

# 21<sup>st</sup> CENTURY

## 2<sup>nd</sup> Grade 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.

#### Second Grade

Grade 2		Mathematics		
Standard 1		Number and Operations		
M.S.2.1	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"> <li>• demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems,</li> <li>• demonstrate meanings of operations and how they relate to one another, and</li> <li>• compute fluently and make reasonable estimates.</li> </ul>			
Performance Descriptors (M.PD.2.1)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Second grade students at the distinguished level in mathematics read, write, order, and compare numbers above 1000 and use ordinal numbers to identify position in a sequence. They demonstrate quick recall of basic addition facts and related subtraction facts to 18. They use 2- and 3-digit numbers to solve problems, justifying their results. They create real-world grade-appropriate one and two student problems using multiple strategies, present and justifying procedures in a clear and concise manner.	Second grade students at the above mastery level in mathematics read, write, order and compares numbers above 1000 and use ordinal numbers to identify position in a sequence. They demonstrate quick recall of basic addition facts and related subtraction facts to 18. They add and subtract two- and three-digit numbers with and without grouping. They create real-world grade-appropriate one- and two-step problems using multiple strategies, present and justify results.	Second grade students at the mastery level in mathematics read, write, order and compare numbers to 1000 and identify ordinal numbers to identify position in a sequence. They model and identify place value to 1000 and round numbers to the nearer 10 and 100. They demonstrate quick recall of basic addition facts with sums to 18 and corresponding subtraction facts. They model and justify the relationship between addition and subtraction facts. They model two- and three-digit addition and subtraction with regrouping. They identify, name, and explain fractions as part of whole and as part of a set using models. They create one and two-step grade-appropriate story problems using multiple strategies and present and justify results.	Second grade students at the partial mastery level in mathematics read and write numbers to 1000 and identify ordinal numbers to the 20 <sup>th</sup> position. They identify place value to 1000 and round numbers to the nearer 100. They demonstrate recall of basic addition facts with sums to 18 and corresponding subtraction facts. They model two- and three-digit addition and subtraction without regrouping. They identify and name fractions as part of a whole and part of a set using models. They create one-step grade-appropriate story problems using multiple strategies.	Second grade students at the novice level in mathematics read numbers to 1000 and identify ordinal numbers to the 10 <sup>th</sup> position. They model and solve problems involving addition and corresponding subtraction facts to 18. They round numbers less than 50 to the nearer 10. They add and subtract 2-digit numbers without regrouping. They recognize fractions as part of a whole. They solve one-step grade-level story problems using multiple strategies.

Objectives	Students will
M.O.2.1.1	read, write, order, and compare numbers to 1,000 using multiple strategies (e.g. symbols, manipulatives, number line).
M.O.2.1.2	identify any number as odd or even and determine if a set has an odd or even number of elements.
M.O.2.1.3	count and group concrete manipulatives by ones, tens, and hundreds to 1,000.
M.O.2.1.4	model and identify place value of each digit utilizing standard and expanded form through 1000.
M.O.2.1.5	identify and read any ordinal number to identify position in a sequence.
M.O.2.1.6	round any 3-digit number to both the nearest 10 and 100.
M.O.2.1.7	Identify and explain fractions as part of a whole and as part of a set/group using models.
M.O.2.1.8	model and justify the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
M.O.2.1.9	demonstrate quick recall of basic addition facts with sums to 18 and corresponding subtraction facts.
M.O.2.1.10	model 2- and 3-digit addition and subtraction with regrouping using multiple strategies.
M.O.2.1.11	add and subtract 2- and 3-digit numbers without regrouping.
M.O.2.1.12	use rounding to analyze the reasonableness of a sum or a difference.
M.O.2.1.13	create story problems that require one or two-step procedures, using a variety of strategies explain the reasoning used, justify the procedures selected and present the results.

Grade 2	Mathematics			
Standard 2	Algebra			
M.S.2.2	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"> <li>demonstrate understanding of patterns, relations and functions,</li> <li>represent and analyze mathematical situations and structures using algebraic symbols,</li> <li>use mathematical models to represent and understand quantitative relationships, and</li> <li>analyze change in various contexts.</li> </ul>			
<b>Performance Descriptors (M.PD.2.2)</b>				
<b>Distinguished</b>	<b>Above Mastery</b>	<b>Mastery</b>	<b>Partial Mastery</b>	<b>Novice</b>
Second grade students at the distinguished level in mathematics analyze, describe, extend and create a growing pattern, justifying their mathematical reasoning in a clear and concise manner. They create a rule and then create a pattern to match the rule justifying their reasoning. They write equivalent numerical expressions and defend their reasoning.	Second grade students at the above mastery level in mathematics analyze, describe, extend and create a growing pattern, justifying their reasoning. They create a rule and then create a pattern to match the rule. They write equivalent numerical expressions.	Second grade students at the mastery level in mathematics analyze, describe, extend and create a growing pattern. They identify a rule for a pattern and use it to complete the pattern. They create equivalent numerical expressions.	Second grade students at the partial mastery level in mathematics describe, extend and create a growing pattern. They use a rule to complete a pattern. They describe equivalent numerical expressions.	Second grade students at the novice level in mathematics identify and extend a growing pattern. They recognize a rule used to complete a pattern. They recognize equivalent numerical expressions.

Objectives	Students will
M.O.2.2.1	analyze, describe, extend and create a growing pattern using objects or numbers.
M.O.2.2.2	explain how one variable produces a change in another variable
M.O.2.2.3	describe, complete and extend a variety of counting patterns, according to a given rule.
M.O.2.2.4	create physical models to demonstrate equivalency of two numerical expressions written as a grade-appropriate number sentence.

Grade 2	Mathematics
Standard 3	Geometry
M.S.2.3	<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"> <li>analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships,</li> <li>specify locations and describe spatial relationships using coordinate geometry and other representational systems,</li> <li>apply transformations and use symmetry to analyze mathematical situations, and</li> <li>solve problems using visualization, spatial reasoning, and geometric modeling.</li> </ul>

Performance Descriptors (M.PD.2.3)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Second grade students at the distinguished level in mathematics identify, describe and analyze geometric solids. They communicate their reasoning in a clear and concise manner. They create shapes and the reflected image. They create paths between locations on a grid. They create similar shapes and justify why they are similar in written form.	Second grade students at the above mastery level in mathematics identify, describe and analyze geometric solids. They compare and contrast plane and solid geometric shapes communicating their reasoning orally. They create shapes and the reflected image. They combine line segments and angles to form new shapes. They plot and describe multiple paths between locations on a grid. They create similar shapes and justify why they are similar.	Second grade students at the mastery level in mathematics identify and describe geometric solids. They compare and contrast plane and solid geometric shapes. They identify and draw congruent shapes that have been rotated or reflected. They model and draw line segments and angles. They plot and describe the path between locations on a grid. They identify similar shapes.	Second grade students at the partial mastery level in mathematics identify geometric solids. They compare plane and solid geometric shapes. They identify congruent shapes that have been rotated or reflected. They identify line segments and angles. They describe the path between locations on a grid They recognize similar shapes.	Second grade students at the novice level in mathematics recognize three-dimensional solids. They identify plane and solid geometric shapes. They recognize congruent shapes. They locate points on a grid. They recognize line segments and angles.

Objectives	Students will
M.O.2.3.1	identify and describe the following geometric solids according to the number of faces and edges: <ul style="list-style-type: none"> <li>• rectangular solid</li> <li>• cube</li> <li>• cylinder</li> <li>• cone</li> <li>• pyramid</li> </ul>
M.O.2.3.2	compare and contrast plane and solid geometric shapes.
M.O.2.3.3	identify and draw congruent shapes that have been rotated or reflected
M.O.2.3.4	model and draw line segments and angles.
M.O.2.3.5	plot and describe the path between locations on a grid.
M.O.2.3.6	identify similar shapes.

Grade 2	Mathematics
Standard 4	Measurement
M.S.2.4	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"> <li>• demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement, and</li> <li>• apply appropriate techniques, tools and formulas to determine measurements.</li> </ul>

Performance Descriptors (M.PD.2.4)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Second grade students at the distinguished level in mathematics estimate measures, select and correctly use the appropriate measuring tool to compare objects and justify their reasoning. They determine the perimeter and area of a given shape using manipulatives and justify their reasoning. They explain the relationship between coins and make change from \$1.00 justifying their procedures.	Second grade students at the above mastery level in mathematics estimate measures, select and correctly use the appropriate measuring tool to compare objects. They determine the perimeter and area of a given shape using manipulatives and explain their reasoning. They read time to 5 minute intervals. They compare dates on a calendar. They explain the relationship between coins and make change from \$1.00 explaining their procedures.	Second grade students at the mastery level in mathematics estimate measures, select and correctly use the appropriate measuring tool. They determine the perimeter and the area of a given shape using manipulatives. They order events and read time to the nearest quarter hour using an analog and digital clock. They identify specific dates on a calendar and determine past and future dates. They explain the relationship between coins and make change from \$1.00.	Second grade students at the partial mastery level in mathematics select and correctly use the appropriate measuring tool. They determine the perimeter of a shape and recognize that a shape has area. They order events and read time to half hour on an analog and digital clock. They identify specific dates on a calendar. They count coins to \$1.00.	Second grade students at the novice level in mathematics, given a measuring tool determines, the measure of an object. They read time to the nearest hour on an analog clock. They read dates on a calendar. They explain the relationship between coins.

Objectives	Students will
M.O.2.4.1	estimate measures, select and correctly use the appropriate measurement tool to measure the object and determine the reasonableness of the estimate: <ul style="list-style-type: none"> <li>length in centimeters and inches,</li> <li>temperature in Celsius and Fahrenheit,</li> <li>weight/mass in pounds and kilograms, and</li> </ul> justify estimates when communicating results.
M.O.2.4.2	estimate and determine the perimeter of squares, rectangles and triangles.
M.O.2.4.3	estimate and count the number of square units needed to cover a given area using manipulatives.
M.O.2.4.4	order events in relation to time.
M.O.2.4.5	determine past and future days of the week and identify specific dates, given a calendar.
M.O.2.4.6	read time to the quarter hour using an analog and digital clock.
M.O.2.4.7	identify, count and organize coins and bills to display a variety of price values from real-life examples with a total value of one dollar or less and model making change using manipulatives.

Grade 2	Mathematics
Standard 5	Data Analysis and Probability
M.S.2.5	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"> <li>formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them,</li> <li>select and use appropriate statistical methods to analyze data,</li> <li>develop and evaluate inferences and predictions that are based on models, and</li> <li>apply and demonstrate an understanding of basic concepts of probability.</li> </ul>

Performance Descriptors (M.PD.2.5)				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Second grade students at the distinguished level in mathematics create, read, and interpret a pictograph and justify their reasoning to the class. They plan and conduct simple probability experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated, present and justify the results. They formulate questions, collect data, organize and display data in a chart, table, or bar graph and justify results to the class.	Second grade students at the above mastery level in mathematics create, read and interpret a pictograph and present their reasoning to the class. They plan and conduct simple probability experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated and present the results. They formulate questions, collect data, organize and display data in a chart, table, or bar graph and present the information to the class in oral form.	Second grade students at the mastery level in mathematics create, read, and interpret a pictograph. They conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated. They formulate questions, collect data, organize and display data in a chart, table or bar graph.	Second grade students at the partial mastery level in mathematics read and interpret a pictograph. They conduct simple probability experiments and describe the results. They collect and organize data into a chart, table or bar graph.	Second grade students at the novice level in mathematics read a pictograph. They conduct simple probability experiments. They organize data into a table or bar graph.

Objectives	Students will
M.O.2.5.1	create, read, and interpret a pictograph with each picture representing greater than or equal to a single unit.
M.O.2.5.2	conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
M.O.2.5.3	analyze data represented on a graph using grade-appropriate questions.
M.O.2.5.4	formulate questions, collect data, organize and display as a chart, table or bar graph.