

# Frameworks for Mathematics *Grade 2*





### West Virginia Board of Education 2018-2019

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# Grade 2

In grade two, students further build a mathematical foundation that is critical to learning higher mathematics. Instructional time focuses on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes (National Governors Association Center for Best Practices, Council of Chief State School Officers [NGA/CCSSO] 2010i). Students also work toward fluency with addition and subtraction within 20 using mental strategies and within 100 using strategies based on place value, properties of operations, and the relationship between addition and subtraction. They know from memory all sums of two one-digit numbers.

## **Operations and Algebraic Thinking**

Standards	Teacher Understandings	Resources	Student Understandings
Represent and solve problems involving addition and subtraction. M.2.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions (e.g. by using drawings and equations with a symbol for the unknown number to represent the	It is important for teachers to understand that neglecting any grade-level standards will leave gaps in students' skills and understandings. This will leave students unprepared for the challenges they face in later grades. Students use the Mathematical Habits of	The following is a list of resources for teachers and students: Math TREE Online Education Resources A curated set of aligned, internet resources for WV elementary math teachers	<ul> <li>Students solve addition and subtraction problems related to all additive structures with unknowns in all positions.</li> <li>Students fluently add and subtract within 20.</li> <li>Students determine a number up to 20 is odd or even by pairing</li> </ul>
Add and subtract within 20. M.2.2 Fluently add and subtract within 20 using mental strategies and by end of Grade 2, know from memory all sums of two one-digit numbers. Work with equal groups of objects to	grade level content standards. The teacher needs to craft instructional tasks that connect the Mathematical Habits of Mind to the content standards. By the end of grade two students are to be	Assistant This tool is aligned to WV standards and is designed to help educators locate resources that can support instruction and identify skills most relevant to standards.	<ul> <li>objects or counting them by twos.</li> <li>Students use repeated addition to find the sum of equal groups of objects up to 5.</li> </ul>



gain foundations for multiplication.	proficient in solving	Illustrative	Common Misconceptions
M.2.3	addition and subtraction	Mathematics	-
Determine whether a group of objects	problems related to the all	<u>http://www.illustrative</u>	Students frequently
(up to 20) has an odd or even number	of additive structures with	mathmatics.org	think that the equal
of members, e.g. by pairing objects or	unknowns in all positions.	This website provides	sign (=) is an operation
counting them by 2s; write an equation	These problems should	teachers with learning	and that they must do
to express an even number as a sum of	include numbers that are	tasks that develop the	something to find an
two equal addends.	appropriate for grade two	WV College- and	answer
	students (related to sums	Career-Readiness	a Students may believe
M.2.4	less than 1000). See	Standards for	Students may believe     that they can apply
Use addition to find the total number of	standards in Operations	Mathematics,	that they can apply
objects arranged in rectangular arrays	and Algebraic Thinking and	supporting the	properties related to
with up to 5 rows and up to 5 columns;	Numbers and Operations in	teacher's content	addition to subtraction.
write an equation to express the total	Base len to identify	Knowledge of	For example, students
as a sum of equal addenus.	strategies and appropriate	mathematics.	may apply the
	algorithm is not a grade two	Graham Eletcher Site G	commutative property
	algorithm is not a grade two	Elotoby	to subtraction. The
	four expectation	http://www.ofletchy.co	commutative property
		m	does not apply to
	Students in grade two	This website includes	subtraction because
	develop fluency with	learning progression	order makes a
	addition and subtraction	videos related to	difference in
	within 20. Students develop	counting, and 3-Act	subtraction.
	fluency by using number	tasks that may be	• Student may think that
	relationships and mental	connected to the WV	you are not able to
	strategies. Students need	College- and Career-	subtract a larger
	ample opportunity to	Readiness Standards	number from a smaller
	practice these strategies.	for Mathematics.	number because
	Games are effective in	_	problems in second
	providing opportunities for	Inside Mathematics	grade always have a
	students to practice	<u>http://insidemathemat</u>	smaller number taken
	strategies. Inis is an end-	ICS.Org	from a larger number
	or-year expectation.	Inside Mathematics is a	Focus on the structure
		nationally recognized	



	multimedia website for educators around the world. This site includes videos, learning tasks, and performance assessment tasks. <b>NCTM Illuminations</b> https://illuminations.n ctm.org/ Illuminations is a project designed by NCTM. The site includes lessons, activities, and computer applets. <b>Math Coach's Corner</b> <b>Donna Boucher</b> http://www.mathcoach	of subtraction problems. Students will overgeneralize situations. For example, <i>in all</i> does not always indicate addition. There are 4 cookies on the plate. There were 8 cookies in all. How many did I eat? When students see the words <i>in all</i> they believe they should add.
	project designed by NCTM. The site includes lessons, activities, and computer applets. Math Coach's Corner Donna Boucher http://www.mathcoach scorner.com This site is a blog by an elementary	eat? When students see the words <i>in all</i> they believe they should add.
	mathematics coach. Her blog includes mathematical background on concepts as well as mathematical tasks.	



# Number and Operations in Base Ten

Standards	Teacher Understandings	Resources	Student Understandings
Understand place value.         M.2.5         Understand that the three digits of a three-digit number represent amounts of hundreds, tens and ones (e.g., 706 equals 7 hundreds, 0 tens and 6 ones).         Understand the following as special cases:         a.       100 can be thought of as a bundle of ten tens – called a "hundred."         b.       Numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight or nine hundreds, and 0 tens and 0 ones.         M.2.6       Count within 1000 and skip-count by 5s, 10s and 100s.         M.2.7       Read and write numbers to 1000 using base-ten numerals, number names and expanded form.	It is important for teachers to understand that neglecting any grade-level standards will leave gaps in students' skills and understandings. This will leave students unprepared for the challenges they face in later grades. Students use the <b>Mathematical Habits of Mind</b> to interact with the grade level content standards. The teacher needs to craft instructional tasks that connect the Mathematical Habits of Mind to the content standards. Understanding place value is more than identifying the number in the tens place. Students use place value in strategies to add and cubtract larger numbers.	NesourcesThe following is a list of resources for teachers and students:Math TREE Online Education ResourcesA curated set of aligned, internet resources for WV elementary math teachersQuantile Teacher AssistantThis tool is aligned to WV standards and is designed to help educators locate resources that can support instruction and identify skills most relevant to standards.Illustrative Hadian et al.	<ul> <li>Student onderstandings</li> <li>Students understand the digits in a three- digit number represents amounts of hundreds, tens and ones.</li> <li>Students read and write numbers to 1000.</li> <li>Students compare two three-digit numbers based on meanings of the hundreds, tens, and ones digit and use the symbols &gt;, =, &lt;.</li> <li>Students use place value strategies (expanded number form) and properties of operations within 1000.</li> <li>Students understand that subtraction is the inverse of addition.</li> <li>Students mentally add</li> </ul>
M.2.8 Compare two three-digit numbers	subtract larger numbers. An example of this is partial	Mathematics http://www.illustrative	10 or100 to a given number.
based on meanings of the hundreds, tens and ones digits, using >, = and < symbols to record the results of comparisons.	sums. The standards in Number and Operations in Base Ten	<u>mathmatics.org</u> This website provides teachers with learning tasks that develop the	Common Misconceptions



Ose place value understanding and properties of operations to add and subtract.Selecting numbers for addition and subtraction problems. An example of this is add up to 4 two digit numbers.Career-Readiness Standards for Mathematics, supporting the teacher's content knowledge of mathematics.larger numbers. For example, 572 is read as five hundred and seventy-two instead of five hundred seventy- two.M.2.9 Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.The equal sign (=) is related to the greater than symbol (<) and less than symbol (<) and shows a relationship between to quantities. TheGraham Fletcher Site G FletchyIarger numbers. For example, 572 is read as five hundred and seventy-two instead of five hundred seventy- two.
properties of operations to add and subtract.addition and subtraction problems. An example of this is add up to 4 two digit numbers.Standards for Mathematics, supporting the teacher's content knowledge of mathematics.example, 572 is read as five hundred and seventy-two instead of five hundred seventy- two.M.2.9Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.The equal sign (=) is related to the greater than symbol (<) and less than symbol (<) and shows a relationship between to quantities. TheStandards for Mathematics, supporting the teacher's content knowledge of mathematics.example, 572 is read as five hundred and seventy-two instead of five hundred seventy- two.
Subtract.problems. An example of this is add up to 4 two digit numbers.Mathematics, supporting the teacher's content knowledge of mathematics.five hundred and seventy-two instead of five hundred seventy- two.M.2.9Image: Content numbers.Supporting the teacher's content knowledge of mathematics.five hundred and seventy-two instead of five hundred seventy- two.Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.The equal sign (=) is related to the greater than symbol (<) and less than symbol (<) and shows a relationship botween to quantities. TheGraham Fletcher Site G Fletchy
M.2.9this is add up to 4 two digit numbers.supporting the teacher's content knowledge of mathematics.seventy-two instead of five hundred seventy- two.Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.The equal sign (=) is related to the greater than symbol (>) and less than symbol (<) and shows a relationship botween to quantities. TheSupporting the teacher's content knowledge of mathematics.seventy-two instead of five hundred seventy- two.
M.2.9numbers.teacher's content knowledge of mathematics.five hundred seventy- two.Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.The equal sign (=) is related to the greater than symbol (>) and less than symbol (<) and shows a relationship botween to quantities. Thefive hundred seventy- two.
Fluently add and subtract within 100       International optimized
using strategies based on place value, properties of operations and/or the relationship between addition and subtraction. The equal sign (=) is related to the greater than symbol (>) and less than symbol (<) and shows a relationship botween to quantities. The
properties of operations and/or the relationship between addition and subtraction.to the greater than symbol (>) and less than symbol (<) and shows a relationshipGraham Fletcher Site G Fletchybetween to quantities. Thebetween to quantities. Thebetween to quantities. The
relationship between addition and (>) and less than symbol (<) Graham Fletcher Site G subtraction. Fletchy
subtraction. and shows a relationship Fletchy
between to quantities. The bttp://www.ofletchu.c
between to quantities. The <u>nttp://www.gitetchy.c</u>
M.2.10 equal sign means that the <u>om</u>
Add up to four two-digit numbers using two sides of the equation This website includes
strategies based on place value and have the same value. learning progression
properties of operations. videos related to
counting, and 3-Act
M.2.11 tasks that may be
Add and subtract within 1000, using connected to the WV
concrete models or drawings and College- and Career-
strategies based on place value. Readiness Standards
properties of operations and/or the for Mathematics.
relationship between addition and
subtraction: relate the strategy to a
written method. Understand that in http://insidemathema
adding or subtracting three-digit
numbers one adds or subtracts
hundreds and hundreds tens and tens
ones and ones and sometimes it is
necessary to compose or decompose
tens or hundreds
This site includes
M 2 12 videos learning tasks
Mentally add 10 or 100 to a given
number 100-000 and mentally subtract



10 or 100 from a given number 100-900.		
	NCTM Illuminations	
M 2 12	https://illuminations	
M.2.13	<u>nups://itumnations.</u>	
Explain why addition and subtraction	<u>nctm.org/</u>	
strategies work, using place value and	Illuminations is a	
the properties of operations.	project designed by	
Instructional Note: Explanations may	NCTM The site	
he supported by drawing or objects	includos lossons	
be supported by drawing of objects.	activities and	
	activities, and	
	computer applets.	
	Math Coach's Corner	
	Donna Boucher	
	http://www.mathcoac	
	hscorner com	
	This site is a blog by	
	an elementary	
	mathematics coach.	
	Her blog includes	
	mathematical	
	background on	
	concents as well as	
	mathematical tasks	
	mathematical tasks.	



## Measurement and Data

Standards	Teacher Understandings	Resources	Student Understandings
Standards Measure and estimate lengths in standard units. M.2.14 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. M.2.15 Measure the length of an object twice, using length units of different lengths for the two measurements, describe how the two measurements relate to	Teacher Understandings It is important for teachers to understand that neglecting any grade-level standards will leave gaps in students' skills and understandings. This will leave students unprepared for the challenges they face in later grades. Students use the Mathematical Habits of Mind to interact with the grade level content standards. The	Resources The following is a list of resources for teachers and students: Math TREE Online Education Resources A curated set of aligned, internet resources for WV elementary math teachers Quantile Teacher Assistant This teacher aligned in	<ul> <li>Student Understandings</li> <li>Students are able to measure length using standard tools to the whole unit.</li> <li>Students estimate lengths.</li> <li>Students measure length to compare the length of units.</li> <li>Students begin using the number line to solve addition and subtraction problems.</li> </ul>
the size of the unit chosen. M.2.16 Estimate lengths using units of inches, feet, centimeters, and meters.	teacher needs to craft instructional tasks that connect the Mathematical Habits of Mind to the content standards. Grade two students begin	This tool is aligned to WV standards and is designed to help educators locate resources that can support instruction and identify skills	<ul> <li>Students tell time to the nearest 5 minutes.</li> <li>Students solve problems related to money using dollars or cents.</li> </ul>
Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	using standard tools for measuring such as rulers, yardsticks and meter sticks. They need multiple experiences with tools using various standards of	most relevant to standards.	<ul> <li>Students use a line plot, bar graph, picture graph to represent data and answer questions based on the line plot.</li> </ul>
M.2.18 Use addition and subtraction within 100 to solve word problems involving	A connection should be made between the ruler and	<u>mathmatics.org</u> This website provides teachers with learning tasks that develop the	<ul> <li>Common Misconceptions</li> <li>Students may not make the connection</li> </ul>



lengths that are given in the same units	the number line. As students	WV College- and	between the ruler and
(e.g., by using drawings, such as	become familiar with a	Career-Readiness	the number line
drawings of rulers) and equations with	number line do not allow it	Standards for	- Students may use the
a symbol for the unknown number to	to become a tool for	Mathematics	• Students may use the
represent the problem	counting	supporting the	number line as a
	counting.	toochor's contont	counting tool and not
M 2 10	Problems related to monov	knowledge of	use their thinking skills
M.2.19	include numbers that are	Knowledge of	to solve problems.
Represent whole numbers as lengths	consistent with the Number	mathematics.	<ul> <li>Money is counter-</li> </ul>
from 0 on a number line diagram with	in Operations have Tan		intuitivo A nickol is
equally spaced points corresponding to	In Operations base Ten	Graham Fletcher Site G	larger then a dime but
the numbers 0, 1, 2 and represent	standards. Grade two	Fletchy	larger than a dime but
whole-number sums and differences	students will NOT work with	<u>http://www.gfletchy.c</u>	a dime is worth more.
within 100 on a number line diagram.	amounts represented as	om	
	decimals. Students in grade	This website includes	
Work with time and money.	two work with either dollars	learning progression	
M.2.20	or cents using the follow	videos related to	
Tell and write time from analog and	symbols: \$ or ¢. Students	counting, and 3-Act	
digital clocks to the nearest five	work with either dollars or	tasks that may be	
minutes, using a.m. and p.m.	cents but not both at the	connected to the WV	
	same time.	College- and Career-	
M.2.21		Readiness Standards	
Solve word problems involving dollar	A connection should be	for Mathematics.	
bills, quarters, dimes, nickels, and	made between the data		
pennies, using S and c symbols	standards and the standards	Inside Mathematics	
appropriately (e.g. If you have 2 dimes	in Number and Operations in	http://insidemathema	
and 3 pennies how many cents do you	Base Ten. Ask guestions like.	tics org	
have?)	"How many more? How	Inside Mathematics is	
	many less? or How many in	a nationally	
Poprosont and interpret data	all?"	rocognized multimodia	
Represent and interpret data.		website for educators	
M 2 22		website ior educators	
MI.Z.ZZ		This site includes	
Generate measurement data by		This site includes	
measuring lengths of several objects to		videos, learning tasks,	
the nearest whole unit or by making		and performance	
repeated measurements of the same		assessment tasks.	



object. Show the measurements by		
making a line plot, where the horizontal	NCTM Illuminations	
scale is marked off in whole-number	https://illuminations.	
units.	nctm.org/	
	Illuminations is a	
M 2 23	project designed by	
Draw a nicture granh and a har granh	NCTM The site	
(with single-unit scale) to represent a	includes lessons	
data set with up to four categories	activities and	
Solve simple put-together take-apart	computer applets	
and compare problems using	computer applets.	
information procented in a bar graph	Math Caach's Corner	
mormation presented in a bar graph.	Math Coach S Corner	
	Donna Boucher	
	<u>nttp://www.mathcoac</u>	
	<u>nscorner.com</u>	
	This site is a blog by	
	an elementary	
	mathematics coach.	
	Her blog includes	
	mathematical	
	background on	
	concepts as well as	
	mathematical tasks.	



# Geometry

Standards	Teacher Understandings	Resources	Student Understandings
Reason with shapes and their attributes. M.2.24 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring) Identify triangles	It is important for teachers to understand that neglecting any grade-level standards will leave gaps in students' skills and understandings. This will leave students unprepared for the challenges they face in later grades.	The following is a list of resources for teachers and students: <b>Math TREE Online Education Resources</b> A curated set of aligned, internet resources for WV elementary math	<ul> <li>Students will recognize and draw shapes based on identified attributes.</li> <li>Students will partition a rectangle into rows and columns of the same size.</li> <li>Students will partition</li> </ul>
M.2.25 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	Students use the <b>Mathematical Habits of Mind</b> to interact with the grade level content standards. The teacher needs to craft instructional tasks that connect the Mathematical Habits of Mind to the content standards.	teachers <u>Quantile Teacher</u> <u>Assistant</u> This tool is aligned to WV standards and is designed to help educators locate resources that can	<ul> <li>rectangles into two, three, or four equal shares.</li> <li>Students will use the vocabulary halves, thirds and fourths to describe the equal shares.</li> </ul>
Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	Partitioning a rectangle into rows and columns is providing the foundation for grade three standards related to multiplication. Partitioning circles and rectangles and using terms such as halves and thirds and describing the whole as	support instruction and identify skills most relevant to standards. Illustrative Mathematics http://www.illustrative mathmatics.org This website provides teachers with learning	<ul> <li>Students may believe that a rectangle divided into four unequal pieces is divided into fourths.</li> </ul>



two halves is providing the	tasks that develop the	
foundation for formal work	WV College- and	
with fractions in grade three.	Career-Readiness	
	Standards for	
	Mathematics,	
	supporting the	
	teacher's content	
	knowledge of	
	mathematics	
	Graham Eletcher Site G	
	Fletchy	
	http://www.gfletchy.c	
	om	
	This website includes	
	loarning progression	
	videos related to	
	videos related to	
	counting, and 3-Act	
	tasks that may be	
	connected to the WV	
	College- and Career-	
	Readiness Standards	
	for Mathematics.	
	Inside Mathematics	
	<u>http://insidemathema</u>	
	<u>tics.org</u>	
	Inside Mathematics is	
	a nationally	
	recognized multimedia	
	website for educators	
	around the world.	
	This site includes	
	videos, learning tasks,	



	and performance	
	assessment tasks.	
	NCTM Illuminations	
	https://illuminations.	
	nctm.org/	
	Illuminations is a	
	project designed by	
	NCTM The site	
	includes lessons	
	activities and	
	computer applete	
	computer applets.	
	Math Carabia Comor	
	Math Coach s Corner	
	Donna Boucner	
	http://www.mathcoac	
	hscorner.com	
	This site is a blog by	
	an elementary	
	mathematics coach.	
	Her blog includes	
	mathematical	
	background on	
	concepts as well as	
	mathematical tasks.	





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