DREYFOUS

Thematic guide

MATH 7
DREYFOUS

TABLE OF CONTENTS

Course Description

The main objective of the Math 7 course is to prepare the student with the necessary knowledge for the study of the Pre-Algebra course. The concepts studied in this course are fundamental to formalize the study of disciplines such as Geometry and Algebra, among others. This knowledge will allow students to continue to study mathematical subjects in greater depth, since learning these concepts will serve as a basis for the following grades. The contents of this course are aligned with the *Estándares de contenido y expectativas de grado* (2014) of the Puerto Rico Department of Education, as well as the United States *Common Core State Standards*. Students will make connections between the standards of the topics of algebra, numbering and operation, geometry, measurement, and data analysis. The pedagogical approach is focused on the teaching math for problem solving and the development of critical thinking skills as a means for the integral formation of the human being. The course emphasizes connecting curricular content to the solution of real-life problems so that the student finds relevance in the topics discussed and this awakens their interest in mathematics.

The Math 7 course includes topics that address standards such as: numerical and algebraic expressions, integers and rational numbers, equations and inequalities, ratios, proportions, percentages, relations and functions, plane and spatial geometry, measurement systems, data analysis, and probability.

The outline of objectives by lesson takes into consideration all the skills and concepts necessary for the student to establish the connections between the different standards in which mathematics is currently categorized. The general objectives contemplated in the Math 7 course are aligned with those of the Puerto Rico Department of Education, and allow for the transition between grade 6 and the Pre-Algebra course. Among them are:

1. To use the understanding of rational numbers, their properties and the order of operations to solve daily-life problems that includes various frameworks, such as financial decisions, calculation of distances and comparing temperatures.
2. To use ratios, proportions, and percentages to solve problems in everyday life such as calculating taxes, prizes, tips, and prices of items on sale.
3. To apply the order of operations to write, evaluate and simplify numerical expressions that model daily life situations and solve problems.
4. To identify the every-day relations that can be modeled with linear equations. The student will also be able to interpret what the slope and Y intercept tells us about that relation.

5. To understand how to use the characteristics of two- and three-dimensional figures such as perimeter, area, surface and volume to describe and model the world around them.
6. Use statistical data in a critical manner, and critically analyze statistical information presented by others.
7. Represent and analyze daily life events using a probability model.

The teaching method focuses on conceptual understanding, skill development, and mathematical problem solving, together with the development of critical thinking skills, as a means for the integral formation of the student.

The course deliberately integrates content related to natural sciences, social sciences, technology and engineering, among others, with a double purpose: to encourage the student to see the direct application of what they learn and to visualize the importance of mathematics as a universal discipline at the service of society and its institutions. On the other hand, the incorporation of daily life situations and problems in each of the topics discussed aims to awaken the student's interest in the study of the discipline. The Math 7 course intends that the student understands the importance of mathematics, and knows how to use it in the decision making process to solve different kinds of problems, reaching their own conclusions. The student is expected to communicate appropriately using scientific and mathematical terminology, and to handle technology appropriately. Finally, it is expected that the student will be able to recognize the relevance of mathematics in personal and professional life.

Course Structure

The Math 7 course consists of twelve units carefully subdivided into different lessons. The number of lessons per unit depends on the scope and depth with which the different topics are discussed and developed. Each lesson has an interactive presentation divided, in turn, into sections that present and explain the contents of the topic to be studied. Each presentation includes conceptual definitions, concrete examples, explanations, multiple representations, practice exercises, application of concepts and skills in everyday life.

In addition, the lessons include practice exercises, quizzes, additional practice labs, assignments, self-assessment exercises and a descriptive log with detailed information for the teacher, as well as a variety of internet links, among other resources. In turn, the lessons include worksheet assignments that reinforce the concepts studied in each lesson. The activities are varied and flexible, with the purpose of satisfying the particular needs and interests of each student. The practice and self-assessment activities seek to make the student aware of their strengths and weaknesses in the mastery of the content, with the purpose of them gradually taking control of their learning. The teacher, as an integral and essential part of the process, will have the responsibility of stimulating, orienting, guiding and periodically evaluating the learning achieved of each student.

The units are made up of the following parts:

Lessons

Each unit is made up of different lessons, divided into topics, macro concepts and skills. In turn, each lesson consists of five key elements: course presentation or content, documents in digital format (PDF), internet links, self-assessment and descriptive Log.

- ***Lesson Content*.** Each *lesson conten*t presented contains a detailed explanation of the concepts and skills of the lesson as established in the objectives. In addition, it consists of the following elements that systematically contribute to the development of the desired learning in the student:
  - **Examples.** In each section, when skills are developed, examples that explain step-by-step the solution to an exercise or problem are included, so that the student reviews the concepts and skills presented.
  - **Practice.** This includes a series of carefully selected exercises in order for the student to practice the skills and concepts discussed. Its purpose is to periodically compare the learning achieved by the student before continuing with other subjects and skills. It does not include procedures or explanations; it only includes the solution of the exercises.

- **Solution.** It is used to hide the solution to an exercise or problem that the student should try to answer. Once you click on this icon, the solution or answer to the exercise will be displayed.

- **Process.** It is a button behind that brings up the steps or the algorithm to follow when solving an exercise or problem.

- **Demonstration / Steps.** It presents formal demonstrations of the derivation of important formulas or algorithms.

- **Calculator.** It includes the explanation of the processes when using and handling the calculator to solve the section's exercises. It also connects the student to the virtual graphing calculator.

- **Animation.** It gives access to explanations, procedures or graphics that visually show the concepts and skills discussed in the section. It ensures that the development and conceptual understanding of the student is looked after.

- **Definition.** It includes formal mathematical definitions of concepts and processes mentioned or discussed.

- **Biography.** Includes a short biography of the mathematician or scientist who is credited with developing the definition, formula, procedure, or demonstration used in the lesson.

- **Note.** This icon points out common errors or reinforces details that should not be forgotten.

- **Did you know...** This section presents an explanation or situation that connects aspects of everyday life with the mathematical skills and concepts discussed. In some cases, this section shows the link between the development of logical thinking in humans with certain mathematical skills and processes.

- **Tabs.** They are located on the right side of the presentation, and can be maroon or blue. They unfold to the left, and include flow charts, biographies, notes, photos, explanations, suggestions, reminders, Did you know... or necessary background knowledge.

- **Incorrect.** Indicates when the student has selected an incorrect answer in the included practice exercises.

- **Correct.** Indicates the correct selection to the answer of an exercise or practice problem.

- **Photo or image.** Connects a particular explanation to a photo or image.

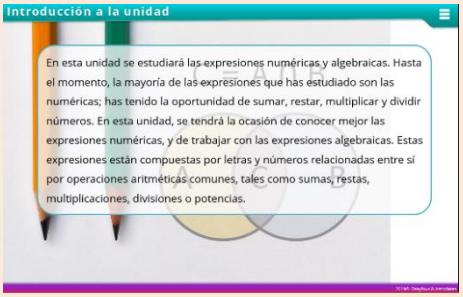
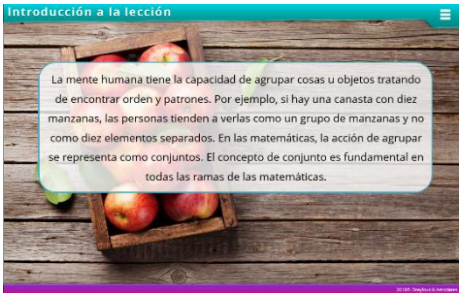
- **Video.** It accesses a short video that links mathematical content to everyday life.

- **Internet.** It is a direct link to a site or Internet portal closely related to the topic.

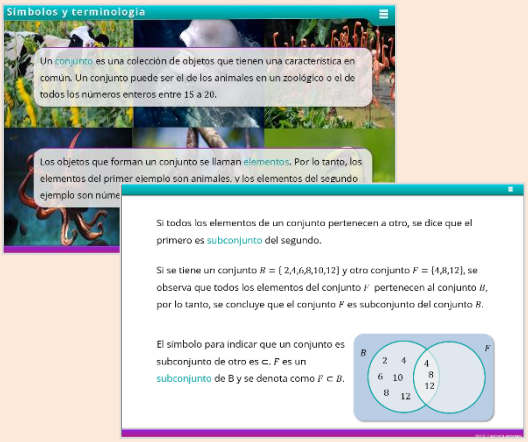
Each of the sections included in the presentation is connected to a particular icon that identifies it, as shown in the explanation provided. In the initial presentations of the course the icon with the word that describes the section is included, this way the student will become familiar with what each of the icons represents. In subsequent presentations only the icon that accesses the section is included. In subsequent presentations only the icon that accesses to the section is included.

- **PDF documents.** These documents include a copy of practice exercises from the lesson, an additional practice section, activities that require the use of a calculator, or assignments. These documents can be printed out for the student to work on in pencil and on paper. Assignments are exercises and problems that the student works on at home, and that allow them, through practice, to strengthen the skills and concepts learned. Assignments are optional.
- **Internet Links.** These links are a direct connection to the Internet, and can be accessed directly from the presentation. They include additional explanations, examples, applications or demonstrations that allow students' conceptual development in the skills and topics discussed.
- **Self-assessment.** It consists of practice tests that the student answers to monitor their own learning before taking the formal unit evaluation tests offered by the teacher.
- **Descriptive Log.** This is the detailed lesson plan. This includes specific lesson objectives, standards and expectations, teaching strategies and resources, concepts, Internet links and references, among others. The only person with access to the descriptive logs will be the teacher.

Course Structure: Curricular Components

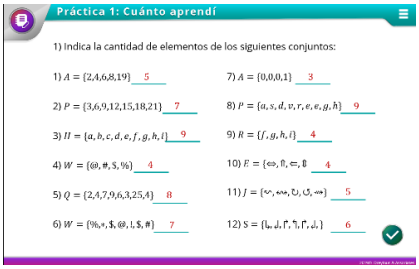
Lesson content	
Cover 	This is the presentation letter of the course and the lesson. Identifies the course, the unit, and the lesson. It contains: ○ Course title ○ Unit and lesson title ○ Image ○ Credits
Directory 	Presents the section and topics of the lesson. Each button has a hyperlink to the section it represents.
Unit Introduction 	It is a section found only in the first lesson of each unit.
Introduction 	This section is found in all lessons.

Topics (content)



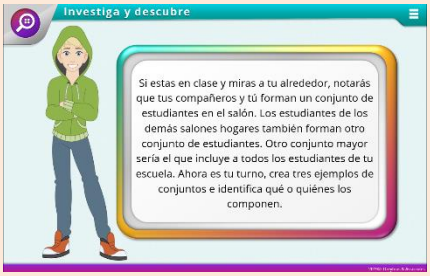
These develop the content through definitions, explanations, examples and demonstrations.

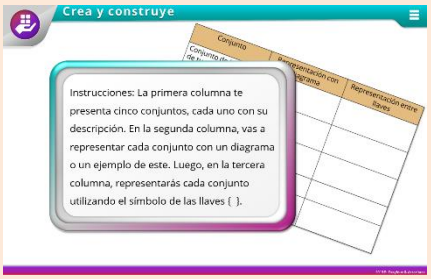
How Much Did I Learn?



Short and objective exercises aimed at the evaluation and application of knowledge, located at the end of the development of the topics. Contains the solutions.

Special sections

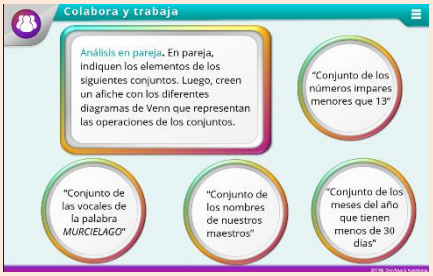


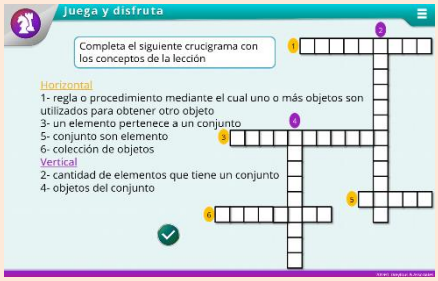


These broaden students' learning experiences. The lessons may have one or more They will be included where relevant. These sections are:

Research and Discover: Research on additional topics or integration with other subjects.

Create and Build: Applications of what has been learned and creation of projects.

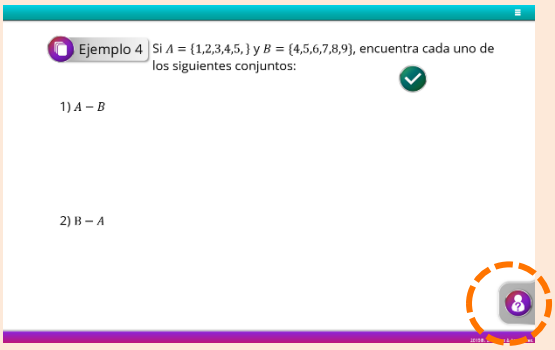


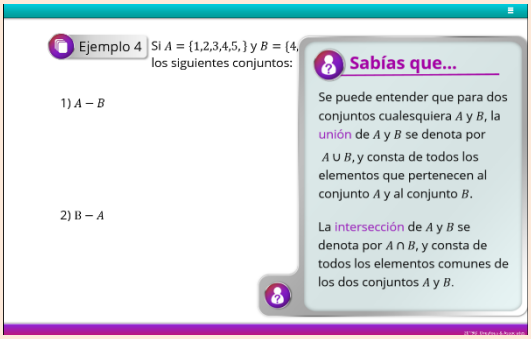


Collaborate and Work: Opportunity for collaborative or cooperative work to exchange knowledge.

Think and Play: Integration of a playful strategy for the development of concepts and skills.

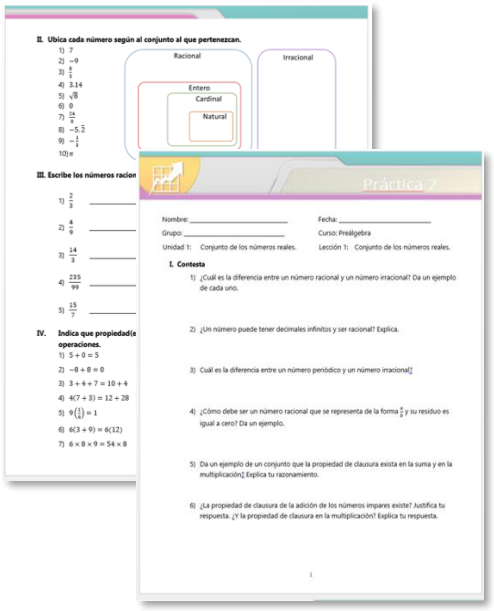
The Tab





By clicking the gray tab at the top or bottom right of some of the *Lesson Content* slides, the student will be able to see some important notes to reinforce or clarify the content, such as formulas or prior definitions.

Button Directory			
Navigation			
	Close		Credits
	Solution		Return
Generals			
	Animation		Practice
	Link		Reason
	Definition		Review
	Biography		Steps
	Connect what you have learned		Graph
	Image		Calculator
	Note		Example
	Diagram		Self-assessment.
	Question		Process

	Video		Zoom
	Did you know...		Text
	Challenge your mind		Information
Special sections			
	Research and Discover		Create and Build
	Collaborate and Work		Think and Play
Work Documents			
Objective Exercises 		They are found in all lessons and provide the key for the teacher. ○ Practice 1 and 2 ○ Activity	

Unit Breakdown

The titles of each unit will be detailed below, and the content of the units will be broken down into lessons with their titles, codes, objectives, topics, concepts and vocabulary.

Unit 1. Numerical and Algebraic Expressions

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Sets

Code: C338G0SU01L01

Objectives

At the end of the lesson the student will:

- identify the elements of a set.
- use the relevant concepts for sets, elements, and sub-sets.
- carry out joining and intersecting operations between sets.

Topics

- Symbols and Terminology
- Operations to combine sets*

Concepts

- sets
- elements
- set operations
  - union
  - intersection
  - subtraction
  - complement
- subsets

Vocabulary

- complement
- set
- element
- intersection
- subset
- union

Lesson 2. Numerical and Geometric Patterns

Code: C338G0SU01L02

Objectives

At the end of the lesson the student will:

- identify numerical or geometric patterns.
- find the term or figure before or after in geometric numerical sequences.

Topics

- Patterns or Sequences
- Numeric Patterns
- Geometric patterns

Concepts

- geometric patterns
- numeric patterns

Vocabulary

- pattern
- sequence

Lesson 3. Powers and Square Roots

Code: C338G0SU01L03

Objectives

At the end of the lesson the student will:

- calculate the powers of integers.
- determine the square root of perfect squares.

Topics

- Exponential Expression
- Properties of the Powers
- Square Roots
- Scientific Notation

Concepts

- scientific notation
- powers of a number
- square root

Vocabulary

- base
- exponential
- power
- root

Lesson 4. Numerical Expressions and Order of Operations

Code: C338G0SU01L04

Objectives

At the end of the lesson the student will:

- apply the order of operations to simplify algebraic expressions.

Topics

- Numeric Expressions
- Order of Operations

Concepts

- order of operations

Vocabulary

- operations

Lesson 5. Algebraic Expressions and Evaluation

Code: C338G0SU01L05

Objectives

At the end of the lesson the student will:

- evaluate the algebraic expressions and apply the order of operations to simplify them.

Topics

- Algebraic Expressions and Terms
- Evaluate Expressions
- Simplify Algebraic Expressions
- Verbal Expression to Algebraic Expression

Concepts

- evaluate expressions
- verbal expression
- algebraic expressions

Vocabulary

- coefficient
- constant
- evaluation
- expression
- variable

Lesson 6. Properties of Real Numbers

Code: C338G0SU01L06

Objectives

At the end of the lesson the student will:

- sort the numbers into subsets of the actual numbers.
- identify the additive and multiplicative inverse and the identity element of operations between integers.

Topics

- Set of real numbers
- Properties of Real Numbers

Concepts

- identity element
- inverse element
- associative property
- commutative property
- distributive property

Vocabulary

- associative
- commutative
- distributive
- identity
- inverse

Unit 2. Integers

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Absolute Value

Code: C338G0SU02L01

Objectives

At the end of the lesson the student will:

- define integers based on the concept of absolute value.
- determine the absolute value of integers.

Topics

- Absolute Value and the Number Line
- Integers

Concepts

- distance on the number line
- integer
- absolute value

Vocabulary

- distance
- integer
- absolute value

Lesson 2. Addition and Subtraction of Integers

Code: C338G0SU02L02

Objectives

At the end of the lesson the student will:

- add and subtract integers.

Topics

- Integers
- Sum of integers
- Subtraction of integers

Concepts

- subtraction
- sum

Vocabulary

- minuend
- opposite
- result
- subtrahend

Lesson 3. Multiplication and Division of Integers.

Code: C338G0SU02L03

Objectives

At the end of the lesson the student will:

- multiply and divide integers.

Topics

- Multiplying Integers
- Dividing Integers

Concepts

- dividing integers
- multiplying integers

Vocabulary

- quotient
- dividend
- divisor
- factors
- product
- remainder

Lesson 4. The Coordinates (Cartesian) Plane

Code: C338G0SU02L04

Objectives

At the end of the lesson the student will:

- identify in the coordinates plane the ordered pairs with integers.

Topics

- The Coordinates (Cartesian) Plane
- Points on the Coordinates Plane

Concepts

- horizontal and vertical coordinate
- point location
- ordered pairs

Vocabulary

- abscissa
- coordinate
- distance
- axis
- ordinate
- ordered pair
- plane
- points

Unit 3. Rational numbers

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Rational numbers

Code: C338G0SU03L01

Objectives

At the end of the lesson the student will:

- identify the rational numbers

Topics

- Rational numbers
- Relation between Integers and Rational Numbers
- Fractions and Decimals

Concepts

- decimals
- numerator and denominator
- rational numbers

Vocabulary

- quotient
- decimal
- denominator
- numerator
- ratio

Lesson 2. Exact and Regular Decimals

Code: C338G0SU03L02

Objectives

At the end of the lesson the student will:

- differentiate between exact and periodic rational numbers.
- use the terminology to represent the periodic numbers.

Topics

- From Rational to Decimal
- From Decimal to Rational
- Periodic Decimals

Concepts

- decimal number
- periodic number

Vocabulary

- decimal
- periodic

Lesson 3. Compare and Order Decimals

Code: C338G0SU03L03

Objectives

At the end of the lesson the student will:

- compare and order the rational numbers in ascending and descending order.

Topics

- Order decimals in ascending order
- Order decimals in descending order

Concepts

- compare numbers
- greater than
- less than

Vocabulary

- ascending
- descending
- greater than
- less than

Lesson 4. Homogeneous Fractions

Code: C338G0SU03L04

Objectives

At the end of the lesson the student will:

- perform the operations of addition, subtraction, multiplication, and division of homogeneous fractions.

Topics

- Addition and Subtraction of Homogeneous Fractions
- Multiplication of Homogeneous Fractions
- Division of Homogeneous Fractions

Concepts

- multiplying and dividing homogeneous fractions
- adding and subtracting homogeneous fractions

Vocabulary

- homogeneous

Lesson 5. Heterogeneous Fractions

Code: C338G0SU03L05

Objectives

At the end of the lesson the student will:

- perform the operations of addition, subtraction, multiplication, and division of heterogeneous fractions.

Topics

- Addition and Subtraction of Heterogeneous Fractions
- Multiplying Heterogeneous Fractions

- Dividing Heterogeneous Fractions

Concepts

- multiplying and dividing heterogeneous fractions
- adding and subtracting heterogeneous fractions

Vocabulary

- heterogeneous

Lesson 6. Mixed Numbers

Code: C338G0SU03L06

Objectives

At the end of the lesson the student will:

- change from improper to mixed fraction and vice versa.
- perform the operations of addition, subtraction, multiplication, and division of mixed numerals.

Topics

- From Improper Fraction to Mixed Number
- From Mixed Number to Improper Fraction
- Operations with Mixed Numbers

Concepts

- improper fraction
- mixed number

Vocabulary

- improper
- mixed

Lesson 7. Negative Exponents and Scientific Notation

Code: C338G0SU03L07

Objectives

At the end of the lesson the student will:

- apply the laws of exponents to simplify expressions with negative exponents.
- write the numbers in scientific notation.

Topics

- Negative Exponents and the Inverse Expression
- Simplify Algebraic Expressions.
- Expressing Numbers in Scientific Notation

Concepts

- negative exponents
- inverse expression
- scientific notation

Vocabulary

- exponent
- monomial

Unit 4. Equations and Inequalities

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Expressions and Equations

Code: C338G0SU04L01

Objectives

At the end of the lesson the student will:

- differentiate between an expression and an equation.
- evaluate the expressions and equations.

Topics

- Expressions or Equation
- Evaluate expressions
- Evaluate equations

Concepts

- evaluation of expressions and equations
- equation solving

Vocabulary

- equation
- evaluation
- expression
- solution

Lesson 2. Equations with Addition and Subtraction

Code: C338G0SU04L02

Objectives

At the end of the lesson the student will:

- solve degree equations with addition and subtraction.

Topics

- Solving Equations
- Solving Equations with Addition and Subtraction

Concepts

- solving equations

Vocabulary

- additive inverse
- solution

Lesson 3. Equations with Multiplication and Division

Code: C338G0SU04L03

Objectives

At the end of the lesson the student will:

- solve first-degree equations with multiplication and division.

Topics
- Solving Equations
- Solving Equations with Multiplication and Division

Concepts
- solving equations

Vocabulary
- multiplicative inverse
- solution

Lesson 4. Equations with Combined Operations

Code: C338G0SU04L04

Objectives

At the end of the lesson the student will:
- solve first-degree equations with several operations.

Topics
- Solving Equations
- Solving Equations with Combined Operations

Concepts
- solving equations
- solving combined equations

Vocabulary
- additive inverse
- multiplicative inverse
- solution

Lesson 5. Inequalities and Graphs

Code: C338G0SU04L05

Objectives

At the end of the lesson the student will:
- interpret first-degree inequality and their graphs.

Topics
- First-Degree Inequalities**
- Solution Set
- Graphs of Inequalities

Concepts
- solution set
- inequalities
- region

Vocabulary
- inequality
- region

Lesson 6. Inequalities with Addition and Subtraction

Code: C338G0SU04L06

Objectives

At the end of the lesson the student will:

- solve first-degree inequalities with addition and subtraction.
- represent the solution set in set notation, interval, and in graph.

Topics

- Inequalities
- Solving Inequalities with Addition and Subtraction
- Graph of the Solution Set

Concepts

- solution set
- graph of the solution set

Vocabulary

- solution set
- infinite
- interval
- open interval
- closed interval
- semi-open interval

Lesson 7. Inequalities with Multiplication and Division

Code: C338G0SU04L07

Objectives

At the end of the lesson the student will:

- solve first-degree inequalities with multiplication and division.
- represent the solution set in set notation, interval, and in graph.

Topics

- Inequalities
- Solving Inequalities with Multiplication and Division
- Graph of the Solution Set

Concepts

- solution set
- graph of the solution set

Vocabulary

- solution set
- infinite
- interval
- open interval
- closed interval
- semi-open interval

Lesson 8. Inequalities with Combined Operations

Code: C338G0SU04L08

Objectives

At the end of the lesson the student will:

- solve first-degree inequalities with combined operations.
- represent the solution set in set notation, interval, and in graph.

Topics

- Inequalities
- Solving Inequalities with Combined Operations
- Graph of the Solution Set

Concepts

- solution set
- graph of the solution set

Vocabulary

- solution set
- infinite
- interval
- open interval
- closed interval
- semi-open interval

Unit 5. Ratios and Proportions

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Ratios and Proportions

Code: C338G0SU05L01

Objectives

At the end of the lesson the student will:

- define ratio and proportion.
- determine the proportional ratios.

Topics

- Ratios
- Proportions
- Solving proportions

Concepts

- equivalent fractions
- proportion
- ratio

Vocabulary

- antecedent
- consequent
- proportion
- ratio

Lesson 2. Ratios and Unit Rates

Code: C338G0SU05L02

Objectives

At the end of the lesson the student will:

- determine the ratios and find the unit rates.

Topics

- Ratios and Rates
- Unit Rates

Concepts

- ratio
- rates

Vocabulary

- ratio
- rate
- unit

Lesson 3. Proportions

Code: C338G0SU05L03

Objectives

At the end of the lesson the student will:

- solve the proportions by applying cross-multiplication.

Topics

- Proportions
- Solving proportions

Concepts

- equivalent fractions
- proportions
- ratios

Vocabulary

- ends
- means
- proportion
- solution

Lesson 4. Similar figures

Code: C338G0SU05L04

Objectives

At the end of the lesson the student will:

- apply the concept of proportionality in similar figures.

Topics

- Similar figures
- Proportionality and Similar Figures

Concepts

- proportionality
- similarity

Vocabulary

- proportional
- similar

Lesson 5. Scales

Code: C338G0SU05L05

Objectives

At the end of the lesson the student will:

- apply the scales to everyday problems such as models and maps.

Topics

- Scales
- Models and Maps

Concepts

- scales
- similarity
- models

Vocabulary

- scale
- model

Unit 6. Percentage

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Percentage

Code: C338G0SU06L01

Objectives

At the end of the lesson the student will:

- represent one percent of a relation.

Topics

- Concept of Percentage
- The Percent of an Amount
- Percentages Greater than 100%.

Concepts

- percentage
- percent

Vocabulary

- percent

Lesson 2. Fractions, Decimals, and Percent

Code: C338G0SU06L02

Objectives

At the end of the lesson the student will:

- calculate the equivalence between fractions, decimals, and percentages.

Topics

- From Fraction to Percent
- From Decimal to Percent
- Equivalences between fraction, decimal, and percent

Concepts

- percentage
- percent proportion

Vocabulary

- percentage
- percentage

Lesson 3. Percent Proportions

Code: C338G0SU06L03

Objectives

At the end of the lesson the student will:

- use the proportions to calculate the percent and percentage.

Topics

- Percentage Calculation
- Calculation of the Part
- Calculation of the Total

Concepts

- percent proportion

Vocabulary

- percent proportion

Lesson 4. Percentage Equation

Code: C338G0SU06L04

Objectives

At the end of the lesson the student will:

- apply the percentage equation to everyday problems.

Topics

- Percentage Equation
- Calculation of the Part
- Calculation of the Whole

Concepts

- percentage equation

Vocabulary

- percentage

Lesson 5. Percentage Change

Code: C338G0SU06L05

Objectives

At the end of the lesson the student will:

- calculate the percentage change in everyday situations.

Topics

- Percentage increase
- Percentage decrease

Concepts

- increase
- decrease
- percentage of change

Vocabulary

- percentage change

Lesson 6. Percentage and Finances

Code: C338G0SU06L06

Objectives

At the end of the lesson the student will:

- apply percentage in money and personal finance situations.

Topics

- Sales Tax
- Discounts on Purchases
- Simple Interest

Concepts

- calculate the increase
- calculate the decrease
- simple interest

Vocabulary

- interest

Unit 7. Relations and Functions

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Relations and Functions

Code: C338G0SU07L01

Objectives

At the end of the lesson the student will:

- define relation and function.
- identify whether a relationship is a function from the representation of sets, tables, graphs, ordered pairs, and verbal expressions.

Topics

- Relation and Function
- Domain and Range
- Evaluation of Functions and Graphs

Concepts

- range
- domain
- function
- relation
- dependent variable
- independent variable

Vocabulary

- range
- domain
- function
- relation

Lesson 2. Equations, Tables, and Graphs

Code: C338G0SU07L02

Objectives

At the end of the lesson the student will:

- establish the relationship between the equation, table of values, and graph of a numerical relation.

Topics

- Table of Values
- Equations and Functions
- Function Graph

Concepts

- equations
- function notation
- table of values

Vocabulary

- table of values

Lesson 3. Two-variable Equations and Graphs

Code: C338G0SU07L03

Objectives

At the end of the lesson the student will:

- graph the relations of two variables on a coordinates plane.

Topics

- Two-variable Equations
- Graph of Two-variable Equations

Concepts

- graphs of linear equations

Vocabulary

- abscissa
- ordinate

Lesson 4. Constant rate of change

Code: C338G0SU07L04

Objectives

At the end of the lesson the student will:

- determine the rate of constant change of a linear function.

Topics

- Rate of Change
- Slope

Concepts

- horizontal rise
- vertical rise
- slope
- rate of change

Vocabulary

- slope
- rate of change

Lesson 5. Straight Line Equation

Code: C338G0SU07L05

Objectives

At the end of the lesson the student will:

- determine the equation of a line from the general information of the line, such as the slope and a point, or given two points.

Topics

- General Equation of the Line
- Slope-intercept Equation
- Equation of the Line Given Two Points

Concepts

- slope-intercept equation
- Point-slope Equations

Vocabulary

- slope

Lesson 6. Direct and Indirect Variation

Code: C338G0SU07L06

Objectives

At the end of the lesson the student will:

- determine whether a relation has a direct or inverse variation.

Topics

- Direct variation
- Inverse variation

Concepts

- constant variation
- direct variation
- indirect variation

Vocabulary

- reciprocal
- variation

Lesson 7. Interpretation of Line Graphs

Code: C338G0SU07L07

Objectives

At the end of the lesson the student will:

- interpret the line graphs in parts.

Topics

- Graph Analysis
- Increasing, Decreasing, and Constant Intervals

Concepts

- constant
- increasing intervals
- decreasing intervals

Vocabulary

- constant
- increasing
- decreasing

Unit 8. Plane Geometry

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Points, Lines and Planes

Code: C338G0SU08L01

Objectives

At the end of the lesson the student will:

- identify the basic elements of the geometry with the corresponding terminology: point, line, and plane

Topics

- Geometry
- Points, Lines and Planes

Concepts

- collinear**
- distance between points
- terminology of points, lines and planes
- planes
- points
- lines
- relation between planes
- segments and rays
- types of lines

Vocabulary

- collinear**
- distance
- intersection
- plane
- point
- line
- segment
- ray

Lesson 2. Lines and segments (rays)

Code: C338G0SU08L02

Objectives

At the end of the lesson the student will:

- identify straight lines, segments, and rays with the corresponding terminology.

Topics

- The line
- Rays
- Segments

Concepts

- direction of the ray
- operations with segments
- relation between lines

Vocabulary

- intersection
- oblique
- parallels
- Perpendicular
- line
- segment
- ray

Lesson 3. Distance Between two Points

Code: C338G0SU08L03

Objectives

At the end of the lesson the student will:

- calculate the distance between two points on the coordinates plane.

Topics

- Distance Between Two Points on a Straight Line
- Distance Between Two Points in the Coordinates Plane

Concepts

- distance between points
- straight segment between two points

Vocabulary

- collinear
- distance
- Pythagorean theorem

Lesson 4. Angles

Code: C338G0SU08L04

Objectives

At the end of the lesson the student will:

- define and identify the angles with the corresponding terminology.
- Classify the angles according to their size.

Topics

- Definition of Angle
- Angle Classification
- Operations with Angles

Concepts

- angle classification
  - acute
  - right
  - obtuse

        - flat or straight
    - angle measurement
    - rotation of an axis

Vocabulary

- acute
- angle
- degree
- flat*
- obtuse
- straight
- right
- rotation
- vertex

Lesson 5. Relation Between Angles

Code: C338G0SU08L05

Objectives

At the end of the lesson the student will:

- carry out operations relating to complementary, supplementary, consecutive angles on a straight line, consecutive around a point, and opposed by the vertex.

Topics

- Complementary and Supplementary Angles
- Consecutive Angles
- Angles Opposed by the Vertex

Concepts

- angles around a point
- angles opposed by the vertex
- angles on a straight line
- complement of an angle
- sum of angles
- supplement of an angle

Vocabulary

- complementary
- opposite of the vertex
- supplementary

Lesson 6. Triangles and Quadrilaterals

Code: C338G0SU08L06

Objectives

At the end of the lesson the student will:

- classify the triangles and quadrilaterals with their properties.

Topics

- The Triangle and its Classifications
- Properties of the Triangles
- Quadrilaterals and their classifications
- Properties of the Quadrilaterals

Concepts

- classifying of quadrilaterals
- classification of triangles according to angles
- classification of triangles by its sides
- diagonals of quadrilaterals
- sum of inner angles

Vocabulary

- acute
- square
- diagonal
- equilateral
- scalene
- isosceles
- obtuse
- rectangle
- rhombus
- rhomboid
- **trapezium
- trapezoid

Lesson 7. Transformations

Code: C338G0SU08L07

Objectives

At the end of the lesson the student will:

- perform polygon transformations on the coordinates plane.

Topics

- Transformations
- Translations
- Reflections
- Rotations

Concepts

- horizontal reflection
- vertical reflection

- rotation
- horizontal translation
- vertical translation

Vocabulary

- axis of reflection
- degrees
- reflection
- rotation
- orbit

Lesson 8. Perimeter and Area

Code: C338G0SU08L08

Objectives

At the end of the lesson the student will:

- calculate the perimeter and area of the triangles and quadrilaterals.

Topics

- Concepts of Perimeter and Area
- Perimeter and Area of Triangles
- Perimeter and Area of Quadrilaterals

Concepts

- area
- calculation of area
- calculation of perimeter
- perimeter

Vocabulary

- height
- area
- base
- diagonal
- side
- perimeter

Lesson 9. Polygons

Code: C338G0SU08L09

Objectives

At the end of the lesson the student will:

- classify the polygons.
- identify the congruence of the polygon and determine the similarity of the polygons.

Topics

- Polygon Classification
- Polygon Consistency
- Similarity of Polygons

Concepts

- polygon consistency
- irregular polygons
- regular polygons
- proportionality
- similarity of polygons
- sum of interior angles

Vocabulary

- interior angle
- congruence
- diagonal
- side
- Polygon
- proportionality
- similarity
- vertex

Lesson 10. Circle and Circumference

Code: C338G0SU08L10

Objectives

At the end of the lesson the student will:

- define circumference and circle.
- identify the elements related to the circumference and circle.
- calculate the length of the circumference and the area of the circle.

Topics

- Elements of the Circle
- Circumference
- Area of the Circle

Concepts

- area of the circle
- diameter
- length of the circumference

Vocabulary

- arc
- center
- circle
- circumference
- chord
- diameter
- pi (π)
- radius
- secant
- circular sector
- tangent

Unit 9. Spatial Geometry

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Polyhedron

Code: C338G0SU09L01

Objectives

At the end of the lesson the student will:

- classify the polyhedrons as prisms or pyramids.
- identify the elements of the prisms and pyramids.

Topics

- Polyhedron
- Prisms
- Pyramids

Concepts

- polyhedron classification
- pyramid classification
- prism classification

Vocabulary

- edge
- base
- face
- pyramid
- polyhedron
- prisms
- projection
- vertex

Lesson 2. Volume and Surface Area of Prisms

Code: C338G0SU09L02

Objectives

At the end of the lesson the student will:

- calculate the surface area and volume of the prisms.

Topics

- Surface Area of Prisms
- Volume of Prisms

Concepts

- volume calculation
- sum of the area

Vocabulary

- height
- apothem
- area

- edge
- base
- face
- volume

Lesson 3. Volume and Surface Area of Pyramids

Code: C338G0SU09L03

Objectives

At the end of the lesson the student will:

- calculate the surface area and volume of the pyramids.

Topics

- Surface Area of Pyramids
- Volume of Pyramids

Concepts

- volume calculation
- sum of areas

Vocabulary

- height
- apothem
- area
- edge
- base
- face
- surface
- volume

Lesson 4. Round Bodies

Code: C338G0SU09L04

Objectives

At the end of the lesson the student will:

- identify the round bodies and their elements.

Topics

- Round Bodies
- Cylinders
- Cones
- Spheres

Concepts

- characteristics of cylinders
- characteristics of cone
- characteristics of round bodies
- characteristics of spheres

Vocabulary

- cylinder
- cone
- diameter
- sphere
- radius
- round

Lesson 5. Volume and Surface Area of Cylinders

Code: C338G0SU09L05

Objectives

At the end of the lesson the student will:

- calculate the surface area and volume of the cylinders.

Topics

- Surface Area of Cylinders
- Volume of Cylinders

Concepts

- cylinder surface area calculation
- cylinder volume calculation

Vocabulary

- height
- area
- base
- diameter
- radius
- surface
- volume

Lesson 6. Volume and Surface Area of Cones

Code: C338G0SU09L06

Objectives

At the end of the lesson the student will:

- calculate the surface area and volume of cones.

Topics

- Surface Area of Cones
- Volume of Cones

Concepts

- cylinder surface area calculation
- cylinder volume calculation

Vocabulary

- height
- area
- base

- diameter
- radius
- surface
- volume

Lesson 7. Volume and Surface Area of Spheres

Code: C338G0SU09L07

Objectives

At the end of the lesson the student will:

- calculate the surface area and volume of spheres.

Topics

- Surface area of Spheres
- Volume of Spheres

Concepts

- calculating the surface area of a sphere
- calculating the volume of a sphere

Vocabulary

- area
- diameter
- radius
- surface
- volume

Lesson 8. Area and Volume of Composite Figures

Code: C338G0SU09L08

Objectives

At the end of the lesson the student will:

- calculate the surface area and volume of composite figures.

Topics

- Area of Composite Figures
- Volume of Composite Bodies

Concepts

- calculation of area
- volume calculation
- sum of volume
- addition and subtraction of areas

Vocabulary

- area
- volume

Unit 10. Measurement Systems

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Customary System (English)

Code: C338G0SU10L01

Objectives

At the end of the lesson the student will:

- recognize the units of measurement from the customary system (English)

Topics

- Units of Length
- Units of Weight
- Units of Capacity

Concepts

- capacity of a body
- length of a body
- weight of a body
- English measurement system

Vocabulary

- capacity
- quartile
- gallon
- pound
- length
- measurement
- mile
- ounces
- weight
- foot (ft)
- inches
- cup
- ton
- yard

Lesson 2. Metric System

Code: C338G0SU10L02

Objectives

At the end of the lesson the student will:

- recognize the units of measurement of the metric system.

Topics

- Units of Length
- Units of Weight
- Units of Capacity

Concepts

- capacity of a body
- unit of measurement conversion
- length of a body
- weight of a body
- metric system of measurement

Vocabulary

- centimeter
- gram
- kilogram
- kilometer
- liter
- meter
- milligram
- milliliter

Lesson 3. Conversions in the Customary System

Code: C338G0SU10L03

Objectives

At the end of the lesson the student will:

- perform the conversions within the customary system (English).

Topics

- Units of Length Conversion
- Units of Weight Conversion
- Units of Capacity Conversion

Concepts

- equivalence of measures in the usual system

Vocabulary

- capacity
- quartile
- gallon
- pound
- length
- measurement
- mile
- ounces
- weight
- foot (ft)
- inches
- cup
- ton
- yard

Lesson 4. Conversions in the Metric System

Code: C338G0SU10L04

Objectives

At the end of the lesson the student will:

- perform the conversions within the metric system.

Topics

- Units of Length Conversion
- Units of Weight Conversion
- Units of Capacity Conversion

Concepts

- equivalence of measures in the metric system

Vocabulary

- centimeter
- gram
- kilogram
- kilometer
- liter
- meter
- milligram
- milliliter

Lesson 5. Conversions Between the Customary and the Metric System

Code: C338G0SU10L05

Objectives

At the end of the lesson the student will:

- perform the conversions between the metric and the customary (English) system.

Topics

- Units of Length Conversion
- Units of Weight Conversion
- Units of Capacity Conversion

Concepts

- measurement equivalences between the customary system and the metric system

Vocabulary

- conversion
- equivalence
- factor

Lesson 6. Conversion of Ratios, Areas, and Volumes

Code: C338G0SU10L06

Objectives

At the end of the lesson the student will:

- convert ratio, area and volume measurements between metric and customary measurement (English) systems.

Topics

- Conversion of Units with Ratios
- Units of Area Conversion
- Units of Volume Conversion

Concepts

- equivalence of area
- equivalence of volume
- equivalent ratios

Vocabulary

- conversion factor

Unit 11. Data Analysis

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Data Collection and Organization

Code: C338G0SU11L01

Objectives

At the end of the lesson the student will:

- identify data collection and organization strategies.

Topics

- Data Collection
- Frequency Table
- Stem-and-Leaf Display

Concepts

- data organization
- data collection
- data representation

Vocabulary

- data
- frequency
- gathering
- stem and leaf

Lesson 2. Data Representation and Graphs**

Code: C338G0SU11L02

Objectives

At the end of the lesson the student will:

- apply the different graphical representations of the collected data.

Topics

- Bar and Column Graph
- Line Graph
- Pie Chart
- Pictograph

Concepts

- data frequency
- drawing graphs
- maximum and minimum values

Vocabulary

- central angle
- bar
- pie
- column
- axis

- scale
- maximum
- minimum
- picture
- percent

Lesson 3. Stem-and-Leaf Display

Code: C338G0SU11L03

Objectives

At the end of the lesson the student will:

- construct stem-and-leaf displays for a data set.

Topics

- Stem-and-Leaf Display
- Analysis of a Stem-and-Leaf Display

Concepts

- graph construction
- graph interpretation

Vocabulary

- frequency
- maximum
- minimum
- stem and leaf

Lesson 4. Measures of Central Tendency

Code: C338G0SU11L04

Objectives

At the end of the lesson the student will:

- identify and calculate measures of central tendency such as mode, median, and arithmetic mean (average).

Topics

- Mode
- Median
- Arithmetic Mean (Average)

Concepts

- arithmetic mean
- median
- measures of central tendency
- mode

Vocabulary

- median
- mode
- average
- summation
- tendency

Lesson 5. Quartiles and Percentiles

Code: C338G0SU11L05

Objectives

At the end of the lesson the student will:

- identify the quartiles and percentiles of a data set.

Topics

- Distribution Measures
- Quartile
- Percentile

Concepts

- data analysis
- data set comparison
- data representation

Vocabulary

- quartile
- percentile

Lesson 6. Variation, Range, and Outliers

Code: C338G0SU11L06

Objectives

At the end of the lesson the student will:

- calculate the range of the data.
- compare two sets of data based on the variability or dispersion of the data.
- identify outliers in a data set.

Topics

- Range of Data
- Variability
- Atypical Value

Concepts

- data dispersion
- data distribution

Vocabulary

- atypical
- dispersion
- range
- variability

Lesson 7. Selecting the Best Graph

Code: C338G0SU11L07

Objectives

At the end of the lesson the student will:

- select the best graph to represent a data set.
- build different types of charts with all the elements identified.

Topics

- Types of Graphs
- Selecting the Best Graph

Concepts

- data analysis
- graphical display of data

Vocabulary

- bar
- pie
- column
- linear
- point

Lesson 8. Line of Best Fit

Code: C338G0SU11L08

Objectives

At the end of the lesson the student will:

- draw the line that best fits a set of graphed data in the coordinates plane.

Topics

- Data Trend
- Line of Best Fit
- Data Interpretation and Range**

Concepts

- linear approximation*
- projections
- data trend

Vocabulary

- adjustment
- approximation
- increasing
- decreasing
- projection
- tendency

Unit 12. Probability

At the end of this unit the student will have completed the objectives found in the following lessons:

Lesson 1. Probability of a Simple Event

Code: C338G0SU12L01

Objectives

At the end of the lesson the student will:

- determine the probability of a simple event.

Topics

- Probability
- Probability of a Simple Event

Concepts

- occurrence of an event
- probability of an event

Vocabulary

- occurrence
- possibility
- probability

Lesson 2. Probability and Sampling

Code: C338G0SU12L02

Objectives

At the end of the lesson the student will:

- establish the relationship between the sample and the probability of an event.

Topics

- Population and Samples
- Sample Selection

Concepts

- characteristics of the sample
- sample of the population
- types of samples

Vocabulary

- random
- stratified
- sample
- population

Lesson 3. Counting

Code: C338G0SU12L03

Objectives

At the end of the lesson the student will:

- apply the theory of counting* and its relationship to the probability of an event.

Topics

- Counting Strategies
- Counting and Probability

Concepts

- counting methods
- probability of an event

Vocabulary

- counting
- probability

Lesson 4. Permutations

Code: C338G0SU12L04

Objectives

At the end of the lesson the student will:

- apply the permutations theory and its relationship to the probability of an event.

Topics

- Permutations
- Linear Permutation
- Circular Permutation
- Probability and Combinations

Concepts

- combinations
- permutations

Vocabulary

- combination
- factorial
- permutation

Lesson 5. Independent and Dependent Events

Code: C338G0SU12L05

Objectives

At the end of the lesson the student will:

- differentiate between independent and dependent events.
- calculate the probability of dependent and independent events.

Topics

- Probability of Independent Events
- Probability of Dependent Events

Concepts

- dependent event
- independent event

Vocabulary

- dependent
- independent

Lesson 6. Theoretical and Experimental Probability

Code: C338G0SU12L06

Objectives

At the end of the lesson the student will:

- determine the theoretical and experimental probability of events.

Topics

- Theoretical Probability
- Experimental Probability

Concepts

- experimental probability
- theoretical probability

Vocabulary

- experimental
- theoretical

Lesson 7. Unbiased and Biased Sample

Code: C338G0SU12L07

Objectives

At the end of the lesson the student will:

- identify biased and unbiased samples.

Topics

- Biased Samples
- Unbiased Samples

Concepts

- unbiased samples
- biased samples

Vocabulary

- unbiased
- biased

Lesson 8. Predictions

Code: C338G0SU12L08

Objectives

At the end of the lesson the student will:

- make predictions of events based on the calculation of probabilities or the interpretation of the graph.

Topics

- Graph interpretation
- Predictions based on a Graph

Concepts

- data interpretation and graphs**
- making predictions

Vocabulary

- prediction