Correlation to *Common Core Standards for School Mathematics--Creating Fraction and Decimal AHAs*

Number and Operations--Fractions 3.NF		
Develop understanding of fractions as numbers.		
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 fraction *1/b* as the quantity formed by *a* parts of size *1/b*.**	pp. 10-15, 28-30; Fractions of Regions, Number Words, and Symbols Card Set, pp. 138-140
3.NF.2	**Understand a fraction as a number on the number line; represent fractions on a number line diagram.**	pp. 31-32; Common Fraction Number Line Representations Card Set, pp. 141-143
3.NF.2a	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.	pp. 31-32; Common Fraction Number Line Representations Card Set, pp. 141-143
3.NF.2b	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.	pp. 31-32; Common Fraction Number Line Representations Card Set, pp. 141-143
3.NF.3	**Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.**	pp. 18-22, 31-38; Each time teachers choose the recommended *Who Has More?* or *Less is More* games students are comparing fractions.
3.NF.3a	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	pp. 18-22, 32-34; Investigating Equivalencies Card Set, pp. 132-134; Common Fraction Number Line Representations Card Set, pp. 141-143
3.NF.3b	Recognize and generate simple equivalent fractions, e.g., 1/2 x 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.	pp. 21-22; Investigating Equivalencies Card Set, pp. 132-134
3.NF.3c	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.	pp. 20, 31-35; Investigating Equivalencies Card Set, pp. 132-134; Common Fraction Number Line Representations Card Set, pp. 141-143
3.NF.3d	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.	pp. 36-38; Each time teachers choose the recommended *Who Has More?* or *Less is More* games students are comparing fractions.

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Number and Operations--Fractions 4.NF		
Extend understanding of fraction equivalence and ordering.		
4.NF.1	**Explain why a fraction *a/b* is equivalent to a fraction *(n x a)/(n x b)* by using visual fraction moels, 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.**	p. 45
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 visula fraction model.**	pp. 38-39; Each time teachers choose the recommended *Who Has More?* or *Less is More* games students are comparing fractions.
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.		
4.NF.3	**Understand a fraction *a/b* with *a > 1* as a sum of fractions *1/b*.**	pp. 13-17, 54-63; Addition of Common Fractions Card Set, pp. 150-152; Mixed Number Subtraction Card Set, pp. 153-155
4.NF.3a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	pp. 54-60; Addition of Common Fractions Card Set, pp. 150-152; Mixed Number Subtraction Card Set, pp. 153-155
4.NF.3b	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.	pp. 13-17
4.NF.3c	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.	pp. 54-63; Addition of Common Fractions Card Set, pp. 150-152; Mixed Number Subtraction Card Set, pp. 153-155; Missing Addend Card Set, pp. 156-158
4.NF.3d	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 equiations to represent the problem.	Story problems are not included. However, students write story problems, pp. 60, 63. Visual models for adding and subtracting fractions are developed throughout pp. 54-63

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4.NF.4	**Apply and extend previous understandings of muliplicatio to multiply a fraction by a whole number.**	pp. 14, 20, 23-25, 64-67, 74-75; Mixed Number-Improper Fraction Equivalencies Card Set, pp. 135-137; Common Fraction Multiplication Card Set, pp. 159-161
4.NF.4a	Understand a fraction *a/b* as a multiple of *1/b*. For example, use a visual fraciton model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equation 5/4 = 5 x (1/4).	pp. 14, 20, 23-25; Mixed Number-Improper Fraction Equivalencies Card Set, pp. 135-137
4.NF.4b	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 x (2/5) as 6 x (1/5), recognizing this product as 6/5. (In general, *n x (a/b) = (n x a)/b*.)	pp. 64-67, 74-75; Common Fraction Multiplication Card Set, pp. 159-161
4.NF.4c	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?	Story problems are not included. However, students repeatedly use visual models to represent the multiplication of fractions, pp. 64-75.
Understand decimal notation for fractions and compare decimal fractions		
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.**	pp. 84-86, 98-99; Decimal Fractions and Common Fractions Card Set, pp. 165-167
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.**	pp. 78-85, 90-94; Decimal Fractions and Common Fractions Card Set, pp. 165-167; Decimals on a Number Line Card Set, pp. 168-170; Common and Decimal Fractions on a Number Line Card Set, pp. 171-173.
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.**	pp. 95-97; Decimal Fractions and Common Fractions Card Set, pp. 165-167

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Number and Operations in Base Ten 5.NBT		
Understand the Place Value System		
5.NBT.3	**Read, write, and compare decimals to thousandths.**	
5.NBT.3a	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) + 2 x (1/1000).	Students read and write decimals as they complete four-way charts throughout the decimal section.
5.NBT.3b	Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	pp. 95-97; Decimal Fractions and Common Fractions Card Set, pp. 165-167; Each time teachers choose the recommended *Who Has More?* or *Less is More* games students are comparing decimal fractions.
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.**	pp. 98-109; Bridge to One with Decimals Card Set, pp. 174-176
Number and Operations--Fractions 5.NF		
Use equivalent fractions as a strategy to add and subtract fractions.		
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*.)**	pp. 56-63; Addition of Common Fractions Card Set, pp. 150-152; Mixed Number Subtraction Card Set, pp. 153-155; Missing Addend Card Set, pp. 156-158
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**	Story problems are not included. However, students write story problems, pp. 60, 63. Visual models for adding and subtracting fractions are developed pp. 54-63
Apply and extend previous understandings of multiplication and division to multiply and divide 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?**	pp. 51-53

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5.NF.4	**Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.**	pp. 64-75; Common Fraction Multiplication Card Set, pp. 159-161.
5.NF.4a	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 $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)	pp. 64-70
5.NF.4b	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.	pp. 71-75; Common Fraction Multiplication Card Set, pp. 159-161
5.NF.5	**Interpret multiplication as scaling (resizing), by:**	
5.NF.5a	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.	The included Investigations prepare students for this discussion, pp. 64-75.
5.NF.5b	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 products smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	The included Investigations prepare students for this discussion, pp. 64-75.
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.**	Story problems are not included. However students repeatedly use visual models to represent the multiplication of fractions, including mixed numbers, pp. 64-75.
5.NF.7	**Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.**	pp. 43-53; Common Fraction Division Language Card Set, pp. 147-149
5.NF.7a	Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.	pp. 45-46, 48-50
5.NF.7b	Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.	pp. 43-47; Common Fraction Division Language Card Set, pp. 147-149.
5.NF.7c	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?	Story problems are not included. However students repeatedly use visual models to represent fraction division, pp. 42-53.