

Prep for Mathematics 6**Scope and Sequence****Unit Lesson****Objectives****Diagnostic PreTest**

TEST

Whole Numbers and Operations

Multiplying with Powers of 10

Interpret the change in position of a digit as a number is multiplied by a power of 10.

Multiply whole numbers by powers of 10 using place value strategies.

Use strategies for mentally multiplying by a power of 10.

Real-World Application: Multiply a number with a power of 10 to represent a variety of real-world situations.

Dividing with Powers of 10

Interpret the change in position of a digit as a change of value by a power of 10 using division.

Divide whole numbers by powers of 10 by thinking about the change to place values.

Use strategies for mentally dividing by a power of 10.

Real-World Application: Divide a number by a power of 10 to represent a variety of real-world situations.

Multi-Digit Multiplication

Apply the standard algorithm for multiplying multi-digit whole numbers.

Use estimation strategies to predict and check products.

Use various grouping strategies to multiply multi-digit numbers.

Real-World Application: Multiply multi-digit numbers that model real-world situations.

Multi-Digit Division

Apply the standard algorithm for dividing multi-digit whole numbers.

Use estimation strategies to predict and check quotients.

Use place value strategies to divide multi-digit numbers.

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Real-World Application: Divide multi-digit numbers that model real-world situations.

Multi-Digit Arithmetic:
Comparing the Four
Operations

Correctly use place value in the standard algorithms for the four basic mathematical operations.

Relate and/or contrast the standard algorithms for the pairings of $+/ -$ \times/\div $\pm/\times\div$, and use their relationships to check answers.

Real-World Application: Solve one-step real-world problems using any of the four operations and whole numbers.

Interpreting and Simplifying
Multistep Expressions

Order the operations for solving a multistep problem.

Evaluate expressions with multiple operations, including parentheses and brackets.

Real-World Application: Solve real-world problems involving multistep operations, including identifying expressions that model the problem.

Using a Calculator
Appropriately and
Strategically

Use a calculator to evaluate whole-number expressions without variables, including clearing the calculator.

Use order of operations in the calculator entries of multistep problems.

Assess the reasonableness of calculator output using mental computation, estimation strategies, and rounding.

Real-World Application: Use a calculator to solve real-world problems.

Perimeter, Area, and
Volume: Concepts and Units

Express perimeter, area, and volume using measurements such as units, square units, and cubic units.

Measure length, perimeter, area, and volume using visual models of rectangles and rectangular solids by counting units.

Real-World Application: Determine which kind of measurement is appropriate for a given real-world situation.

Unit Lesson**Objectives**

Perimeter, Area, and
Volume: Calculations

Calculate perimeter, area, and volume of rectangles and rectangular solids using formulas.

Determine the perimeter, area, or missing dimension of an irregular figure.

Real-World Application: Determine the perimeter, area, and volume of real-world objects, including combining the perimeters and areas of objects comprised of multiple rectangles.

Fractions

Using Equivalent Fractions
to Add and Subtract
Fractions

Use visual representations to add and subtract fractions with denominators that are different but compatible (e.g., $5/6 - 1/2$, which can be shown as $2/6$ visually; the difference shows that $5/6$ is $2/6$ greater than $1/2$).

Add and subtract two fractions with different denominators.

Real-World Application: Find common denominators to add or subtract different parts of inches and feet.

Multiplying a Fraction by a
Whole Number

Interpret $n \times (1/b)$ as the sum of $1/b + 1/b + \dots + 1/b$ (n terms); extend to $n \times a/b$ through repeated addition.

Interpret $1/b \times n$ as $1/b$ th of n by comparing to $1 \times n$, $2 \times n$, etc.

Interpret $a/b \times n$ in terms of repeated addition, and compute products of the form $n \times a/b$ using that algorithm.

Real-World Application: Solve real-world problems involving a fraction of a total using multiplication (both unit fractions and otherwise).

Multiplying a Fraction by a
Fraction

Explain the algorithm for multiplying $a/b \times c/d$ through visual representations.

Unit Lesson**Objectives**

Explain $a/b \times c/d$ as a fractional part of a fraction.

Multiply fractions and mixed numbers.

Real-World Application: Solve a variety of problems involving a fractional part of a fraction.

Dividing a Fraction by a Whole Number

Divide a fraction by a whole number equal to the fraction's denominator in real-world situations.

Divide a fraction by a whole number using an equivalent fraction in real-world situations.

Using Visual Models in Fraction Division

Use models to divide a whole number by a whole number.

Use models to divide a whole number by a fraction.

Decimals

Place Value and Decimals

Model decimals to hundredths.

State the meaning of a given digit to thousandths (e.g., The 6 in 3.067 represents 6 hundredths).

Convert decimals in expanded, standard, or word form to thousandths.

Comparing Decimals

Create and justify the equivalence of multiple representations of decimal values.

Use various place value strategies to compare decimal values.

Real-World Application: Compare decimals using real-world measurements.

Adding Decimals

Represent sums using manipulatives (base-10 blocks, money).

Add decimals using a variety of strategies, including counting up and the standard algorithm.

Unit Lesson**Objectives**

Identify and correct common errors of addition with decimals.

Real-World Application: Use decimals to find real-world sums involving money.

Subtracting Decimals

Represent differences using manipulatives (base 10 blocks, money).

Subtract by place value using a variety of strategies including counting up and the standard algorithm.

Real-World Application: Solve real-world problems involving subtraction of decimals.

Multiplying and Dividing
Decimals by a Power of 10

Multiply decimals by powers of 10.

Divide by powers of 10.

Real-World Application: Solve real-world problems involving multiplication and division by 10, 100, 1000, etc., and describe the relative sizes of the numbers.

Multiplying a Whole Number
by a Decimal Less than 1

Interpret $n \times d$ both as the sum of n copies of the decimal d and a portion of n to justify multiplying according to place value, regrouping as needed.

Multiply whole numbers by decimals less than one.

Use rounding to estimate a product before computing as a means of developing a sense of the size of the product.

Real-World Application: Solve real-world problems involving a decimal part of a whole number using multiplication.

Multiplying Decimals

Use rounding to estimate a product before computing as a means of developing a sense of the size of the product, including the position of the decimal point in the product.

Multiply decimals to the hundredths place.

Real-World Application: Solve real-world problems involving multiplication of decimals, especially those involving a decimal part of a decimal.

Unit Lesson

Objectives

Rational Numbers

Equivalent Fractions and Decimals

Use equivalent fractions to convert between “friendly” fractions and decimals.

Interpret a/b as the quotient of a and b in order to find a decimal equivalent for a/b by dividing.

Find the fraction form of a decimal, including common repeating decimals.

Real-World Application: Solve real-world problems by converting between fractions and decimals.

Ordering, Adding, and Subtracting Fractions and Decimals

Use rounding, benchmarks, and common denominators to compare decimals to fractions and to estimate a sum or difference before or after computing.

Order a list of fractions and decimals using various strategies, including a number line, common denominators, rounding, and benchmarks.

Real-World Application: Solve real-world problems that involve a mixture of decimals and fractions.

Word Problems: Multiplying by a Fraction and a Decimal

Estimate a product before computing as a means of developing a sense of the size of the product, or after to check for reasonableness.

Multiply fractions and decimals.

Real-World Application: Solve real-world problems involving multiplication of fractions and decimals.

Using a Calculator with Fractions and Decimals

Use estimation and number sense strategies for checking the output of a calculator computation involving fractions and/or decimals (E.g., when you multiply 923 by 0.123, what should you expect the calculator to give you, approximately?).

Identify reasons for using or not using a calculator on a given problem involving fractions and/or decimals.

Unit Lesson

Objectives

Determine an error in a calculator entry dealing with order of operations involving fractions and/or decimals.

Diagnostic PostTest

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