

Course Syllabus

Mathematics, Grade 5

Grade 5 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 fifth grade students.

The Principles and Standards for School Mathematics provide standards for students in grades 3-5.

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 recognize the commutative, associative, and distributive properties and apply them to compute with whole numbers.
- The learner will be able to illustrate the concept of a variable as an unknown quantity using a letter or a symbol.
- The learner will be able to choose suitable strategies and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil based upon the context and nature of the computation and apply the chosen strategy or tool.
- The learner will be able to create and apply methods to estimate the results of whole number computations and to judge the reasonableness of results.
- The learner will be able to understand the concepts of inequalities.
- The learner will be able to comprehend the properties of operations.
- The learner will be able to comprehend the relationships among operations.
- The learner will be able to apply the properties of operations.

Course Syllabus

Mathematics, Grade 5

Grade 5 Math, Final
Guardian Angels School

- The learner will be able to obtain solutions to problems by identifying the relationships between operations.
- The learner will be able to obtain solutions to problems by applying the relationships between operations.
- The learner will be able to explore how a change in one variable relates to a change in another variable.
- The learner will be able to compute fluently.

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 multiply a decimal number by a one-digit whole number (regrouping when necessary).
- The learner will be able to multiply 2 decimal numbers.
- The learner will be able to represent decimals.
- The learner will be able to divide a decimal number by a whole number.

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 add mixed fractions.
- The learner will be able to subtract two mixed fractions.
- The learner will be able to multiply 2 fractions.
- The learner will be able to divide two fractions.
- The learner will be able to develop a comprehension of fractions as parts of unit wholes.

- The learner will be able to develop a comprehension of fractions as parts of a collection.
- The learner will be able to develop a comprehension of fractions as locations on number lines.
- The learner will be able to develop a comprehension of fractions as divisions of whole numbers.

Functions

The Functions Unit includes Competencies/Objectives which focus on exploring polynomial, rational, exponential, logarithmic, trigonometric, and circular functions.

- The learner will be able to understand functions.

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 recognize and make a three-dimensional object from two-dimensional representations of that object.
- The learner will be able to recognize and make a two-dimensional representation of a three-dimensional object.
- The learner will be able to recognize and explain line and rotational symmetry in two- and three-dimensional figures and designs.
- The learner will be able to specify locations and explain spatial relationships by applying coordinate geometry and various other representational systems.
- The learner will be able to identify geometric concepts and relationships and use them in other disciplines and in problems in the classroom or in real life.
- The learner will be able to describe which attributes of a figure are being considered when the figure is used for classification.

Course Syllabus

Mathematics, Grade 5

Grade 5 Math, Final
Guardian Angels School

- The learner will be able to study the characteristics of three-dimensional solids.
- The learner will be able to study the characteristics of two-dimensional shapes.
- The learner will be able to compare characteristics of two- and three-dimensional figures.
- The learner will be able to draw geometric objects.
- The learner will be able to build geometric objects.
- The learner will be able to develop the terminology to describe the characteristics of two-dimensional shapes.
- The learner will be able to compose definitions for classes of geometric figures.
- The learner will be able to explore concepts of symmetry and congruency.
- The learner will be able to explain the motion or series of motions that are necessary to match two congruent shapes.
- The learner will be able to explain the effects of slides, flips, and turns of two-dimensional figures.
- The learner will be able to predict the effects of slides, flips, and turns of two-dimensional figures.
- The learner will be able to apply transformations to study mathematical situations.
- The learner will be able to use spatial reasoning to solve problems.
- The learner will be able to describe similar figures as not differing in shape but only in size or proportion.
- The learner will be able to use everyday language to explain location and movement.
- The learner will be able to use geometric vocabulary to explain location and movement.
- The learner will be able to identify specific shapes as congruent.

- The learner will be able to obtain solutions to problem situations with geometric models.
- The learner will be able to obtain solutions to problems using spatial visualization.

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 investigate negative numbers by extending the number line and through common applications.

Mathematics Processes

The Mathematics Processes Unit includes Competencies/Objectives which focus on mathematical connections. Students communicate and model concepts and procedures.

- The learner will be able to study and evaluate the mathematical thought processes and strategies of others.
- The learner will be able to comprehend how mathematical concepts interconnect and build on one another to create a coherent whole.
- The learner will be able to integrate their mathematical thought processes through communication.
- The learner will be able to express mathematical thought processes in an understandable and precise way to peers, teachers, and others.
- The learner will be able to create and evaluate mathematical arguments.
- The learner will be able to create new mathematical knowledge through the problem solving process.
- The learner will be able to apply representations to illustrate and interpret physical, social and mathematical scenarios.

Course Syllabus

Mathematics, Grade 5

Grade 5 Math, Final
Guardian Angels School

- The learner will be able to apply a variety of mathematical representations for organizing, recording, and explaining mathematical concepts.
- The learner will be able to make mathematical representations for organizing, recording, and explaining mathematical concepts.
- The learner will be able to identify mathematics in contexts outside of mathematics.
- The learner will be able to organize their mathematical thought processes through communication.
- The learner will be able to use mathematics in contexts outside of mathematics.
- The learner will be able to state mathematical relationships by applying equations.
- The learner will be able to choose various types of reasoning strategies.
- The learner will be able to use many different reasoning strategies.
- The learner will be able to state mathematical ideas clearly using mathematical language.
- The learner will be able to identify connections among mathematical concepts.
- The learner will be able to apply connections among mathematical concepts.
- The learner will be able to choose and use suitable standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.
- The learner will be able to understand characteristics of length, area, weight, volume, and size of angles and choose the suitable unit for measuring each characteristic.
- The learner will be able to understand and compare the perimeters of rectangular figures.
- The learner will be able to create, understand, and apply formulas to determine the area of rectangles and related triangles and parallelograms.
- The learner will be able to use various methods to determine measurements.
- The learner will be able to gain familiarity with standard units of measure in the customary system.
- The learner will be able to gain familiarity with standard units of measure in the metric system.
- The learner will be able to comprehend how differences in units affect the accuracy of measurement.
- The learner will be able to understand the necessity of standard units of measure.
- The learner will be able to measure an object using a standard ruler.
- The learner will be able to calculate the amount of time which has elapsed between two given times.
- The learner will be able to create strategies to find the surface areas of rectangular solids.
- The learner will be able to use appropriate tools to measure mass.
- The learner will be able to understand large capacity.
- The learner will be able to calculate the area of a rectangle given its measurements.

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 comprehend the measurable characteristics of objects and the units, systems, and processes of measurement.

Course Syllabus

Mathematics, Grade 5

Grade 5 Math, Final
Guardian Angels School

- The learner will be able to choose benchmarks to approximate measurements.
- The learner will be able to apply benchmarks to approximate measurements.
- The learner will be able to comprehend that measurement is approximate.
- The learner will be able to use various formulas to determine measurements.

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 and formulate equivalent forms of common fractions, decimals, and percents.
- The learner will be able to add and subtract common fractions and decimals by applying visual models, benchmarks, and equivalent forms.
- The learner will be able to know the word name of a given 10-digit whole number.
- The learner will be able to understand whole number place values.
- The learner will be able to develop a comprehension of the base-ten place-value system.
- The learner will be able to identify the expanded form of whole numbers less than 1,000,000.
- The learner will be able to identify equivalent forms of the same number.
- The learner will be able to identify equivalent fractions and decimals.
- The learner will be able to compare the values of whole numbers and decimals.
- The learner will be able to apply models in order to assess the size of fractions.

- The learner will be able to apply equivalent forms in order to assess the size of fractions.
- The learner will be able to identify the lowest common multiple of a group of two or more numbers.
- The learner will be able to explain classes of numbers based upon their attributes.
- The learner will be able to understand number relationships.
- The learner will be able to understand the various ways of representing numbers.

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 use words, tables, and graphs to represent and study patterns and functions.
- The learner will be able to make and explain mental images of patterns, objects, and paths.
- The learner will be able to create and apply methods to estimate computations involving fractions and decimals in scenarios relevant to students' experience.
- The learner will be able to describe number patterns.
- The learner will be able to extend patterns of numbers.
- The learner will be able to generalize number patterns.
- The learner will be able to comprehend quantitative relationships using mathematical models.
- The learner will be able to illustrate quantitative relationships using mathematical models.
- The learner will be able to determine which of two numbers is greater than or less than the other.
- The learner will be able to comprehend patterns.
- The learner will be able to order whole numbers in the correct sequence.

Course Syllabus

Mathematics, Grade 5

Grade 5 Math, Final
Guardian Angels School

- The learner will be able to analyze change in many different contexts.
- The learner will be able to apply estimation to obtain reasonable approximations.
- The learner will be able to round whole numbers to the nearest ten, hundred, or thousand, and use this to estimate the outcome of a given equation (numbers are whole numbers less than 10,000).
- The learner will be able to comprehend numbers.

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 create questions and gather, organize, and illustrate data to answer those questions.
- The learner will be able to explain events as likely or unlikely and describe the degree of likelihood.
- The learner will be able to propose and justify conclusions and predictions that have been founded upon data and develop studies to continue investigations of the conclusions or predictions.
- The learner will be able to formulate predictions about the outcomes of simple experiments and test the predictions.
- The learner will be able to apply measures of central tendency, with emphasis on the median, and comprehend what each does and does not indicate about the set of data.
- The learner will be able to develop investigations in order to address a question and consider how data collection strategies have an affect upon the nature of the set of data.
- The learner will be able to comprehend the basic concept of probability.

- The learner will be able to comprehend that the likelihood of an event can be represented by a number from zero to one.
- The learner will be able to use the basic concepts of probability.
- The learner will be able to use a table to represent a group of data.
- The learner will be able to use a graph to represent a group of data.
- The learner will be able to compare different representations of the same information.
- The learner will be able to make predictions based on a given set of data.
- The learner will be able to choose suitable statistical methods to analyze data.
- The learner will be able to apply suitable statistical methods to analyze data.
- The learner will be able to formulate inferences and/or predictions for data.
- The learner will be able to evaluate inferences from data.
- The learner will be able to use observations to gather data.
- The learner will be able to use surveys to gather data.
- The learner will be able to use experiments to gather data.

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 choose, use, and translate among mathematical representations to obtain solutions to problems.

Course Syllabus

Mathematics, Grade 5

Grade 5 Math, Final
Guardian Angels School

- The learner will be able to represent problem scenarios with objects and apply representations to draw conclusions.
- The learner will be able to adapt many different appropriate strategies in order to obtain problem solutions.
- The learner will be able to apply a variety of strategies to obtain problem solutions.
- The learner will be able to solve mathematical problems.
- The learner will be able to obtain solutions to problems that arise in contexts outside of mathematics.
- The learner will be able to reflect on the processes applied to solve a problem.
- The learner will be able to monitor the processes applied to obtain solutions to mathematical problems.
- The learner will be able to understand the meaning of operations.
- The learner will be able to represent whole numbers.

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 develop proficiency with basic number combinations for multiplication and division and apply these combinations to mentally calculate associated problems.
- The learner will be able to become proficient in the addition, subtraction, multiplication, and division of whole numbers.
- The learner will be able to comprehend the different meanings of multiplication.
- The learner will be able to comprehend the different meanings of division.
- The learner will be able to comprehend the effects of multiplying and dividing whole numbers.