

Course: Mathematics – Grade 4

Rationale: To develop and master basic mathematical concepts needed for scaffolding to higher order thinking.

To apply mathematical thinking and concepts to everyday life.

Course Description: See Program of Study

Materials: Houghton Mifflin Math Central 1998

- Textbook
- Daily Cumulative Review Workbooks
- Practice Masters
- Reteaching Masters
- Enrichment Masters
- Assessment Masters
- Problem of the Day

Supplemental blackline masters from various publishers

Teacher-made supplemental masters

Place-value posters

Individual white boards

Math Journal

Mathematical Tools

- Calculators
- Geoboards
- Balance Scales
- Rulers
- Compass
- Thermometer
- Clocks
- Grid paper – inch and centimeter

Mathematical Manipulatives

- Base Ten Set
- Centimeter Locking Cubes
- Chip Trading
- Colored Tiles
- Connecting Cubes
- Counters
- Dice
- Decimal Models
- Fraction Models
- Geometric Solids
- Money Set
- Number cubes
- Pattern Blocks
- Place Value Blocks
- Place Value Mats
- Spinners
- Gram Stackers

- Tenths and Hundredths squares

Instructional Strategies:

Direct Instruction
 Guided Instruction
 Individual Instruction
 Cooperative Group Work
 Individual Practice
 Discussion of concepts and Vocabulary
 Hands-on Investigation
 Introductory exploration activities
 Flexible grouping for accommodating learning needs
 Explore concrete concepts using manipulatives
 Math discovery games
 Problem solving strategies

Assessments:

Prior Knowledge Assessment
 Prior MCAS Scores (beginning 2006)
 Daily homework
 Daily Cumulative Review
 Midchapter Reviews
 Math mat timings for math facts
 Chapter Tests
 Problem solving samples
 MCAS Alternative Assessment
 MCAS

First Marking Period (September – November)

<u>General Standard/Content</u>	<u>Framework</u>	<u>Learning Objective</u>
Number Sense and Operations	4.N.1	The learner will be able to: Exhibit an understanding of the base ten number system by reading, modeling, writing, and interpreting whole numbers to at least 100,000; demonstrating an understanding of the values of the digits; and comparing and ordering the numbers.
	4.N.2	Represent, order, and compare large numbers (to at least 100,000) using various forms, including expanded notation, e.g., $853 = 8 \times 100 + 5 \times 10 + 3$.
	4.N.9	Select, use, and explain the commutative, associative, and identity properties of operations on whole numbers in problem situations, e.g., $37 \times 46 = 46 \times 37$, $(5 \times 7) \times 2 = 5 \times (7 \times 2)$.
	4.N.10	Select and use appropriate operations (addition, subtraction, multiplication, and division) to solve problems, including those involving money.

Patterns, Relations, and Algebra	4.N.12	Add and subtract (up to five-digit numbers)
	4.N.14	Demonstrate in the classroom an understanding of and the ability to use the conventional algorithms for addition and subtraction (up to five-digit numbers)
	4.N.16	Round whole numbers through 100,000 to the nearest 10, 100, 1000, 10,000, and 100,000.
	4.N.17	Select and use a variety of strategies (e.g., front-end, rounding, and regrouping) to estimate quantities, measures, and the results of whole-number computations up to three-digit whole numbers and amounts of money to \$1000, and to judge the reasonableness of the answer
	4.P.2	Use symbol and letter variables (e.g., Δ , x) to represent unknowns or quantities that vary in expressions and in equations or inequalities (mathematical sentences that use =, <, >).
	4.P.4	Use pictures, models, tables, charts, graphs, words, number sentences, and mathematical notations to interpret mathematical relationships.
Data Analysis, Statistics, and Probability	4.P.5	Solve problems involving proportional relationships, including unit pricing (e.g., four apples cost 80¢, so one apple costs 20¢) and map interpretation (e.g., one inch represents five miles, so two inches represent ten miles).
	4.D.1	Collect and organize data using observations, measurements, surveys, or experiments, and identify appropriate ways to display the data.
	4.D.2	Match a representation of a data set such as lists, tables, or graphs (including circle graphs) with the actual set of data.
	4.D.3	Construct, draw conclusions, and make predictions from various representations of data sets, including tables, bar graphs, pictographs, line graphs, line plots, and tallies.
	4.D.4	Represent the possible outcomes for a simple probability situation, e.g., the probability of drawing a red marble from a bag containing three red marbles and four green marbles.
	4.D.5	List and count the number of possible combinations of objects from three sets, e.g., how many different outfits can one make from

	4.D.6	<p>a set of three shirts, a set of two skirts, and a set of two hats?</p> <p>Classify outcomes as certain, likely, unlikely, or impossible by designing and conducting experiments using concrete objects such as counters, number cubes, spinners, or coins.</p>
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Second Marking Period (December – March)

<u>General Standard/Content</u>	<u>Framework</u>	<u>Learning Objective</u>
Number Sense and Operations	4.N.7	<p>The learner will be able to:</p> <p>Recognize classes (in particular, odds, evens; factors or multiples of a given number; and squares) to which a number may belong, and identify the numbers in those classes. Use these in the solution of problems.</p>
	4.N.8	Select, use, and explain various meanings and models of multiplication and division of whole numbers. Understand and use the inverse relationship between the two operations.
	4.N.9	Select, use, and explain the commutative, associative, and identity properties of operations on whole numbers in problem situations, e.g., $37 \times 46 = 46 \times 37$, $(5 \times 7) \times 2 = 5 \times (7 \times 2)$.
	4.N.11	Know multiplication facts through 12×12 and related division facts. Use these facts to solve related multiplication problems and compute related problems, e.g., 3×5 is related to 30×50 , 300×5 , and 30×500 .
	4.N.12	Multiply (up to three digits by two digits) accurately and efficiently.
	4.N.14	Demonstrate in the classroom an understanding of and the ability to use the conventional algorithms for addition and subtraction (up to five-digit numbers), and multiplication (up to three digits by two digits).
Patterns, Relations, and Algebra	4.P.4	Use pictures, models, tables, charts graphs, words, number sentences, and mathematical notations to interpret mathematical relationships.
Geometry	4.G.1	Compare and analyze attributes and other features (e.g., number of sides, faces, corners, right angles, diagonals, and symmetry) of two- and three-dimensional geometric shapes.

	4.G.2	Describe, model, draw, compare, and classify two- and three-dimensional shapes, e.g., circles, polygons-especially triangles and quadrilaterals-cubes, spheres, pyramids.
	4.G.3	Recognize similar figures.
	4.G.4	Identify angles as acute, right, or obtuse.
	4.G.5	Describe and draw intersecting, parallel, and perpendicular lines.
	4.G.6	Use ordered pairs of numbers and/or letters, graph, locate, identify points, and describe paths (first quadrant).
	4.G.7	Describe and apply techniques such as reflections (flips), rotations (turns), and translations (slides) for determining if two shapes are congruent.
	4.G.8	Identify and describe line symmetry in two-dimensional shapes.
	4.G.9	Predict and validate the results of partitioning, folding, and combining two- and three-dimensional shapes.

Third Marking Period (March – June)

<u>General Standard/Content</u>	Framework	Learning Objective
Number Sense and Operations	4.N.3	The learner will be able to: Demonstrate an understanding of fractions as parts of unit wholes, as parts of a collection, and as locations on the number line.
	4.N.4	Select, use, and explain models to relate common fractions and mixed numbers ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$, and $\frac{11}{2}$), find equivalent fractions, mixed numbers, and decimals, and order fractions.
	4.N.5	Identify and generate equivalent forms of common decimals and fractions less than one whole (halves, quarters, fifths, and tenths). :
	4.N.6	Exhibit an understanding of the base ten number system by reading, naming, and writing decimals between 0 and 1 up to the hundredths.
	4.N.8	Select, use, and explain various meanings and models of multiplication and division of whole numbers. Understand and use the inverse relationship between the two operations.

Patterns, Relations, and Algebra	4.N.10	Select and use appropriate operations (addition, subtraction, multiplication, and division) to solve problems, including those involving money.
	4.N.13	Divide up to a three-digit whole number with a single-digit divisor (with or without remainders) accurately and efficiently. Interpret any remainders.
	4.N.15	Demonstrate in the classroom an understanding of and the ability to use the conventional algorithm for division of up to a three-digit whole number with a single-digit divisor (with or without remainders).
	4.N.17	Select and use a variety of strategies (e.g., front-end, rounding, and regrouping) to estimate quantities, measures, and the results of whole-number computations up to three-digit whole numbers and amounts of money to \$1000, and to judge the reasonableness of the answer. σ
	4.N.18	Use concrete objects and visual models to add and subtract common fractions.
	4.P.1	Create, describe, extend, and explain symbolic (geometric) and numeric patterns, including multiplication patterns like 3, 30, 300, 3000, :
	4.P.2	Use symbol and letter variables (e.g., Δ , x) to represent unknowns or quantities that vary in expressions and in equations or inequalities (mathematical sentences that use =, <, >).
	4.P.3	Determine values of variables in simple equations, e.g., $4106 - \nabla = 37$, $5 = \mu + 3$, and $\square - \mu = 3$.
	4.P.4	Use pictures, models, tables, charts, graphs, words, number sentences, and mathematical notations to interpret mathematical relationships.
	4.P.5	Solve problems involving proportional relationships, including unit pricing (e.g., four apples cost 80¢, so one apple costs 20¢) and map interpretation (e.g., one inch represents five miles, so two inches represent ten miles).
Measurement	4.P.6	Determine how change in one variable relates to a change in a second variable, e.g., input-output tables.
	4.M.1	Demonstrate an understanding of such

		attributes as length, area, weight, and volume, and select the appropriate type of unit for measuring each attribute. :
	4.M.2	Carry out simple unit conversions within a system of measurement, e.g., hours to minutes, cents to dollars, yards to feet or inches, etc. :
	4.M.3	Identify time to the minute on analog and digital clocks using a.m. and p.m. Compute elapsed time using a clock (e.g., hours and minutes since...) and using a calendar (e.g., days since...).
	4.M.4	Estimate and find area and perimeter of a rectangle, triangle, or irregular shape using diagrams, models, and grids or by measuring.
	4.M.5	Identify and use appropriate metric and English units and tools (e.g., ruler, angle ruler, graduated cylinder, thermometer) to estimate, measure, and solve problems involving length, area, volume, weight, time, angle size, and temperature.