**THE FOLLOWING STATE CURRICULUM STANDARDS ARE ADDRESSED BY
THE QUARTER MILE MATH SOFTWARE
FOR THE STATE OF MASSACHUSETTS**

**Subject: MATH
Standard: Number Sense And Operations
Strand: Number Sense and Operations**

Substrand   **Titles that Address the Substrand**

(Gr. PreK-K) K.N.1 Match quantities up to at least 10 with numerals and words.
Quarter Mile Math Level 1

(Gr. PreK-K) K.N.2 Count by ones to at least 20.
Quarter Mile Math Level 1

(Gr. PreK-K) K.N.3 Identify positions of objects in sequences (e.g., first, second) up to fifth.
Quarter Mile Math Level 1

**Subject: MATH
Standard: Patterns, Relations, And Algebra
Strand: Patterns, Relations, and Algebra**

Substrand   **Titles that Address the Substrand**

(Gr. PreK-K) K.P.4 Count by fives and tens at least up to 50.
Quarter Mile Math Level 1

**Subject: MATH
Standard: Number Sense And Operations
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Substrand   **Titles that Address the Substrand**

(Gr. 1-2) 2.N.1 Name and write (in numerals) whole numbers to 1000, identify the place values of the digits, and order the numbers.
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.2 Identify and distinguish among multiple uses of numbers, including cardinal (to tell how many) and ordinal (to tell which one) numbers, and numbers as labels and as measurements.
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.4 Compare whole numbers using terms and symbols, e.g., less than, equal to, greater than (<, =, >).
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.5 Identify odd and even numbers and determine whether a set of objects has an odd or even number of elements.
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.6 Identify the value of all U.S. coins, and $1, $5, $10, and $20 bills. Find the value of a collection of coins and dollar bills and different ways to represent an amount of money up to $5. Use appropriate notation, e.g., 69, $1.35.
Quarter Mile Math Level 2

(Gr. 1-2) 2.N.7 Demonstrate an understanding of various meanings of addition and subtraction, e.g., addition as combination (plus,combined with, more); subtraction as comparison (how much less, how much more), equalizing (how many more are needed to make these equal), and separation (how much remaining).
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.8 Understand and use the inverse relationship between addition and subtraction (e.g., 8 + 6 = 14 is equivalent to 14 6 = 8 and is also equivalent to 14 8 = 6) to solve problems and check solutions.
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.9 Know addition facts (addends to ten) and related subtraction facts, and use them to solve problems.
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.10 Demonstrate the ability to add and subtract three-digit numbers accurately and efficiently.
Quarter Mile Math Level 1

(Gr. 1-2) 2.N.12 Estimate, calculate, and solve problems involving addition and subtraction of two-digit numbers. Describe differences between estimates and actual calculations.
Quarter Mile Math Level 1

Subject: MATH
Standard: Patterns, Relations, And Algebra
Strand: Patterns, Relations, and Algebra

Substrand   Titles that Address the Substrand

(Gr. 1-2) 2.P.4 Skip count by twos, fives, and tens up to at least 50, starting at any number.
Quarter Mile Math Level 1

(Gr. 1-2) 2.P.5 Construct and solve open sentences that have variables, e.g., c + 7 = 10.
Quarter Mile Math Level 2

Subject: MATH
Standard: Number Sense And Operations
Strand: Number Sense and Operations

Substrand   Titles that Address the Substrand

(Gr. 3-4) 4.N.1 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.
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.2 Represent, order, and compare large numbers (to at least 100,000) using various forms, including expanded notation, e.g., 853 = 8 x 100 + 5 x 10 + 3.
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.3 Demonstrate an understanding of fractions as parts of unit wholes, as parts of a collection, and as locations on the number
line.
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.4 Select, use, and explain models to relate common fractions and mixed numbers (1/2, 1/3, 1/4, 1/5, 1/6, 1/8, 1/10, 1/12, and 11/2), find equivalent fractions, mixed numbers, and decimals, and order fractions.
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.5 Identify and generate equivalent forms of common decimals and fractions less than one whole (halves, quarters, fifths, and tenths).
Quarter Mile Math Level 2

(Gr. 3-4) 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.
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.7 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.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 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.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.9 Select, use, and explain the commutative, associative, and identity properties of operations on whole numbers in problem situations, e.g., 37 x 46 = 46 x 37, (5 x 7) x 2 = 5 x (7 x 2).
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.10 Select and use an appropriate operation(s) (addition, subtraction, multiplication, and division) to solve problems, including those involving money.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.11 Know multiplication facts through 12 x 12 and related division facts. Use these facts to solve related multiplication problems and compute related problems, e.g., 3 x 5 is related to 30 x 50, 300 x 5, and 30 x 500.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.12 Add and subtract (up to five-digit numbers) and multiply (up to three digits by two digits) accurately and efficiently.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 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.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 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).
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 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).
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(Gr. 3-4) 4.N.16 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.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 4.N.18 Round whole numbers through 100,000 to the nearest 10, 100, 1000, 10,000, and 100,000.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

Subject: MATH
Standard: Patterns, Relations, And Algebra
Strand: Patterns, Relations, and Algebra

Substrand   Titles that Address the Substrand

(Gr. 3-4) 4.P.3 Determine values of variables in simple equations, e.g., 4106 - = 37; c m = 3 and 4 + 5 = m + 3.
Quarter Mile Math Level 1

(Gr. 3-4) 4.P.4 Use pictures, models, tables, charts, graphs, words, number sentences, and mathematical notations to interpret mathematical relationships.
Quarter Mile Math Level 1
Quarter Mile Math Level 2

(Gr. 3-4) 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).
Quarter Mile Math Level 2

Grades 5 - 6

Subject: MATH
Standard: Data Analysis, Statistics, And Probability
Strand: Data Analysis, Statistics, and Probability

Substrand   Titles that Address the Substrand

(Gr. 5-6) 6.D.1 Describe and compare data sets using the concepts of median, mean, mode, maximum and minimum, and range.
Quarter Mile Math Level 2

Subject: MATH
Standard: Number Sense And Operations
Strand: Number Sense and Operations

Substrand   Titles that Address the Substrand

(Gr. 5-6) 6.N.1 Demonstrate an understanding of positive integer exponents, in particular, when used in powers of ten, e.g., 102, 105.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.2 Demonstrate an understanding of place value to billions and thousandths.
Quarter Mile Math Level 2

(Gr. 5-6) 6.N.3 Represent and compare very large (billions) and very small (thousandths) positive numbers in various forms such as expanded notation without exponents, e.g., 9724 = 9 x 1000 + 7 x 100 + 2 x 10 + 4.
Quarter Mile Math Level 2

(Gr. 5-6) 6.N.4 Demonstrate an understanding of fractions as a ratio of whole numbers, as parts of unit wholes, as parts of a collection, and as locations on the number line.
Quarter Mile Math Level 2

(Gr. 5-6) 6.N.5 Identify and determine common equivalent fractions, mixed numbers, decimals, and percents.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.7 Compare and order integers (including negative integers), and positive fractions, mixed numbers, decimals, and percents.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.8 Apply number theory concepts-including prime and composite numbers, prime factorization, greatest common factor, least common multiple, and divisibility rules for 2, 3, 4, 5, 6, 9, and 10-to the solution of problems.
Quarter Mile Math Level 2

(Gr. 5-6) 6.N.9 Select and use appropriate operations to solve problems involving addition, subtraction, multiplication, division, and positive integer exponents with whole numbers, and with positive fractions, mixed numbers, decimals, and percents.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.10 Use the number line to model addition and subtraction of integers, with the exception of subtracting negative integers.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.11 Apply the Order of Operations for expressions involving addition, subtraction, multiplication, and division with grouping symbols (+, , x,).
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.12 Demonstrate an understanding of the inverse relationship of addition and subtraction, and use that understanding to simplify computation and solve problems.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.13 Accurately and efficiently add, subtract, multiply, and divide (with double-digit divisors) whole numbers and positive decimals.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.14 Accurately and efficiently add, subtract, multiply, and divide positive fractions and mixed numbers. Simplify fractions.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.15 Add and subtract integers, with the exception of subtracting negative integers.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

(Gr. 5-6) 6.N.16 Estimate results of computations with whole numbers, and with positive fractions, mixed numbers, decimals, and percents. Describe reasonableness of estimates.
Quarter Mile Math Level 2
Quarter Mile Math Level 3

Subject: MATH
Standard: Patterns, Relations, And Algebra
Strand: Patterns, Relations, and Algebra

Substrand   **Titles that Address the Substrand**

(Gr. 5-6) 6.P.2 Replace variables with given values and evaluate/simplify, e.g., 2(m) + 3 when m = 4.
Quarter Mile Math Level 3

(Gr. 5-6) 6.P.3 Use the properties of equality to solve problems, e.g., if c + 7 = 13, then c = 13 7, therefore c = 6; if 3 x c = 15, then 1/3 x 3 x c = 1/3 x 15, therefore c = 5.
Quarter Mile Math Level 3

Subject: MATH
Standard: Number Sense And Operations
Strand: Number Sense and Operations

Substrand   **Titles that Address the Substrand**

(Gr. 7-8) 8.N.1 Compare, order, estimate, and translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents.
Quarter Mile Math Level 3

(Gr. 7-8) 8.N.2 Define, compare, order, and apply frequently used irrational numbers, such as +2 and p.
Quarter Mile Math Level 3

(Gr. 7-8) 8.N.8 Demonstrate an understanding of the properties of arithmetic operations on rational numbers. Use the associative, commutative, and distributive properties; properties of the identity and inverse elements (e.g., -7 + 7 = 0; 3/4 x 4/3 = 1); and the notion of closure of a subset of the rational numbers under an operation (e.g., the set of odd integers is closed under multiplication but not under addition).
Quarter Mile Math Level 3

(Gr. 7-8) 8.N.9 Use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems, e.g. multiplying by 1/2 or 0.5 is the same as dividing by 2.

(Gr. 7-8) 8.N.10 Estimate and compute with fractions (including simplification of fractions), integers, decimals, and percents (including those greater than 100 and less than 1).
Quarter Mile Math Level 3

(Gr. 7-8) 8.N.11 Determine when an estimate rather than an exact answer is appropriate and apply in problem situations.
Quarter Mile Math Level 3

(Gr. 7-8) 8.N.12 Select and use appropriate operations-addition, subtraction, multiplication, division, and positive integer exponents-to solve problems with rational numbers (including negatives).
Quarter Mile Math Level 3

Subject: MATH

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Standard: Patterns, Relations, And Algebra
Strand: **Patterns, Relations, and Algebra**

Substrand	Titles that Address the Substrand

(Gr. 7-8) 8.P.2 Evaluate simple algebraic expressions for given variable values, e.g., $3a2$ b for a = 3 and b = 7.
Quarter Mile Math Level 3

(Gr. 7-8) 8.P.3 Demonstrate an understanding of the identity (-x)(-y) = xy. Use this identity to simplify algebraic expressions, e.g., (-2)(-x+2) = 2x - 4.
Quarter Mile Math Level 3

(Gr. 7-8) 8.P.7 Set up and solve linear equations and inequalities with one or two variables, using algebraic methods, models, and/or graphs.
Quarter Mile Math Level 3

Grades 9 - 10
Subject: **MATH**
Standard: Algebra I
Strand: **Data Analysis, Statistics, and Probability**

Substrand	Titles that Address the Substrand

(Gr. 9-10) AI.D.1 Select, create, and interpret an appropriate graphical representation (e.g., scatterplot, table, stem-and-leaf plots, circle graph, line graph, and line plot) for a set of data and use appropriate statistics (e.g., mean, median, range, and mode) to communicate information about the data. Use these notions to compare different sets of data. (10.D.1)
Quarter Mile Math Level 2

Subject: **MATH**
Standard: Algebra I
Strand: **Number Sense and Operations**

Substrand	Titles that Address the Substrand

(Gr. 9-10) AI.N.1 Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of nth roots of positive real numbers for any positive integer n; the inverse relationship between taking the nth root of and the nth power of a positive real number; and the density of the set of rational numbers in the set of real numbers. (10.N.1)
Quarter Mile Math Level 3

(Gr. 9-10) AI.N.2 Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., 3(24 1) = 45, 4|3 5| + 6 = 14; apply such simplifications in the solution of problems. (10.N.2)
Quarter Mile Math Level 3

(Gr. 9-10) AI.N.4 Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers. (10.N.4)
Quarter Mile Math Level 2

Subject: **MATH**
Standard: Algebra I
Strand: **Patterns, Relations, and Algebra**

Substrand	Titles that Address the Substrand

(Gr. 9-10) AI.P.3 Demonstrate an understanding of relations and functions. Identify the domain, range, dependent, and independent variables of functions.

Quarter Mile Math Level 3

(Gr. 9-10) AI.P.7 Add, subtract, and multiply polynomials. Divide polynomials by monomials. (10.P.3)

Quarter Mile Math Level 3

(Gr. 9-10) AI.P.8 Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms, factoring (e.g., $a2\ b2 = (a + b)(a - b)$, $x2 + 10x + 21 = (x + 3)(x + 7)$, $5x4 + 10x3\ 5x2 = 5x2\ (x2 + 2x\ 1)$), identifying and canceling common factors in rational expressions, and applying the properties of positive integer exponents. (10.P.4)

Quarter Mile Math Level 3

Subject: MATH
Standard: Number Sense And Operations
Strand: Number Sense and Operations

Substrand	Titles that Address the Substrand

(Gr. 9-10) 10.N.1 Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of nth roots of positive real numbers for any positive integer n; and the inverse relationship between taking the nth root of and the nth power of a positive real number.

Quarter Mile Math Level 3

(Gr. 9-10) 10.N.2 Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., $3(24\ 1) = 45$, $4|3\ 5| + 6 = 14$; apply such simplifications in the solution of problems.

Quarter Mile Math Level 3

(Gr. 9-10) 10.N.4 Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers.

Quarter Mile Math Level 2

Subject: MATH
Standard: Patterns, Relations, And Algebra
Strand: Patterns, Relations, and Algebra

Substrand	Titles that Address the Substrand

(Gr. 9-10) 10.P.1 Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive (e.g., Fibonnacci Numbers), linear, quadratic, and exponential functional relationships.

Quarter Mile Math Level 3

(Gr. 9-10) 10.P.3 Add, subtract, and multiply polynomials. Divide polynomials by monomials.

Quarter Mile Math Level 3

(Gr. 9-10) 10.P.4 Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms; factoring (e.g., $a2\ b2 = (a + b)(a\ b)$, $x2 + 10x + 21 = (x + 3)(x + 7)$, $5x4 + 10x3\ 5x2 = 5x2\ (x2 + 2x\ 1)$); identifying and canceling common factors in rational expressions; and applying the properties of positive integer exponents.

Quarter Mile Math Level 3

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