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Grade 5 Number and Operations

Multiplication and Division

Solving multiplication problems with 2-digit numbers

UNIT 1 MATH FOCUS POINTS

- Using arrays to represent multiplication
- Determining whether one number is a factor or multiple of another
- Identifying prime, square, even, and odd numbers
- Using properties (even, odd, prime, square) and relationships (factor, multiple) of numbers to solve problems
- Identifying and learning multiplication facts not yet fluently known
- Solving 2-digit by 2-digit multiplication problems
- Describing and comparing strategies used to solve multiplication problems
- Creating a story problem represented by a multiplication expression
- Multiplying fluently by multiples of 10
- Comparing multiplication problems to determine which product is greater
- Estimating the product of two numbers
- O Breaking apart multiplication problems efficiently

TEN-MINUTE MATH

- Organizing and analyzing visual images
- Writing multiplication equations that model the structure of dot arrangements

Each strand is labeled with a grade level.

The content is organized around six strands. All strands do not appear at every grade level.

main math ideas.

The strands are divided into

The main math ideas are further subdivided into Math Focus Points. The main math ideas may appear in one or more units.

The main math ideas are also supported by the Ten-Minute Math activities.

Number and Operations

Multiplication and Division

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TEN-MINUTE MATH

- Organizing and analyzing visual images
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Understanding and using the relationship between multiplication and division to solve division problems

UNIT 1 MATH FOCUS POINTS

- Representing a division problem with a picture or diagram
- Creating a story problem represented by a division expression
- Describing and comparing strategies used to solve division problems
- Using knowledge of multiples of 10 to solve division problems
- Using and interpreting notation that represents division, and relating division and multiplication notations
 (e.g., 170 ÷ 15 = _____, and _____ × 15 = 170)
- Solving division problems with 2-digit divisors
- Making sense of remainders in terms of problem contexts
- Solving a division problem by breaking the dividend into parts
- Comparing division problems to determine which quotient is greater

Writing and interpreting numerical expressions

UNIT 1 MATH FOCUS POINTS

- Using clear and concise notation
- Solving problems using the order of operations
- Writing and interpreting expressions involving grouping symbols

- Solving problems using the order of operations
- Interpreting expressions involving grouping symbols

Solving multiplication problems fluently

UNIT 4 MATH FOCUS POINTS

- Solving multiplication problems fluently
- Describing and comparing strategies used to solve multidigit multiplication problems
- Estimating answers to multiplication problems
- Understanding the U.S. standard algorithm for multiplication
- Multiplying using the U.S. standard algorithm for multiplication
- Using clear and concise notation
- Solving multi-step word problems
- Using all four operations to solve problems

TEN-MINUTE MATH

- Estimating solutions to multiplication problems
- Breaking apart, reordering, rounding, or changing numbers mentally to determine a reasonable estimate
- Generating expressions equivalent to a given number using particular constraints
- Practicing computation skills

Solving division problems efficiently

UNIT 4 MATH FOCUS POINTS

- Representing a division problem with a picture or diagram
- Creating a story context for a division expression
- Using clear and concise notation
- Describing and comparing strategies used to solve division problems
- Solving division problems with a 2-digit divisor efficiently
- Solving multi-step word problems
- Using all four operations to solve problems

- Estimating solutions to division problems
- Breaking apart, reordering, rounding, or changing numbers mentally to determine a reasonable estimate

Rational Numbers

Addition and Subtraction: Fractions

Finding equivalents and comparing fractions

UNIT 3 MATH FOCUS POINTS

- Finding fractional parts of a whole or of a group
- Identifying fraction equivalents through reasoning about representations and relationships
- Representing fractions on different-sized rectangles
- Ordering fractions and justifying their order through reasoning about fraction equivalents and relationships
- Comparing fractions to the landmarks 0, $\frac{1}{2}$, and 1
- Finding and comparing fractional parts of a whole or a group
- Comparing fractional parts of different-sized wholes
- Using equivalent fractions to solve problems
- Comparing fractions on a number line

TEN-MINUTE MATH

- Identifying fractions of a group
- Identifying common attributes of a group of people
- Using benchmark fractions to compare fractions

Adding and subtracting fractions

UNIT 3 MATH FOCUS POINTS

- Finding fractional parts of the rotation around a circle
- Adding fractions by using a rotation model
- Representing fractions on a number line
- Using equivalencies to place fractions on a set of number lines (Fraction Tracks)
- Finding combinations of fractions with sums between 0 and 2
- Adding and subtracting fractions by using a number line
- Adding and subtracting fractions through reasoning about fraction equivalents and relationships
- Using common denominators to add and subtract fractions
- Adding and subtracting fractions and mixed numbers
- Finding general rules for adding and subtracting fractions
- Making a line plot to display a data set of measurements involving fractions
- Using addition and subtraction of fractions to solve problems involving information given in line plots
- Using benchmark fractions to estimate sums and differences

- Generating expressions equivalent to a given number using particular constraints
- Practicing computation skills with rational numbers
- Estimating solutions to addition and subtraction problems with fractions and mixed numbers
- Breaking apart, reordering, rounding, or changing numbers mentally to determine a reasonable estimate

Addition and Subtraction: Decimals

Understanding the meaning of decimals

UNIT 6 MATH FOCUS POINTS

- Identifying everyday uses of fractions and decimals
- Representing decimals as parts of an area
- Reading and writing tenths, hundredths, and thousandths
- Identifying decimal and fraction equivalents
- Representing decimals on a number line
- Rounding decimals to the nearest one, tenth, or hundredth
- Writing decimals in expanded form

TEN-MINUTE MATH

- Reading, writing, and rounding decimals
- Writing decimals in expanded form
- Adding tenths and hundredths to, and subtracting them from, decimals
- Reading, writing, and rounding multidigit numbers
- Writing numbers in expanded form using exponents to denote powers of 10
- Adding multiples of 10 to, and subtracting multiples of 10 from, multidigit numbers

Comparing decimals

UNIT 6 MATH FOCUS POINTS

- Comparing decimals to thousandths
- Ordering decimals and justifying their order through reasoning about decimal representations, equivalents, and relationships
- Comparing decimals to the landmarks 0, $\frac{1}{2}$, and 1

Adding and subtracting decimals

UNIT 6 MATH FOCUS POINTS

- Estimating sums and differences of decimals
- Using representations to add and subtract tenths, hundredths, and thousandths
- Adding and subtracting decimals through reasoning about place value, equivalents, and representations
- Comparing sums and differences of decimal numbers to determine which is greater

- Adding tenths and hundredths to, and subtracting them from, decimals
- Estimating solutions to addition and subtraction problems with decimals
- Breaking apart, reordering, rounding, or changing numbers mentally to determine a reasonable estimate

Multiplication and Division: Fractions

Multiplying and dividing fractions, mixed numbers, and whole numbers

UNIT 7 MATH FOCUS POINTS

- Using a representation to multiply a fraction and a whole number
- Extending understanding of the operation of multiplication to include fractions
- Writing multiplication equations for multiplying a fraction and a whole number
- Writing and interpreting multiplication equations involving a fraction and a whole number
- Using a representation and reasoning to multiply a whole number by a fraction or mixed number
- Comparing the size of the product to the size of one factor based on the size of the other factor
- Multiplying a fraction or mixed number and a whole number
- Multiplying a fraction by a fraction
- Representing a fractional part of a fractional quantity

- Using arrays to represent multiplication of fractions
- Understanding the relationship between the denominators and numerators of the factors and the denominator and numerator of the product
- Using representations to solve problems involving dividing a whole number by a unit fraction and dividing a unit fraction by a whole number
- Using reasoning, and the relationship between division and multiplication, to solve division problems involving whole numbers and unit fractions

TEN-MINUTE MATH

- Estimating solutions to multiplication problems with fractions and mixed numbers
- Breaking apart, reordering, rounding, or changing numbers mentally to determine a reasonable estimate

Interpreting fractions as division

UNIT 7 MATH FOCUS POINTS

- Solving problems that involve dividing a whole number by a whole number resulting in a fraction or a mixed number
- Interpreting fractions as division
- Identifying decimal and fraction equivalents
- Interpreting the meaning of digits in a decimal number

Multiplication and Division: Decimals

Multiplying with decimals

UNIT 7 MATH FOCUS POINTS

- Using representations and reasoning to multiply whole numbers by powers of 10 (including 1, 0.1, and 0.01)
- Explaining the patterns in the placement of the decimal point when a decimal is multiplied by a power of 10
- Estimating products of decimals
- Multiplying decimals to hundredths through reasoning about place value and multiplication
- Writing a strategy for multiplying decimals

TEN-MINUTE MATH

- Estimating solutions to multiplication problems with decimals
- Breaking apart, reordering, rounding, or changing numbers mentally to determine a reasonable estimate

Dividing with decimals

UNIT 7 MATH FOCUS POINTS

- Using representations and reasoning to divide whole numbers by powers of 10 (including 1, 0.1, and 0.01)
- Explaining the patterns in the placement of the decimal point when a decimal is divided by a power of 10
- Estimating quotients of decimals
- Dividing decimals to hundredths through reasoning about place value and division

- Estimating solutions to division problems with decimals
- Breaking apart, reordering, rounding, or changing numbers mentally to determine a reasonable estimate

Analyzing Patterns and Rules

Reading and constructing coordinate graphs

UNIT 5 MATH FOCUS POINTS

- Understanding the meaning of points on a coordinate graph
- Plotting points on a coordinate grid
- Generating ordered pairs and recording them in a table
- Identifying points in a graph with corresponding ordered pairs in a table
- Identifying the *x* and *y*-coordinates of a point on a coordinate grid

Modeling situations with mathematics: Graphs, ordered pairs, tables, and symbolic notation

UNIT 5 MATH FOCUS POINTS

- Interpreting values of the points on a coordinate grid in the context of the situation
- Interpreting a numerical pattern in a table in terms of the situation it represents
- Interpreting the shape of a graph in terms of the situation the graph represents
- Using symbolic letter notation to represent the value of one varying quantity in terms of another

Analyzing and comparing mathematical patterns and relationships

UNIT 5 MATH FOCUS POINTS

- Comparing situations by describing differences in their graphs
- Articulating a rule that describes a numerical pattern
- Describing the relationship between two varying quantities related by a rule (e.g., age and height)
- Using a numerical relationship generated by a given rule to solve problems in that context
- Writing an equation that describes the relationship between two varying quantities
- Analyzing and comparing numerical patterns generated by different rules

Analyzing numerical patterns in the perimeters and areas of related rectangles

UNIT 8 MATH FOCUS POINTS

- Comparing the perimeters and areas of rectangles when the dimensions are multiplied by given amounts
- Using numerical and/or geometric patterns to describe how the perimeters and areas of rectangles change when the dimensions change
- Using representations to explain how perimeters and areas of rectangles change
- Creating different rectangles with the same area but different perimeters
- Creating different rectangles with the same perimeter but different areas
- Describing the shapes of rectangles that have the same area or the same perimeter

Grade 5 Measurement

Translating between two-dimensional and three-dimensional shapes

UNIT 2 MATH FOCUS POINT

 Decomposing 3-D shapes and then recombining them to make a given solid

TEN-MINUTE MATH

- Looking for and making use of the structure of 3-D geometric solids
- Developing language and concepts needed to communicate about spatial relationships
- Decomposing and recombining 3-D solids

Structuring rectangular prisms and determining their volume

UNIT 2 MATH FOCUS POINTS

- Determining the number of cubes that will fit into the box made by a given pattern
- Developing a strategy for determining the volume of rectangular prisms
- Designing patterns for boxes with given dimensions
- Finding the volume of rectangular prisms
- Considering how the dimensions of a box change when the volume is changed (doubled or halved)

- Organizing rectangular packages to fit in rectangular boxes
- Using formulas to find the volume of rectangular prisms
- Finding the volume of a solid composed of two rectangular prisms
- Designing a box that can be completely filled with several differently-shaped rectangular packages
- Determining the volume, in cubic centimeters, of a small rectangular prism
- Constructing units of volume—cubic centimeter, cubic inch, cubic foot, cubic yard (optional), cubic meter
- Choosing an appropriate unit of volume to measure a large space
- Describing and defending measurement methods
- Finding the volume of a large space using cubic meters

Converting measurements

UNIT 7 MATH FOCUS POINTS

- Converting U.S. standard and metric measurements
- Solving multi-step word problems involving measurement

Geometry

Reading and constructing coordinate graphs

UNIT 5 MATH FOCUS POINTS

- Understanding the meaning of points on a coordinate graph
- Plotting points on a coordinate grid
- Generating ordered pairs and recording them in a table
- Identifying points in a graph with corresponding ordered pairs in a table
- Identifying the x- and y-coordinates of a point on a coordinate grid
- Interpreting values of the points on a coordinate grid in the context of the situation

Classifying two-dimensional figures

UNIT 8 MATH FOCUS POINTS

- Identifying attributes of polygons
- Classifying triangles by the sizes of their angles and the lengths of their sides
- Using attributes to classify quadrilaterals
- Identifying the properties of categories of quadrilaterals
- Recognizing that a polygon can belong to more than one category

- Looking for and making use of the structure of 2-D geometric shapes
- Developing language and concepts needed to communicate about spatial relationships, including shape names and attributes
- Decomposing and recombining 2-D shapes