

Grade 2 Mathematics Item Specifications



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Introduction

In 2014 Missouri legislators passed House Bill 1490, mandating the development of the Missouri Learning Expectations. In April of 2016, these Missouri Learning Expectations were adopted by the State Board of Education. Groups of Missouri educators from across the state collaborated to create the documents necessary to support the implementation of these expectations.

One of the documents developed is the item specification document, which includes all Missouri grade level/course expectations arranged by domains/strands. It defines what could be measured on a variety of assessments. The document serves as the foundation of the assessment development process.

Although teachers may use this document to provide clarity to the expectations, these specifications are intended for summative, benchmark, and large-scale assessment purposes.

Components of the item specifications include:

Expectation Unwrapped breaks down a list of clearly delineated content and skills the students are expected to know and be able to do upon mastery of the Expectation.

Depth of Knowledge (DOK) Ceiling indicates the highest level of cognitive complexity that would typically be assessed on a large scale assessment. The DOK ceiling is not intended to limit the complexity one might reach in classroom instruction.

Item Format indicates the types of items used in large scale assessment. For each expectation, the item format specifies the type best suited for that particular expectation.

Text Types suggests a broad list of text types for both literary and informational expectations. This list is not intended to be all inclusive: other text types may be used in the classroom setting. The expectations were written in grade level bands; for this reason, the progression of the expectations relies upon increasing levels of quantitative and qualitative text complexities.

Grade 2 Mathematics

Content Limits/Assessment Boundaries are parameters that item writers should consider when developing a large scale assessment. For example, some expectations should not be assessed on a large scale assessment but are better suited for local assessment.

Sample stems are examples that address the specific elements of each expectation and address varying DOK levels. The sample stems provided in this document are in no way intended to limit the depth and breadth of possible item stems. The expectation should be assessed in a variety of ways.

Grade 2 Mathematics

Mathematics		2.NBT.A.1
NBT A 1	<p>Number Sense and Operations in Base Ten</p> <p>Understand place value of three digit numbers</p> <p>Understand three-digit numbers are composed of hundreds, tens and ones.</p>	
<p style="text-align: center;"><u>Expectation Unwrapped</u></p> <p>The student will understand three-digit numbers are composed of hundreds (100, 200, 300 ...), tens (10, 20, 30 ...) and ones (0, 1, 2, 3 ...).</p> <p>The student will compose three digit numbers in multiple ways.</p> <p>The student will decompose three digit numbers in multiple ways.</p>		<p style="text-align: center;"><u>DOK Ceiling</u></p> <p style="text-align: center;">3</p> <hr/> <p style="text-align: center;"><u>Item Format</u></p> <p>Selected Response Constructed Response Technology Enhanced</p> <hr/> <p style="text-align: center;"><u>Sample Stems</u></p> <p>How many tens are in 120? (12)</p> <p>What number does each of the following expressions represent?</p> <ol style="list-style-type: none"> 1. 34 tens and 3 ones (343) 2. 3 hundreds, 3 tens and 13 ones (343) 3. 2 hundreds, 12 tens and 23 ones (343) <p>Show the value of 217 in two ways. (2 hundreds, 1 ten and 7 ones; 21 tens and 7 ones)</p> <p>Draw 142 using hundred flats, ten rods and units.</p> <p>Margaret has a favorite number. Her number has the digit 7 in the ones place, a 5 in the tens place and a 1 in the hundreds place. What is Margaret's favorite number? (157)</p>
<p style="text-align: center;"><u>Content Limits/Assessment Boundaries</u></p> <p>Three-digit numbers. Manipulatives should be used.</p>		<p style="text-align: center;"><u>Calculator Designation</u></p> <p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.NBT.A.2
NBT A 2	Number Sense and Operations in Base Ten Understand place value of three digit numbers Understand that 100 can be thought of as 10 tens – called a “hundred”.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 2
<p>The student will decompose one hundred into ten tens.</p> <p>The student will compose ten tens into one hundred called a “hundred”.</p>		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		<p>Laura has one hundred marbles. How many bags of ten marbles can she make?</p> <p>Braeden has ten boxes of crayons. Each box holds ten crayons. How many crayons does Braeden have?</p> <p>Colored pencils are sold in boxes of ten pencils. Mr. Ellis needs one hundred and forty pencils. He has forty pencils. How many boxes of ten pencils should he buy?</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Limited to three-digit numbers.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.NBT.A.3
NBT A 3	Number Sense and Operations in Base Ten Understand place value of three digit numbers Count within 1000 by 1s, 10s and 100s starting with any number.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will count forward within one thousand by ones starting with any number.</p> <p>The student will count forward within one thousand by tens starting with any number.</p> <p>The student will count forward within one thousand by one hundreds starting with any number.</p> <p>The student will count backward within one thousand by ones starting with any number.</p> <p>The student will count backward within one thousand by tens starting with any number.</p> <p>The student will count backward within one thousand by one hundreds starting with any number.</p>		2
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		Ask student to count: forward by ones starting with 452 (452, 452, 454...) forward by one hundreds starting with 337 (337, 437, 537...) backwards by ones starting with 754 (754, 753, 752...) backwards by tens starting with 551 (551, 541, 531...)
		Do the numbers show counting by tens? Yes or No 120, 130, 140, 150, 160 135, 235, 335, 435, 535
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Beginning at zero and not greater than one thousand.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.NBT.A.4
NBT A 4	<p>Number Sense and Operations in Base Ten</p> <p>Understand place value of three digit numbers</p> <p>Read and write numbers to 1000 using number names, base-ten numerals and expanded form.</p>	
<p style="text-align: center;"><u>Expectation Unwrapped</u></p> <p>The student will read the number name for any given number zero to one thousand.</p> <p>The student will read any number zero to one thousand given the base-ten numeral.</p> <p>The student will read any given number zero to one thousand expressed in expanded form.</p> <p>The student will write any given number zero to one thousand using number names.</p> <p>The student will write any given number zero to one thousand using base-ten numerals.</p> <p>The student will write any given number zero to one thousand using expanded form.</p>		<p style="text-align: center;"><u>DOK Ceiling</u></p> <p style="text-align: center;">2</p> <hr/> <p style="text-align: center;"><u>Item Format</u></p> <p>Selected Response Constructed Response Technology Enhanced</p> <hr/> <p style="text-align: center;"><u>Sample Stems</u></p> <p>It is 143 days until Shaun’s birthday. Write the number name for the days until his birthday. <i>(one hundred forty-three)</i></p> <p>Write 286 in expanded form. <i>(200 + 80 + 6)</i></p> <p>Write the number name (word form) for 286. <i>(two hundred eighty-six)</i></p> <p>Write two hundred eighty-six as a base ten-numeral. <i>(286)</i></p> <p>Mrs. Cannon has a box of 457 straws. Write the number of straws in expanded form. <i>(400 + 50 + 7)</i></p>
<p style="text-align: center;"><u>Content Limits/Assessment Boundaries</u></p> <p>Numbers beginning at zero and not greater than one thousand. For classroom purposes, use the terminology “base ten numerals” and “standard form” interchangeably. For classroom purposes, use the terminology “number names” and “word form” interchangeably. For assessment purposes, use the terminology of the expectation: “base ten numerals” and “number names”.</p>		<p style="text-align: center;"><u>Calculator Designation</u></p> <p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

NBT A 5	Number Sense and Operations in Base Ten Understand place value of three digit numbers Compare two three-digit numbers using the symbols $>$, $=$ or $<$.	
<p style="text-align: center;"><u>Expectation Unwrapped</u></p> <p>The student will compare two three-digit numbers based on the meaning (value) of the hundreds, tens and ones digits using the symbols $<$, $=$, or $>$.</p> <p>The student will use the meaning (value) of the hundreds, tens and ones digits to explain the comparison of two three-digit numbers.</p> <p>The student will record the results of comparison using the symbols $<$, $=$, or $>$.</p>		<p style="text-align: center;"><u>DOK Ceiling</u></p> <p style="text-align: center;">3</p> <hr/> <p style="text-align: center;"><u>Item Format</u></p> <p>Selected Response Constructed Response Technology Enhanced</p> <hr/> <p style="text-align: center;"><u>Sample Stems</u></p> <p>Use the symbols $<$, $=$, or $>$ to compare the numbers.</p> <p>257 _____ 432 649 _____ 533 399 _____ 399</p> <p>Is the comparison true? Yes or No</p> <p>343 < 314 718 > 680 129 < 131</p>
<p style="text-align: center;"><u>Content Limits/Assessment Boundaries</u></p> <p>Limited to two three-digit numbers</p>		<p style="text-align: center;"><u>Calculator Designation</u></p> <p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.NBT.B.6
NBT B 6	Number Sense and Operations in Base Ten Use place value understanding and properties of operations to add and subtract. Demonstrate fluency with addition and subtraction within 100.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
<p>The student will use multiple representations to model real-world and mathematic problems involving addition and subtraction within one hundred.</p> <p>The student will critique the reasoning of others, identifying errors and alternate approaches to solving problems involving addition and subtraction within one hundred.</p> <p>The student will decontextualize and contextualize problems and solutions to explain his or her reasoning in addition and subtraction problems within one hundred.</p> <p>The student will identify and explain patterns and the structure of the problems with specific focus on the properties of mathematics when solving problems involving addition and subtraction within one hundred.</p> <p>The student will communicate his or her reasoning precisely to problems involving addition and subtraction within one hundred.</p>		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		<p>Jeremy explained how he added $13 + 34 + 7$ He knew $13 = 10 + 3$ and $34 = 30 + 4$. So he adds $10 + 30$ to get 40. He then said to add the $3 + 4 + 7$ he would add $3 + 7$ and get another 10. So $40 + 10 = 50$ and the remaining 4 would make 54.</p> <p>Jane said she first added 13 and 7 to get 20. She then added 20 and 34 to get 54.</p> <p>Who is correct and why. Who do you think is more efficient and why?</p> <p>Linda said she knew that $54 - 34 = 20$ because $20 + 34 = 54$. Is she correct in her thinking? Why or why not?</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Sum and minuend not greater than one hundred.</p> <p>Students should be able to apply the understanding of compose/decompose a ten and the associative property but not be expected to name, label or identify.</p> <p>Student explanations of strategies used to add and subtract within one hundred should be assessed verbally.</p> <p>Fluency refers to accuracy and efficiency and does not equate to memorization.</p>		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.NBT.B.7
NBT B 7	<p>Number Sense and Operations in Base Ten</p> <p>Use place value understanding and properties of operations to add and subtract.</p> <p>Add up to four two-digit numbers.</p>	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will add up to four two-digit numbers using strategies based on place value.</p> <p>The student will add up to four two-digit numbers using the commutative and associative properties of operations.</p>		2
		<u>Item Format</u>
		<p>Selected Response Constructed Response Technology Enhanced</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Sample Stems</u>
<p>Four two-digit numbers, sum not greater than one hundred</p> <p>The students need not be assessed on the use of formal terms for these properties; however, the teacher should use the correct mathematical vocabulary in class.</p>		<p>Melody practiced the piano on four days this week for twenty-five minutes, seventeen minutes, fifteen minutes and twenty-three minutes. Write an equation to show the number of minutes Melody practiced the piano.</p> <p>(Possible equations include $25+17+15+23 = 80$ or $25+15+17+23 = 80$)</p>
		<u>Calculator Designation</u>
		<p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.NBT.B.8
NBT B 8	<p>Number Sense and Operations in Base Ten</p> <p>Use place value understanding and properties of operations to add and subtract.</p> <p>Add or subtract within 1000, and justify the solution.</p>	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
<p>The student will add within one thousand.</p> <p>The student will justify the sum using concrete models and drawings.</p> <p>The student will justify the sum using strategies based on place value understanding.</p> <p>The student will subtract within one thousand.</p> <p>The student will justify the difference using concrete models and drawings.</p> <p>The student will justify the difference using strategies based on place value understanding.</p> <p>Another possible sample stem: Use the numbers 2, 5 and 6 to solve the problem.</p> $\begin{array}{r} 399 \\ + 2\boxed{}3 \\ \hline \boxed{}5\boxed{} \end{array}$ <p>Explain how you solved the problem.</p>		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u> The school ordered 136 blue shirts and 152 red shirts. How many shirts were ordered? 136 -> 100 + 30 + 6 <u>152</u> -> <u>100</u> + 50 + 2 Nancy collected 317 box tops. Margie collected one hundred fewer box tops than Nancy. Sally collected ten fewer box tops than Margie. How many box tops did Sally collect?
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Sum and minuend cannot be greater than one thousand. Concrete models and/or drawings should be used as appropriate for initial development of concepts.</p>		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.NBT.B.9
NBT B 9	<p>Number Sense and Operations in Base Ten</p> <p>Use place value understanding and properties of operations to add and subtract.</p> <p>Use the relationship between addition and subtraction to solve problems.</p>	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will use the relationship between addition and subtraction to solve problems.</p> <p>The student will use addition to solve problems that involve subtraction.</p>		2
		<u>Item Format</u>
		<p>Selected Response Constructed Response Technology Enhanced</p>
		<u>Sample Stems</u>
		<p>If Kurt had forty seven video games and sold some of them, and now had thirty five. How many did Kurt sell?</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Sum not greater than one thousand.</p> <p>Students will not be required or encouraged to use equation solving techniques (Addition/Subtraction property of equality). The focus will be on the relationships between the terms of equations involving addition or subtraction.</p> <p>Problem context should focus on the following structures: $A - \square = B$ and $\square + C = D$.</p>		<p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.NBT.B.10
NBT B 10	<p>Number Sense and Operations in Base Ten</p> <p>Use place value understanding and properties of operations to add and subtract.</p> <p>Add or subtract mentally 10 or 100 to or from a given number within one thousand.</p>	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will mentally add ten to a given number within one thousand.</p> <p>The student will mentally subtract ten from a given number within one thousand.</p> <p>The student will mentally add one hundred to a given number within one thousand.</p> <p>The student will mentally subtract one hundred from a given number within one thousand.</p>		3
		<u>Item Format</u>
		<p>Selected Response</p> <p>Constructed Response</p> <p>Technology Enhanced</p>
		<u>Sample Stems</u>
		<p>What is ten more than 564? (574)</p> <p>What is $564 - 10$? (554)</p> <p>What is $344 + 100$? (444)</p> <p>What is 100 less than 344? (244)</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Sum and minuend cannot be greater than one thousand		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.NBT.C.11
NBT C 11	<p>Number Sense and Operations in Base Ten</p> <p>Represent and solve problems involving addition and subtraction</p> <p>Write and solve problems involving addition and subtraction within 100.</p>	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will write (e.g., represent) problems involving addition within one hundred.</p> <p>The student will solve problems involving addition within one hundred.</p> <p>The student will write (e.g., represent) problems involving subtraction within one hundred.</p> <p>The student will solve problems involving subtraction within one hundred.</p> <p>The student will write (e.g., represent) and solve problems involving addition and subtraction within one hundred to solve one-step problems with unknowns in all positions.</p> <p>The student will use drawing and/or equations with a symbol for the unknown number in all positions.</p>		3
		<u>Item Format</u>
		<p>Selected Response</p> <p>Constructed Response</p> <p>Technology Enhanced</p>
		<u>Sample Stems</u>
		<p>Jay picked 41 apples on Friday. He picked some more apples on Saturday. Jay now has 76 apples. How many apples did Jay pick on Saturday? Write an equation and solve.</p> <p>Possible solution</p> $41 + \square = 76$
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Sum and minuend cannot be greater than one hundred.</p> <p>One unknown.</p> <p>One-step problems.</p> <p>Unknowns in all positions include $4 + n = 7$, $n + 3 = 7$, $4 + 3 = n$, $7 - n = 4$, $n - 3 = 7$, $4 - 3 = n$.</p> <p>Symbol used should be a \square.</p>		<p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.RA.A.1
RA A 1	Relationships and Algebraic Thinking Add and subtract within 20 Demonstrate fluency with addition and subtraction within 20.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will use multiple representations to model real-world and mathematic problems involving addition and subtraction within twenty.</p> <p>The student will critique the reasoning of others, identifying errors and alternate approaches to solving problems involving addition and subtraction within twenty.</p> <p>The student will decontextualize and contextualize problems and solutions to explain his or her reasoning in addition and subtraction problems within twenty.</p> <p>The student will identify and explain patterns and the structure of the problems with specific focus on the properties of mathematics when solving problems involving addition and subtraction within twenty.</p> <p>The student will communicate his or her reasoning precisely to problems involving addition and subtraction within twenty.</p>		1
		<u>Item Format</u>
		<u>Sample Stems</u>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Sum and minuend cannot be greater than twenty. While automaticity for basic facts is desired, quick use of mental strategies may suffice. Fluency refers to accuracy and efficiency and does not equate to memorization.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.RA.B.2.a																				
RA	Relationships and Algebraic Thinking																					
B	Develop foundations for multiplication and division.																					
2	Determine if a set of objects has an odd or even number of members.																					
a	Count by 2s to 100 starting with any even number.																					
<p style="text-align: center;"><u>Expectation Unwrapped</u></p> <p>The student will determine if a set of objects has an odd or even number of members.</p> <p>The student will count by twos to one hundred starting with any even number.</p>		<p style="text-align: center;"><u>DOK Ceiling</u></p> <p style="text-align: center;">1</p> <hr/> <p style="text-align: center;"><u>Item Format</u></p> <p>Selected Response Constructed Response Technology Enhanced</p> <hr/> <p style="text-align: center;"><u>Sample Stems</u></p> <p>Does the ten frame show an even or an odd number?</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td><td>x</td><td>x</td><td>x</td><td>x</td> </tr> <tr> <td>x</td><td>x</td><td></td><td></td><td></td> </tr> </table> <p style="text-align: right;"><i>(odd)</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td><td>x</td><td>x</td><td></td><td></td> </tr> <tr> <td>x</td><td>x</td><td>x</td><td></td><td></td> </tr> </table> <p style="text-align: right;"><i>(even)</i></p> <p>Circle the set of numbers that show counting by 2s.</p> <p style="margin-left: 40px;">34, 36, 38, 40, 42</p> <p style="margin-left: 40px;">52, 62, 72, 82, 92</p>	x	x	x	x	x	x	x				x	x	x			x	x	x		
x	x	x	x	x																		
x	x																					
x	x	x																				
x	x	x																				
<p style="text-align: center;"><u>Content Limits/Assessment Boundaries</u></p> <p>Counting by twos to no greater than one hundred. Can be assessed verbally or non-verbally. It is understood that the formal definition of even will not be used at this grade level.</p>		<p style="text-align: center;"><u>Calculator Designation</u></p> <p>NO – a calculator will not be available for items</p>																				

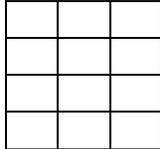
Grade 2 Mathematics

Mathematics		2.RA.B.2.b
RA	Relationships and Algebraic Thinking	
B	Develop foundations for multiplication and division.	
2	Determine if a set of objects has an odd or even number of members.	
b	Express even numbers as pairings/groups of 2, and write an expression to represent the number using addends of 2.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will determine if a set of objects has an odd or even number of members.</p> <p>The student will express even numbers as pairings/groups of two.</p> <p>The student will write an expression to represent the number using addends of two.</p>		1
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		<p>Show that eight is an even number. <i>(Student draws 8 objects and pairs them by circling groups of 2.)</i></p> <p>Write an expression to match your drawing using addends of two. <i>(2 + 2 + 2 + 2)</i></p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
A sum no greater than one hundred.		NO – a calculator will not be available for items

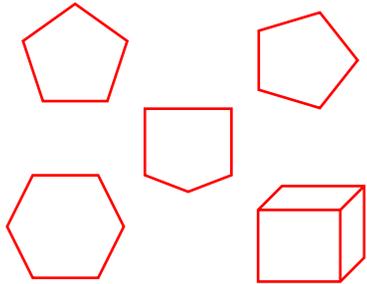
Grade 2 Mathematics

Mathematics		2.RA.B.2.c
RA	Relationships and Algebraic Thinking	
B	Develop foundations for multiplication and division.	
2	Determine if a set of objects has an odd or even number of members.	
c	Express even numbers as being composed of equal groups and write an expression to represent the number with 2 equal addends.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
The student will determine if a set of objects has an odd or even number of members.		3
The student will express even numbers as being composed of two equal groups.		<u>Item Format</u>
The student will write an expression to represent an even number with two equal addends.		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		How would you divide six objects into two equal groups? <i>(Student represents 6 objects and models putting them into 2 groups of 3.)</i>
		What is the expression that represents the two equal groups? <i>(3 + 3)</i>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Equal addends with a sum not greater than one hundred.		NO – a calculator will not be available for items

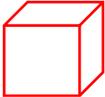
Grade 2 Mathematics

Mathematics		2.RA.B.3
RA B 3	Relationships and Algebraic Thinking Develop foundations for multiplication and division. Find the total number of objects arranged in a rectangular array with up to 5 rows and 5 columns, and write an equation to represent the total as a sum of equal addends.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
<p>The student will find the total number of objects arranged in a rectangular array with up to five rows and five columns.</p> <p>The student will write an equation to represent the total number of objects in a rectangular array with up to five rows and five columns as a sum of equal addends.</p>		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u> <p>Write an equation to represent the total number of squares as a sum of equal addends.</p> <div style="text-align: center;">  </div> <p>(Student answers 3+3+3+3 or 4+4+4)</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Up to five rows and five columns. Students need not be assessed on their ability to differentiate between a row and a column. Solutions to a 3 X 4 array may be 4 + 4 + 4 and/or 3 + 3 + 3 + 3.</p>		<p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.GM.A.1.a
GM	Geometry and Measurement	
A	Reason with shapes and their attributes.	
1	Recognize and draw shapes having specified attributes, such as a given number of angles or sides.	
a	Identify triangles, quadrilaterals, pentagons, hexagons, circles and cubes.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
The student will identify triangles in different orientations.		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
The student will identify quadrilaterals in different orientations.		
The student will identify pentagons in different orientations.		
The student will identify hexagons in different orientations.		
The student will identify circles.		
The student will identify cubes.		
The student will draw shapes when given specified attributes such as sides and angles.		
		<u>Sample Stems</u>
		<p>Color the pentagons blue.</p>  <p>Draw a two-dimensional shape that has four sides and four angles.</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Triangles, quadrilaterals, pentagons, hexagons, circles and cubes.</p> <p>Cube is the only three-dimensional shape to identify and should not be expected to be drawn.</p> <p>Students are expected to apply their learning from K.GM.C.6, K.GM.C.8 and 1.GM.A.2 to support their learning with this expectation.</p> <p>When discussing two-dimensional shapes, the teacher should use the term angles. When discussing three-dimensional shapes, the teacher should use the term vertices.</p>		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.A.1.b
GM	Geometry and Measurement	
A	Reason with shapes and their attributes.	
1	Recognize and draw shapes having specified attributes, such as a given number of angles or sides.	
b	Identify the faces of three-dimensional objects.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will understand that three-dimensional objects have two-dimensional faces.</p> <p>The student will identify the shapes of those faces.</p> <p>The student will draw a face of a three-dimensional figure</p>		3
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		What shape is the face of a pyramid? <i>(triangle)</i> How many faces does a cube have? <i>(6)</i>
		
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Students are not being assessed on three-dimensional shape identification. Face of a pyramid or prism.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.A.2
GM A 2	Geometry and Measurement Reason with shapes and their attributes. Partition a rectangle into rows and columns of same-size squares and count to find the total number of squares.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
The student will partition (divide) a rectangle into rows and columns of same-sized squares. The student will count to find the total number of squares.		3
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		(<i>Provide a 2 cm x 3 cm rectangle</i>) Ask the student to measure the sides of the rectangle in centimeters. Instruct them to draw rows and columns of the same-sized squares. (<i>2 rows and 3 columns</i>)
		
		What is the total number of squares? (6)
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Rectangles including squares. The student will understand partition is the same as divide. The differentiation between rows and columns for instructional purposes by the teacher is encouraged but not expected to be assessed.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.A.3.a
GM	Geometry and Measurement	
A	Reason with shapes and their attributes.	
3	Partition circles and rectangles into two, three or four equal shares, and describe the shares and the whole.	
a	Demonstrate that equal shares of identical wholes need not have the same shape.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
The student will partition (divide) circles and rectangles into two, three or four equal shares.		3
The student will describe the shares using the words halves, thirds, half of, a third of, etc.		<u>Item Format</u>
The student will describe the whole as two halves, three thirds or four fourths.		Selected Response Constructed Response Technology Enhanced
The student will demonstrate that equal shares of identical wholes need not have the same shape.		<u>Sample Stems</u>
		Cooper cut his sandwich in half vertically.
		
		Wyatt cut his sandwich in half diagonally.
		
		Do both boys have the same amount? Explain why or why not.
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Limit shapes to circles and rectangles. Two, three and four equal shares. The student will understand partition is the same as divide.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.B.4
GM B 4	Geometry and Measurement Measure and estimate lengths in standard units. Measure the length of an object by selecting and using appropriate tools.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
The student will know the customary units of measurement (inches, feet and yards) and metric units of measurement (centimeters, meters). The student will know the customary units of measurement (inches, feet and yards) of a yardstick. The student will know the metric units of measurement (centimeters, meter) of a meter stick. The student will select an appropriate tool such as rulers, yardsticks, meter sticks and measuring tapes, to measure length. The student will use tools such as rulers, yardsticks, meter sticks and measuring tapes, to measure length. The student will measure the length of an object.		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u> What would be an appropriate tool to use to measure a pencil? (<i>ruler</i>) How many inches long is the pencil? (<i>Use a ruler marked in inches and select a pencil that measures a whole number of inches.</i>) What would be an appropriate tool to use to measure a baseball bat? (<i>meter stick or yardstick</i>) How long is the baseball bat in centimeters? (<i>Use a meter stick marked in centimeters only</i>)
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u> NO – a calculator will not be available for items
Whole number units only on the measuring device. Inches, feet, yards, centimeters and meters. The student is selecting the tool not the appropriate unit. This is the introduction to standard units of measurement. First grade has used only non-standard. Standard units of measurement for the customary system include inches, feet and yards. Standard units of measurement for the metric system include centimeters and meters. For instructional purposes units should be identified as belonging to the customary or metric system but not expected to be assessed.		

Grade 2 Mathematics

Mathematics		2.GM.B.5
GM B 5	Geometry and Measurement Measure and estimate lengths in standard units. Analyze the results of measuring the same object with different units.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
<p>The student will measure the same object with different units.</p> <p>The student will analyze the results of measuring the same object with different units.</p> <p>The student will recognize that the size of the measurement unit used is related to the number of units needed to measure the object. When larger units are used, fewer of the units will be used to measure the objects.</p>		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u> Measure your pencil in inches. Measure your pencil in centimeters. How are the measurements alike or different? (<i>inches are bigger so the number is less</i>) When given a piece of ribbon one yard long ask: Measure the ribbon in feet. Measure the ribbon in inches. How are the measurements alike or different?
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Whole number units only on the measuring device. Inches, feet, yards, centimeters and meters.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.B.6
GM B 6	Geometry and Measurement Measure and estimate lengths in standard units. Estimate lengths using units of inches, feet, yards, centimeters and meters.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
The student will estimate lengths using units of inches. The student will estimate lengths using units of feet. The student will estimate lengths using units of yards. The student will estimate lengths using units of centimeters. The student will estimate lengths using units of meters.		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u> About how many inches long is toothbrush? About how many centimeters long is a dollar bill? Is a jump rope about 12 inches long or 12 feet long? About how many meters long is a golf club?
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Whole number units only. Inches, feet, yards, centimeters and meters. The student may be expected to select the tool but not the appropriate unit.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.B.7
GM B 7	Geometry and Measurement Measure and estimate lengths in standard units. Measure to determine how much longer one object is than another.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 2
The student will measure two objects using customary or metric units of measurement. The student will determine how much longer one object is than another, expressing the length difference in terms of customary or metric units of length.		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u> Find something in the classroom that measures about a foot. Find something in the classroom that measures about 4 feet. How much longer is one object than the other? About how many centimeters long is your math book? About how many centimeters long is your pencil? How much longer is one object than the other?
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Whole number units only on the measuring device. Inches, feet, yards, centimeters and meters. Limited to two objects.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.C.8
GM	Geometry and Measurement	
C	Relate addition and subtraction to length.	
8	Use addition and subtraction within 100 to solve problems involving lengths that are given in the same units.	
<p style="text-align: center;"><u>Expectation Unwrapped</u></p> <p>The student will solve problems involving addition within one hundred to solve problems involving lengths that are given in the same units.</p> <p>The student will solve problems involving subtraction within one hundred to solve problems involving lengths that are given in the same units.</p> <p>The student will use drawings and/or equations to solve problems.</p>		<p style="text-align: center;"><u>DOK Ceiling</u></p> <p style="text-align: center;">3</p> <hr/> <p style="text-align: center;"><u>Item Format</u></p> <p>Selected Response Constructed Response Technology Enhanced</p> <hr/> <p style="text-align: center;"><u>Sample Stems</u></p> <p>Mr. Ellis puts a fence around his garden. The garden has three sides. One side is 12 feet long. The second side is 15 feet long. And the third side is 9 feet long. How many feet of fencing does Mr. Ellis use? (36)</p> <p>Clay has a piece of string that is 35 inches long. He cuts off a piece of string to tie around a post. Clay's ribbon is now 7 inches long. How many inches of string did Clay use to tie around the post? Write an equation using a <input type="text"/> for the missing number. Then solve. (35 - <input type="text"/> = 7)</p>
<p style="text-align: center;"><u>Content Limits/Assessment Boundaries</u></p> <p>Sum and minuend cannot be greater than one hundred. Units are the same within the problem. Whole number units only on the measuring device. Inches, feet, yards, centimeters and meters. Unknowns in all positions include $4 + n = 7$, $n + 3 = 7$, $4 + 3 = n$, $7 - n = 4$, $n - 3 = 7$, $4 - 3 = n$. Symbol used should be a <input type="text"/>.</p>		<p style="text-align: center;"><u>Calculator Designation</u></p> <p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.GM.C.9
GM C 9	Geometry and Measurement Relate addition and subtraction to length. Represent whole numbers as lengths on a number line, and represent whole-number sums and differences within 100 on a number line.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 2
<p>The student will represent whole numbers as lengths on a number line.</p> <p>The student will represent whole number sums within one hundred using a different number line for each addend and show how both number lines represent the sum.</p> <p>The student will represent whole number differences within one hundred using a different number line for the minuend and the subtrahend, and show how both number lines represent the difference.</p> <p>The student will represent whole number sums within one hundred on a single number line.</p> <p>The student will represent whole number differences within one hundred on a single number line.</p>		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		<p>Show how you would represent 5 inches on a number line.</p> <p>Using one number line show that measurements of 2 inches plus 3 inches equals 5 inches.</p> <p>Using one number line show that the difference between a piece of ribbon measuring 7 inches long and a piece of ribbon 5 inches long is 2 inches.</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Sums and minuend cannot be greater than one hundred. Limited to whole numbers.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.D.10
GM	Geometry and Measurement	
D	Work with time and money.	
10	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will tell time from a digital clock to the nearest five minutes, using a.m. and p.m. when given a scenario.</p> <p>The student will tell time from an analog clock to the nearest five minutes, using a.m. and p.m. when given a scenario.</p> <p>The student will write time from a digital clock to nearest five minutes, using a.m. and p.m. when given a scenario.</p> <p>The student will write time from an analog clock to the nearest five minutes, using a.m. and p.m. when given a scenario.</p>		3
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		<p><i>Student is shown a clock with a time appropriate for the time a student would get on a bus to come to school.</i></p> <p>The clock shows what time Lisa gets on the bus to come to school. What time does Lisa get on the bus to come to school?</p> <p>Is it a.m. or p.m.?</p> <p>Explain how you know.</p> <p><i>(e.g., 7:30 a.m. because it is in the morning)</i></p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Time to the nearest five minutes. The student is expected to write answers involving time correctly from a scenario without being prompted a.m. or p.m. The student will correctly use the colon.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.D.11
GM D 11	Geometry and Measurement Work with time and money. Describe a time shown on a digital clock as representing hours and minutes, and relate a time shown on a digital clock to the same time on an analog clock.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
The student will describe a time shown on a digital clock as representing hours and minutes, to the nearest five minutes.		<u>Item Format</u>
The student will describe a time shown on an analog clock as representing hours and minutes, to the nearest five minutes.		Selected Response Constructed Response Technology Enhanced
The student will relate a time shown on a digital clock to the same time on an analog clock.		<u>Sample Stems</u>
		How many hours and how many minutes are represented by the time shown on the digital clock?
		<div style="border: 2px solid red; padding: 5px; display: inline-block;">9 : 25</div>
		Given an analog clock face ask student to show the same time on the clock face.
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Time to the nearest five minutes.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.D.12
GM D 12	Geometry and Measurement Work with time and money. Find the value of combinations of dollar bills, quarters, dimes, nickels and pennies, using \$ and ¢ appropriately.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will be able to represent 100¢ as \$1 in multiple ways.</p> <p>The student will find and represent the value of multiples of the same coin using the ¢ symbol.</p> <p>The student will find and represent the value of combinations of any two different types of coins using the ¢ symbol.</p> <p>The student will find and represent the value of multiples of the same dollar using the \$ symbol.</p> <p>The student will find and represent the value of combinations of any two different types of bills using the \$ symbol.</p> <p>The student will find and represent the value of combinations of dollar bills, quarters, dimes, nickels and pennies, using \$ and ¢ symbols appropriately.</p>		3
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		Four quarters equal how many cents? (100¢) How many dollars is that? (\$1) How much is $5¢ + 5¢ + 5¢ + 5¢ + 5¢$ (25¢) What is the value of 3 dimes plus 2 nickels? ($10¢ + 10¢ + 10¢ + 5¢ + 5¢ = 40¢$) How many one-dollar bills equal a five-dollar bill? (5) What is the value of 3 one-dollar bills and 2 ten dollar bills? ($\$1 + \$1 + \$1 + \$10 + \$10 = \23)
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Quarters, dimes, nickels and pennies not to total more than 100¢ or \$1. One, five and ten dollar bills not to total more than \$100.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.GM.D.13
GM D 13	Geometry and Measurement Work with time and money. Find combinations of coins that equal a given amount.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
The student will find a combination of coins that equal a given amount. The student will find multiple combinations of coins that equal a given amount.		2
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		What combination of coins equals 50¢? (Possible answers: 2 quarters; five dimes; ten nickels; 1 quarter, 2 dimes and 1 nickel, etc.)
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Limited to 100¢ or less. Quarters, dimes, nickels and pennies.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.DS.A.1
DS A 1	<p>Data and Statistics</p> <p>Represent and interpret data</p> <p>Create a line plot to represent a set of numeric data, given a horizontal scale marked in whole numbers.</p>	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will create a line plot on a given horizontal scale marked in whole numbers to represent a set of numeric data.</p>		3
		<u>Item Format</u>
		<p>Selected Response Constructed Response Technology Enhanced</p>
		<u>Sample Stems</u>
		<p>Provide the students with a line plot where the horizontal scale is marked off in whole-number units and ask: Create a line plot to show the lengths of Drew’s colored pencils. Red pencil - 3 inches Blue pencil - 4 inches Green pencil – 5 inches Yellow pencil – 7 inches Orange pencil – 5 inches Purple pencil – 4 inches Pink pencil – 7 inches Brown pencil – 5 inches Black pencil – 5 inches</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Horizontal number line is given and marked in whole numbers (scale is one only). Each data marker (dot, etc.) must represent one and only one piece of data. Up to four categories and twenty discrete data values. Line plot and dot plot may be used interchangeably. For assessment purposes use line plot. This should not be confused with line graphs which are introduced at grade five.</p>		<p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics		2.DS.A.2
DS A 2	<p>Data and Statistics</p> <p>Represent and interpret data</p> <p>Generate measurement data to the nearest whole unit, and display the data in a line plot.</p>	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will generate measurement data by measuring lengths of several related objects to the nearest whole unit.</p> <p>The student will make multiple measurements of the same object to the nearest whole unit.</p> <p>The student will construct a complete line plot (number line, scale, axis label and title) that will display the measurement data.</p> <p>The student will display measurements data on a line plot.</p>		3
		<u>Item Format</u>
		<p>Selected Response Constructed Response Technology Enhanced</p>
		<u>Sample Stems</u>
		<p>Ask students to measure the length of their shoe to the nearest inch.</p> <p>Ask them to measure the length of their math book to the nearest inch. Ask students to report out each measurement. Teacher records the data.</p> <p>Provide the students with a line plot where the horizontal scale is marked off in whole-number units and ask: Display the recorded data on the line plot.</p>
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
<p>Horizontal number line is given and marked in whole numbers (scale is one only).</p> <p>Each data marker (dot, etc.) must represent one and only one piece of data.</p> <p>The number of data points on the assessments should be limited to ten.</p> <p>Line plot and dot plot may be used interchangeably. For assessment purposes use line plot. This should not be confused with line graphs which are introduced at grade five.</p>		<p>NO – a calculator will not be available for items</p>

Grade 2 Mathematics

Mathematics

2.DS.A.3

DS
A
3 **Data and Statistics**
Represent and interpret data
Draw a picture graph or a bar graph to represent a data set with up to four categories.

Expectation Unwrapped

The student will construct a picture graph (number line, scale, axis label and title) to display given or collected data.

The student will display data in a picture graph.

The student will construct a bar graph (intersecting number lines, axes labels and title) to display given or collected data.

The student will display data in a bar graph.

DOK Ceiling

3

Item Format

Selected Response
Constructed Response
Technology Enhanced

Sample Stems

Use the tally chart to draw a picture graph. Draw a ☺ to represent each child's choice.

Use the same data to draw a bar graph.

Favorite Pet	
dog	IIII
cat	III
rabbit	II
hamster	III

Content Limits/Assessment Boundaries

All given graphs should be oriented horizontally but students may choose to display vertically.
Up to four categories and twenty discrete data values.
The scale of the axis or axes will be limited to one.
The pictures of a picture graph will be a scale of one.
It should not be assumed that the reader will know what the picture represents in the picture graph.
These must be labeled as well (e.g., a picture of an apple should also have an axis labeled with "apple(s)")

Calculator Designation

NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.DS.A.4
DS A 4	Data and Statistics Represent and interpret data Solve problems using information presented in line plots, picture graphs and bar graphs.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u>
<p>The student will solve addition and subtraction problems using information presented in line plots.</p> <p>The student will solve addition and subtraction problems using information presented in picture graphs.</p> <p>The student will solve addition and subtraction problems using information presented in bar graphs.</p>		3
		<u>Item Format</u>
		Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u>
		Given a line plot or graph that supports the following question, student is able to answer: How many more children like bananas than oranges?
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Line plots, picture graphs and bar graphs. Up to four categories and twenty discrete data values. The scale of the axis or axes will be limited to one. The pictures of a picture graph will be a scale of one.		NO – a calculator will not be available for items

Grade 2 Mathematics

Mathematics		2.DS.A.5
DS A 5	Data and Statistics Represent and interpret data Draw conclusions from line plots, picture graphs and bar graphs.	
<u>Expectation Unwrapped</u>		<u>DOK Ceiling</u> 3
The student will draw conclusions from line plots. The student will draw conclusions from picture graph. The student will draw conclusions from bar graphs.		<u>Item Format</u> Selected Response Constructed Response Technology Enhanced
		<u>Sample Stems</u> Given a line plot or graph that supports the following questions, student is able to answer: How many students voted for their favorite fruit? How many voted for bananas? Which fruit was liked the least? The student compares data from two bar graphs taken a month apart on spelling test scores. What information supports the claim that students are improving? What information does not support the claim?
<u>Content Limits/Assessment Boundaries</u>		<u>Calculator Designation</u>
Line plots, picture graphs and bar graphs. Up to four categories and twenty discrete data values. The scale of the axis or axes will be limited to one. The pictures of a picture graph will be a scale of one.		NO – a calculator will not be available for items