

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

**Subject: MATH**  
**Standard: Mathematics - Kindergarten**  
**Strand: Standard I. Students will understand simple number concepts and relationships.**

**Substrand Titles that Address the Substrand**

(Gr. K) Objective 1. Identify and use whole numbers. a. Relate a numeral to the number of objects in a set (e.g., ??? = 3). - b. Construct models of numbers to 10 with physical objects or manipulatives. - c. Make pictorial representations of numbers to 10 (e.g., draw four circles, draw six squares). - d. Recognize and write numerals from 0 to 10. - e. Manipulate objects to demonstrate and describe multiple ways of representing a number (e.g., 5 can be 3 and 2 more, 5 can also be 2 and 2 and 1).

**Quarter Mile Math Level 1**

(Gr. K) Objective 2. Identify simple relationships among whole numbers. a. Develop strategies for one-to-one correspondence and keeping track of quantities. - b. Compare two sets of objects to determine whether they have the same, fewer, or more elements. - c. Order sets of objects from 1 to 9. - d. Estimate quantities less than 10.

**Quarter Mile Math Level 1**

**Subject: MATH**  
**Standard: Mathematics - Kindergarten**  
**Strand: Standard II. Students will identify and use patterns to represent mathematical situations.**

**Substrand Titles that Address the Substrand**

(Gr. K) Objective 2. Identify and use patterns to describe numbers or objects. a. Use patterns to count orally from 1 to 20 and backward from 10 to 0. - b. Identify which attribute was used to sort objects into a group. - c. Predict what comes next in an established pattern and justify thinking. - d. Duplicate, extend, and create simple patterns using objects and pictorial representations.

**Quarter Mile Math Level 1**

**Grades 1 - 1**

**Subject: MATH**  
**Standard: Mathematics - 1st Grade**  
**Strand: Standard I. Students will acquire number sense and perform simple operations with whole numbers.**

**Substrand Titles that Address the Substrand**

(Gr. 1) Objective 1. Represent whole numbers in a variety of ways. a. Relate number words to the numerals that represent the quantities 0 to 10. - b. Sort objects into groups of tens and ones and write the numeral representing the set. - c. Represent whole numbers up to 100 in groups of tens and ones using objects. - d. Write a numeral when given the number of tens and ones. - e. Write a numeral to 99 in expanded form (e.g., 39 is 3 tens and 9 ones or  $30+9$ ). - f. Use zero to represent the number of elements in the empty set or as a placeholder in a two-digit numeral.

**Quarter Mile Math Level 1**

(Gr. 1) Objective 2. Identify simple relationships among whole numbers. a. Identify the number that is one more or one less than any whole number from 1 to 99. - b. Use the vocabulary “greater than,” “less than,” and “equal to” when comparing sets of objects or numbers. - c. Order sets of objects and numbers from 0 to 20. - d. Use ordinal numbers 1st through 5th (i.e., 1st, 2nd, 3rd, 4th, 5th).

**Quarter Mile Math Level 1**

(Gr. 1) Objective 5. Solve whole number problems using addition and subtraction in horizontal and vertical notation. a. Compute addition and subtraction facts to twelve. - b. Add three whole numbers with sums to twelve.

**Quarter Mile Math Level 1**

**Subject: MATH**

**Standard: Mathematics - 1st Grade**

**Strand: Standard II. Students will identify and use patterns and relations to represent mathematical situations.**

**Substrand Titles that Address the Substrand**

(Gr. 1) Objective 1. Recognize and represent patterns with one or two attributes. a. Sort and classify objects by one or two attributes. - b. Identify, create, and label simple patterns using manipulatives, pictures, and symbolic notation (e.g., ABAB . . . , ??????. . .). - c. Identify patterns in the environment. - d. Identify horizontal and vertical patterns on hundreds charts. - e. Use patterns to establish skip counting by twos to 20 and by fives and tens to 100. - f. Count backward from 10 to 0 and identify the pattern.

**Quarter Mile Math Level 1**

(Gr. 1) Objective 2. Recognize and represent relations using mathematical symbols. a. Recognize that “=” indicates a relationship in which the quantities on each side of an equation are equal. - b. Recognize that symbols such as ?, ?, ? or in an addition or subtraction equation represent a missing value that will make the statement true (e.g., ? + 3 = 6, 5 + 7 = ?, 4 = 5 – ?). - c. Demonstrate that changing the order of addends does not change the sum (e.g., 3+2=5 and 2+3=5).

**Quarter Mile Math Level 1**

**Subject: MATH**

**Standard: Mathematics - 2nd Grade**

**Strand: Standard I. Students will acquire number sense and perform operations with whole numbers.**

**Substrand Titles that Address the Substrand**

(Gr. 2) Objective 1. Represent whole numbers in a variety of ways. a. Relate number words to the numerals that represent the quantities 0-100. - b. Represent whole numbers up to 1,000 in groups of hundreds, tens, and ones using base ten models, and write the numeral representing the set. - c. Read and write a three-digit numeral, relating it to a set of objects and a pictorial representation. - d. Write a numeral to 999 in expanded form (e.g., 539 is 5 hundreds, 3 tens, 9 ones or 500+30+9). - e. Identify the place and the value of a given digit in a three-digit numeral (e.g., the two in 281 means 2 hundreds or 200). - f. Demonstrate multiple ways to represent numbers using symbolic representations (e.g., thirty is the same as two groups of 15, the number of pennies in three dimes, or 58-28).

**Quarter Mile Math Level 1**

(Gr. 2) Objective 2. Identify simple relationships among whole numbers. a. Identify the number that is one more, one less, ten more, or ten less than any whole number up to 100. - b. Write number sentences using the terms “greater than,” “less than,” or “equal to,” to compare numbers. - c. Order four whole numbers less than 100 from least to greatest and from greatest to least. - d. Use ordinal numbers 1st through 10th.

**Quarter Mile Math Level 1**

(Gr. 2) Objective 3. Model and illustrate meanings of the operations of addition and subtraction and describe how they relate. a. Demonstrate the joining and separating of sets with eighteen or fewer objects and record the results with pictures or symbols. - b. Model three meanings of subtraction: separating of sets (“take away”), comparison of sets (“how many more/fewer”), and missing addends using objects, pictorial representations, and symbols. - c. Separate a



**Strand: Standard II. Students will use patterns and relations to represent mathematical situations.**

**Substrand Titles that Address the Substrand**

(Gr. 3) Objective 2. Recognize and represent mathematical situations using patterns and symbols. a. Recognize that symbols such as  $?$ ,  $?$ , or  $?$  in an addition, subtraction, or multiplication equation, represent a value that will make the statement true (e.g.,  $5+7=?$ ,  $?-3=6$ ,  $?=2\times 4$ ). - b. Solve equations involving equivalent expressions (e.g.,  $6+4 = ?+7$ ). - c. Use the  $>$ ,  $<$ , and  $=$  symbols to compare two expressions involving addition and subtraction (e.g.,  $4+6?3+2$ ;  $3+5 ? 16-9$ ). - d. Demonstrate that grouping three or more addends does not change the sum (e.g.,  $3+(2+7)=12$ ,  $(7+3)+2=12$ ) and changing the order of factors does not change the product (e.g.,  $3\times 7=21$ ,  $7\times 3=21$ ). - e. Use a variety of manipulatives to model the identity property of addition (e.g.,  $3+0=3$ ), the identity property of multiplication (e.g.,  $7\times 1=7$ ), and the zero property of multiplication (e.g.,  $6\times 0=0$ ).

**Quarter Mile Math Level 1**

**Subject: MATH**

**Standard: Mathematics - 4th Grade**

**Strand: Standard II. Students will use patterns and relations to represent mathematical situations.**

**Substrand Titles that Address the Substrand**

(Gr. 4) Objective 1. Recognize, describe, and use patterns and identify the attributes. a. Represent and analyze repeating and growing patterns using objects, pictures, numbers, and tables. - b. Recognize and extend multiples and other number patterns using a variety of methods.

**Quarter Mile Math Level 2**

(Gr. 4) Objective 2. Recognize, represent, and solve mathematical situations using patterns and symbols. a. Solve equations involving equivalent expressions (e.g.,  $6x2 = ?x3$  or  $6x?=9+9$ ). - b. Use the  $<$ ,  $>$ ,  $=$  symbols to compare two expressions involving addition, subtraction, multiplication, and division (e.g.,  $5x4?9\div 3$ ). - c. Recognize that a given variable maintains the same value throughout an equation or expression (e.g.,  $?+?=8$ ;  $?=4$ ). - d. Demonstrate that changing the order of factors does not change the product (e.g.,  $2x3=6$ ,  $3x2=6$ ) and that the grouping of three or more factors does not change the product (e.g.,  $(2x3)x1=6$ ;  $2x(3x1)=6$ ). - e. Demonstrate the distribution of multiplication over addition using a rectangular array (e.g.,  $8x14=8$  rows of 10 plus 8 rows of 4).

**Quarter Mile Math Level 2**

**Subject: MATH**

**Standard: Mathematics - 4th Grade**

**Strand: Standard I. Students will acquire number sense and perform operations with whole numbers, simple fractions, and decimals.**

**Substrand Titles that Address the Substrand**

(Gr. 4) Objective 1. Represent whole numbers and decimals in a variety of ways. a. Model, read, and write numerals from tenths to 100,000. - b. Write a whole number up to 99,999 in expanded form (e.g., 76,539 is 7 ten-thousands, 6 one-thousands, 5 hundreds, 3 tens, 9 ones or  $70,000+6,000+500+30+9$ ). - c. Identify the place and the value of a given digit in a five-digit numeral, including decimals to tenths. - d. Demonstrate multiple ways to represent numbers by using models and symbolic representations (e.g., 36 is the same as the square of six, three dozen, or  $9\times 4$ ). - e. Identify square numbers using models.

**Quarter Mile Math Level 2**

(Gr. 4) Objective 2. Identify relationships among whole numbers and decimals. a. Identify the number that is 100 more, 100 less, 1,000 more, or 1,000 less than any whole number up to 10,000. - b. Compare the relative size of numbers (e.g., 100 is small compared to a million, but large compared to 5). - c. Compare whole numbers up to five digits using the symbols  $<$ ,  $>$ , and  $=$ . - d. Identify a whole number that is between two given whole numbers. - e. Order and compare whole numbers and decimals to tenths on a number line.

**Quarter Mile Math Level 2**

(Gr. 4) Objective 3. Model and illustrate meanings of the four operations and describe how they relate. a. Use models to represent multiplication of a one- or two-digit factor by a two-digit factor (up to 30) using a variety of methods (e.g., rectangular arrays, manipulatives, pictures) and connect the representation to an algorithm. - b. Recognize that division by zero is not possible (e.g.,  $6 \div 0$  is undefined). - c. Select and write a multiplication or division sentence to solve a problem related to the students' environment and write a story problem that relates to a given equation. - d. Represent division of a two-digit dividend by a one-digit divisor, including whole number remainders, using various methods (e.g., rectangular arrays, manipulatives, pictures) and connect the representation to an algorithm. - e. Demonstrate that multiplication and division are inverse operations (e.g.,  $3 \times 4 = 12$ ; thus,  $12 \div 4 = 3$  and  $12 \div 3 = 4$ ). - f. Describe the effect of place value when multiplying whole numbers by 10 and 100.

#### **Quarter Mile Math Level 2**

(Gr. 4) Objective 4. Use fractions to communicate parts of the whole. a. Divide regions and sets of objects into equal parts using a variety of models and illustrations. - b. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, fifths, sixths, eighths, and tenths. - c. Relate fractions to decimals that represent tenths. - d. Determine which of two fractions is greater using models or illustrations. - e. Find equivalent fractions for one-half, one-third, and one-fourth using manipulatives and pictorial representations.

#### **Quarter Mile Math Level 2**

(Gr. 4) Objective 5. Solve whole number problems using addition, subtraction, multiplication, and division in vertical and horizontal notation. a. Determine when it is appropriate to use estimation, mental math strategies, paper and pencil, or a calculator. - b. Find the sum and difference of four-digit numbers and describe the process used. - c. Multiply two- and three-digit factors by a one-digit factor and describe the process used. - d. Divide a two-digit whole number dividend by a one-digit divisor, with a remainder of zero, and describe the process used.

#### **Quarter Mile Math Level 2**

### **Grades 5 - 5**

**Subject: MATH**

**Standard: Mathematics - 5th Grade**

**Strand: Standard I. Students will acquire number sense and perform operations with whole numbers, simple fractions, and decimals.**

#### **Substrand**

#### **Titles that Address the Substrand**

(Gr. 5) Objective 1. Represent whole numbers and decimals in a variety of ways. a. Model, read, and write numerals from hundredths to one millions. - b. Write a whole number up to 999,999 in expanded form (e.g.,  $876,539 = 8$  hundred-thousands,  $7$  ten-thousands,  $6$  thousands,  $5$  hundreds,  $3$  tens,  $9$  ones or  $8 \times 100,000 + 7 \times 10,000 + 6 \times 1,000 + 5 \times 100 + 3 \times 10 + 9$ ). - c. Demonstrate multiple ways to represent whole numbers by using models and symbolic representations (e.g.,  $108 = 2 \times 50 + 8$ ;  $108 = 102 + 8$ ). - d. Classify whole numbers from 2 to 20 as prime or composite and 0 and 1 as neither prime nor composite, using models. - e. Represent repeated factors using exponents up to three (e.g.,  $8 = 2 \times 2 \times 2 = 2^3$ ).

#### **Quarter Mile Math Level 2**

(Gr. 5) Objective 2. Identify relationships among whole numbers, fractions, decimals, and percents. a. Order and compare whole numbers, fractions (including mixed numbers), and decimals using a variety of methods and symbols. - b. Rewrite mixed numbers and improper fractions from one form to the other. - c. Find the least common denominator for two fractions. - d. Represent commonly used fractions as decimals and percents in various ways (e.g., objects, pictures, calculators).

#### **Quarter Mile Math Level 2**

(Gr. 5) Objective 3. Model and illustrate meanings of operations and describe how they relate. a. Identify the dividend, divisor, and quotient regardless of the division symbol used. - b. Determine whether a whole number is divisible by 2, 3, 5, 9, and/or 10, using the rules of divisibility. - c. Represent remainders as whole numbers, decimals, or fractions and describe the meaning of remainders as they apply to problems from the students' environment (e.g., If there are 53 people, how many vans are needed if each van holds 8 people?). - d. Model addition, subtraction, and multiplication of

fractions and decimals in a variety of ways (e.g., using objects and a number line). - e. Model strategies for whole number multiplication (e.g., partial product, lattice) or division (e.g., partial quotient). - f. Select or write the number sentences that can be used to solve a two-step problem. - g. Describe the effect of place value when multiplying and dividing whole numbers and decimals by 10, 100, and 1,000.

### Quarter Mile Math Level 2

(Gr. 5) Objective 4. Use fractions to communicate parts of the whole. a. Divide regions, sets of objects, and line segments into equal parts using a variety of models and illustrations. - b. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, fifths, sixths, eighths, tenths, and twelfths. - c. Represent the simplest form of a fraction in various ways (e.g., objects, pictorial representations, symbols). - d. Represent mixed numbers and improper fractions in various ways (e.g., rulers, objects, number lines, symbols). - e. Rename whole numbers as fractions with different denominators (e.g.,  $5=5/1$ ,  $3=6/2$ ,  $1=7/7$ ). - f. Model and calculate equivalent forms of a fraction and describe the process used.

### Quarter Mile Math Level 2

(Gr. 5) Objective 5. Solve problems using the four operations with whole numbers, decimals, and fractions. a. Determine when it is appropriate to use estimation, mental math strategies, paper and pencil, or a calculator. - b. Use estimation strategies to determine whether results obtained using a calculator are reasonable. - c. Multiply up to a three-digit whole number by a one- or two-digit whole number. - d. Divide up to a three-digit whole number dividend by a one-digit divisor. - e. Add and subtract decimals with digits to the hundredths place (e.g.,  $35.42+7.2$ ;  $75.2-13.45$ ). - f. Add, subtract, and multiply fractions. - g. Simplify expressions, without exponents, using the order of operations.

### Quarter Mile Math Level 2

**Subject:** MATH

**Standard:** Mathematics - 5th Grade

**Strand:** Standard II. Students will use patterns and relations to represent and analyze mathematical situations using algebraic symbols.

**Substrand**

**Titles that Address the Substrand**

(Gr. 5) Objective 2. Represent, solve, and analyze mathematical situations using algebraic symbols. a. Recognize a variety of symbols for multiplication and division including  $\times$ ,  $\bullet$ , and  $*$  as symbols for multiplication and  $\div$ ,  $/$ , and a fraction bar ( $/$  or  $-$ ) as division symbols. - b. Recognize that a variable ( $n$ ,  $x$ ) represents an unknown quantity. - c. Solve one-step equations involving whole numbers and a single variable (e.g.,  $n+7=3$ ). - d. Recognize that the answer to a multiplication problem involving a factor of zero is equal to zero (e.g.,  $0 \times 45=0$ ). - e. Use expressions or one-step equations to represent real-world situations. - f. Use the associative, commutative, and distributive properties to compute with whole numbers.

### Quarter Mile Math Level 2

**Subject:** MATH

**Standard:** Mathematics - 5th Grade

**Strand:** Standard V. Students will collect, analyze, and draw conclusions from data and apply basic concepts of probability.

**Substrand**

**Titles that Address the Substrand**

(Gr. 5) Objective 1. Formulate and answer questions using statistical methods to compare data. a. Formulate a question that can be answered by collecting data. - b. Collect, compare, and display data using an appropriate format (i.e., line plots, bar graphs, pictographs, circle graphs, line graphs). - c. Identify minimum and maximum values for a set of data. - d. Identify or calculate the mean, mode, and range. - e. Propose and justify inferences based on data.

### Quarter Mile Math Level 2

**Subject:** MATH

**Standard:** Mathematics - 6th Grade

**Strand:** Standard I. Students will acquire number sense and perform operations with rational numbers.

**Substrand****Titles that Address the Substrand**

(Gr. 6) Objective 1. Represent whole numbers and decimals in a variety of ways. a. Change whole numbers with exponents to standard form (e.g.,  $24 = 16$ ) and recognize that  $100 = 1$ . - b. Read and write numerals from thousandths to one billion. - c. Write a whole number to 999,999 in expanded form using exponents (e.g.,  $876,539 = 8 \times 10^5 + 7 \times 10^4 + 6 \times 10^3 + 5 \times 10^2 + 3 \times 10^1 + 9 \times 10^0$ ). - d. Express numbers in scientific notation using positive powers of ten. - e. Classify whole numbers to 100 as prime, composite, or neither. - f. Determine the prime factorization for a whole number up to 50.

**Quarter Mile Math Level 2**

**Quarter Mile Math Level 3**

(Gr. 6) Objective 2. Identify relationships among whole numbers, fractions (rational numbers), decimals, and percents. a. Find the greatest common factor and least common multiple for two numbers using a variety of methods (e.g., list of multiples, prime factorization). - b. Compare and order rational numbers, including mixed fractions, using a variety of methods and symbols. - c. Locate positive rational numbers on a number line. - d. Convert common fractions, decimals, and percents from one form to another (e.g.,  $\frac{3}{4} = 0.75 = 75\%$ ). - a. Represent division of a multi-digit dividend by two-digit divisors, including decimals, using models, pictures, and symbols.

**Quarter Mile Math Level 2**

**Quarter Mile Math Level 3**

(Gr. 6) Objective 4. Use fractions and percents to communicate parts of the whole. a. Divide regions, sets of objects, and line segments into equal parts using a variety of models and illustrations. - b. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, fifths, sixths, eighths, tenths, twelfths, and sixteenths. - c. Write a fraction or ratio in simplest form. - d. Name equivalent forms for fractions (halves, thirds, fourths, fifths, tenths), ratios, percents, and decimals, including repeating or terminating decimals. - e. Relate percents less than 1% or greater than 100% to equivalent fractions, decimals, whole numbers, and mixed numbers.

**Quarter Mile Math Level 2**

**Quarter Mile Math Level 3**

(Gr. 6) Objective 5. Solve problems using the four operations with whole numbers, decimals, and fractions. a. Determine when it is appropriate to use estimation, mental math strategies, paper and pencil, or a calculator. - b. Use estimation strategies to determine whether results obtained using a calculator are reasonable. - c. Multiply up to a three-digit factor by a one- or two-digit factor including decimals. - d. Divide up to a four-digit dividend by a one- or two-digit divisor including decimals. - e. Add and subtract decimals to the thousandths place (e.g.,  $34.567 + 3.45$ ;  $65.3 - 5.987$ ). - f. Add, subtract, multiply, and divide fractions and mixed numbers. - g. Solve problems using ratios and proportions. - h. Simplify expressions, with exponents, using the order of operations.

**Quarter Mile Math Level 2**

**Quarter Mile Math Level 3**

(Gr. 6) Objective 6. Model, illustrate, and perform the operations of addition and subtraction of integers. a. Recognize that the sum of an integer and its opposite is zero. - b. Model addition and subtraction of integers using manipulatives and a number line. - c. Add and subtract integers.

**Quarter Mile Math Level 2**

**Quarter Mile Math Level 3**

**Subject: MATH**

**Standard: Mathematics - 6th Grade**

**Strand: Standard II. Students will use patterns, relations, and functions to represent and analyze mathematical situations using algebraic symbols.**

**Substrand****Titles that Address the Substrand**

(Gr. 6) Objective 2. Represent, solve, and analyze mathematical situations using algebraic symbols. a. Recognize that a number in front of a variable indicates multiplication (e.g.,  $3y$  means 3 times the quantity  $y$ ). - b. Solve two-step

equations involving whole numbers and a single variable (e.g.,  $3x+4=19$ ). - c. Recognize that “ $\sim$ ” indicates a relationship in which the quantities on each side are approximately of equal value (e.g.,  $p \sim 3.14$ ). - d. Recognize that an exponent can be represented in the following ways:  $4^3$  or  $4^3$ . - e. Evaluate expressions and formulas, substituting given values for the variables (e.g.,  $2x+4$ ;  $x=2$ ; therefore,  $2(2)+4=8$ ). - f. Recognize that if the product is zero, then one or more factors equal zero (i.e., if  $a \cdot b=0$  then either  $a=0$  or  $b=0$  or  $a$  and  $b=0$ ).

**Quarter Mile Math Level 2**  
**Quarter Mile Math Level 3**

**Grades 7 - 12**

**Subject: MATH**

**Standard: Applied Mathematics I**

**Strand: Standard 1. Students will acquire number sense and perform operations with real numbers.**

**Substrand Titles that Address the Substrand**

(Gr. 7-12) Objective 1.1. Compute fluently and make reasonable estimates. 1. Add, subtract, multiply, and divide real numbers using the order of operations. 2. Approximate radical expressions. 3. Determine the reasonableness of an answer by relating it to the problem.

**Quarter Mile Math Level 3**

(Gr. 7-12) Objective 1.2. Represent real numbers in a variety of ways. 1. Compare and order real numbers. 2. Choose appropriate and convenient forms of real numbers for solving problems and representing answers, e.g., radical form, multiples of pi, decimal, fraction, or percent. 3. Recognize and use commonly encountered irrational numbers.

**Quarter Mile Math Level 3**

(Gr. 7-12) Objective 1.3. Identify relationships among real numbers and operations involving these numbers. 1. Simplify numerical expressions and solve problems using real numbers. 2. Classify numbers as rational or irrational in the real number system.

**Quarter Mile Math Level 3**

**Subject: MATH**

**Standard: Applied Mathematics I**

**Strand: Standard 2. Students will represent and analyze mathematical situations and properties using patterns, relations, functions, and algebraic symbols.**

**Substrand Titles that Address the Substrand**

(Gr. 7-12) Objective 2.2. Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols. 1. Evaluate numerical and algebraic expressions, formulas, and equations. 2. Solve multi-step linear equations and inequalities algebraically and graphically. 3. Solve systems of two linear equations and inequalities that have two variables algebraically and graphically. 4. Solve first-degree absolute value one- and two-variable equations, e.g.,  $y = |x + 4|$ . 5. Solve proportions that include algebraic first-degree expressions. 6. Solve linear formulas and literal equations for a specified variable, e.g., solve for pi in  $I = prt$ . 7. Solve real-world problems involving constant rates of change, e.g., distance, rate and time, hourly wages, rates of interest. 8. Determine whether two lines are parallel when given the equations.

**Quarter Mile Math Level 3**

**Subject: MATH**

**Standard: Elementary Algebra**

**Strand: Standard 1. Students will acquire number sense and perform operations with real numbers.**

**Substrand Titles that Address the Substrand**

(Gr. 7-12) Objective 1.1. Compute fluently and make reasonable estimates. 1. Estimate solutions to problems. 2. Compute solutions to problems. 3. Determine the reasonableness of an answer by relating it to the problem.



### Quarter Mile Math Level 3

(Gr. 7-12) Objective 1.2. Represent real numbers in a variety of ways. 1. Compare and order real numbers. 2. Choose appropriate and convenient forms of real numbers for solving problems and representing answers, e.g., radical form, multiples of pi, decimal, fraction, or percent.

### Quarter Mile Math Level 3

(Gr. 7-12) Objective 1.3. Identify relationships among real numbers and operations involving these numbers. 1. Classify numbers as rational or irrational in the real number system. 2. Relate properties and operations of rational numbers to irrational numbers. 3. Simplify numerical expressions and solve problems using real numbers.

### Quarter Mile Math Level 3

**Subject:** MATH

**Standard:** Elementary Algebra

**Strand:** Standard 2. Students will represent and analyze mathematical situations and properties using patterns, relations, functions, and algebraic symbols.

Substrand	Titles that Address the Substrand
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(Gr. 7-12) Objective 2.2. Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols. 1. Solve real-world problems involving constant rates of change, e.g., rates of travel, hourly wages, or rates of interest. 2. Solve multi-step equations and inequalities: a. Numerically; e.g., from a table or guess and check. - b. Algebraically. - c. Graphically. - d. Using technology. 3. Solve systems of two linear equations or inequalities: a. Numerically; e.g., from a table or guess and check. - b. Algebraically. - c. Graphically. - d. Using technology. 4. Determine the number of possible solutions for a system of two linear equations. 5. Evaluate numerical expressions (including exponents and square roots), algebraic expressions, formulas, and equations. 6. Solve linear formulas and literal equations for a specified variable, e.g., solve for p in  $I = prt$ . 7. Simplify algebraic expressions, including those having integer exponents. 8. Solve proportions that include algebraic first-degree expressions. 9. Determine the number of solutions for a system of linear equations.

### Quarter Mile Math Level 3

**Subject:** MATH

**Standard:** Pre-Algebra

**Strand:** Standard 1. Students will acquire number sense and perform operations with rational numbers.

Substrand	Titles that Address the Substrand
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(Gr. 7-12) Objective 1.1 . Compute fluently and make reasonable estimates. 1. Compute using selected methods from among mental arithmetic, estimation, paper and pencil, and calculator. 2. Add, subtract, multiply, and divide integers. 3. Check the reasonableness of results using estimation. 4. Justify the steps used in solving problems using correct notation.

### Quarter Mile Math Level 3

(Gr. 7-12) Objective 1.3. Identify relationships among rational numbers and operations involving these numbers. 1. Compare and order rational numbers. 2. Identify the effects of arithmetic operations among fractions, decimals, percents, and integers; e.g., multiplying or dividing by a number larger or smaller than 1. 3. Recognize and use the special multiplication properties of zero. 4. Recognize that division by zero is not defined. 5. Recognize and use the inverse relationships of addition and subtraction, multiplication and division, and perfect square roots and squares. 6. Add or multiply numbers using the Commutative and Associative Properties of Addition or Multiplication.

### Quarter Mile Math Level 3

(Gr. 7-12) Objective 1.4. Solve problems involving rational numbers using addition, subtraction, multiplication, and division. 1. Recognize absolute value of a rational number as the value of its distance from zero. 2. Evaluate numerical and algebraic expressions containing absolute value. 3. Compute with percents, including those greater than 100% and less than 1%. 4. Solve problems using simple proportions.

### Quarter Mile Math Level 3

(Gr. 7-12) Objective 2.2. Represent, solve, and analyze mathematical situations and properties using algebraic symbols. 1. Evaluate algebraic expressions when given values for the variable(s). 2. Identify the horizontal and vertical intercepts of a linear relation from a graph or table. 3. Determine the slope of a linear relation from a graph or ordered pairs. 4. Solve one- and two-step single-variable equations and inequalities.

### Quarter Mile Math Level 3

**Subject:** MATH

**Standard:** Pre-calculus

**Strand:** Standard 1. Students will acquire number sense and perform operations with real and complex numbers.

#### Substrand

#### Titles that Address the Substrand

(Gr. 7-12) Objective 1.1. Compute fluently and make reasonable estimates. 1. Add, subtract, multiply, and find the absolute value using complex numbers. 2. Add, subtract and perform scalar multiplication on vectors using a variety of techniques with or without the use of technology.

### Quarter Mile Math Level 3