NJDOE MODEL CURRICULUM

CONTENT AREA: Mathematics	GRADE: 4	UNIT: # 2	UNIT NAME: Compute with Multi-digit Whole Numbers and Define Equivalent Fractions

This is a very busy unit.

#	STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS
1	**Compose equations from information supplied in word problems (with all 4 operations) using letters to represent unknowns (without solving).**	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.
2	Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits).	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.
3	Use strategies to divide multi-digit dividends by one-digit divisors and explain the answer using equations, rectangular arrays, and 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	Recognize and generate equivalent fractions and explain why they are equivalent using visual fraction models.	4.NF.1	Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100).
5	Compare two fractions with different numerators and different denominators using >, <, and = and justify the comparison by using visual fraction models (recognizing the comparison is valid only when two fractions refer to the same whole).	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.
6	Determine if a number between 1 and 100 is a prime or composite number	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.

#	STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS
7	Find all factor pairs for a whole number up to 100 and determine whether it is a multiple of a given 1-digit whole number.	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.

Selected Opportunities for Connection to Mathematical Practices

1. **Make sense of problems and persevere in solving them.**
   SLO #1 Explain correspondences among equations involving all four operations in word problems.
2. **Reason abstractly and quantitatively.**
   SLO #1 Use quantitative reasoning that involves creating a coherent representation of equations from word problems.
   SLO #4 Understand and make sense of equivalent fractions' quantities and their relationships.
   SLO #5 Understand and make sense of fraction quantities with different numerators and denominators in order to compare them.
3. **Construct viable arguments and critique the reason of others.**
   SLO #4 Understand and use stated assumptions and definitions about fractions in order to recognize and generate equivalent fractions.
   SLO #4 Be able to communicate and justify conclusions made about equivalent fractions.
4. **Model with mathematics.**
   SLO #1 Apply and use previously learned concepts about equations and word problems to compose an equation from a word problem.
   SLO #5 Map the relationship between fractions with different numerators and denominators using tools.
5. **Use appropriate tools strategically.**
   SLO #2 Consider and use available tools, such as rectangular arrays and area models, when multiplying multi-digit numbers.
   SLO #3 Consider and use available tools, such as rectangular arrays and area models, when using equations in division.
   SLO #4 Consider and use available tools, such as visual fraction models, when working with equivalent fractions.
6. **Attend to precision.**
   SLO #2 Calculate multiplication of multi-digit numbers accurately and efficiently and be able to explain the solution.
   SLO #3 Calculate division of multi-digit dividends by one-digit divisors accurately and efficiently and be able to explain the solution.
   SLO #4 Be able to precisely communicate why fractions are equivalent.
   SLO #5 State the meaning of the symbols <, >, or = when comparing two fractions with different numerators and denominators.
7. **Look for and make use of structure.**
   SLO #6 Look for and discern patterns to determine prime numbers between 1 and 100.
   SLO #7 Look for and discern patterns to determine factor pairs and multiples of whole numbers up to 100.
8. **Look for and express regularity in repeated reasoning.**
   SLO #6 Look for and express regularity in repeated reasoning when determining prime numbers between 1 and 100.
   SLO #7 Look for and express regularity in repeated reasoning when determining factor pairs and multiples of whole numbers.

Bold type identifies possible starting points for connections to the SLOs in this unit.

Greater Brunswick Charter School Curriculum

Grade level:	4			Subject:	Math		Unit #:	2

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources (in addition to MyMath)
					Whole Group	**Small Group / Stations**	
1	Multiplication Properties	2	To identify the commutative, identity, and zero properties of multiplication	*What special rules exist to make it easier to multiply with some numbers?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.161-166
2	Multiply more than two numbers	2	Apply the Associative Property of multiplication to evaluate a math expression	*Does it matter if I go from left to right or group pairs of numbers when I'm multiplying more than two numbers?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.167-172
3	Problem Solving	1	Apply current skills in real world situations	*Now that I have them, can I use my skills when it counts?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.179-188
4	Multiples of 10	2	Fluently multiply by multiples of 10	*How do I know adding zeroes even works?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.191-202
5	Multiples and Multiplying	1, 2	You may want a test here, because the next few days are so connected that you are unlikely to want to break them up with a test day.			• Review • Assessment	
6	Estimation Multiplication with multi-digit numbers	2	To identify the reasonableness range of an answer before the algorithm is used to find the answer.	*Before I do a problem, how can I know about how big my answer should be?*	Don't shy from the estimation skill here. It is estimation that adults do in real life much more often than actually multiplying out a pair of numbers.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.203-208
7	Models for multiplying	2	To use visual models to see multiples of a number	*Can I actually see what I'm doing or am I just playing with numbers that don't mean anything to me?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.209-214

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources (in addition to MyMath)
					Whole Group	Small Group / Stations	
8	Partial Products	2	To use partial products to multiply mentally	*How can I break a number apart in my head to make it easier to multiply larger numbers without writing them down?*	This skills of partial products is CRUCIAL to the development of the concept of multiplying with real life sized numbers and to do it mentally. Students who don't master this will have adult sized problems estimating and multiplying when they get older.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.215-222
9 10	Multiplying with partial products	2	To use partial products to multiply larger numbers mentally This is a really important concept and skill for mental math. Take your time to ensure the skill is obtained by students.	*How can I use parts of a number so I can multiply in my head going from left to right?*	Real mathematicians multiply mentally from left to right using partial products. The book's examples are backwards, i.e. teach students to multiply the 2x20 to get 40, hold that in their head, then multiply 2x4 to get 8 and add that to the 40 to arrive at 48. This is visually demonstrated on p. 229.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready • Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.223-234 Integrate the content pages for both lessons to best accentuate the skill of multiplying two-digit numbers from left to right.
11	Distributive Property of Multiplication	2	Multiply more numbers using partial products	*How does the Distributive Property say the same thing that partial products did?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.235-240
12	Multiplying with regrouping	2	To use the standard algorithm to multiply two-digit numbers	*How does multiplying work just like addition when I multiply and get an answer bigger than 10?*	Make the connection that the process/rule is the same as it is in addition. Then, they don't have to remember a new rule.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.241-246
13	Multiplying with even bigger numbers	2	Use the standard algorithm to multiply number with more than two digits.	*Is there anything different in multiplying when the numbers get bigger?*	Since there is nothing new, you can go a little farther in the assignment.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.247-260

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources (in addition to MyMath)
					Whole Group	Small Group / Stations	
14	Multiplying across zeros	2	Multiply multi-digit numbers with zero in a place value	*What can I do so I don't get tripped up by a zero?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.261-270 Don't waste time on that word search.
15	Multiplying with partial products and multi-digit numbers					• Review • Assessment	
16	Multiply by 10s	2	To multiply by 10s using the concept and the algorithm	*How can I multiply by factors of 10 quickly and fluently?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.279-284
17	Estimate products	2	To use the strategy of rounding to a 10 to estimate a product of two 2-digit numbers.	*How can rounding numbers to the nearest 10 make it easier for me to estimate the answer?*	Rounding factors to estimate the product is a pretty important skill for later mental math.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.285-292
18	The Distributive Property in 2-digit multiplication	2	To be able to explain the concept of multiplying a 2-digit number by distributing one factor across the tens and ones digits of the other.	*Why does the standard multiplication algorithm work?*	This is actually a big deal. If you can't understand why it works, then you may never be able to round and estimate products using mental math.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.293-298
19	Multiplying 2-digit numbers and applying it to real world problems	2	To multiply 2-digit numbers	*How can I solve problems better if I can multiply effectively?*	There is no harm in finding ways to increase the practice students have multiplying single digit numbers from the multiplication tables	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.299-310
20	Dividing multiples of 10	3	To fluently divide multiples of 10 by single digit numbers	*How can I shortcut the division process using multiples of 10 to my advantage?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.329-334

					Suggested Student Activities		Possible Resources
Day	**Topic**	**SLO**	**Learning Objectives**	**Essential Questions**	**Whole Group**	**Small Group / Stations**	**(in addition to MyMath)**
21	Estimating quotients	3	To use the strategy of rounding to a 10 to estimate a quotient from a 2-digit dividend.	*How can rounding numbers to the nearest 10 make it easier for me to estimate the answer?*	Rounding dividends to estimate the quotient is a pretty important skill for later mental math.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.335-340
22	Using place value to divide	3	To use place value to ensure the correct placement of digits in the quotient.	*How is dividing a big number just like dividing a little number more times?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.341-352
23	Dividing with remainders	3	To divide 2-digit dividends by 1-digit divisors and describe the meaning of the remainder	*What does the remainder actually mean in a division problem?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.353-364
24	Placing the first digit in the quotient	3	To divide accurately by correctly placing the first digit in the quotient	*How can I keep the quotient digits lined up correctly?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.367-372
25	Division with the Distributive Property and Partial Quotients	3	To be able to explain the concept of dividing a 2-digit number by distributing one divisor across the hundred, tens, and ones digits of the dividend.	*Why does the standard division algorithm work?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.373-378
25	Division of larger numbers and those yielding zeros in the quotient	3	To divide correctly and fluently dividends of three and four digits and those that yield zeros in the quotient	*How can I keep the quotient digits lined up correctly?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.379-392
26	Multi-step word problems	1, 3	To solve real world applications involving division	*How can I solve problems more easily if I can divide fluently?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.393-398, p. 403

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources (in addition to MyMath)
					Whole Group	Small Group / Stations	
27	Multiplication and division	1, 2, 3				• Differentiated intervention as needed • Review Practice • Intervention/Enrichment • i-Ready	MyMath p.399-402
28	Multiplication and division	1, 2, 3				• Review • Assessment	
29	Factors	6	To find all the factors of a number	*Do I know my multiplication facts well enough to tell immediately the possible factors of a number?*	The suggestion here is that these concepts be taught or reviewed on separate days. Many students get these two concepts confused because they are taught at the same time – as the text here presents them. This means you will need to be specific in the problem numbers you assigned students for work.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.173-178 MyMath p.485-490
30	Multiples	6	To find the first few multiples of a number	*Do I know my multiplication facts well enough to tell immediately the first five multiples of a number?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	
31	Factors Prime and Composite numbers	6	To identify the factors of a number. To determine if a number is prime or composite	What makes a prime number so lonely? *(It only has 1 in its factor family.)*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.491-498
32	Equivalent fractions	4	To make an equivalent fraction given a fraction	*How can two different numbers be the same number?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.499-504
33						• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.505-510

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources (in addition to MyMath)
					Whole Group	**Small Group / Stations**	
34	Fractions: Simplest Form	4	To write fractions in their (reduced) simplest form	*How does having the smallest number and smallest denominator possible make it easier to work with a fraction?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.511-516
			The book focuses on Greatest Common Factor to reduce a fraction. Many students take much more time to find that GCF than it would take them to simply reduce the fraction a second time with a new common factor. The suggestion here is to allow students to simplify a fraction with the first (correct) common factor that comes to their mind then determine if there is another common factor that could go into their resulting numerator and denominator, then reduce and repeat until there is no more to go.				
35	Comparing fractions	5	To create common denominators for two fractions to compare their values	*What needs to be in the denominator to help me decide which fraction is larger?*		• Warm-up or Prep • Lesson Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.517-522
			The book focuses on Least Common Denominator when, in reality, any common denominator will suffice for determining which fraction is larger. Students will take longer to determine the LCM of the two denominators than to actually make the common multiple that can be derived by multiplying the two denominators together then multiplying the numerators appropriately. It create unneeded anxiety in students and confuses many of them. In later topics, when they are adding or subtracting, they can reduce their answer, if they need to do so.				
36	Landmark fractions	5	Compare benchmark fractions with computing	*What denominators are important enough for me to memorize their values?*		• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.523-528
37	Problem Solving	4, 5, 6	To apply skills with fractions	*How do I know when to use my new tools in real life?*	It's not only important to have the skills. It's crucial for students to know how to recognize when to use the skills they have.	• Warm-up or Prep • Lesson • Independent Practice • Intervention/Enrichment • i-Ready	MyMath p.529-536
38	Fractions	4, 5, 6				• Differentiated intervention as needed • Review Practice • Intervention/Enrichment • i-Ready	
39	Fractions	4, 5, 6				• Review • Assessment	

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Word Wall Candidates

Associative Property	Commutative Property	Identify Property	Zero Property	Decompose
Dividend	Divisor	Quotient	Fact family	Factor
Multiple	Product	Common Factor	Common Multiple	Greatest
Least	Distributive Property	Partial Products		

Authentic Application

Your goal: Using a favorite family recipe, find a way to adapt the recipe by using serving size and ingredients to serve our class

Your role: Students will understand this real world problem encountered by all as we prepare to feed larger numbers of people

Your audience: Classmates

The situation: You are to create a new recipe from an original recipe so that there is enough of the recipe made that everyone in the class gets to enjoy a serving of your family's favorite holiday food.

Your Product: A recipe that has been created in a Microsoft Word Table (possibly as part of a computer class project or using Chromebooks/iPads in the classroom).

Success Criteria: Scoring will be as follows:

5 points	4 points	3 points	2 points	1 point
Recipe has been adapted correctly to feed the class	Recipe has been adapted correctly but is too large or too small	An attempt was made to adapt a recipe from home	There are many errors in the adapted recipe	A recipe was brought in but not adapted
The table has been created properly, and the recipe is clearly represented	The table has been created but there are some unclear representations	An attempt was made to create a table, but is mostly unclear	The table is incomplete and has many errors	A document was created, but the table is incomplete
		All of the math is correct	Most of the math is correct	There are many errors in the math
			The recipe seems to be one that would be tasty to most people	The recipe seems to be one that would disappoint most people
13-15 pts. = A	10-12 pts. = B	7-9 pts. = C	4-6 pts. = D	0-3 pts = F