sran

Revisions Prepared By

Ashley Balzofiore

Kristy Cognata

Erica Magley

Arthur Tippin

Course Adoption: 4/21/1986

Curriculum Adoption: 11/2/17

Date of Last Revision Adoption: 9/1/2017

Course Overview

Course Description:

The overall mission of the mathematics curriculum is for students to communicate, make connections, reason and represent the world quantitatively in order to pose and solve problems. In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends (this includes students generalizing their understanding of place value to 1,000,000, applying their understanding of models for multiplication, using appropriate methods to estimate or mentally calculate products, developing fluency with efficient procedures for multiplying whole numbers, applying their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication, selecting appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context); (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers (this includes developing an understanding of fraction equivalence and operations with fractions, extending previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number); (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry (this includes building, drawing, and analyzing two-dimensional shapes to help students deepen their understanding of the different properties of two-dimensional objects).

Textbooks and other resources

Textbook: Everyday Math 4 (Grade 4) by McGraw-Hill Education (2014).

- Student Math Journal, Vol. 1 (ISBN 978-0-02-143092-5)
- Student Math Journal, Vol. 2 (ISBN 978-0-02-143096-3)
- Student Home Links (ISBN 978-0-02-137966-8)
- Teacher's Resource Package, classroom resources and online resources accompanying text (connectED.mcgraw-hill.com)

Units

Course Scope and Sequence:

Unit	Focus Skills	Approximate Time Frame	Quarter Report Card
1	Place Value, Rounding/Estimation Addition/Subtraction Geometry	4 weeks	1
2	Square Numbers Area Factors Multiples Prime and Composite Geometry	5 weeks	1
3	Fractions Decimals	5 weeks	2
4	Multiplication	4 weeks	2
5	Fractions and Mixed Number Computation Measurement	4 weeks	3
6	Division Angles	4 weeks	3
	Multiplication of a Fraction by a Whole		

7	Number Division Measurement	6 weeks	4
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Standards

Grade Four Overview

Operations and Algebraic Thinking

- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.

Number and Operations in Base Ten

- Generalize place value understanding for multi-digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions

- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.

Measurement and Data

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.

Geometry

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Standards for Mathematical Practice:

MP1. Make sense of problems and persevere in solving them.

MP2. Reason abstractly and quantitatively.

MP3. Construct viable arguments and critique the reasoning of others.

MP4. Model with mathematics.

MP5. Use appropriate tools strategically.

MP6. Attend to precision.

MP7. Look for and make use of structure.

MP8. Look for and express regularity in repeated reasoning

MA.4.G.A.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
MA.4.G.A.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
MA.4.G.A.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.
MA.4.MD.A.1	Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table.
MA.4.MD.A.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

MA.4.MD.A.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
MA.4.MD.B.4	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
MA.4.MD.C.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
MA.4.MD.C.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
MA.4.MD.C.5a	An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.
MA.4.MD.C.5b	An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
MA.4.NF.A.1	Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{n \times a}{n \times b}$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
MA.4.NF.A.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
MA.4.NF.B.3a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
MA.4.NF.B.3b	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
MA.4.NF.B.3c	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
MA.4.NF.B.3d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
MA.4.NF.B.4a	Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$.
MA.4.NF.B.4b	Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number.
MA.4.NF.B.4c	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.
MA.4.NF.C.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.
MA.4.NF.C.6	Use decimal notation for fractions with denominators 10 or 100.
MA.4.NF.C.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.

MA.4.OA.A.1	Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
MA.4.OA.A.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
MA.4.OA.A.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
MA.4.OA.B.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
MA.4.OA.C.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
MA.4.NBT.A.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
MA.4.NBT.A.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
MA.4.NBT.A.3	Use place value understanding to round multi-digit whole numbers to any place.
MA.4.NBT.B.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.
MA.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MA.4.NBT.B.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Grading and Evaluation Guidelines

Grading Guidelines:

Students are regularly assessed for learning at developmentally appropriate levels throughout the school year. Items used for assessment may include: teacher observation, explanations of problems, ability to use manipulatives to model mathematical thinking, fact fluency assessments, extended constructed responses and unit tests. Common summative assessments for each unit of study are used to measure attainment of grade level goals.

In terms of proficiency level, the East Brunswick grades equate to the following for course standards:

- **+**: Special Commendation
- **√**: Steady Progress

- -: Needs Improvement

In terms of proficiency level, the East Brunswick grades equate to the following as an overall assessment of marking period progress:

A	Excellent	Advanced Proficient
B	Good	Above Average Proficient
C	Fair	Proficient
D	Poor	Minimally Proficient
F	Failing	Partially Proficient

Assessments of student progress are reported to parents as follows:

- Parent conferences are held twice a year
- Standards-based report cards are sent home four times a year
- Students in Grade 4 are evaluated through a variety of indicators. Specific mathematics skills are outlined and assessed both informally in verbal and written form and through the use of end of unit district oral and unit assessments.
- Unit Portfolio assessments, delineated for each unit, will include such measures as:
 - Written and Performance Measures of proficiency objectives (NJSLO)
 - Records of oral participation in classroom discussions related to unit objectives
 - Records of achievement of lesson objectives (i.e. activity pages, relevant homework)

Course Evaluation:

In Grade 4 Mathematics the goal is that a minimum of 95% of the students will meet at least the minimum proficiency level set for the course (an overall course grade of D or better). The department will analyze the achievement of students on Unit Assessments, the mid-year assessment, the end of year test, and Final Course Grades. For final course grades the achievement of sub-groups identified by the state will be used to determine if modifications to the curriculum and instructional methods are needed.

Course evaluation requires the answering of the following questions:

1. Are course content, instruction and assessments aligned with the required NJ Student Learning Standards?
2. Is instruction sufficient for students to achieve the Standards?
3. Do all students achieve the set proficiencies/benchmarks set for the course?

Other Details

Mathematics (AAAN)

Math 4

Course No. 4154

SCED

52034 Mathematics (Grade 4)

Mathematics (grade 4) courses typically emphasize number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking; geometry and spatial reasoning; and measurement. Course content may include activities that help students increase operational fluency, make connections between abstract symbols and concrete events or concepts, or present conclusions based on data. Specific course content depends upon state learning standards for grade 4.