

NJDOE MODEL CURRICULUM

CONTENT AREA: Mathematics	GRADE: 4	UNIT: # 4	UNIT NAME: Extend Understanding of Fractions, Solve Word Problems, and Introduce Decimals
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#	STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS
1	Generate number or shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. 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.	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. <i>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.</i>
2	Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	4.AO.3	Solve multistep word problems 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 & estimation strategies including rounding.
3	Add two fractions with respective denominators of 10 and 100 by writing each fraction as a fraction with denominator 100.	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. <i>For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.</i>
4	Use decimal notation to write fractions with denominators of 10 or 100 by writing each fraction as a fraction with denominator 100.	4.NF.6	Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i>
5	Apply area and perimeter formulas for rectangles in real world math problems (whole numbers).	4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i>
6	Make a line plot to display a data set in measurements in fractions of a unit ($1/2$, $1/4$, $1/8$) and use it to solve problems involving addition and subtraction of fractions with like denominators.	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. <i>For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.</i>

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS	
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.	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.
8	Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).	4.MD.2 4.NF.4c	<p>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.</p> <p>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. <i>For example, if each person at a party will eat $\frac{3}{8}$ 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?</i></p>

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.

SLO #1 Use concrete models to help conceptualize, generate, and identify number and shape patterns using predetermined rules.

SLO #2 Be able to explain the meaning of equations derived from word problems, and know the process involved in composing equations.

SLO #2 Explain correspondences between composed equations and information supplied in a word problem.

SLO #5 Analyze the relationship between area and perimeter in order to solve real world problems involving rectangles.

SLO #6 Draw diagrams and construct graphs of important features contained in a dataset.

SLO #8 Be able to explain the meaning of fractions or decimals that incorporate measurement, and know the process to solve word problems that incorporate both.

2. Reason abstractly and quantitatively.

SLO #3 Understand and make sense of fraction quantities with denominators of 10 or 100.

SLO #4 Understand and make sense of quantities expressed in decimal notation and as fractions.

SLO #6 Use and apply two abilities (making a line plot, solving addition and subtraction problems with fractions) to solve problems.

SLO #7 Understand and make sense of decimal quantities in order to compare them.

SLO #7 Use quantitative reasoning to create a coherent representation of decimal numbers in order to compare their size.

SLO #8 Understand and make sense of both decimal and fraction quantities and understand their relationship to each other.

SLO #8 Use quantitative reasoning to create a coherent representation of word problems involving fractions and decimals.

3. Construct viable arguments and critique the reasoning of others.

SLO #1 Make conjectures and build a logical progression of statements in order to generate and identify number and shape patterns when using predetermined rules.

4. Model with mathematics.

SLO #1 Map the relationships of numbers and shapes using tools that include models, words, and graphs.

SLO #1 Analyze the relationships and patterns between numbers and shapes that have been generated using a similar rule.

SLO #2 Apply previously learned concepts regarding composing equations, and all four operations.

SLO #6 Draw diagrams and construct graphs of important features contained in a dataset.

SLO #7 Map the relationship of two decimal numbers using various tools.

5. Use appropriate tools strategically.

6. Attend to precision.

SLO #4 Use clear reasoning and definitions to describe writing fractions in decimal notation.

SLO #6 Specify units of measure when making a line plot from a dataset.

SLO #7 State the meaning of the $<$, $>$, or $=$ symbols when comparing two decimal numbers.

7. Look for and make use of structure.

SLO #3 Look for and discern patterns when adding two fraction with denominators of 10 or 100.

SLO #4 Look for and discern a pattern when using decimal notation to express a fraction quantity.

Look for and express regularity in repeated reasoning.

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 #: 4		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
1	Fractional parts		To determine readiness for next topic of study	<i>Do I know enough to go forward?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath p.625-630
2	Place value	4	To recognize and write decimals to the hundredths place value	<i>I know about tens and hundreds. Where are tenths and hundredths and what do they mean?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.1 p.631-636
3	Tenths	4	To recognize, write, and denote problems using tenths	<i>How does dividing items and events into ten equal segments help me understand them?</i>	<i>Through these two lessons, consider enforcing the correct reading of a decimal, i.e. 5.7 is "five AND seven tenths." This will help with converting them to fractions in a later lesson. This is also a time to remind them that 120 is NOT read "one hundred and twenty" because "and" means there is a decimal point.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.2 p.637-642
4	Hundredths	4	To recognize, write, and denote problems using hundredths	<i>How does dividing items and events into a hundred equal parts help me understand them or money?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.3 p.643-648
5	Tenths and Hundredths	4	To recognize, write, and denote problems using tenths or hundredths	<i>How am I doing with this?</i>		<ul style="list-style-type: none"> •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath p.649-650
6	Tenths and Hundredths	4				<ul style="list-style-type: none"> •Review •Assessment 	
7	Multi-step word problems	2	To solve multi-step word problems using variables	<i>How can I make a movie in my mind to understand the story in a problem?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	Learnzillion lesson Multi-step worksheet 1

Grade level: 4		Subject: Math			Unit #: 4		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
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8	Fractions with denominators of 10 or 100	3, 4	To write decimals as fractions	<i>How does reading the decimal automatically tell me the fraction version of the number?</i>	<i>This is the first lesson in which correct reading of the decimal will improve its conversion to a fraction.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.4 p.651-656
9	Converting tenths to hundredths	3, 4	To solidify the understanding that tenths can be written as hundredths in fraction and decimal form	<i>Why does 7/10 and 0.7 mean the same as 70/100 and .70</i>	<i>The book has you working with converting fractions to decimals and back. Most kids will have that after the last lesson. The real issue for students here is adding the 0 on the back of a decimal and having it mean the same thing and 'raising' a fraction from a denominator of 10 to 100.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.5 p.657-662
10	Adding tenths and hundredths	3, 4	To add tenths and hundredths as fractions and decimals	<i>Is there an easier way to add 3/10 and 54/100?</i>	<i>Taking advantage of mentally being able to convert a fraction to a decimal for easier adding is not a terrible idea here since most of their adult lives will have them changing most fractions to decimals for operating with them.</i>	<ul style="list-style-type: none"> •Independent Practice •Intervention/Enrichment as needed with strugglers •i-Ready 	MyMath 10.6 p.663-668
11	Ordering decimals	7, 4	To compare decimals	<i>What are the most reliable ways to tell which decimal is larger?</i>	<i>Adding that 0 on the end and knowing it doesn't change anything is going to come in real handy here.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.7 p.669-674
12	Problems with decimals and fractions	2, 3, 4, 8	To solve problems using fractions, decimals, and letters to stand for a value.	<i>How does having a letter take the place of a value I am trying to find help me solve the problem?</i>	<i>Have the students begin the practice of using a variable for an unknown value. The text does not explicitly do this, but it is an important SLO in this unit.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.8 p.675-680
13	Problems with decimals and fractions	2, 3, 4, 8	To solve problems using fractions, decimals, and letters to stand for a value.	<i>How does having a letter take the place of a value I am trying to find help me solve the problem?</i>	<i>Take another day</i>	<ul style="list-style-type: none"> •Independent Practice •Intervention/Enrichment •i-Ready 	<ul style="list-style-type: none"> • Decimals word problems: addition • Decimals word problems: subtraction

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14	Fractions and decimals	2, 3, 4, 8	To evaluate mastery			<ul style="list-style-type: none"> Intervention/Enrichment as needed with strugglers i-Ready 	MyMath p.681-684 Worksheets for many decimal operations
15	Fractions and decimals	2, 3, 4, 8				<ul style="list-style-type: none"> Review Assessment 	
16	Multi-step word problems	2	To solve multi-step word problems using variables	<i>How can I make a movie in my mind to understand the story in a problem?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> Lesson and drills from EngageNY Page of worksheets
17	Line plots	6	To revisit and reaffirm line plot mastery	<i>How do I show data on a number line?</i>	<i>This should be a review, but one that is possibly needed. You can reuse the text pages or use the additional resources.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	MyMath 11.8 p.743-748 <ul style="list-style-type: none"> A science lesson that fits
18	Line plots	6	To revisit and reaffirm line plot mastery	<i>How do I show data on a number line?</i>	<i>Take another day, since you probably are reviewing the Day 14 test somewhere in here. No harm in sharing that a ruler is just a wooden or plastic line plot.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> KhanAcademy lesson Simple practice with line plots
19	Non-numeric patterns	1	To determine the pattern in a sequence of shapes	<i>How can I know what is coming next?</i>	<i>Recognizing and predicting patterns is a CRUCIAL life skill that goes far beyond math to patterns of behavior and events. Feel free to share some 4th grade type examples of exactly that.</i>	<ul style="list-style-type: none"> Independent Practice Intervention/Enrichment as needed with strugglers i-Ready 	MyMath 7.1 p.413-418
20	Numeric patterns	1	To determine the pattern in a sequence of numbers	<i>How can I know what is coming next?</i>		<ul style="list-style-type: none"> Independent Practice Intervention/Enrichment as needed with strugglers i-Ready 	MyMath 7.2 p.419-424
21	Numeric sequences	1	To determine the characteristic of a numeric sequence	<i>How can I make a rule so I will always know what is coming next?</i>	<i>You have probably been making rules for the past two days. This merely formalizes it a bit.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	MyMath 7.3 p.425-430

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
22	Line plots, patterns, and sequence	1, 6	To determine mastery			<ul style="list-style-type: none"> •Independent Practice •Intervention/Enrichment •i-Ready 	<ul style="list-style-type: none"> • Printable Task • Patterns • Generate Number or Shape Patterns
23	Line plots, patterns, and sequence	1, 6				<ul style="list-style-type: none"> •Review •Assessment 	
24	Multi-step word problems	2	To solve multi-step word problems using variables	<i>How can I make a movie in my mind to understand the story in a problem?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	A different page of worksheet options
25	Perimeter and area	5	To determine readiness for measuring perimeter and calculating area	<i>What do I know about rectangles?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath p.818-824
26	Perimeter	5	To measure and calculate perimeter of a rectangle	<i>What is the perimeter and how can I figure it out without measuring all the way around?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 13.1 p.825-830
27	Real world problems in perimeter	5	To use perimeter to solve real world problems	<i>When am I going to use perimeter?</i>		<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 13.2 p.831-838
28	Area models	5	To use models to determine the area of a space	<i>What does 'area' actually mean?</i>	<i>A big confusion for students is between perimeter and area. Often, it is better not to teach them contiguously. Your text doesn't allow for that. Take care to ensure students have an excellent mental image of perimeter of something and a different mental image of its area.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 13.3 p.839-844

Grade level: 4

Subject: Math

Unit #: 4

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
29	Area measure	5	To calculate the area of a rectangle	<i>How can I figure the area without making all the drawings?</i>	<i>No harm in reliving the multiplication definition based on arrays. The more you can tie what they know to something new, the more concrete it will be for them.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 13.4 p.845-850 Arrays for Multiplication More arrays Area counting sheet
30	Perimeter and area	5	To calculate area and perimeter	<i>How do I keep perimeter and area separate in my mind when I'm doing both for the same figure?</i>	<i>Work on ways to keep the confusion away.</i>	<ul style="list-style-type: none"> •Lesson/Guided Practice •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath 10.5 p.851-856
31	Perimeter and area		To determine mastery	<i>How much do I know about perimeter and area?</i>		<ul style="list-style-type: none"> •Independent Practice •Intervention/Enrichment •i-Ready 	MyMath p.857-860
32	Perimeter and area					<ul style="list-style-type: none"> •Review •Assessment 	
Word Wall Candidates Decimal Tenths Hundredths Place value Line plot Pattern Sequence Perimeter Area Length Square unit							

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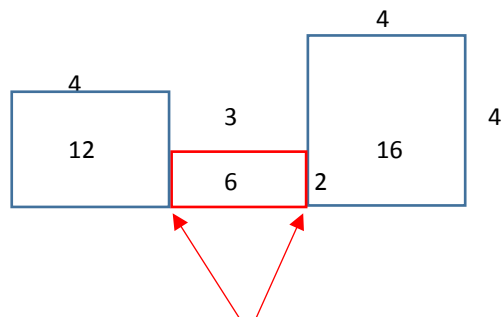
Authentic Application

Your goal: To draw your perfect playground having various pieces of equipment and sections for each piece of equipment with wood borders.

Your role: Playground architect

Your audience: Show your classmates the best playground ever

The situation: Make a playground that has at least three different pieces of equipment in it. An example: one section for a set of swings, another section for slides, another section for some climbing equipment. Then, calculate the area of each section and add them for the total area of your playground. Also, calculate the perimeter of each area. Then decide how much wood is needed to make a border for each area. Remember do not count twice wood that is a border for two sections.



Don't count twice

Your Product: Provide a sketch of your playground with the length of each side written on the sketch. The sketch also must show the area of each section.

Success Criteria: Scoring rubric:

	4 points	3 points	2 points	1 point
Design	The sections have creative equipment in them	There are more than 3 sections	The sections are of different sizes	There are not 3 sections
Calculations	All calculations are accurate	All calculations are performed correctly, but there is an arithmetic error	All the area calculations or all of the perimeter calculations are correct	There are multiple errors in calculations
Submission	The design is neatly done All length and area labels are included All equipment is labeled	The design is neat, but a label or more is missing	The design is not neat, there are labels missing.	The design is not neat, the areas are not clear, there are no labels.

