

## Course/Grade Level: Grade Seven Math Curriculum

**Focus:** Students will apply rational numbers and algebraic expressions in real-world situations; as well as, recognize and explain arithmetic and geometric patterns. They will compare and contrast the specific properties of geometric shapes, and organize and interpret data in various forms.

### **Students will classify and utilize the concepts in number sense.**

#### **M.7.1** Students will...

- M.7.1.1 know and explain the relationship between natural (counting) numbers, whole numbers, integers, and rational numbers using mathematical models (number lines, Venn diagrams). (7.1.2.K1)
- M.7.1.2 generate and/or solve real-world problems using the commutative, associative, distributive, substitution, symmetric, identity, zero, and inverse properties of addition and multiplication. (7.1.2.A1a-h)
- M.7.1.3 simplify positive rational numbers raised to positive whole number powers. (7.1.4.K2g)
- M.7.1.4 convert positive rational numbers written in scientific notation with positive integer exponents to and from standard form. (7.1.1.K1)
- M.7.1.5 **N** use order of operations (evaluate within grouping symbols, evaluate powers to the second or third power, multiply or divide in order from left to right, then add or subtract in order from left to right) using whole numbers. (7.1.4.Kf)
- M.7.1.6 **N** find the root of perfect whole number squares. (6.1.4.K2g)

#### **M.7.2** **Students will model, perform, and explain the computation of fractions with an emphasis on simplification in a variety of situations.**

Students will...

- M.7.2.1 **▲N** add, subtract, multiply, and divide fractions and express answers in simplest form. (7.1.4.K2d)
- M.7.2.2 **▲** addition, subtraction, multiplication, and division of rational numbers with a special emphasis on fractions and expressing answers in simplest form. e.g., At the candy store, you buy \_\_\_ of a pound of peppermints and \_\_\_ of a pound of licorice. The cost per pound for each kind of candy is \$3.00. What is the total cost of the candy purchased? (7.1.1.A1a)

**M.7.3 Students will model, perform, and explain the computation of decimals in a variety of situations. Students will...**

- M.7.3.1 ▲N add and subtract decimals from ten millions place through hundred thousandths place. (7.1.4.K2a)
- M.7.3.2 ▲N multiply and divide a four-digit number by a two-digit number using numbers from thousands place through hundred thousandths place. (7.1.4.K2b)
- M.7.3.3 ▲N multiply and divide using numbers from thousands place through thousandths place by 10, 100, 1,000; .1, .01, .001, or single-digit multiples of each. (7.1.4.K2c)
- M.7.3.4 ▲ find percentages of rational numbers. e.g.,  $12.5\% \times \$40.25 = n$  or 150% of 90 is what number? (For the purpose of assessment, percents will be 1% or greater) (7.1.4.K5)

**M.7.4 Students will model, apply, and explain the computation of integers in a variety of situations. Students will...**

- M.7.4.1 add, subtract, multiply, and divide integers. (7.1.4.K2e)
- M.7.4.2 solve one-step real-world problems using addition, subtraction, multiplication, and division of rational numbers with a special emphasis on integers. e.g., The high temps were -4, 10, -1, 0, 7, 3, and -5. What is the mean temp? (7.1.4.A1b)

**M.7.5 Students will evaluate and apply algebraic expressions and equations to real-world situations. Students will...**

- M.7.5.1 explain the difference between an equation and an expression. (7.2.2.K4)
- M.7.5.2 ▲ generate and/or solve real-world problems using equivalent representations of rational numbers and simple algebraic expressions. e.g., Wilson Mtn. has an altitude of  $5.28 \times 10^3$  ft. Rush Mtn. is 4,300 ft. tall. How much higher is Wilson Mtn. than Rush Mtn.? (7.1.1.A1a)
- M.7.5.3 explain and use the equality and inequality symbols ( $=$ ,  $\neq$ ,  $<$ ,  $\leq$ ,  $>$ ,  $\geq$ ) and corresponding meanings (is equal to, is not equal to, is less than, is less than or equal to, is greater than, is greater than or equal to) to represent mathematical relationships with rational numbers. (7.2.2.K6)
- M.7.5.4 ▲ know the mathematical relationship between ratios, proportions, and percents and how to solve for a missing term in a proportion with positive rational number solutions and monomials. e.g.,  $5/6 = 2/x$ . (7.2.2.K7)
- M.7.5.5 ▲ evaluate simple algebraic expressions using positive rational numbers. e.g.,  $x = 3/2$ ,  $y = 2$ , then  $5xy + 2 = 5(3/2)(2) + 2 = 17$  (7.2.2.K8)
- M.7.5.6 ▲ represent real-world problems using variables and symbols to write linear expressions, one- or two-step equations. e.g., John has three times as much money as his sister. If M is the amount of money his sister has, what is the equation that represents the amount of money that John has?  $J = 3M$  (7.2.2.A1)

## **M.7.6 Students will recognize, describe, extend, and explain patterns.**

Students will ...

- M.7.6.1 ▲ use counting numbers including perfect squares, cubes, factors and multiples. **(7.2.1.K1a)**
- M.7.6.2 ▲ use positive rational numbers including arithmetic and geometric sequences. (arithmetic: the difference of two consecutive numbers is the same; geometric: each succeeding term is obtained by multiplying the preceding term by the same number.) **(7.2.1.K1b)**
- M.7.6.3 ▲ state the rule to find the  $n$ th term of a pattern with one operational change (addition or subtraction) between consecutive terms. e.g., given 3, 5, 7, and 9... the  $n$ th term is  $2n + 1$  **(7.2.1.K4)**

## **M.7.7 Students will classify and compare the properties of geometric figures and will compute and apply various measurement formulas in a variety of situations. Students will ...**

- M.7.7.1 ▲ identify the sum of the interior angles of any triangle is 180. **(7.3.1.K3a)**
- M.7.7.2 ▲ identify the sum of the interior angles of any quadrilateral is 360.
- M.7.7.3 ▲ identify parallelograms have opposite sides that are parallel and congruent. **(7.3.1.K3c)**
- M.7.7.4 ▲ identify that rectangles have angles of 90, opposite sides are congruent. **(7.3.1.K3d)**
- M.7.7.5 ▲ identify that rhombi have all sides the same length, opposite angles are congruent. **(7.3.1.K3e)**
- M.7.7.6 ▲ identify squares have angles of 90, all sides congruent. **(7.3.1.K3f)**
- M.7.7.7 ▲ identify trapezoids have one pair of opposite sides parallel and the other pair of opposite sides are not parallel. **(7.3.1.K3g)**
- M.7.7.8 ▲ know and use perimeter and area formulas for circles, squares, rectangles, triangles, and parallelograms. **(7.3.2.K4)**
- M.7.7.9 ▲ use given measurement formulas to find:
  - a. surface area of cubes
  - b. volume of rectangular prisms**(7.3.2.K6a-b)**
- M.7.7.10 ▲ solve real-world problems by finding perimeter and area of two-dimensional composite figures of squares, rectangles, and triangles. e.g., The front of the barn is rectangular in shape with a height of 10 feet wide and a width of 48 feet. Above the rectangle is a triangle that is 7 feet high with sides 25 feet long. What is the area of the front of the barn? **(7.3.2.A1c)**
- M.7.7.11 ▲ determine the actual dimensions and/or measurements of a two-dimensional figure represented in a scale drawing. **(7.3.3.A3)**

**M.7.8 Students will apply the concept of probability to draw conclusions and make predictions based on a given situation. They will also compose and evaluate various forms of data sets. Students will ...**

M.7.8.1 compare results of theoretical (expected) probability with empirical (experimental) probability in an experiment or situation with a compound event composed of two simple independent events and understand that the larger the sample size, the greater the likelihood that the experimental results will equal the theoretical probability. (7.4.1.A3)

M.7.8.2 ▲ organize, display, and read quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these data displays:

- a. frequency tables and line plots
- b. bar, line, and circle graphs
- c. Venn diagrams or other pictorial displays
- d. charts and tables
- e. stem-and-leaf plots (single)
- f. scatter plots
- g. box-and-whiskers

**(7.4.2.K1a-g)**

M.7.8.3 ▲ recognize and explain:

- a. misleading representations of data
- b. the effects of scale and interval changes on graphs of data sets

**(7.4.2.A3a-b)**