Overview of Pre-Kindergarten Standards as Aligned to Modules

Unit	Standards

Module 1:
Analyze, Sort, Classify, and Count up to 5
	PK.CC 1 Count to 20.
	
	PK.CC 2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).
	
	PK.CC 3 Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
	   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	   a. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	   c. Understand that each successive number name refers to a quantity that is one larger.
	
	PK.CC 4 Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or as many as 5 things in a scattered configuration; given a number from 1–10, count out that many objects.
	
	PK.CC 5 Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies.[1]
	
	PK.CC 6 Identify "first" and "last" related to order or position.
	
	PK.MD 2 Sort objects into categories; count the numbers of objects in each category. [2]

Module 2:
Count and Answer "How Many" Questions up to 10
	PK.CC 1 Count to 20.
	
	PK.CC 2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).
	
	PK.CC 3 Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
	   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	   b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	   c. Understand that each successive number name refers to a quantity that is one larger.
	
	PK.CC 4 Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or as many as 5 things in a scattered configuration; given a number from 1–10, count out that many objects.

---

[1] *Up to 5 objects.*

[2] *Limit category counts to be less than or equal to 10.*

	PK.CC 5 Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies.[3] PK.CC 6 Identify "first" and "last" related to order or position. PK.OA 1 Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., If we have 3 apples and add two more, how many apples do we have all together?) PK.MD 2 Sort objects into categories; count the numbers of objects in each category. [4]

Module 3:
 Analyze, Compare,
 Create, and Compose
 Shapes
	PK.CC 1 Count to 20.
	
	 PK.CC 2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).
	
	 PK.CC 3 Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
	   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	   b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	   c. Understand that each successive number name refers to a quantity that is one larger.
	
	 PK.MD 2 Sort objects into categories; count the numbers of objects in each category. [5]
	
	 PK.G 1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as top, bottom, up, down, in front of, behind, over, under, and next to.
	
	 PK.G 2 Correctly name shapes regardless of size.
	
	 PK. G 3 Analyze, compare, and sort two- and three-dimensional shapes and objects, in different sizes, using informal language to describe their similarities, differences, and other attributes (e.g., color, size, and shape).
	
	 PK.G 4 Create and build shapes from components (e.g., sticks and clay balls).

---

[3] *Up to 5 objects.*

[4] *Limit category counts to be less than or equal to 10.*

[5] *Limit category counts to be less than or equal to 10.*

Module 4:
Describe and Compare Length, Weight, and Capacity
	PK.CC 1 Count to 20.
	
	PK.CC 2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).
	
	PK.CC 3 Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
	   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	   b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	   c. Understand that each successive number name refers to a quantity that is one larger.
	
	PK.MD 1 Identify measurable attributes of objects, such as length, and weight. Describe them using correct vocabulary (e.g., small, big, short, tall, empty, full, heavy, and light).
	
	PK.MD 2 Sort objects into categories; count the numbers of objects in each category. [6]

Module 5:
Write and Compare Numbers to 5. Count to 20.
	PK.CC 1 Count to 20.
	
	PK.CC 2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).
	
	PK.CC 3 Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
	   b. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	   c. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	   c. Understand that each successive number name refers to a quantity that is one larger.
	
	PK.CC 4 Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or as many as 5 things in a scattered configuration; given a number from 1–10, count out that many objects.
	
	PK.CC 5 Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies.[7]
	
	PK.CC 6 Identify "first" and "last" related to order or position.
	
	PK.OA 1 Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., If we have 3 apples and add two more, how many apples do we have all together?).
	
	PK.OA 2 Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects

---

[6] *Limit category counts to be less than or equal to 10.*

[7] *Up to 5 objects.*

Overview of Kindergarten Standards as Aligned to Modules

Unit	Standards

Module 1:
Classify and Count
Numbers to 10
	KCC 1 Count to 100 by ones and by tens.
	
	KCC 5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.
	
	KCC 3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). [8]
	
	K.MD 3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
	
	K.CC 4: Understand the relationship between numbers and quantities; connect counting to cardinality.
	    a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one & only one object.
	    b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	    c. Understand that each successive number name refers to a quantity that is one larger.

Module 2: **Identify and Describe** **Shapes**	K.G 1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, & *next to*. K.G 2 Correctly name shapes regardless of their orientations or overall size. K.G 3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").
Module 3: **Comparison with** **Length, Weight and** **Numbers to 10**	K.MD 1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.MD 2 Directly compare two objects with a measurable attribute in common to see which object has "more of"/"less of" the attribute & describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.* K.CC 6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. K.CC 7 Compare two numbers between 1 and 10 presented as written numerals. [9]

---

[8] *Only the for numbers 1-10.*

[9] At the concrete and pictorial level only.

▌▌▌ COMMON CORE

Module 4: **Number Pairs, Addition and Subtraction of Numbers to 10**	K.CC 7 Compare two numbers between 1 and 10 presented as written numerals. K.OA 1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. K.OA 5 Fluently add and subtract within 5. K.OA 2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem. K.OA 3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g. 5 = 2 + 3 and 5 = 4 + 1). K.OA 4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
Modules 5: **Numbers 10-20, Counting to 100 by 1 and 10**	KCC 1 Count to 100 by ones and by tens. KCC 5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects. KCC 3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). K.NBT 1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two three, four, five, six, seven, eight or nine ones. KCC 2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
Module 6: **Analyze, Compare, Create, and Compose Shapes**	K.G 4 Analyze & compare two & three dimensional shapes, in different sizes & orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length). K.G 5 Model shapes in the world by building shapes from components (e.g., sticks & clay balls) & drawing shapes. K.G 6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?*

▌▌ COMMON CORE

Overview of Grade 1 Standards as Aligned to Modules

Unit	Standards
Module 1: Addition, Subtraction of Numbers to 10 and Fluency	1.OA 7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 − 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2 1.OA 5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2). 1.OA 3 Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, s o 2 + 6 + 4 = 2 + 10 = 12.*[10] *(Associative property of addition.)* 1.OA 4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 − 8 by finding the number that makes 10 when added to 8. Add and subtract within 20.* 1.OA 6 Add and subtract within *20*, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g. 8 + 6= 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 − 4 = 13- 3 − 1 = 10 − 1 = 9);-using the relationship between addition and subtraction-(e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4);-and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 = 6 = 1 = 12 + 1 = 13.)[11] 1.OA 8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ?, 6 + 6 = ?.*[12] 1.OA 1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings and equations with a symbol for the unknown number to represent the problem. 1.OA 2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

	1.NBT 2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
	  a. 10 can be thought of as a bundle of ten ones – called a "ten."
	  b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight or nine ones.
	
	1.OA 3 Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also*

---

[10] *1.OA.3 Only numbers within 10 are considered in this Module.*
[11] *1.OA.6 Only numbers within 10 are considered in this Module.*
[12] *1.OA.8 Only numbers within 10 are considered in this Module.*

Module 2: **Place Value,** **Comparison, Addition** **and Subtraction of** **Numbers to 20**	*known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten,* *so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)* 1.OA 6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on: making ten (e.g. 8 + 6= 8 + 2 + 4 = 10 + 4 = 14): decomposing a number leading to a ten (e.g., 13 − 4 = 13- 3 − 1 = 10 − 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 = 6 = 1 = 12 + 1 = 13). 1.OA 8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ___- 3, 6+ 6 = _. 1.NBT 1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
Module 3: **Ordering and** **Expressing Length** **Measurements as** **Numbers**	1.MD 2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.* 1MD 1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. 1.MD 4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
Module 4: **Place Value,** **Comparison, Addition** **and Subtraction of** **Numbers to 40**	1.NBT 2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (& 0 ones). 1.NBT 3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.[13] 1.NBT 5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. 1.NBT 6 Subtract multiplies of 10 in the range 10-90 from multiples of 10 in the range 10-*90* (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.[14]

---

[13] *1.NBT.3 Comparison of numbers is focused primarily on numbers to 40. In Module 6, the set of numbers to 100 is the focus.*
[14] *1.NBT.3 In Module 4, subtraction & addition of numbers is focused on numbers to 40. In Module 6, the set of numbers to 100 is the focus.*

▌▌ COMMON CORE

	1.NBT 4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and one; and sometimes it is necessary to compose a ten.[15]
Module 5: **Identify, Compose, and Partition Shapes**	1.G 1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. 1.G 2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, & right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. 1.G 3 Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves, fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. 1.MD 3 Tell and write time in hours and half-hours using analog and digital clocks.
Module 6: **Place Value, Comparison, Addition and Subtraction of Numbers to 100**	1.NBT 2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: c The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). 1.NBT 3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <. 1.NBT 5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count: explain the reasoning used. 1.NBT 6 Subtract multiplies of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition & subtraction; relate the strategy to a written method and explain the reasoning used. 1.NBT 4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method & explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

---

[15] *1.NBT.4 In Module 4, subtraction & addition of numbers is focused on numbers to 40. In Module 6, the set of numbers to 100 is the focus.*

Overview of Grade 2 Standards as Aligned to Modules

Unit	Standards
Module 1: Addition and Subtraction of Numbers to 20 and Fluency	2.OA 2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. 2.MD 6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, … , and represent whole-number sums and differences within *100* [16]on a number line diagram. 2.NBT 1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, ones; eg., 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."* [17] 2.NBT 2 Count within 1000; skip-count by 5s, 10s & *100s.*[18] 2.OA 1 Use addition and subtraction within 100 to solve one- *and two-*[19]step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns *in* all positions,[20] e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. [21] 2.MD 1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks and measuring tapes.[22]
Module 2: Adding and Subtracting Length, Weight, and Capacity Measurements	2.MD 10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in bar graph. 2.MD 1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks and measuring tapes. 2.MD 2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen. 2.MD 3 Estimate lengths using units of inches, feet, centimeters and meters. 2.MD 6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, …, and *represent whole-number sums & differences within 100 on a number line diagram.*[23]

---

[16] *2.MD.6 In Module 1 the focus is primarily on numbers to 20 on a number line diagram.*

[17] *2.NBT.1a In Module 1 the focus is primarily on numbers to 20. The balance of the standard is taught primarily in Module 3.*

[18] *2.NBT.2 In Module 1 the focus is primarily on counting through 120 & skip counting by 5s, & 10s. The balance of the standard is taught in Module 3.*

[19] *2.OA.1 In Module 1 problem solving focuses primarily on one step problems. 2 step problems are taught primarily in Module 3.*

[20] *2.OA.1 In Module 1, story problems focus primarily on the positions of result & change unknown.*

[21] *2.OA.1 In Module 1 problem solving strategies are largely within parameters of Grade 1 NBT: 4-6.*

[22] *2.MD 1 uses nonstandard units only for preparation for Module 2.*

▌▌▌ COMMON CORE

Module 3:
Place Value,
Comparison, Addition,
and Subtraction of
Numbers to 1,000
	2.NBT 1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens & ones; e.g., 706 equals 7 hundreds, 0 tens & 6 ones. Understand the following as special cases:
	  a. 100 can be thought of as a bundle of ten tens - called a "hundred."
	  b. The 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).
	
	2.NBT 2 Count within 1000; skip-count by 5s, 10s, ad 100s.
	
	2.NBT 3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
	
	2.NBT 4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and <symbols to record the results of comparisons.
	
	2.NBT 8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
	
	2.NBT 5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
	
	2.NBT 6 Add up to four two-digit numbers using strategies based on place value and properties of operations.
	
	2.NBT 7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in 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.
	
	2.NBT 9 Explain why addition and subtraction strategies work, using place value and the properties of operations.
	
	2.OA 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 problem.

Module 4: **Preparation for** **Multiplication and** **Division Facts**	2.G 2 Partition a rectangle into rows and columns of same size squares and count to find the total number of them. 2.OA 3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s: write an equation to express an even number as a sum of two equal addends. 2.OA 4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

[23] 2.MD.6 *In Module 2, addition & subtraction strategies are largely with the parameters of Grade 1 NBT:4-6*

Module 5: **Comparison, Addition and Subtraction with Length and Money**	2.MD 6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, …, and represent whole-number sums and differences within 100 on a number line diagram. 2.MD 4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. 2.MD 5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problems. 2.MD 9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units. 2.MD 8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ & cents symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have? 2.MD 10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. 1.G 2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, & quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
Module 6: **Recognizing Angles, Faces, and Vertices of Shapes and Fractions**	2.G 1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. 2.G 3 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., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. 2.MD 7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.[24]

---

[24] *Time is a fluency activity starts at the beginning of the year and practiced weekly. We consolidate and summarize those activities here in Module 6.*

Overview of Grade 3 Standards as Aligned to Modules

Unit	Standards
Module 1: **Rounding, Addition, and Subtraction Algorithms of Numbers to 1000**	3.NBT 1 Use place value understanding to round whole numbers to the nearest 10 or 100. 3.NBT 2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. 3.OA 9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*[25]
Module 2: **Multiplication and Division with Factors of 2,3,4,5, and 10**	3.OA. 1 Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7.* 3.OA 2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.* 3.OA 3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA 4 Determine the unknown number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5=____ ÷ 3, 6 x 6=?* 3.OA 5 Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)* 3.OA 6 Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8. Multiply and divide within 100.*[26] 3.OA 7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

---

[25] *In Module 1, patterns are mostly in reference to understanding place value. A larger unit can be decomposed into 10 equal addends. Conversely 10 equal addends can be composed into 1 larger unit.*

[26] 3.*OA.1-9 In Module 2, the students work with factors through 5 and include 10. This work includes 2 x 8, 3 x 9 and 5 x 7.*

III COMMON CORE

	3.OA 8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.* 3.MD 3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less"" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*[27]
Module 3: Measure, Add, Subtract, Multiply and Divide Weight, Capacity, and Time	3.OA 3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA 7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. 3.NBT 2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. 3.MD 2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.[28] 3.MD 1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line.
	3.OA 1 Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7.*

---

[27] *3.MD 3 In Module 2, each unit of the bar or picture graph would have a value of 2,3,4, 5 or 10. Greater values are used in Module 5.*
[28] *3.MD 2 The scale is an example of a vertical (as with a beaker) or round (as with a dial scale) number line.*

▐▐▌ COMMON CORE

Module 4: **Multiplication and Division with Factors of 6, 7, 8, 9, Multiples of 10 up to 90 by Single Digit Numbers**	3.OA 2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.* 3.OA 3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA 4 Determine the unknown number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = ____ ÷ 3. 6 x 6 = ?* 3.OA 5 Apply properties of operations as strategies to multiply and divide.2 *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)* 3.OA 6 Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.* 3.OA 7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. 3.OA 8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.3 3.OA 9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.* 3.NBT 3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. 3.MD 3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

III COMMON CORE

	3.MD 7 Relate area to the operations of multiplication and addition.[29]
	  a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
	  b. Multiply side lengths to find areas of rectangles with whole- number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
	  c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
	  d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

Module 5:
Multiplication and Area
	3.OA 3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent
	
	3.OA 8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding
	
	3.MD 5 Recognize area as an attribute of plane figures and understand concepts of area measurement.
	  a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
	  b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
	
	3.MD 6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
	
	3.MD 7 Relate area to the operations of multiplication and addition.
	  a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
	  b. Multiply side lengths to find areas of rectangles with whole- number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
	  c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
	  d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

	3.G 2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area and describe the area of each part as ¼ of the area of the shape.* 3.NF 1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a

[29] *The focus of this standard in this module is on using rectangular array models to teach arithmetic described in (a)—(c), not on area itself.*

Module 6:
Fractions as Numbers
on the Number Line
	fraction *a/b* as the quantity formed by a parts of size 1/*b*.
	
	3.NF 2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.
	    a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.
	    b. Represent a fraction *a/b* on a number line diagram by marking off a lengths 1/*b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.
	
	3.NF 3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
	    a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
	    b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.
	    c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram*.
	    d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
	
	3.MD 4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units--whole numbers, halves, or quarters.

Module 7: **Quadrilaterals**	3.OA 3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent 3.OA 8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 3.G 1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. 3.MD 8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

❙❙❙ COMMON CORE

Overview of Grade 4 Standards as Aligned to Modules

Unit	Standards
Module 1: Place Value, Rounding, Fluency with Addition and Subtraction Algorithms of Whole Numbers	4.NBT 3 Use place value understanding to round multi-digit whole numbers to any place. 4.NBT 4 Fluently add and subtract multi-digit whole numbers using the standard algorithm. 4.NBT 1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.* 4.NBT 2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. 4.OA 1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. [30] 4.OA 5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.* [31]
Module 2: Unit Conversions: Addition and Subtraction of Length, Weight, and Capacity	4.MD 1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two- column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...* [32] 4.MD 2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. [33] 4.NBT 4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

---

[30] *4.OA 1 In Module 1, largely as is relevant to place value i.e. 100 is 10 times as many as 10, 1000 is 10 times as many as 100 etc.*
[31] *In Module 1, patterns are mostly in reference to understanding place value.*
[32] *The focus of this module is on the Metric System to reinforce place value and compound units.*
[33] *4.MD 2 In Module 2 is focused on word problems with unit conversions from current instruction. Decimal and fraction word problems wait until Modules 4 and 6.*

Module 3: **Multiplication and Division of Up to a 4-Digit Number by Up to a 1-Digit Number Using Place Value**	4.MD 3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula and the length, by viewing the area formula as a multiplication equation with an unknown factor.* 4.NBT 5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.NBT 6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.OA 3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
Module 4: **Addition and Subtraction of Angle Measurements of Planar Figures**	4.G 1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. 4.G 2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. 4.G 3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. 4.MD 5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees. 4.MD 6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. 4.MD 7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
	4.MD 4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

III COMMON CORE

Module 5:
Order and Operations
with Unit Fractions and
Decimals
	4.NF 1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
	
	4.NF 2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
	
	4.NF 3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
	    a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
	
	    b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*
	    c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
	    d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
	
	4.NF 4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
	
	    a. Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*
	
	    b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*
	
	    c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*
	
	4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. [34]

---

[34] *4.MD 2 In Module 2 is focused on word problems with fractions, unit conversions, multiplication and division.*

	4.NF 5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.* 4.NF 6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.* 4.NF 7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
Module 6: Exploring Multiplication	4.OA 5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.* 4.OA 4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite. 4.OA 1 Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. 4.OA 2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. 4.NBT 5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.MD 1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two- column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*[35]

---

[35] *The focus of this module in on the Metric System to reinforce place value.*

Overview of Grade 5 Standards as Aligned to Modules

Unit	Standards

Module 1: Decimal Place Value and Arithmetic: Addition and Subtraction to 1/100ths, multiplication and division by a one-digit whole number.	5.OA 1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
	
	5.OA 2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*
	
	5.OA 3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*
	
	5.NBT 1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
	
	5.NBT 2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. [36]
	
	5.NBT 3 Read, write, and compare decimals to thousandths.
	   a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
	   b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	
	5.NBT 4 Use place value understanding to round decimals to any place.
	
	5.NBT 7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
	
	5.MD 1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. [37]

	5.OA 1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

---

[36] *The focus in this module is on patterns when multiplying or dividing by 10, not powers of 10.*

[37] *The focus of this module is on the Metric System to reinforce place value and compound units.*

Module 2: Multi Digit Whole Number Operations	**5.OA 2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

5.OA 3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

5.NBT 1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

5.NBT 2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT 5 Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT 6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. |
| **Module 3: Addition, Subtraction, Multiplication and Division of Fractions** | **5.OA 1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA 2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.* [38]

5.NF 1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NF 2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF 3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving |

---

[38] *The focus of this standard in this module is on fractions.*

IIIII COMMON CORE

	division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?* 5.NF 6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Module 4: Extensions and Applications of Multiplication and Division of Fractions	5.NF 3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*
	
	5.NF 4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. [39]
	    a. Interpret the product (*a/b*) × *q* as a parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a* × *q* ÷ *b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*
	    b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
	
	5. NF 5 Interpret multiplication as scaling (resizing), by:
	    a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
	    b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence *a/b = (n×a)/(n×b)* to the effect of multiplying *a/b* by 1.
	
	5.NF 6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
	
	5.NF 7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
	    a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*

---

[39] *The focus of 5.NF 4 in this module is only on part (a).*

	b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?* 5.MD 1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. [40] 5.MD 2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*
Module 5: Addition and Multiplication with Volume and Area	5.NF 4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. 5. NF 5 Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n×a)/(n×b)$ to the effect of multiplying a/b by 1. 5.MD 3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. 5.MD 4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

---

[40] *The focus of 5.MD 1 in this module is on the customary system of units.*

	5.MD 5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. 5.G 3 Understand that attributes belonging to a category of two- dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. 5.G 4 Classify two-dimensional figures in a hierarchy based on properties.

COMMON CORE

Module 6: Graph Points on the Coordinate Plane to Solve Problems	5.OA 1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
	
	5.OA 2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*
	
	5.OA 3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*
	
	5. NF 5 Interpret multiplication as scaling (resizing), by:
	   a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
	   b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n×a)/(n×b)$ to the effect of multiplying a/b by 1.
	
	5.MD 2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*
	
	5.G 1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
	5.G 2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

IΙ COMMON CORE