

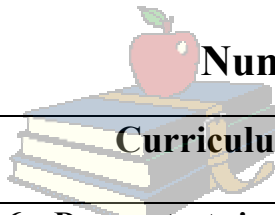


Grade 4 Expectations in Mathematics

Learning Standards from the MA Mathematics Curriculum Framework for the end of Grade 4 are numbered and printed in bold. The Franklin Public School System's grade level expectations for Grade 4 are bulleted below each learning standard. If there are no bulleted items after the MA Learning Standard, that standard is the grade level expectation. All students are expected to master all grade level expectations.

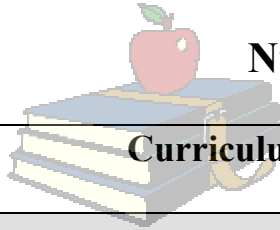
Number and Operations

Curriculum Framework Learning Standard	Everyday Math Reference/Notes
1. 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.	D
2. Select, use and explain the commutative, associative, and identity properties of operations on whole numbers in problem situations, e.g. $37 \times 46 = 46 \times 37$, $(5 \times 7) \times 2 = 5 \times (7 \times 2)$.	B/D: Terms are found in EM Teacher's Reference Book, and the state (MCAS) expects students to know them. Students are exposed to turn around facts and use of parentheses in Units 3, 4, 5.
3. 2. Round whole numbers through the 100,000s to the nearest 10, 100, 1000, 10,000, and 100,000.	
<ul style="list-style-type: none"> Round whole numbers through the 100,000s to the nearest 10, 100, 1000, 10,000, and 100,000. 	D: Lessons: 5.3, 5.4, 5.10, and Unit 6; also covered in Grade 3.
4. Represent, order, and compare large numbers (to at least 100,000) using various forms, including expanded notation, e.g., $853 = 8 \times 100 + 5 \times 10 + 3$.	D: Lessons: 5.8, 5.9, 5.10 Exponential notation for powers of 10. Expanded notation taught in grade 3.
5. Add, subtract (up to five-digit numbers) and multiply (up to three digits by two digits) accurately and efficiently.	
<ul style="list-style-type: none"> Multiply three digits by two digits accurately and efficiently. 	D



Number Sense and Operations Continued

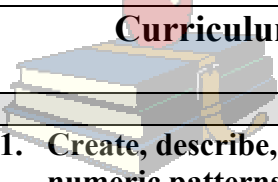
Curriculum Framework Learning Standard	Everyday Math Reference/Notes
<p>6. Demonstrate in the classroom an understanding of and the ability to use the conventional algorithm for addition, subtraction (up to five-digit numbers), and multiplication (up to three digits by two digits).</p>	
<ul style="list-style-type: none"> • Demonstrate an understanding of and the ability to use the conventional algorithm for multiplication (up to three digits by two digits). * <i>Conventional algorithms not required on MCAS Test; use a conventional algorithm is used as one strategy.</i> * <i>Although this standard is appropriate as stated for this grade span, the state assessment program at the 3-4-grade span will test multiplication of only up to two digits by two digits at the present time.</i> 	D
<p>7. Divide up to a three-digit whole number with a single-digit divisor (with or without remainders) accurately and efficiently. Interpret any remainders.</p>	D
<p>8. 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).</p> <ul style="list-style-type: none"> * <i>Conventional algorithms not required on MCAS Test; use a Conventional algorithm is used as one strategy.</i> 	D
<p>9. 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.</p>	
<ul style="list-style-type: none"> • Apply a variety of mental mathematics and estimation methods to problems involving amounts of money to \$1000. 	S

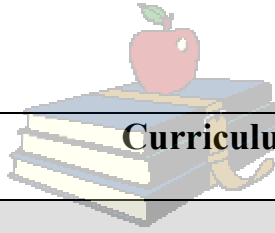


Number Sense and Operations Continued

Curriculum Framework Learning Standard	Everyday Math Reference/Notes
10. 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 $1\frac{1}{2}$), find equivalent fractions, mixed numbers, and decimals order fractions.	
<ul style="list-style-type: none"> • Use models to relate fractions ($\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{12}$) to equivalent fractions. • Order fractions ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$). • Identify the fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$ on a 0 to 1 number line. 	D: Unit 7
11. Identify and generate equivalent forms of common decimal and fractions less than one whole (halves, quarters, fifths, and tenths).	D
12. Use concrete objects and visual models to add and subtract common fractions and decimals.	
<ul style="list-style-type: none"> • Use concrete objects and visual models to add and subtract decimals. 	D
13. Select and use appropriate operations (addition, subtraction, multiplication, division) to solve problems, including those involving money.	
<ul style="list-style-type: none"> • Choose the appropriate operations (multiplication, division) to solve problems, including those involving money, and solve the problem. 	D: Lessons 3.7, 6.3, 12.2, 12.3, 12.4, 12.5, 12.6
14. 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 and 30×500	S Play games 3x/week Practice fact triangles nightly.
15. Exhibit an understanding of the base ten number system by reading, naming, and writing decimals between 0 and 1 up to the hundredths.	D
16. 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.	D

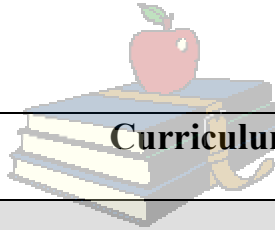
Patterns, Functions, and Algebra

 Curriculum Framework Learning Standard	Everyday Math Reference/Notes
1. Create, describe, extend and explain symbolic (geometric) and numeric patterns, including multiplication patterns like 3, 30, 3,000,	
<ul style="list-style-type: none"> • Create, describe and extend symbolic patterns. • Create, describe and extend numeric patterns, including multiples of whole number sequences. 	D/S: Units 1,7, and 10
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 =, <, >).	
<ul style="list-style-type: none"> • Use symbol and letter variables to represent unknowns or quantities that vary in expressions and in equations or inequalities involving all four operations. 	D
3. Determine the values of variables in simple equations, e.g., $4106 - \Delta = 37$; $5 = O + 3$ and $\Delta - O = 3$	B
4. Use pictures, models, tables, charts, graphs, words, number sentences, and mathematical notations to interpret mathematical relationships.	B Use Exemplars
5. Solve problems involving proportional relationships, including unit pricing (e.g., four apples cost 80¢, so one apple cost 20¢) and map interpretation (e.g., one inch represents five miles, so two inches represent ten miles.)	D Unit 12
6. Determine how change in one variable relates to a change in a second variable, e.g., input-output tables.	D



Geometry

Curriculum Framework Learning Standard	Everyday Math Reference/Notes
1. Identify angles as acute, right, or obtuse.	D
2. Describe, model, draw, compare, and classify two- and three-dimensional geometric shapes, e.g., circles, polygons- especially triangles and quadrilaterals- cubes, spheres, and pyramids.	
<ul style="list-style-type: none"> • Define and differentiate among various quadrilaterals, including rhombuses, parallelograms, and trapezoids. 	D/S
3. Predict and validate the results of partitioning, folding, and combining two- and three-dimensional shapes.	
<ul style="list-style-type: none"> • Predict and validate the results of partitioning and combining three-dimensional shapes. 	D: Unit 11
4. Using ordered pairs of numbers and/or letters, graph, locate, identify points, and describe paths (first quadrant).	D
5. Describe and apply techniques such as reflections (flips), rotations (turns), and translations (slides) for determining if two shapes are congruent.	B/D: Unit 11
6. 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.	S: Unit 10 and 11
7. Recognize similar figures.	D: Unit 8
8. Describe and draw intersecting, parallel, and perpendicular lines.	D: Lesson 8.6 perpendicular
9. Identify and describe line symmetry in two-dimensional shapes.	S



Measurement

Curriculum Framework Learning Standard	Everyday Math Reference/Notes
1. 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...)	
<ul style="list-style-type: none"> • Compute elapsed time 	D: Units 3 and 6
2. Identify and use appropriate customary (English) and metric 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.	D: Length Lessons: 4.7, 4.8, 4.9 Angle Lessons: 1.3, 6.6, 6.7, 6.8 Volume: Unit 11 Temperature: Unit 10
3. Estimate and find area and perimeter of a rectangle, triangle, or irregular shape using diagrams, models, and grids or by measuring.	B/D: Unit 8 & 9
4. Demonstrate an understanding of such attributes as length, area, weight, and volume, and select the appropriate type of unit for measuring each attribute.	D
5. Carry out simple unit conversions within a system of measurement, e.g., hours to minutes, cents to dollars, yards to feet or inches, etc.	D



Data Analysis, Statistics, and Probability

Curriculum Framework Learning Standard	Everyday Math Reference/Notes
1. Construct, draw conclusions, and make predictions from various representations of data sets, including tables, bar graphs, pictographs, line graphs, line plots, and tallies.	
<ul style="list-style-type: none"> Construct, draw conclusions, and make predictions from various representations of data sets, including line graphs and line plots. 	D: Units 2 and 4
2. 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.	D: Lessons 7.11 & 7.12
3. Classify outcomes as likely, unlikely, certain, and impossible by designing and conducting experiments using concrete objects such as counters, number cubes, spinners, or coins.	D
4. Collect and organize data using observations, measurements, surveys, or experiments, and identify appropriate ways to display the data.	D/S
5. Match representations of a data set such as lists, tables, or graphs (including circle graphs) with the actual set of data.	D: Units 5, 7, 8, 9, 10, 11, 12
6. List and count the number of possible combinations of objects from three sets, e.g., how many different outfits can one make from a set of three shirts, a set of two skirts, and a set of two hats?	See Grade 3 Exploration C in Unit 8.2 “Dressing for the Party” and MCAS Questions (Taco 2002)