

Course Syllabus

Mathematics, Grade 7

Grade 7 Math, Final
Guardian Angels School

The Foundations of Learning (1999) curriculum offers kindergarten through grade 12 objectives for the Knowledge and Comprehension levels of Bloom's Taxonomy. EdVISION developed this curriculum based on extensive research of standardized and state tests. Additional objectives were added to enhance the content areas.

The mathematics component of the Foundations of Learning curriculum focuses on basic skills. Objectives primarily involve the identification, recognition, comprehension, or understanding of various math topics.

The Principles and Standards for School Mathematics describe the mathematical understanding, knowledge, and skills that students should acquire from prekindergarten through grade 12.

The ITBS Form A for mathematics measures the skills and achievement of students.

In this area students concentrate on making mathematical connections and using principles of mathematics to communicate, reason, and solve problems. Students engage in projects which require them to apply number systems, operations, and forms in real-world contexts.

The MEAP assesses student progress in Mathematics.

The Michigan Curriculum Framework describes Mathematics as the science of patterns and relationships and as the language and logic of our technological world. The Michigan Curriculum Framework states that Mathematical power is the ability to explore, to conjecture, to reason logically, and to use a variety of mathematical methods effectively to solve problems; whereas the ultimate goal of mathematics education is for all students to develop mathematical power to participate fully as a citizen and worker in our contemporary world.

The Michigan Curriculum Framework Mathematics Vision Statement states that a mathematically powerful individual should be able to:

- * reason mathematically
- * communicate mathematically
- * problem solve using mathematics

* make connections within mathematics and between mathematics and other fields.

The Foundations of Learning curriculum provides objectives for seventh grade students.

The ITBS Form A for mathematics measures the skills and achievement of students in seventh grade.

The Principles and Standards for School Mathematics provide standards for students in grades 6-8.

In this course students learn foundational mathematics skills. Course work includes operations, number forms, systems, and skills needed for entrance into high school mathematics courses. Students engage in activities which provide them with opportunities to perform operations and conversions with whole numbers, decimals, fractions, and percents, and to identify, approach, understand, and solve problems in real-world contexts.

The MEAP assesses student performance in mathematics at grade eight.

The Michigan Curriculum Framework for Mathematics outlines Content Standards for students in grade eight.

Algebraic Concepts

The Algebraic Concepts Unit includes Competencies/Objectives which focus on algebraic equations and operations. Students explore the symbolic nature of algebraic concepts by identifying and extending patterns in algebra, by following algebraic procedures, and by proving theorems with properties.

- The learner will be able to identify the missing element of an equation by applying the commutative (order) property of multiplication.
- The learner will be able to add, subtract, multiply, and divide with algebraic expressions.
- The learner will be able to show ways of performing basic operations.

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- The learner will be able to apply variable expressions to illustrate scenarios.
- The learner will be able to solve inequalities.
- The learner will be able to obtain solutions to multiple-step problems.
- The learner will be able to solve one-step problems.
- The learner will be able to solve given equations.
- The learner will be able to apply operational symbols.
- The learner will be able to apply relational symbols.
- The learner will be able to make interpretations of operational symbols.
- The learner will be able to make interpretations of relational symbols.

Data Interpretation

The Data Interpretation Unit includes Competencies/Objectives which focus on the study and use of graphical forms. Students collect and classify data, organize and display data, use logical reasoning, and problem solving.

- The learner will be able to add or subtract information presented in the form of a bar graph.
- The learner will be able to find percentages from a pictograph.
- The learner will be able to interpret data shown in a circle graph.
- The learner will be able to read amounts by finding a particular cell in a table.

Decimals

The Decimals Unit includes Competencies/Objectives which focus on number sense and operations with decimals. Students compare and compute decimals, study money, estimate decimals, problem solve using decimals, and reason using decimals.

- The learner will be able to use manipulatives to represent decimals through thousandths as fractions.
- The learner will be able to determine equivalent fractions and decimals.
- The learner will be able to perform addition of decimals with differing numbers of decimal places.
- The learner will be able to add decimals which are of the same place value.
- The learner will be able to divide a decimal number by a whole number.
- The learner will be able to divide a decimal number by a decimal number.
- The learner will be able to multiply 2 decimal numbers.
- The learner will be able to multiply a decimal by a whole number.
- The learner will be able to subtract decimals which are of the same place value.

Fractions

The Fractions Unit includes Competencies/Objectives which focus on number sense and operations with fractions. Students compare and order fractions, study fraction parts, estimate with fractions, reason using fractions, and problem solve using fractions.

- The learner will be able to recognize and understand the difference between both proper and improper forms of fractions.
- The learner will be able to identify the proper form of an improper fraction.
- The learner will be able to add two fractions with different denominators.
- The learner will be able to divide a fraction by a whole number.
- The learner will be able to divide two basic fractions.

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- The learner will be able to multiply two basic fractions.
- The learner will be able to multiply fractions and whole numbers.
- The learner will be able to subtract fractions with like denominators.
- The learner will be able to subtract fractions that possess different denominators.

Geometry

The Geometry Unit includes Competencies/Objectives which focus on exploring geometric concepts from multiple perspectives. Students study properties and construction of figures, proofs and theorems, history of geometry, transformations, logic, and problem solving.

- The learner will be able to compare a given angle to a right angle.
- The learner will be able to compare angles.
- The learner will be able to identify a point on a circle.
- The learner will be able to identify the center, radius, diameter, circumference, and a semi-circle on a circle.
- The learner will be able to understand the concept of circumference of a circle.
- The learner will be able to determine the unknown side length of a given figure when given all of the side lengths of a similar figure.
- The learner will be able to classify geometric figures.
- The learner will be able to compare figures.
- The learner will be able to identify various geometric figures.
- The learner will be able to recognize geometric relationships.
- The learner will be able to recognize properties of geometric figures.

Integers

The Integers Unit includes Competencies/Objectives which focus on number sense and operations with integers. Students compare integers, perform operations with integers, convert integers to other number forms, use manipulatives to demonstrate integers, and solve problems with integers in real world contexts.

- The learner will be able to add integers.
- The learner will be able to subtract integers.
- The learner will be able to identify the missing element in an integer equation.
- The learner will be able to order a set of integers by value.
- The learner will be able to compare number sentences that include negative integers and ordering symbols ($<$, $>$, $=$).
- The learner will be able to multiply integers.
- The learner will be able to divide integers.

Measurement

The Measurement Unit includes Competencies/Objectives which focus on measurement concepts, applications, and analysis. Students study length, area, circumference, perimeter, volume, weight, formulas, distance, calendar, money, tools, accuracy, units, constructions, patterns, and problem solving.

- The learner will be able to calculate the volume of a rectangular solid using the correct formula.
- The learner will be able to estimate metric capacity.
- The learner will be able to determine the metric capacity of a container.
- The learner will be able to understand the concept of scale in relation to a ratio in regards to a scale drawing.
- The learner will be able to apply area concepts to obtain problem solutions.
- The learner will be able to approximate measurements with appropriate precision.

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- The learner will be able to measure length.
- The learner will be able to measure mass.
- The learner will be able to apply perimeter concepts to obtain problem solutions.
- The learner will be able to measure temperature and time.
- The learner will be able to apply suitable units of measurement.
- The learner will be able to identify a suitable unit of measure for use in a particular situation.
- The learner will be able to measure the volume of figures.
- The learner will be able to use the concept of volume.
- The learner will be able to measure weight.

Number Theory

The Number Theory Unit includes Competencies/Objectives which focus on manipulating number forms and classifications. Students make connections between number forms and their real world applications.

- The learner will be able to identify equivalent decimals and percents.
- The learner will be able to identify prime and composite numbers.
- The learner will be able to understand and correctly use the terms prime and composite number.
- The learner will be able to make classifications of numbers according to divisibility.
- The learner will be able to write whole numbers in expanded notation.
- The learner will be able to illustrate numbers in various forms.
- The learner will be able to apply place value.

- The learner will be able to correctly write numbers in exponential notation.
- The learner will be able to write numbers in standard form.

Numeration

The Numeration Unit includes Competencies/Objectives which focus on exploring ordinality, identifying and extending number patterns, comparing numbers, and demonstrating number relationships.

- The learner will be able to identify a pattern, and correct errors in pattern extension.
- The learner will be able to order a series of whole numbers, fractions, and decimals.
- The learner will be able to round decimal numbers to the nearest whole number and use this to estimate the outcome of a given equation.
- The learner will be able to round whole and decimal numbers to the nearest hundredth, tenth, whole number, hundred, thousand, million, or billion.
- The learner will be able to round fractions to nearest whole number.
- The learner will be able to compare and order numbers.
- The learner will be able to apply order of magnitude to approximate.
- The learner will be able to apply number sense to approximate.
- The learner will be able to apply standard rounding to approximate.
- The learner will be able to describe the properties of numbers.
- The learner will be able to use properties of numbers.
- The learner will be able to comprehend number patterns.

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- The learner will be able to identify geometric patterns.
- The learner will be able to investigate many different types of number patterns.
- The learner will be able to make comparisons of quantities to decide rank.
- The learner will be able to make comparisons of quantities to determine ratios.
- The learner will be able to make comparisons of quantities to find sums and differences.

Percents

The Percent Unit includes Competencies/Objectives which focus on the concepts of percent. Students perform operations with percents, convert percents to other number forms, use manipulatives to demonstrate percents, and solve problems with percents in real world contexts.

- The learner will be able to calculate the percent of a number.
- The learner will be able to calculate the percent one number is of another number.
- The learner will be able to determine the decimal percent of a whole number.
- The learner will be able to determine the fractional percent of a whole number.

Probability/Statistics

The Probability/Statistics Unit includes Competencies/Objectives which focus on data analysis and probability concepts. Students collect, analyze, and make sense of real world data (including overlapping data, inconclusive data, etc.).

- The learner will be able to make interpretations of relationships and trends to form generalizations or generate conclusions.
- The learner will be able to make interpretations of relationships and trends to distinguish rates or recognize trends.

- The learner will be able to make interpretations of relationships and trends to comprehend underlying and functional relationships.
- The learner will be able to apply counting methods.
- The learner will be able to apply the measures of central tendency.
- The learner will be able to understand the standard measures of central tendency.
- The learner will be able to apply the concepts of probability.
- The learner will be able to apply measures of variability.
- The learner will be able to comprehend measures of variability.

Problem Solving

The Problem Solving Unit includes Competencies/Objectives which focus on analyzing problems, evaluating solutions, exploring problems, and developing strategies for solving problems.

- The learner will be able to identify when information is extraneous or missing.
- The learner will be able to select strategies for obtaining solutions to problems.

Whole Numbers

The Whole Numbers Unit includes Competencies/Objectives which focus on whole number concepts. Students perform operations with whole numbers, use manipulatives to demonstrate whole number concepts, and solve problems with whole numbers in real world contexts.

- The learner will be able to add whole numbers, regrouping when necessary.
- The learner will be able to divide whole numbers with no remainders.

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- The learner will be able to divide whole numbers when remainders are present.
- The learner will be able to multiply whole numbers without regrouping.
- The learner will be able to multiply whole numbers, regrouping when necessary.
- The learner will be able to subtract whole numbers, regrouping when necessary.