

Jackson Area Catholic Schools
Mathematics Academic Standards
for
Sixth Grade

Number and Operations

A. Represent rational numbers as fractions or decimals

- N.ME.06.01 The student will order rational numbers and place them on the number line.
- N.ME.06.02 The student will represent rational numbers as fractions or terminating decimals when possible, and translate between these representations.
- N.ME.06.03 The student will understand that a fraction or a negative fraction is a quotient of two integers (e.g., $-\frac{8}{3}$ is -8 divided by 3).

B. Understand rational numbers and their location on the number line

- N.ME.06.04 The student will locate negative rational numbers on both the horizontal and vertical number line; know that numbers and their negatives add to 0, and are on opposite sides and at equal distance from 0 on a number line.
- N.ME.06.05 The student will understand that rational numbers are quotients of integers (non-zero denominators), (e.g., a rational number is either a fraction or a negative fraction).
- N.ME.06.06 The student will understand that 0 is an integer that is neither negative nor positive.
- N.ME.06.07 The student will know that the absolute value of a number is the value of the number ignoring the sign; or is the distance of the number from 0.
- N.ME.06.08 The student will plot ordered pairs of integers and use ordered pairs of integers to identify points in all four quadrants of the coordinate plane.

C. Operations with integers and rational numbers

- N.MR.06.09 The student will understand division of fractions as the inverse of multiplication (e.g., if $4/5 \div 2/3 = \underline{\quad}$, then $2/3 \cdot \underline{\quad} = 4/5$, so $\underline{\quad} = 4/5 \cdot 3/2 = 12/10$).
- N.FL.06.10 The student, given an applied situation involving dividing fractions will write a mathematical statement to represent the situation.
- N.MR.06.11 The student will solve for the unknown in equations such as:
 $1 \underline{\quad} \div \underline{\quad} = 1$, $3 \underline{\quad} \div \underline{\quad} = 1/4$, and $1/2 = 1 \cdot \underline{\quad}$.
- N.FL.06.12 The student will multiply and divide any two fractions, including mixed numbers, fluently.
- N.MR.06.13 The student will understand integer subtraction as the inverse of integer addition.
- N.FL.06.14 The student will add and multiply integers between -10 and 10; subtract and divide integers using the related facts. Use the number line and chip models for addition and subtraction.
- N.FL.06.15 The student will add, subtract, multiply and divide positive rational numbers fluently.
- N.FL.06.16 The student will solve applied problems that use the four operations with appropriate decimal numbers.

D. Understand ratio concepts and use ratio reasoning to solve problems

- N.ME.06.17 The student will understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
- N.ME.06.18 The student will find equivalent ratios by scaling up or scaling down.
- N.ME.06.19 The student will understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.
- N.ME.06.20 The student will solve applied problems including rates, unit rates, and constant speed.
- N.FL.06.21 The student will understand percentages as parts out of 100, use percent notation (%) and express a part of whole percentage.

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D. Understand ratio concepts and use ratio reasoning to solve problems (cont.)

- N.FL.06.22 The student will calculate part of a number given the percentage and the number and also calculate the whole, given the part and the percentage.
- N.MR.06.23 The student will solve contextual problems involving percentages such as sales taxes, tips, discount and interest..

E. Use exponents

- N.ME.06.24 The student will understand and use positive exponents, excluding negative bases.
- N.MR.06.25 The student will write and evaluate numerical expressions involving whole-number exponents.
- N.MR.06.26 The student will find the prime factorization of numbers from 2 through 100, express in exponential notation.

F. Use factors and multiples

- N.MR.06.27 The student will use prime factorization to find LCM and GCF, and apply to word problems.
- N.MR.06.28 The student will find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.

Algebra

A. Understand Algebraic expressions and equations and inequalities

- A.FO.06.01 The student will distinguish between an algebraic expression and an equation.
- A.FO.06.02 The student will use standard conventions for writing algebraic expressions (e.g., $2x + 1$ means “two times x , plus 1” and $2(x + 1)$ means “two times the quantity $(x + 1)$ ”).
- A.FO.06.03 The student will write, read, and evaluate expressions in which letters stand for numbers.
- A.FO.06.04 The student will simplify expressions of the first degree by combining like terms, and evaluate using specific values, and order of operations.

A.FO.06.05 The student will write an inequality from a real world situation or mathematical problem and represent solutions on a number line.

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B. Represent linear functions using tables, equations, and graphs

- A.RP.06.06 The student will understand that relationships between quantities can be suggested by graphs and tables.
- A.PA.06.07 The student will recognize the relationship between dependent and independent variables.
- A.PA.06.08 The student will solve problems involving linear functions whose input values are integers; write the equation; graph the resulting ordered pairs of integers (e.g., given c chairs, the “leg function” is $4c$; if you have 5 chairs, how many legs? ; if you have 12 legs, how many chairs?).
- A.RP.06.09 The student will represent simple relationships between quantities using verbal descriptions, formulas or equations, tables, and graphs (e.g., perimeter-side relationship for a square, distance-time graphs, and conversions such as feet to inches).

C. Solve equations

- A.FO.06.10 Using real world problems, the student will write, and solve one-variable equations using properties of equality.
- A.FO.06.11 The student will relate simple linear equations with integer coefficients (e.g., $3x = 8$ or $x + 5 = 10$) to particular contexts and solve.
- A.FO.06.12 The student will understand that adding or subtracting the same number to both sides of an equation creates a new equation that has the same solution.
- A.FO.06.13 The student will understand that multiplying or dividing both sides of an equation by the same non-zero number creates a new equation that has the same solutions.

Measurement**A. Find area, surface area and volume**

- M.PS.06.01 The student will find area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
- M.PS.06.02 The student will represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
- M.TE.06.03 The student will compute the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formula $V = l w h$ and $V = B h$ to find volume of right rectangular prism with fractional edge lengths in the context of solving real-world an mathematical problems.

Geometry**A. Understand and apply basic properties**

- G.GS.06.01 The student will draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

B. Understand the concept of congruence and basic transformations

- G.TR.06.02 The student will understand the basic rigid motions in the plane (reflections, rotations, translations), relate these to congruence, and apply them to solve problems.

Data and Probability

A. Understand the concept of basic statistics

- D.AN.06.01 The student will recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers (e.g., “How old am I?” is not a statistical question but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages).
- D.AN.06.02 The student will understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- D.AN.06.03 The student will recognize that a measure of center for a numerical data set summarizes all of its values with a single number (mean and median), while a measure of variation (range) describes how its values vary with a single number .
- D.RE.06.04 The student will display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- D.RE.06.05 The student will summarize numerical data sets in relation to their context, such as by:
- a. Reporting the number of observations.
 - b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
 - c. Giving quantitative measures of center (median and/or mean) and variability (range), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
 - d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

