

# MATHEMATICS

## Course Description



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# Series Description

The objective of the EduSystem **Mathematics K-6** series is to help students develop skills and mathematical concepts in accordance with the standards set forth by the Department of Education of Puerto Rico and the National Council of Teachers of Mathematics. The purpose of the series is to create awareness of why studying mathematical processes is important and how it is necessary for solving problems that relate to real-life situations.

Through its content, strategies, and techniques, the EduSystem **Mathematics K-6** series instills a deep understanding of the concepts, skills, and techniques necessary for the subsequent study of higher mathematics and applications. The way in which the topics, examples, and recommended applications are presented allows students to visualize, understand, and value the usefulness of mathematics in everyday life.

The EduSystem **Mathematics K-6** series covers the following areas and topics: number sense, counting, and cardinal numbers; operations and algebraic thought; numbers and operations in base ten; numbers and operations with fractions and ratios; proportional relationships; numeral systems; expressions and equations; measurement and data; statistics and probability, and geometry.

In each lesson, the objectives have been carefully aligned by taking into consideration the concepts and skills students need to establish connections between the different topics. The instructional focus is based upon conceptual understanding, skills development, and mathematical problems/solutions. It also focuses on the development of critical thinking skills which is the integral means of foundation for the students.

The EduSystem **Mathematics K-6** series encourages the direct application of what students learn and how they visualize the importance of mathematics as a universal discipline relating to society, community, organizations, and institutions. Furthermore, the incorporation of situations and real-life problems in each of the topics aims to awaken an interest in the study of mathematics for students.

## Concept Development

The EduSystem **Mathematics K-6** series is directed toward developing a mastery of:

- ▶ Mathematical reasoning skills and their applications.
- ▶ Application of problem-solving processes and strategies.
- ▶ Use of technology as tools to access, analyze, and apply information in the solution of problems in their immediate surroundings.

## General Objectives

The objectives of this Series are to:

- ▶ Help students develop an interest and appreciation for mathematics.
- ▶ Develop mathematical capability within students through experiences that stimulate their curiosity and focus it toward investigation, problem solving, and communication.
- ▶ Promote that the students visualize mathematics as an integral whole and not as a group of isolated topics.
- ▶ Develop the problem-solving processes in students, as a cornerstone of encouragement, furthering the development of mathematical capacity.
- ▶ Stimulate within students the need of using language and academic vocabulary to communicate mathematical ideas.
- ▶ Develop mathematical reasoning and critical thinking skills that allow students to visualize mathematics as a relevant discipline in their lives.
- ▶ Emphasize the concepts of numbers, operations, and calculations so that they are correctly defined, conceived, and adequately applied.
- ▶ Promote the learning of concepts in geometry and measurement through hands-on experiences that incorporate experimentation and discovery of mathematical relationships using solid objects or manipulatives.

## Course Structure

The **Mathematics 6** course is composed of twelve units. Each unit is composed of lessons. Each lesson contains a presentation divided into sections that develop their individual topics. Each lesson also contains a descriptive log, activities, worksheets, and handouts related to the content and, as in most cases, website links and resources. The practice and review documents generally include word problems, as well as a section devoted solely to solving problems.

We invite you to get to know the presentation sections and the documents that are generally found in the course lessons.

The units are made up of the following:

## Lessons

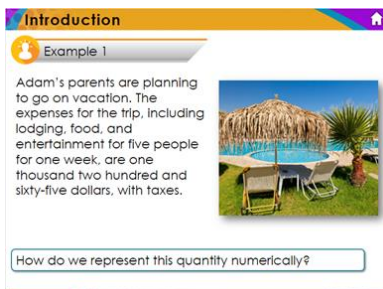
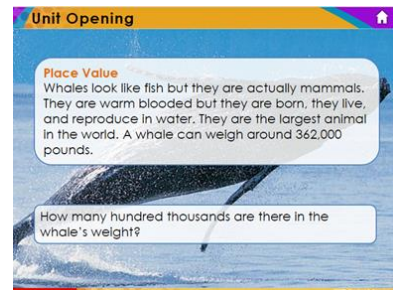
Each unit is composed of several lessons which are divided by topics. Furthermore, each lesson is comprised of the following:

### Presentation

Each presentation is composed of the following sections:

### Unit Opening

Each unit begins with an image which starts off the first lesson of the unit. This section presents the unit's theme as well as several questions in which the image or theme are explored.

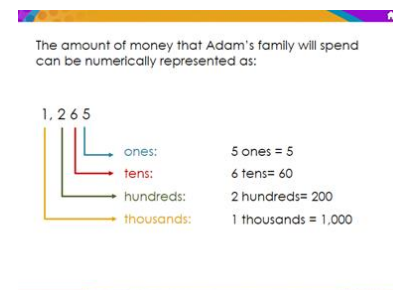


### Introduction

Presentation of a situation and questions to be explored.

## Topics to Be Developed

Sections of concept development, where mathematical ideas and concepts are explained. On some occasions, skills are developed from the situation presented in the introduction and other examples are offered.





### Practice

## Practice

Lesson closure in which students apply what they learned through some exercise.

## Think About It

A reasoning question is presented and identified with a lightbulb. The goal is to develop students' reasoning and analysis capacities.



### Think About It

## Handouts and Worksheets



### Think and Practice

## Think and Practice

It presents exercises and problems after every concept development section. It has activities that help practice, enrich, and reinforce the concepts learned throughout the lesson.

## Homework

Practice for each concept building section. Students are provided with a reasonable number of exercises so that they can master the skills and concepts studied in the lesson.



### Homework

## Lesson 0

This lesson is composed of a series of unit documents and of formative and cumulative evaluation that can be used before, during, or after the study of each unit.

## What I Know!

A pretest of the concepts and skills to be discussed within the unit.



### What I Know!



## Connection

### Connection

Activity that initiates the unit. It relates Mathematics with other fields of study.

### Problem Solving

It explains strategies and procedures for the development of problem-solving skills.



## Problem Solving



## Unit Review

### Unit review

Practice exercises that allow students to confirm what they have learned in the unit.

### Reviewing the Units

Practice exercises that allow the student to confirm what they have learned in previous units.



## Reviewing the Units



## What I Learned

### What I Learned

The skills and concepts learned in the unit are measured. It allows students to do a self-evaluation. The teacher may use it as a test.

### Knowing Technology

It presents technology in its different manifestations, including the computer as well as all the gadgets present in our daily lives. It can be found in some units.



## Knowing Technology



## Think

### Think

It presents activities and includes mathematical reasoning exercises. It can be found in some units.

## Unit Breakdown

Below is an itemization of the division of each unit in lessons, including the name of each lesson with its corresponding objectives, skills, and keywords

### Unit I. Number Sense

At the end of this unit, the student will achieve the objectives found in the following lessons.

#### Unit Concepts

- ▶ arrange decimals in order
- ▶ base
- ▶ billion
- ▶ compare decimals
- ▶ decimal number
- ▶ exponential expression
- ▶ hundred
- ▶ hundredth
- ▶ million
- ▶ ones
- ▶ place value
- ▶ rounding decimals
- ▶ ten thousandths
- ▶ tens
- ▶ tenths
- ▶ thousands
- ▶ trillion
- ▶ units

#### Lesson 0:

**Code:** C319G06U01L00

##### Unit Documents

- ▶ Unit documents

#### Lesson 1: Numbers to the Hundred Trillions

**Code:** C319G06U01L01

##### Objectives

- ▶ Recognize and write numbers up to the hundreds of trillion.

##### Keywords

- ▶ billion, hundreds, million, ones, place value, tens, thousands, trillion, units



## Lesson 2: The Decimal Numbers to the Ten Thousandths

**Code:** C319G06U01L02

### Objectives

- ▶ Recognize and write decimal numbers to the ten thousandth.
- ▶ Write the place value of decimal digits according to their position.
- ▶ Order decimal numbers, as less than ( $<$ ), greater than ( $>$ ), or equal ( $=$ ).

### Keywords

- ▶ decimal, hundredths, place value, tenths, ten thousandths, thousandths

## Lesson 3: Comparing and Arranging in Order Decimal Numbers

**Code:** C319G06U01L03

### Objectives

- ▶ Compare and arrange in order decimal numbers to the ten thousandth.
- ▶ Order decimal numbers from least to greatest or greatest to least.

### Keywords

- ▶ arrange decimals in order, compare decimals, decimal number, place value

## Lesson 4: Rounding Decimal Numbers

**Code:** C319G06U01L04

### Objectives

- ▶ Round decimal numbers.
- ▶ Recognize that when decimals are rounded all the positions to the right of the rounded place are removed.

### Keywords

- ▶ decimal number, place value, rounding decimals

## Lesson 5: Exponential Expressions

**Code:** C319G06U01L05

### Objectives

- ▶ Simplify exponential expressions.
- ▶ Write the exponential expressions parting from a product.

### Keywords

- ▶ base, exponent, exponential expression

## Unit 2. Adding and Subtracting Whole and Decimal Numbers

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ addend
- ▶ adding
- ▶ align
- ▶ associative property of addition
- ▶ commutative property of addition
- ▶ decimal
- ▶ decimal point
- ▶ digit
- ▶ identity property of addition
- ▶ minuend
- ▶ properties of addition
- ▶ regroup
- ▶ subtraction
- ▶ subtrahend
- ▶ sum

### Lesson 0: Adding and Subtracting Whole and Decimal Numbers

**Code:** C319G06U02L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Properties of Addition

**Code:** C319G06U02L01

#### Objectives

- ▶ Know the associative, commutative and identity properties of addition.
- ▶ Recognize that the way in which numbers are grouped in the sum does not affect the result.
- ▶ Know that the order of the addends does not affect the result of the addition.
- ▶ Recognize that adding 0 to any number results in the same number.
- ▶ Solve exercises taking into consideration and using the associative, commutative and identity properties of addition.

#### Keywords

- ▶ associative property of addition, commutative property of addition, identity property of addition, properties of addition, sum

## Lesson 2: Adding Numbers with Six or More Digits

**Code:** C319G06U02L02

### Objectives

- ▶ Perform additions using addends of 6 or more digits.
- ▶ Regroup numbers when necessary.
- ▶ Will review place value positions, from right to left of a number to solve additions of 6 or more digits.

### Keywords

- ▶ addend, regroup, sum

## Lesson 3: Subtracting Numbers with Six or More Digits

**Code:** C319G06U02L03

### Objectives

- ▶ Adapt and solve daily life situations using subtraction.
- ▶ Subtract numbers of 6 or more digits by regrouping when necessary.
- ▶ Arrange the digits vertically, suitable for subtraction.
- ▶ Subtract minuends and subtrahends of 6 or more digits.

### Keywords

- ▶ digit, minuend, regroup, subtraction, subtrahend

## Lesson 4: Adding Decimal Numbers

**Code:** C319G06U02L04

### Objectives

- ▶ Organize decimal numbers vertically for adding.
- ▶ Add decimal numbers by regrouping positions.

### Keywords

- ▶ adding, align, decimal, decimal point, regroup

## Lesson 5: Subtract Four-Digit Numbers

**Code:** C319G06U02L05

### Objectives

- ▶ Organize vertically to subtract decimal numbers.
- ▶ Subtract decimal numbers by regrouping when necessary.
- ▶ Place the decimal point correctly in the results.
- ▶ Subtract four-digit numbers.

### Keywords

- ▶ align, minuend, regroup, subtraction, subtrahend

## Unit 3. Multiplying Whole and Decimals Numbers

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ associative property
- ▶ commutative property
- ▶ decimal places
- ▶ distributive property
- ▶ divisibility rules
- ▶ divisible
- ▶ estimate
- ▶ factors
- ▶ multiple
- ▶ multiplication
- ▶ multiplicative identity property
- ▶ multiplicative property of zero
- ▶ place value
- ▶ products
- ▶ round

### Lesson 0: Multiplying Whole and Decimals Numbers

**Code:** C319G06U03L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Properties of Whole Numbers

**Code:** C319G06U03L01

#### Objectives

- ▶ Recognize and use the associative property of multiplication to solve exercises.
- ▶ Recognize and use the commutative property of multiplication to solve exercises.
- ▶ Recognize and use the distributive property to solve exercises that include addition and multiplication.
- ▶ Recognize and use the multiplicative identity property in the multiplication.
- ▶ Recognize and use the multiplicative property of zero in multiplication.

#### Keywords

- ▶ associative property, commutative property, distributive property, factors, multiplicative identity property, product, multiplicative property of zero

## Lesson 2: Estimating products

**Code:** C3I9G06U03L02

### Objectives

- ▶ Recognize and identify positions in terms of place value in whole numbers.
- ▶ Identify the digit to be rounded.
- ▶ Estimate products.
- ▶ Multiply rounded factors.

### Keywords

- ▶ estimate, factors, product, round

## Lesson 3: Multiplying Whole Numbers by Three-Digit Numbers

**Code:** C3I9G06U03L03

### Objectives

- ▶ Multiply whole numbers by three-digit factors.

### Keywords

- ▶ billion, hundreds, million, ones, place value, tens, thousands, trillion, units

## Lesson 4: Multiplying Whole Numbers with Five or More Digits

**Code:** C3I9G06U03L04

### Objectives

- ▶ Recognize the factors to multiply.
- ▶ Arrange factors vertically to be multiplied.
- ▶ Multiply positions of the second factor by digits of the first factor, in order from right to left.
- ▶ Arrange products in vertical order.
- ▶ Add numbers vertically.
- ▶ Multiply factors of 5 or more digits.

### Keywords

- ▶ digit, factor, hundreds, multiplication, ones, product, ten thousand, tens, thousands

## Lesson 5: Multiplying Decimal Numbers

**Code:** C319G06U03L05

### Objectives

- ▶ Multiply decimal numbers.
- ▶ Organize factors for the multiplication.
- ▶ Multiply the first factor by the second factor in the correct order.
- ▶ Arrange products vertically leaving empty spaces for positions that were already multiplied.
- ▶ Add decimal places of both factors.
- ▶ Place the decimal point in the result or product according to the number of decimal places of the factors.

### Keywords

- ▶ decimal, decimal places, decimal point, factors, products

## Lesson 6: Rules of Divisibility

**Code:** C319G06U03L06

### Objectives

- ▶ Recognize and use the divisibility rules.

### Keywords

- ▶ factor, divisible, divisibility rules, multiple

## Unit 4. Dividing Whole and Decimal Numbers

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ dividend
- ▶ division
- ▶ divisor
- ▶ powers of ten
- ▶ quotient
- ▶ remainder
- ▶ zero

### Lesson 0: Dividing Whole and Decimal Numbers

**Code:** C3I9G06U04L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Dividing Decimal Numbers with Zeroes in the Quotient

**Code:** C3I9G06U04L01

#### Objectives

- ▶ Place the decimal point in the quotient correctly.
- ▶ Add 0 to the quotient if necessary.
- ▶ Identify possible remainder in the process of division.

#### Keywords

- ▶ align, divide, dividend, divisor, quotient, remainder

### Lesson 2: Dividing with Zeroes in the Dividend

**Code:** C3I9G06U04L02

#### Objectives

- ▶ Divide numbers with zeros in the dividend.
- ▶ Align the decimal point in the quotient.
- ▶ Add zeros in the dividend if necessary.
- ▶ Identify possible remainder in the division.

#### Keywords

- ▶ dividend, divisor, quotient, remainder, zero

### Lesson 3: Divide numbers with two-digit divisors

**Code:** C3I9G06U04L03

#### Objectives

- ▶ Solve problems involving division of a number up to four digits, by a two-digit divisor.

#### Keywords

- ▶ dividend, divisor, quotient, remainder

### Lesson 4: Multiplying and Dividing Decimals by Powers of Ten

**Code:** C3I9G06U04L04

#### Objectives

- ▶ • Multiply and divide numbers by powers of ten.
- ▶ • Recognize multiples of ten as powers from the base of ten.
- ▶ • Differentiate operations of multiplication and division.
- ▶ • Move the decimal point to the right in the multiplication by ten and its powers.
- ▶ • Move the decimal point to the left in the division between ten and its powers.

#### Keywords

- ▶ division, multiplication, powers of ten

### Lesson 5: Dividing Decimal Numbers

**Code:** C3I9G06U04L05

#### Objectives

- ▶ Divide a decimal number by another decimal number.
- ▶ Convert a decimal divisor to a whole number by moving its decimal point to the right.
- ▶ Move the decimal point of the dividend the number of times the point moved to the right of the divisor.

#### Keywords

- ▶ decimal, dividend, divisor, powers of 10, quotient



## Unit 5 Number Theory

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ amplification
- ▶ common multiple
- ▶ composite number
- ▶ cross multiplication
- ▶ denominator
- ▶ divisor
- ▶ equivalent fractions
- ▶ factor
- ▶ factor tree
- ▶ fraction
- ▶ greatest common factor (GCF)
- ▶ improper fraction
- ▶ least common multiple (LCM)
- ▶ minimum expression
- ▶ mixed number
- ▶ multiple
- ▶ numerator
- ▶ prime factorization
- ▶ prime number
- ▶ product
- ▶ relatively prime
- ▶ simplify
- ▶ whole number

### Lesson 0: Number Theory

**Code:** C319G06U05L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Prime and Composite Numbers

**Code:** C319G06U05L01

#### Objectives

- ▶ Recognize prime and composite numbers.
- ▶ Name prime and composite numbers.
- ▶ Compare and contrast the prime and composite numbers.
- ▶ Explain the sieve of Eratosthenes, its objective, and use.

#### Keywords

- ▶ Christian Goldbach, composite number, divisor, prime number, sieve of Eratosthenes

## Lesson 2: Prime Factorization

**Code:** C3I9G06U05L02

### Objectives

- ▶ Define prime numbers, composite numbers, factors, and prime factorization.
- ▶ Factor composite numbers through the tree method and the consecutive divisions methods.

### Keywords

- ▶ composite number, factor, factor tree, prime factorization, prime number

## Lesson 3: The Greatest Common Factor of Two

### or more Numbers

**Code:** C3I9G06U05L03

### Objectives

- ▶ Recognize that the greatest common factor of two or more numbers is the largest of its common factors.
- ▶ Define what the acronym GCF (greatest common factor) means.
- ▶ Explain the concept relatively prime numbers.
- ▶ Compare and contrast the methods of list of factors and prime factorization.
- ▶ Find the greatest common factor of two or more numbers using the two methods studied (list of factors and prime factorization).

### Keywords

- ▶ common factor, factor, greatest common factor (GCF), product, relatively prime

## Lesson 4: Simplifying Fractions

**Code:** C3I9G06U05L04

### Objectives

- ▶ Find common factors of the numerator and denominator in a fraction.
- ▶ Identify the greatest common factor of the terms of the fraction.
- ▶ Simplify fractions by dividing the numerator and the denominator by the greatest common factor.
- ▶ Recognize that simplifying a fraction is the same as writing it in minimum expression.

### Keywords

- ▶ common factor, factor, greatest common factor (GCF), minimum expression, simplify

## Lesson 5: Converting Improper Fractions to Mixed Numbers

**Code:** C319G06U05L05

### Objectives

- ▶ Compare proper and improper fractions.
- ▶ Identify numerator and denominator in the fractions.
- ▶ Establish relationships between mixed numbers and improper fractions.
- ▶ Divide improper fractions to form mixed numbers.
- ▶ Change from improper fractions to mixed numbers.

### Keywords

- ▶ denominator, fraction, improper fraction, mixed number, numerator

## Lesson 6: Converting Mixed Numerals into Improper Fractions

**Code:** C319G06U05L06

### Objectives

- ▶ Convert a mixed number into an improper fraction.

### Keywords

- ▶ denominator, fraction, improper fraction, mixed number, numerator, whole number

## Lesson 7: The Least Common Multiple of Two or more Numbers

**Code:** C319G06U05L07

### Objectives

- ▶ Calculate the multiples of a number.
- ▶ Compare the multiples of 2 or more numbers.
- ▶ Find the product of the prime factors of a number.
- ▶ Find the least common multiple of two or more numbers.

### Keywords

- ▶ common multiple, factor, least common multiple (LCM), multiple, prime factors, prime number, product

## Lesson 8: Comparing and Placing Fractions in Order

**Code:** C319G06U05L08

### Objectives

- ▶ Compare and place fractions in order.

### Keywords

- ▶ denominator, equivalent fractions, fraction, least common multiple (LCM), numerator

## Lesson 9: Equivalent Fractions

**Code:** C319G06U05L09

### Objectives

- ▶ Recognize that equivalent fractions represent the same amount when compared to a whole.
- ▶ Mention the methods to achieve equivalent fractions.
- ▶ Simplify fractions.
- ▶ Multiply or divide two fractions to corroborate their equivalence

### Keywords

- ▶ amplification, cross multiplication, equivalent fractions, fraction, minimum expression, simplify

## Unit 6. Operations with Fractions

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ add and subtract like fractions
- ▶ common denominator
- ▶ cross simplify
- ▶ decimal
- ▶ denominator
- ▶ dividing mixed numbers
- ▶ equivalent fractions
- ▶ fraction
- ▶ improper fractions
- ▶ least common multiple (LCM)
- ▶ like fractions
- ▶ mixed numerals
- ▶ numerator
- ▶ product
- ▶ reciprocal
- ▶ simplest form
- ▶ simplified expression
- ▶ simplify
- ▶ unlike fractions
- ▶ whole numbers

### Lesson 0: Operations with Fractions

**Code:** C319G06U06L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Adding and Subtracting Like Fractions

**Code:** C319G06U06L01

#### Objectives

- ▶ Add and subtract like fractions.
- ▶ Recognize the numerator and denominator in a fraction.
- ▶ Simplify results of addition and subtraction of fractions if necessary.

#### Keywords

- ▶ add and subtract like fractions, denominator, like fractions, numerator, simplify

### Lesson 2: Adding and Subtracting Unlike Fractions

**Code:** C319G06U06L02

#### Objectives

- ▶ Differentiate the unlike fractions from the like fractions.
- ▶ Find the common denominator of two unlike fractions by calculating the least common multiple.
- ▶ Convert unlike fractions into like fractions with a common denominator.
- ▶ Add and subtract unlike fractions.
- ▶ Simplify the results of the addition or subtraction of unlike fractions if necessary.

### Keywords

- ▶ common denominator, equivalent fractions, least common multiple (LCM), like fractions, simplify, unlike fractions

## Lesson 3: Adding and Subtracting Mixed Numbers

**Code:** C319G06U06L03

### Objectives

- ▶ • Convert mixed numbers to improper fractions.
- ▶ • Recognize that to add or subtract fractions they must have a common denominator.
- ▶ • Add and subtract mixed numbers.
- ▶ • Simplify the totals or differences if necessary.

### Keywords

- ▶ common denominator, equivalent fractions, improper fractions, mixed numbers, whole numbers

## Lesson 4: Multiplying Fractions

**Code:** C319G06U06L04

### Objectives

- ▶ Recognize that in the multiplication of fractions the numerator of one fraction is multiplied by the numerator of the other fraction. The same process is done with the denominators.
- ▶ Explain that the denominator of any whole number is always 1 (one).
- ▶ Cross simplify (numerators with denominators) in multiplication.
- ▶ Multiply fractions.

### Keywords

- ▶ cross simplify, denominator, numerator, product, simplest form, simplify

## Lesson 5: Multiplying Mixed Numbers

**Code:** C319G06U06L05

### Objectives

- ▶ • Convert mixed numbers to improper fractions and vice versa.
- ▶ • Multiply mixed numbers converted to improper fractions.
- ▶ • Simplify improper fractions.

### Keywords

- ▶ area, improper fractions, mixed numerals, simplify

## Lesson 6: Dividing Fractions

**Code:** C319G06U06L06

### Objectives

- ▶ Convert mixed numbers to improper fractions.
- ▶ Recognize that whole numbers always have a denominator of one (1).
- ▶ Change the fractions into their reciprocal.
- ▶ Divide fractions and mixed numbers.

### Keywords

- ▶ improper fractions, mixed numbers, reciprocal

## Lesson 7: Dividing Mixed Numbers

**Code:** C319G06U06L07

### Objectives

- ▶ Change mixed numbers to improper fractions.
- ▶ Divide mixed numbers.
- ▶ Simplify results.
- ▶ Recognize the reciprocal of a fraction.

### Keywords

- ▶ dividing mixed numbers, improper fraction, mixed number, reciprocal, simplified expression, simplify

## Lesson 8: Converting Fractions into Decimals

**Code:** C319G06U06L08

### Objectives

- ▶ • Convert fractions to decimals.
- ▶ • Recognize decimal, periodical, and terminal fractions.

### Keywords

- ▶ decimal, denominator, fraction, numerator, simplest form, simplify, whole number

## Lesson 9: Converting Decimals into Fractions

**Code:** C319G06U06L09

### Objectives

- ▶ Move the decimal point of a number to convert it into a whole number.
- ▶ Form the denominator of a fraction using a multiple of 10 (starting with the decimal places in the numerator).
- ▶ Convert decimals to fractions and /or mixed numbers.
- ▶ Simplify fractions, taking them to their minimal expression.

### Keywords

- ▶ decimal, denominator, fraction, numerator, simplest form, simplify, whole number



## Unit 7. Expressions, Equations, and Inequalities

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ algebraic expression
- ▶ constant
- ▶ coordinate plane
- ▶ dependent
- ▶ division
- ▶ equal to
- ▶ equation
- ▶ evaluate
- ▶ factor
- ▶ greater than
- ▶ independent
- ▶ inequality
- ▶ inequations
- ▶ inverse operation
- ▶ less than
- ▶ mathematical expression
- ▶ numerical expression
- ▶ operation
- ▶ ordered pairs
- ▶ quotient
- ▶ reciprocal
- ▶ solution
- ▶ solve an equation
- ▶ table of values
- ▶ variable
- ▶ variable expression

### Lesson 0: Expressions, Equations, and Inequalities.

**Code:** C319G06U07L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Writing Mathematical Expressions as Algebraic Expressions

**Code:** C319G06U07L01

#### Objectives

- ▶ Know the meaning of the terms of variable, numerical expression, and algebraic expression.
- ▶ Recognize that a variable in an algebraic expression substitutes a numerical value (number).
- ▶ Read numerical and algebraic expressions correctly.
- ▶ Know the difference between numerical expressions and algebraic expressions.
- ▶ Write a mathematical expression as an algebraic expression.

#### Keywords

- ▶ algebraic expression, numerical expression, variable

## Lesson 2: Evaluating Algebraic Expressions

**Code:** C319G06U07L02

### Objectives

- ▶ Know the meaning of the terms of numerical expression, algebraic expression, and variable.
- ▶ Replace a variable with a given value.
- ▶ Evaluate algebraic expressions substituting with given values.
- ▶ Solve simple numerical expressions.

### Keywords

- ▶ algebraic expression, evaluate, mathematical expression, variable, variable expression

## Lesson 3: Solving Addition and Subtraction Equations

**Code:** C319G06U07L03

### Objectives

- ▶ Assign variables to unknown numeric values.
- ▶ Build equal expressions with a variable.
- ▶ Find the inverse operation as part of solving an equation.
- ▶ Solve addition and subtraction equations by isolating variables.

### Keywords

- ▶ constant, equation, inverse operation, solution, solve an equation, variable

## Lesson 4: Solving Equations using Multiplications and Division

**Code:** C319G06U07L04

### Objectives

- ▶ Write variable expressions for multiplication and division.
- ▶ Recognizes unknown values in word problems.
- ▶ Assign variables in algebraic expressions.
- ▶ Correctly reads algebraic expressions for multiplication and division.

### Keywords

- ▶ quotient, division, Variable expression, factor, multiplication, reciprocal, solution, variable

## Lesson 5: Combined Equations

**Code:** C3I9G06U07L05

### Objectives

- ▶ Solve two-step equations.
- ▶ Indicate the opposite or inverse operation to that of the equation.
- ▶ Solve addition, subtraction, multiplication, and division equations using the opposite or inverse operation.

### Keywords

- ▶ equation, inverse, operation, solve, solution

## Lesson 6: Inequalities and Inequations

**Code:** C3I9G06U7L06

### Objectives

- ▶ Graph an inequality.
- ▶ Recognize and use the correct symbols in inequalities.
- ▶ Solve one-step inequalities.

### Keywords

- ▶ inequality, inequations, less than, greater than, less than or equal to, greater than or equal to

## Lesson 7: Equations with two variables

**Code:** C3I9G06U07L07

### Objectives

- ▶ Recognize and identify an independent and dependent variable.
- ▶ Will establish the relationship between the variables.
- ▶ Construct a table of values that represents an equation of two variables,
- ▶ Plot points on the coordinate plane in the first quadrant.

### Keywords

- ▶ dependent, independent, table of values, ordered pairs, coordinate plane, variables.

## Unit 8. Ratio, Proportion, and Percent

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ decimal
- ▶ equivalent ratios
- ▶ fraction
- ▶ percentage
- ▶ proportion
- ▶ rate
- ▶ ratio
- ▶ unit rate

### Lesson 0: Ratio, Proportion, and Percent

**Code:** C319G06U08L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Ratios

**Code:** C319G06U08L01

#### Objectives

- ▶ Compare quantities.
- ▶ Write ratios.

#### Keywords

- ▶ fraction, ratio

### Lesson 2: Equivalent Ratios

**Code:** C319G06U08L02

#### Objectives

- ▶ Identify the terms of a ratio.
- ▶ Determine if two ratios are equivalent using any of the existing methods.

#### Keywords

- ▶ equivalent ratios, ratio

### Lesson 3: Solving Proportions

**Code:** C3I9G06U08L03

#### Objectives

- ▶ Determine if two ratios are in proportion or not.
- ▶ Solve proportions.

#### Keywords

- ▶ proportion

### Lesson 4: Percentages

**Code:** C3I9G06U08L04

#### Objectives

- ▶ Write a ratio as a percentage.
- ▶ Write a percentage as a ratio.

#### Keywords

- ▶ percentage, ratio

### Lesson 5: Expressing Percentages as Fractions or Decimals

**Code:** C3I9G06U08L05

#### Objectives

- ▶ Write a percent as a fraction and simplify.
- ▶ Write a percent as a decimal.

#### Keywords

- ▶ decimal, fraction, percentage

### Lesson 6: Expressing a Decimal as a Percent

**Code:** C3I9G06U08L06

#### Objectives

- ▶ Write a decimal as a percent.
- ▶ Find the percent of a number.

#### Keywords

- ▶ decimal, percentage

## Lesson 7: Expressing a Ratio as a Percentage

**Code:** C319G06U08L07

### Objectives

- ▶ Write ratios as fractions.
- ▶ Write ratios as percent.

### Keywords

- ▶ percentage, ratio

## Lesson 8: Rates

**Code:** C319G06U08L08

### Objectives

- ▶ Understand the concept of a rate  $a/b$  associated with the ratio  $a:b$  with  $b$  not equal to 0.
- ▶ Use the term rate in the context of relationships expressed as ratios.

### Keywords

- ▶ rate, ratio, unit rate

## Unit 9. Measurement

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ Prefixes
- ▶ Metric Units
- ▶ Metric Units of Length
- ▶ Metric Units of Capacity and Mass
- ▶ Customary Units
- ▶ Customary Units of Length
- ▶ Customary Units of Mass
- ▶ Customary Units of Capacity

### Lesson 0: Measurement

**Code:** C319G06U09L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Prefixes Added to Metric Units

**Code:** C319G06U09L01

#### Objectives

- ▶ Compare metric units.

#### Keywords

- ▶ gram, liter, meter, metric system

### Lesson 2: Metric Units of Length

**Code:** C319G06U09L02

#### Objectives

- ▶ Select the most appropriate metric unit in real life situations.
- ▶ Find estimates and equivalence between metric units of length.

#### Keywords

- ▶ centimeter, decameter, decimeter, hectometer, kilometer, meter, millimeter

### Lesson 3: Converting Metric Units of Length

**Code:** C3I9G06U09L03

#### Objectives

- ▶ Convert a metric unit of length to another applying the correct process.

#### Keywords

- ▶ centimeter, decameter, decimeter, hectometer, kilometer, meter, millimeter

### Lesson 4: Metric Units of Capacity and Mass

**Code:** C3I9G06U09L04

#### Objectives

- ▶ Identify the metric units of capacity and mass.
- ▶ Select the right metric unit according to a situation.

#### Keywords

- ▶ centigram, centimeter, decagram, decameter, decigram, decimeter, gram, hectogram, hectometer, kilogram, kilometer, meter, milligram, millimeter

### Lesson 5: Converting Metric Units of Capacity

**Code:** C3I9G06U09L05

#### Objectives

- ▶ Convert from one metric unit of capacity unit to another using the correct process.

#### Keywords

- ▶ centiliter, decaliter, deciliter, hectoliter, kiloliter, liter, milliliter

### Lesson 6: Converting Metric Units of Mass

**Code:** C3I9G06U09L06

#### Objectives

- ▶ Convert from one metric unit of mass to another using the correct process.

#### Keywords

- ▶ centigram, decagram, decigram, gram, hectogram, kilogram, milligram



## Lesson 7: Customary Units of Mass, Capacity, and Length

**Code:** C319G06U09L07

### Objectives

- ▶ Identify, compare, and classify units in the customary system.

### Keywords

- ▶ cup, fluid ounce, foot, gallon, inch, mile, ounce, pint, pound, quart, ton, yard

## Lesson 8: Converting Customary Units of Length

**Code:** C319G06U09L08

### Objectives

- ▶ Convert from one customary unit of length to another.

### Keywords

- ▶ foot, inch, mile, yard

## Lesson 9: Converting Customary Units of Mass

**Code:** C319G06U09L09

### Objectives

- ▶ • Converting from one customary unit of mass to another.

### Keywords

- ▶ ounce, pound, ton

## Lesson 10: Converting from Customary Units of Capacity

**Code:** C319G06U09L10

### Objectives

- ▶ • Convert from one customary unit of capacity to another.

### Keywords

- ▶ cup, fluid ounce, gallon, pint, quart

## Unit 10. Statistics and Probability

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ arithmetic mean
- ▶ bar graph
- ▶ collect and organize data
- ▶ compile and organize data
- ▶ frequency
- ▶ line graph
- ▶ mode
- ▶ pictograph table
- ▶ pie graph
- ▶ probability
- ▶ range
- ▶ sample space
- ▶ stem-and-leaf tables
- ▶ survey

### Lesson 0: Statistics and Probability

**Code:** C319G06U10L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Compiling and Organizing Data

**Code:** C319G06U10L01

#### Objectives

- ▶ Collect and organize data.

#### Keywords

- ▶ collect, collect and organize data, data, frequency, organize, survey, stem-and-leaf, tables, list

### Lesson 2: Pictographs

**Code:** C319G06U10L02

#### Objectives

- ▶ Build and interpret pictographs.

#### Keywords

- ▶ compile, compile and organize data, data, frequency, pictograph, organize, survey, pictograph table

### Lesson 3: Bar Graphs, Pie Charts, and Line Graphs

**Code:** C319G06U10L03

#### Objectives

- ▶ Observe, analyze, and construct bar, pie and line graphs.
- ▶ Analyze categorical data in graphs.
- ▶ Establish the difference between numerical and categorical data.

#### Keywords

- ▶ bar graph, data, line graph, pie graph

### Lesson 4: Median, Mode, Range, and Arithmetic Mean

**Code:** C319G06U10L04

#### Objectives

- ▶ Find the median, the mode, the range, and arithmetic mean of a given set of numbers or data.

#### Keywords

- ▶ arithmetic mean, data, mode, range, survey

### Lesson 5: Probability

**Code:** C319G06U10L05

#### Objectives

- ▶ Find the probability of an event.

#### Keywords

- ▶ probability, sample space

## Unit 1 I. Geometry

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ angle
- ▶ angles classification
- ▶ axis
- ▶ axis of symmetry
- ▶ complementary angles
- ▶ congruent shapes
- ▶ construction
- ▶ geometric figures
- ▶ geometric shapes
- ▶ geometry
- ▶ line
- ▶ oblique lines
- ▶ parallel lines
- ▶ perpendicular lines
- ▶ plane
- ▶ point
- ▶ proportionality
- ▶ ray
- ▶ segment
- ▶ similar shapes
- ▶ solid figures
- ▶ supplementary angles
- ▶ three-dimensional shape
- ▶ transformations
- ▶ triangles classification

### Lesson 0: Geometry

**Code:** C319G06U11L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Basic Geometric Concepts

**Code:** C319G06U11L01

#### Objectives

- ▶ Recognize and understand facts related to geometry.
- ▶ Define and identify points, segments, lines, rays, angles, and planes.

#### Keywords

- ▶ angle, basic ideas, geometry, line, plane, point, ray, segment

### Lesson 2: Parallel, Oblique, and Perpendicular Lines

**Code:** C319G06U11L02

#### Objectives

- ▶ Recognize parallel, oblique, and perpendicular lines.
- ▶ Identify the relationship between given lines.

#### Keywords

- ▶ oblique lines, parallel lines, perpendicular lines

### Lesson 3: Drawing Angles

**Code:** C319G06U11L03

#### Objectives

- ▶ Construct angles using the protractor.
- ▶ Measure angles.

#### Keywords

- ▶ angles, construction, measuring angles, protractor

### Lesson 4: Classifying Angles by Measurement

**Code:** C319G06U11L04

#### Objectives

- ▶ Classify angles according to their measurement.
- ▶ Find the measurement of the complement of a given angle.
- ▶ Find the measurement of the supplement of a given angle.

#### Keywords

- ▶ angles, complementary, measure angles, obtuse angle, right angle, straight angle, supplementary

### Lesson 5: Classifying Triangles by the Measurement of their Sides and Angles

**Code:** C319G06U11L05

#### Objectives

- ▶ Classify triangles according to the measurement of their sides.
- ▶ Classify triangles according to the measurement of their angles.

#### Keywords

- ▶ acute triangle, angles classification, equilateral, isosceles, obtuse triangle, right triangle, scalene, triangle

### Lesson 6: Congruent and Similar Figures

**Code:** C319G06U11L06

#### Objectives

- ▶ Identify similar shapes.
- ▶ Identify congruent shapes.

#### Keywords

- ▶ congruent shapes, similar shapes, geometric figures, proportionality, similarity

## Lesson 7: Geometric Shapes and their Axes of Symmetry

**Code:** C319G06U11L07

### Objectives

- ▶ Identify figures that have symmetry.
- ▶ Identify and draw the axis of symmetry of a figure.

### Keywords

- ▶ axis of symmetry, geometric shapes

## Lesson 8: Geometric Transformations

**Code:** C319G06U11L08

### Objectives

- ▶ Recognize the movements of a figure in the plane.

### Keywords

- ▶ axis, figures, movements, plane, reflection, rotation, transformations, translations

## Lesson 9: Three-Dimensional Shapes

**Code:** C319G06U11L09

### Objectives

- ▶ Recognize, understand, and identify three-dimensional shapes.

### Keywords

- ▶ geometrical shapes, prism, pyramid, regular polyhedra, rounded shapes, three-dimensional shape, solid figures

## Lesson 10: Elements of Geometric Shapes

**Code:** C319G06U11L10

### Objectives

- ▶ Recognize the elements of geometrical shapes.
- ▶ Identify faces, edges, and vertices of a polyhedron.

### Keywords

- ▶ base, edge, face, geometric shape, vertex

## Unit 12. Area, Perimeter, and Volume

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ area
- ▶ base
- ▶ circle
- ▶ circumference
- ▶ cubic units
- ▶ diameter
- ▶ height
- ▶ perimeter
- ▶ pi
- ▶ plane figures
- ▶ polyhedral
- ▶ radius
- ▶ square units
- ▶ two-dimensional shape
- ▶ volume

### Lesson 0: Area, Perimeter, and Volume

**Code:** C319G06U12L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: The Perimeter of Two-Dimensional Shapes

**Code:** C319G06U12L01

#### Objectives

- ▶ Understand the concept of perimeter.
- ▶ Find the perimeter of two-dimensional figures.

#### Keywords

- ▶ perimeter, plane figures

### Lesson 2: The Area of Two-Dimensional Shapes

**Code:** C319G06U12L05

#### Objectives

- ▶ Understand the concept of area.
- ▶ Find the area of two-dimensional figures.

#### Keywords

- ▶ area, base, height, plane figures, two-dimensional shape

### Lesson 3: The Volume of Polyhedra

**Code:** C3I9G06U12L02

#### Objectives

- ▶ Understand the concept of volume.
- ▶ Find the volume of different polyhedra.

#### Keywords

- ▶ cubic units, polyhedra, volume

### Lesson 4: The Circumference and the Area of a Circle

**Code:** C3I9G06U12L03

#### Objectives

- ▶ Define and understand the concepts of area and circumference.
- ▶ Find the circumference and the area of a circle.

#### Keywords

- ▶ area, circumference, circle, diameter, radius, pi

### Lesson 5: Problems about Area, Perimeter, and Volume

**Code:** C3I9G06U12L04

#### Objectives

- ▶ Solve different problems about area, perimeter, and volume.

#### Keywords

- ▶ square units, area, perimeter, volume



## Unit 13. Integers

At the end of this unit, the student will achieve the objectives found in the following lessons.

### Unit Concepts

- ▶ abscissa (x- axis)
- ▶ absolute value
- ▶ add and subtract integers
- ▶ coordinate plane
- ▶ domain
- ▶ integers
- ▶ multiply and divide integers
- ▶ negative numbers
- ▶ number line
- ▶ opposite numbers
- ▶ order of operations
- ▶ ordered pair
- ▶ ordinate (y-axis)
- ▶ origin
- ▶ positive numbers
- ▶ power
- ▶ range
- ▶ whole numbers

### Lesson 0: Integers

**Code:** C319G06U13L00

#### Unit Documents

- ▶ Unit documents

### Lesson 1: Positive and Negative Numbers

**Code:** C319G06U13L01

#### Objectives

- ▶ Recognize positive and negative numbers in different real-life situations.

#### Keywords

- ▶ negative numbers, positive numbers, whole numbers

### Lesson 2: Graphing Integers on a Number Line

**Code:** C319G06U13L02

#### Objectives

- ▶ Graph different integers on a number line.
- ▶ Write the opposite of an integer.

#### Keywords

- ▶ integers, number line, opposite numbers

### Lesson 3: Comparing Integers

**Code:** C319G06U13L03

#### Objectives

- ▶ Compare integers.
- ▶ Finding a numbers absolute value.

#### Keywords

- ▶ compare integers, integers, absolute value

### Lesson 4: Ordering Integers

**Code:** C319G06U13L04

#### Objectives

- ▶ Ordering whole numbers

#### Keywords

- ▶ integers, order integers, absolute value

### Lesson 5: The Numbers on the Coordinate Plane

**Code:** C319G06U13L05

#### Objectives

- ▶ Locate points and ordered pairs on the coordinate plane.
- ▶ Write ordered pairs on the coordinate plane.

#### Keywords

- ▶ abscissa (x- axis), axis x, axis y, coordinates, coordinate plane, domain, locating numbers, ordered pair, ordinate (y-axis), origin, range

### Lesson 6: Adding Integers

**Code:** C319G06U13L06

#### Objectives

- ▶ Understand the rules for addition of integers.
- ▶ Adding integers.

#### Keywords

- ▶ add integers, integers

## Lesson 7: Subtracting Integers

**Code:** C319G06U13L07

### Objectives

- ▶ Understand the rules for subtraction of integers.
- ▶ Subtract integers.

### Keywords

- ▶ integers, subtract integers, additive inverse, opposite

## Lesson 8: Multiplying and Dividing Integers

**Code:** C319G06U13L08

### Objectives

- ▶ Follow the rule to multiply and divide integers.

### Keywords

- ▶ divide integers, integers, multiply integers

## Lesson 9: Order of Operations

**Code:** C319G06U13L09

### Objectives

- ▶ Use the order of operations to solve problems that contain addition, subtraction, multiplication, division, and exponents.

### Keywords

- ▶ addition, division, multiplication, order of operations, subtraction, power