

21st CENTURY

KINDERGARTEN MATH

CONTENT STANDARDS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS (2520.2)

The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools.

All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

Kindergarten

Grade K	Mathematics			
Standard 1	Number and Operations			
M.S.K.1	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will <ul style="list-style-type: none"> • demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems, • demonstrate meanings of operations and how they relate to one another, and • compute fluently and make reasonable estimates. 			
Performance Descriptors (M.PD.K.1)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Kindergarten students at distinguished level in mathematics count forward to 100 with and without objects. They read, write, order, & compare numbers to 100 using multiple strategies. They group and count by 1's, 2's, 5's, 10's and 20's. They estimate numbers of objects to 100 & can model & identify place value through 99 using standard and expanded form. They model & write addition & subtraction sentences using whole numbers to 18. They interpret the meanings of operations & the relationship between addition and subtraction by creating picture & story problems that can be solved using a variety of strategies. They offer alternative solutions to two-step problems using pictures, numbers and words.	Kindergarten students at the above mastery level in mathematics count forward to 50 and backward from 20 with and without objects. They model and identify place value of each digit utilizing standard and expanded form through 50. They read, write, order, and compare numbers to 50. They estimate numbers of objects to 50. They group objects to 50 and can identify place value though 50. They model and identify place value using standard and expanded form through 50. They create addition and subtraction sentences using whole numbers to 15 and solve two-step problems using pictures. They present their results offering more than one solution.	Kindergarten students at the mastery level in mathematics count to 20, compare numbers to 20 and group and count manipulatives by 1's, 5's and 10's. They model place value to 20 and use ordinal numbers to identify position. They estimate the number of objects in a group of 20 or less and evaluate the reasonableness of the estimation. They identify halves and wholes and use concrete objects to model addition and subtraction with whole numbers to 10. They model meanings of operations. They create picture story problems and present and justify their solutions.	Kindergarten students at the partial mastery level in mathematics count forward to 20 and backward from 10. They read, write, and order numbers to 20. They model place value to 10 and estimate objects to 10. They recognize halves and wholes and ordinal positions to 5 th . They group objects by ones and tens and identify place value using standard form through 20. They solve addition and subtraction sentences using whole numbers to 10. They solve one-step problems using numbers and pictures.	Kindergarten students at the novice level in mathematics count objects to 10. They match halves and wholes and recognize ordinal numbers to 5 th . They copy place values of numbers using standard form. They model addition and subtraction sentences using numbers to 10. They solve one-step problems using pictures.

Objectives	Students will
M.O.K.1.1	count forward to 20 and backward from 10 with and without manipulatives.
M.O.K.1.2	read, write, order, and compare numbers to 20 using multiple strategies (e.g. manipulatives, number line).
M.O.K.1.3	group and count manipulatives by ones, fives, and tens.
M.O.K.1.4	model and identify place value of each digit utilizing standard and expanded form through 20.
M.O.K.1.5	Use ordinal numbers 1 st – 10 th to identify position in a sequence.
M.O.K.1.6	estimate the number of objects in a group of 20 or less and count to evaluate reasonableness of estimation.
M.O.K.1.7	identify and name halves and wholes using concrete models.
M.O.K.1.8	use concrete objects to model addition and subtraction of whole numbers related to sums of 10 or less and write corresponding number sentence.
M.O.K.1.9	model meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property) using manipulatives.
M.O.K.1.10	create grade-appropriate picture and story problems, solve using a variety of strategies, present solutions and justify results.

Grade K	Mathematics			
Standard 2	Algebra			
M.S.K.2	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will <ul style="list-style-type: none"> • demonstrate understanding of patterns, relations and functions, • represent and analyze mathematical situations and structures using algebraic symbols, • use mathematical models to represent and understand quantitative relationships, and • analyze change in various contexts. 			
Performance Descriptors (M.PD.K.2)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Kindergarten students at the distinguished level in mathematics justify classifications of objects by several attributes. They create, extend and describe repeating patterns. They count by 2's, 5's, 10's, and 20's to 100.	Kindergarten students at the above mastery level in mathematics justify the classification of self-selected objects by one attribute and then sort objects in another way and justify the new sort. They create and extend a repeating pattern. They count by 5's and 10's.	Kindergarten students at the mastery level in mathematics justify the classification of self-selected objects by one attribute. They create and extend a repeating pattern using common objects. They model and identify patterns by 5's and 10's.	Kindergarten students at the partial mastery level in mathematics classify objects by one attribute. They repeat a pattern using common objects and model patterns of 5's and 10's.	Kindergarten students at the novice level in mathematics sort objects and identify patterns of counting by 10's. They identify a repeating pattern.

Objectives	Students will
M.O.K.2.1	justify the classification of self-selected objects based on attributes.
M.O.K.2.2	create, describe, and extend a repeating pattern using common objects, sound, and movement.
M.O.K.2.3	model and identify patterns of counting by 5's and 10's.

Grade K	Mathematics
Standard 3	Geometry
M.S.K.3	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will <ul style="list-style-type: none"> analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships, specify locations and describe spatial relationships using coordinate geometry and other representational systems, apply transformations and use symmetry to analyze mathematical situations, and solve problems using visualization, spatial reasoning, and geometric modeling.

Performance Descriptors (M.PD.K.3)

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Kindergarten students at the distinguished level in mathematics construct representations of real-world shapes using multiple shapes together. They write about the shapes using numbers and/or words. They use physical models of separate parts to construct more than one whole object.	Kindergarten students at the above mastery level in mathematics use physical materials to construct, identify and classify geometric plane shapes and connect these shapes to the environment. They use physical models of separate parts to construct a whole object.	Kindergarten students at the mastery level in mathematics, using physical materials, construct, identify and classify geometric plane shapes. They recognize and describe basic shapes in the environment and model and describe spatial relationships. They identify the separate parts used to make a whole object.	Kindergarten students at the partial mastery level in mathematics use physical materials to identify and classify geometric plane shapes. They recognize basic shapes in the environment and model spatial relationships.	Kindergarten students at the novice level in mathematics identify geometric plane shapes. They identify basic shapes in the environment and recognize that separate parts are used to make a whole object.

Objectives	Students will
M.O.K.3.1	use physical materials to construct, identify, and classify basic geometric plane shapes: <ul style="list-style-type: none"> circles / ellipses (oval) / rectangles including squares / triangles
M.O.K.3.2	recognize and describe basic geometric shapes in the environment.
M.O.K.3.3	model and describe spatial relationships: <ul style="list-style-type: none"> inside/outside top/bottom before/after
M.O.K.3.4	identify the separate parts used to make a whole object.

Grade K		Mathematics		
Standard 4		Measurement		
M.S.K.4	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will <ul style="list-style-type: none"> demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement, and apply appropriate techniques, tools and formulas to determine measurements. 			
Performance Descriptors (M.PD.K.4)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Kindergarten students at the distinguished level in mathematics compare and order objects in nonstandard units of measure according to length, height, and weight. They locate a day of the week on a calendar and identify what day is next in the week. They read time to half hour on an analog and digital clock. They determine the value of a set of coins, pennies, nickels and dimes, up to 20. They use the coins to make change from a dime to pennies, a dime to pennies and a nickel, and a nickel to pennies.	Kindergarten students at the above mastery level in mathematics compare objects in nonstandard units of measure according to length, height and weight. They locate a day of the week on a calendar. They read time to the half hour on an analog clock. They determine the value of a set of coins, pennies, nickels and dimes, up to 15. They justify the relationship between the coins through visual representations.	Kindergarten students at the mastery level in mathematics estimate size, compare and order objects by size with respect to a given attribute. They use standard and nonstandard units of measure to find length and compare two objects in non standard units of measure according to length, height and weight. They use the calendar to identify date and the sequence of the days of the week. They read time to the hour with analog and digital clocks. They identify and model the value of penny, nickel, and dime and determine the value of a set of pennies up to 20. They explain the relationship between the coins.	Kindergarten students at the partial mastery in mathematics estimate size of an object and identify objects with respect to an attribute. They use standard and nonstandard units of measure to find length and order objects by length, height and weight. They name the days of the week and the seasons. They read time to the hour on an analog clock. They identify penny, nickel, and dime and determine a value of a set of pennies up to 10.	Kindergarten students at the novice level in mathematics estimate size of an object and order objects with respect to an attribute. They use standard units of measure to find length. They repeat days of the week and repeat the seasons. They match penny, nickel, and dime and determine a set of pennies up to 5.
Objectives	Students will			
M.O.K.4.1	estimate the size of an object and compare and order objects with respect to a given attribute.			
M.O.K.4.2	use standard and nonstandard units of measure to find the length of an object.			
M.O.K.4.3	compare two objects in nonstandard units of measure, according to one or more of the following attributes: <ul style="list-style-type: none"> length / height / weight 			
M.O.K.4.4	use calendar to identify date and the sequence of days of the week.			
M.O.K.4.5	read time to the hour using analog and digital clocks.			
M.O.K.4.6	identify the name and value of coins and explain the relationships between: <ul style="list-style-type: none"> penny / nickel / dime 			

Grade K	Mathematics			
Standard 5	Data Analysis and Probability			
M.S.K.5	<p>Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will</p> <ul style="list-style-type: none"> • formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them, • select and use appropriate statistical methods to analyze data, • develop and evaluate inferences and predictions that are based on models, and • apply and demonstrate an understanding of basic concepts of probability. 			
Performance Descriptors (M.PD.K.5)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Kindergarten students at the distinguished level in mathematics organize and analyze data on a graph. They create simple probability experiments, records results with tallies and interpret results. They make predictions, present their findings and justify their solutions.	Kindergarten students at the above mastery level in mathematics collect, sort, and organize data into a graph using objects and pictures. They analyze the data on a bar graph. They create simple probability experiments and use tallies to record results in a table. They make predictions based on the results and present their findings.	Kindergarten students at the mastery level in mathematics collect, sort and organize data into a graph using objects and pictures. They interpret data represented on a bar graph. They conduct simple probability experiments and use tallies to record results in a table. They make predictions based on results.	Kindergarten students at the partial mastery level in mathematics collect and sort data in a graph with objects and pictures. They describe the data represented on a bar graph. They conduct simple probability experiments.	Kindergarten students at the novice level in mathematics collect and sort data in a graph using objects. They count the data represented on a bar graph. They label simple probability experiments
Objectives	Students will			
M.O.K.5.1	collect, organize, display, and interpret data using a pictograph and bar graph (with and without technology)			
M.O.K.5.2	conduct a simple probability experiment and use tallies to record results in a table, make predictions based on results.			