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Math Curriculum Common Core Grade - 6

Course Contents

Ratios and Proportional Relationships

Introduction to Ratios
Understand the concept of a ratio.
Use ratio language to describe the relationship between two quantities.
Practice examples: "The ratio of wings to beaks is 2:1," "Votes for candidate A vs. candidate C."

Introduction to Unit Rates
Understand unit rates (a/b) in the context of ratios.
Use rate language to describe ratios in real-world contexts.
Examples: "3/4 cup of flour for each cup of sugar," "$5 per hamburger."

Solving Problems with Equivalent Ratios
Create tables of equivalent ratios.
Find missing values in ratio tables.
Plot pairs of ratio values on the coordinate plane.

Unit Rate Problems
Solve unit rate problems involving unit pricing and constant speed.
Example problems: "How many lawns can be mowed in 35 hours?" "What rate were lawns being mowed?"

Working with Percentages as Ratios
Understand percent as a rate per 100.
Solve problems involving percentages (e.g., 30% of a quantity means 30/100 times the quantity).
Find the whole given part and percent.

Ratio Reasoning for Unit Conversions
Use ratio reasoning to convert measurement units.
Manipulate and transform units by multiplying or dividing quantities.

Review and Multi-Step Problem Solving
Apply ratio and rate reasoning to solve real-world and mathematical problems.
Use tables, diagrams, and equations in problem-solving.

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The Number System

Session Syllabus for Dividing Fractions by Fractions

Interpret and compute quotients of fractions.

Use visual fraction models and equations to solve division problems.

Solve real-world word problems involving division of fractions (e.g., (2/3) ÷ (3/4) = 8/9).

Apply the concept to scenarios like:

Sharing 1/2 lb of chocolate among 3 people.

Finding how many 3/4-cup servings are in 2/3 cup of yogurt.

Understand and use the relationship between multiplication and division to explain fraction division.

Fluently Divide Multi-Digit Numbers

Practice fluently dividing multi-digit numbers using the standard algorithm.

Operations with Multi-Digit Decimals

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Finding Greatest Common Factors (GCF)

Find the greatest common factor (GCF) of two whole numbers (≤ 100).

Apply the distributive property to express sums with common factors.

Finding Least Common Multiples (LCM)

Find the least common multiple (LCM) of two whole numbers (≤ 12).

Practice using LCM and GCF in problem-solving contexts.

Positive and Negative Numbers in Real-World Contexts

Understand the use of positive and negative numbers to describe opposite directions or values (e.g., temperature, elevation, credits/debits).

Explore the meaning of zero in different real-world contexts.

Rational Numbers on the Number Line

Understand rational numbers as points on a number line.

Extend number line diagrams to include negative numbers.

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Opposite Signs and Number Line Concepts
Recognize opposite signs of numbers indicating locations on opposite sides of zero.
Understand that the opposite of the opposite of a number is the number itself.

Coordinate Plane and Reflections
Use ordered pairs to indicate locations in quadrants of the coordinate plane.
Recognize reflections of points across axes when ordered pairs differ only by signs.

Plotting Rational Numbers
Find and position integers and rational numbers on horizontal/vertical number lines and the coordinate plane.

Ordering and Inequality of Rational Numbers
Interpret and explain inequality statements about the relative positions of numbers on a number line.
Practice writing and interpreting order for rational numbers in real-world contexts.

Absolute Value and Magnitude
Understand absolute value as the distance from zero on the number line.
Interpret absolute value in real-world situations, distinguishing between order and magnitude.

Graphing in All Four Quadrants
Solve real-world and mathematical problems by graphing points in all four quadrants.
Use coordinates and absolute values to find distances between points with the same first or second coordinate.

Expressions and Equations

Numerical Expressions and Whole-Number Exponents
Write and evaluate numerical expressions involving whole-number exponents.

Writing and Evaluating Algebraic Expressions
Write, read, and evaluate expressions with variables.
Record operations with numbers and letters (e.g., express “Subtract y from 5” as 5-y).

Parts of Expressions and Evaluation
Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient).
Evaluate expressions at specific values of their variables, including real-world problems.

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Order of Operations Perform arithmetic operations involving whole-number exponents following the conventional order of operations (e.g., using formulas for volume and surface area).
Generating Equivalent Expressions Apply properties of operations to generate equivalent expressions (e.g., distributive property).
Identifying Equivalent Expressions Identify when two expressions are equivalent and explain why they name the same number for any substituted value (e.g., y+y+y and 3y).
Understanding Equations and Inequalities Understand solving equations and inequalities as determining which values from a specified set make them true. Use substitution to check if a number in a specified set satisfies an equation or inequality.
Using Variables in Expressions Use variables to represent numbers in real-world or mathematical problems. Understand that a variable can represent an unknown number or any number in a specified set.
Solving Simple Equations Solve real-world and mathematical problems by writing and solving equations of the form x+p=q and px=q with nonnegative rational numbers.
Writing Inequalities Write inequalities of the form x>c or x<c to represent constraints in problems.
Infinite Solutions for Inequalities Recognize that inequalities of the form x>c or x<c have infinitely many solutions. Represent solutions of inequalities on number line diagrams.
Problem-Solving with Equations and Inequalities Solve complex real-world problems involving both equations and inequalities. Apply learned concepts to determine the validity of solutions in context.

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Representing and Analyzing Quantitative Relationships

Use variables to represent two quantities in a real-world context that change in relation to each other.
Write an equation to express the dependent variable in terms of the independent variable.
Analyze the relationship between the dependent and independent variables using graphs and tables.
Relate the graphical and tabular representations to the equation.
Example: In a motion problem, graph ordered pairs of distances and times, and write the equation $d=65t$ to represent the relationship.

Geometry

Finding the Area of Polygons

Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles; apply these techniques in real-world problem-solving.

Volume of Right Rectangular Prisms

Explore the volume of right rectangular prisms with fractional edge lengths by packing with unit cubes; demonstrate that volume calculation aligns with the formula $V=l\times w\times h$ and solve real-world problems.

Drawing Polygons in the Coordinate Plane

Draw polygons in the coordinate plane using given vertex coordinates; use coordinates to calculate the lengths of sides connecting points with the same x- or y-coordinates; apply these methods in practical scenarios.

Surface Area Using Nets

Represent three-dimensional figures using nets made up of rectangles and triangles; find the surface area of these figures using the nets; apply techniques to real-world situations.

Integrating Area, Volume, and Surface Area Concepts

Review and integrate concepts of area, volume, and surface area through a series of real-world problem-solving activities, reinforcing understanding and application of learned techniques.

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Statistics and Probability
Introduction to Statistical Questions Recognize statistical questions and the concept of variability in data; differentiate between non-statistical and statistical questions with examples.
Understanding Data Distribution Explore the components of data distribution: center, spread, and overall shape; discuss how these elements help in analyzing data.
Measures of Center and Variation Understand measures of center (mean and median) and measures of variation (range, interquartile range, and mean absolute deviation); learn how these metrics summarize data sets.
Displaying Data Learn to display numerical data using dot plots, histograms, and box plots; understand the importance of visual representation in interpreting data.
Summarizing and Contextualizing Data Summarize data sets by reporting observations, measuring attributes, calculating center and variability, and discussing data distribution shape; relate findings to the context of the data collection.

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