Jackson Area Catholic Schools

Mathematics Academic Standards
for
Fifth Grade

Numbers and Operations

A. Understand division of whole numbers

N.MR.05.01 The student will understand the meaning of division of whole numbers with and without remainders; relate division to fractions and to repeated subtraction.

N.MR.05.02 The student will relate division of whole numbers with remainders to the form, $a = bq + r$, (e.g., $34 \div 5 = 6$ r 4), so $5 \times 6 + 4 = 34$; note remainder (4) is less than divisor (5).

N.MR.05.03 The student will write mathematical statements involving division for given situations.

B. Multiply and divide whole numbers

N.FL.05.04 The student will multiply a multi-digit number by a two-digit number; recognize and be able to explain common computational errors such as not accounting for place value.

N.FL.05.05 The student will solve applied problems involving multiplication and division of whole numbers.

N.FL.05.06 The student will divide fluently up to a four-digit number by two-digit number.

N.FL.05.07 The student will understand the use of calculators as a tool.

C. Find prime factorizations of whole numbers

N.MR.05.08 The student will identify number as prime or composite.

N.MR.05.09 The student will understand that every composite number can be expressed as a product of primes.

D. Understand meaning of decimal fractions and percentages

N.ME.05.10 The student will understand the relative magnitude of ones, tenths, and hundredths and the relationship of each place value to the place to its right (e.g., one is 10 tenths, one tenth is 10 hundredths).

N.ME.05.11 The student will read, write, and compare decimals to thousandths using based–ten numerals, number names, and expanded form.

N.ME.05.12 The student will use place value understanding to round decimals to any place.

N.ME.05.13 The student will add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

E. Understand fractions as division statements; find equivalent fractions

N.ME.05.14 The student will understand a fraction as a statement of division (e.g., $2 \div 3 = 2/3$) using simple fractions and pictures to represent.

N.ME.05.15 The student given two fractions (e.g., 1/2 and 1/4) will express them as fractions with a common denominator, but not necessarily a least common denominator (e.g., $1/2 = 4/8$ and $3/4 = 6/8$); use denominators less than 12 or factors of 100.

N.ME.05.16 The student will simplify fractions to lowest terms.

F. Multiply and divide fractions

N.ME.05.17 The student will multiply fractions with other fractions, whole numbers, and mixed numbers.

N.MR.05.18 The student will divide a fraction by a whole number, fraction, and a mixed number.

G. Add and subtract fractions and mixed numbers

N.FL.05.19 The student will add and subtract fraction and mixed numbers with like and unlike denominators.

N.FL.05.20 The student will add and subtract mixed numbers with like and unlike denominators that require regrouping.

H. Multiply and divide by powers of ten

N.MR.05.21 The student will multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, 1000; and identify patterns.

N.FL.05.22 The student will divide numbers by 10's, 100's, 1000's using mental strategies.

N.MR.05.23 The student will multiply one-digit and two-digit whole numbers by decimals up to two decimal places.

I. Solve applied problems with fractions

N.MR.05.24 The student will solve contextual problems that involve finding sums and differences of fractions with unlike denominators.

N.MR.05.25 The student will solve contextual problems that involve finding products and quotients using fractions and mixed numbers.

N.FL.05.26 The student will solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness.

Algebra

A. Write and interpret numerical expressions

A.FO.05.01 The student will use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

A.FO.05.02 The student will write simple expressions with grouping symbols that record calculations with numbers, and interpret numerical expressions without evaluating them.

B. Analyze patterns and relationships

A.PO.05.03 The student will generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

Measurement

A. Know, and convert among, measurement units within a given system

N.UN.05.01 The student will recognize the equivalence of 1 liter, 1000 ml and 1000 cm^3 and include conversions among liters, milliliters, and cubic centimeters.

N.UN.05.02 The student will know the units of measure of volume: cubic centimeter, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations (cm^3, m^3, in^3, ft^3, yd^3).

N.UN.05.03 The student will compare the relative sizes of one cubic inch to one cubic foot and one cubic centimeter to one cubic meter.

N.UN.05.04 The student will convert measurements within a given system using easily manipulated numbers (e.g., convert 5 cm to 0.05 m) and use these to solve real world problems.

B. Find areas of geometric shapes using formulas

M.PS.05.05 The student will represent relationships between areas of rectangles, triangles, and parallelograms using models.

M.TE.05.06 The student will understand and know how to use the area formulas of a triangle: A = 1/2bh (where b is length of the base and h is the height), and represent using models and manipulatives.

M.TE.05.07 The student will understand and know how to use the area formula for a parallelogram: A = bh, and represent using models and manipulatives.

C. Understand the concept of volume

M.TE.05.08 The student will build solids with unit cubes and state their volumes.

M.TE.05.09 The student will use filling (unit cubes or liquid) and counting or measuring to find the volume of a cube and rectangular prism.

M.PS.05.10 The student will solve applied problems about the volumes of rectangular prisms using V = lwh and V = Bh with whole number edge lengths and appropriate units.

M.PS.05.11 The student will recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Geometry

A. Know the meaning of angles, and solve problems

G.TR.05.01 The student will associate an angle with a certain amount of turning; know that angles are measured in degrees; understand that 90°, 180°, 270°, and 360° are associated respectively, with 1/4, 1/2, 3/4, and full turns.

G.GS.05.02 The student will measure angles with a protractor and classify them an acute, right, obtuse, or straight.

G.GS.05.03 The student will identify and name angles on a straight line and vertical angles.

G.GS.05.04 The student will know that angles on a straight line add up to 180° and angles surrounding a point add up to 360°; justify informally by "surrounding" a point with angles.

B. Classify two-dimensional figures into categories based on their properties.

G.GS.05.05 The student will understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

G.GS.05.06 The student will classify two-dimensional figures in a hierarchy based on properties.

C. Graph points on the coordinate plane

G.LO.05.07 The student will use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

G.LO.05.08 The student will represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Data and Probability

A. Construct and interpret line graphs

D.RE.05.01 The student will read and interpret line graphs, and solve problems based on line graphs (e.g., distance-time graphs and problems with two or three line graphs on same axes) comparing different data.

D.RE.05.02 The student will construct line graphs from tables of data; include axis labels and scale.

B. Find and interpret mean and mode for a given set of data

D.AN.05.03 The student given a set of data, will find and interpret the mean (using the concept of fair share) and mode.