

NJDOE MODEL CURRICULUM

CONTENT AREA: Mathematics	GRADE: 4	UNIT: # 3	UNIT NAME: Properties of Operations with Multi-Digit Arithmetic. Fraction Addition, and Subtraction
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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
2	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
3	Decompose a fraction into a sum of fractions with the same denominator in more than one way; record the decomposition as an equation and justify with a visual fraction model.	4.NF.3
4	Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction.	4.NF.3
5	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.3
6	Express measurement comparisons within a single system of measurement and record in a two-column chart within a single system of measurement; e.g., <i>know that 1 ft. is 12 times as long as 1 in.</i>	4.MD.1
7	Compose equations from information supplied in word problems using letters to represent unknowns and solve the word problems with addition and subtraction.	4.OA.3
8	Add and subtract two multi-digit whole numbers using the standard algorithm fluently (with speed and accuracy) without a calculator.	4.NBT.4

Major Content **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

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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 #7 Explain correspondences between composed equations and equations represented as word problems.

2. Reason abstractly and quantitatively.

SLO #2 Understand and make sense of fraction quantities with different numerators and denominators in order to compare them.

SLO #3 Understand and make sense of decomposed fraction quantities and understand the relationship to its parts.

SLO #4 Understand and make sense of addition and subtraction of mixed number quantities and their relationship to an equivalent fraction.

SLO #5 Understand and make sense of fraction quantities in the context of addition and subtraction word problems.

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 Map the relationship between fractions with different numerators and denominators using tools.

SLO #3 Apply and use previously learned concepts about fractions in order to decompose fractions and record the decomposition in an equation.

SLO #3 Map the relationship between decomposed fraction units using tools that include a visual fraction model.

SLO #5 Apply and use previously learned concepts about fractions in order to solve addition and subtraction word problems utilizing fractions.

SLO #5 Map the relationship between fractions sums and differences using tools.

SLO #6 Use specific and appropriate units of measurement when comparing two objects within a single system.

5. Use appropriate tools strategically.

SLO #1 Consider and use available tools, such as models and graphs, when solving problems that relate to number and shape patterns.

6. Attend to precision.

SLO #2 State the meaning of the symbols $<$, $>$, or $=$ when comparing two fractions with different numerators and denominators.

SLO #6 Specify units of measure in order to clarify the correspondence with the given quantities.

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<p>7. Look for and make use of structure.</p> <p>SLO #4 Look for and discern patterns when adding and subtracting mixed numbers.</p> <p>SLO #5 Look for and discern patterns when adding and subtraction fractions with like denominators and are represented as word problems.</p> <p>SLO #8 Look for and discern patterns when using the standard algorithm to add or subtract two multi-digit numbers.</p> <p>8. Look for and express regularity in repeated reasoning.</p>

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

Code #	Common Core State Standards
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.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 $\frac{1}{2}$. 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 $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$.
4.NF.3a	a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.3b	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. <i>Examples:</i> $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$.
4.NF.3c	c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent

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4.NF.3d	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.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. <i>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).</i>
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.
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.

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