Unit 1: Addition and Subtraction with Fractions
18-20 Days

Math Background:
- Research - TE p1P-1Q
- Background - TE p1R-1KK
- Learning Community - TE p1MM-1NN

Learning Path:
- **Students study fractions and mixed numbers. They:**
  - find equivalent fractions.
  - compare fractions.
  - add and subtract fractions and mixed numbers.
- **Students apply their understanding of fractions and fraction models. Students:**
  - represent addition and subtraction of fractions with unlike denominators as equivalent problems with like denominators.
  - make reasonable estimates of the sums and differences.
  - tell what quantity of objects is in a set (cardinality).

Progressions:

Last year, my students...	In my class, students will...	Next year, my students will...
- represented fractions as sums of unit fractions. - composed and decomposed fractions and mixed numbers. - Used bar models to represent equivalent fractions and find sums and differences.	- use number lines to represent equivalent fractions. - express fractions with unlike denominators in terms of the same unit fraction so they can be added or subtracted. - use bar models to visualize a sum or difference. - use equations and models to solve real world problems. - use estimation to determine whether answers are reasonable.	use number lines to represent rational numbers.

Big Idea 1: Equivalent Fractions
- About 6 days. Suggested date of completion:

Vocabulary: benchmark, common denominator, common factor, denominator, equivalent fractions, fraction, greater than (>), less than (<), mixed number, multiplier, *n*-split, numerator, simplify, unit fraction, unsimplify

Common Core State Standards for Math [CCSS-M]	Common Core Standards of Mathematical Practices [SMPs]
CC.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.) **CC.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.	CC.K-12.MP.1: Make sense of problems and persevere in solving them. CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others. CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision. CC.K-12.MP.7: Look for and make use of structure. CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
1.1 TE p1-6	**I can** • use the MathBoard fraction bars to discuss basic fraction ideas. **Formative Assessment:** Ask students to explain what unit fractions are and how they are used to build other fractions. Students should explain that a unit fraction has a numerator of 1 and represents one equal part of a whole. Any other fraction can be built by combining (adding) unit fractions.	NF.2 SMP1 SMP2 SMP3 SMP4 SMP5 SMP6 SMP7	HW p1 (E) R p2 (NE)	
	Lesson 1.1 Notes			
1.2 TE p7-16	**I can** • generate and explain simple equivalent fractions. **Formative Assessment:** Ask students to explain how two fractions can be equivalent if they are made up of different numbers. Students should be able to explain that equivalent fractions represent the same part of the whole; the numbers in the fraction do not have to be the same. Two fractions are equivalent if you can multiply the numerator and the denominator of one by the same number to	NF.1 SMP2 SMP3 SMP5 SMP6 SMP7	SAB p3 (E) SAB p4 (E) SAB p5 (E) SAB p6 (E) HW p3 (NE) R p4 (NE)	

	get the numerator and denominator of the other.			
	Lesson 1.2 Notes			
1.3 TE p17-24	**I can** • understand the role of the multiplier in equivalent fractions. **Formative Assessment:** Ask students to explain how they can generate several fractions equivalent to a given fraction.	NF.1 SMP2 SMP3 SMP4 SMP5 SMP6 SMP7 SMP8	SAB p7 (E) SAB p8 (E) HW p5 (NE) R 6 (NE)	
	Lesson 1.3 Notes			
1.4 TE p25-34	**I can** • use a variety of strategies to compare fractions. **Formative Assessment:** Ask students to describe at least two strategies they might use to compare fractions and to give examples to illustrate their method. Students might mention rewriting the fractions so they have the same denominator and then comparing the numerators or using benchmarks and reasoning.	NF.1 SMP2 SMP3 SMP5 SMP6 SMP7 SMP8	SAB p9 (E) SAB p10 (E) SAB p11 (E) SAB p12 (E) HW p7 (NE) R p8 (NE)	

	Lesson 1.4 Notes			
1.5 TE p35-42	**I can** • convert between fractions and mixed numbers. **Formative Assessment:** Ask students how to convert a mixed number to a fraction and how to convert a fraction greater than 1 into a mixed number. Students should be able to explain and consistently use a method for each type of conservation.	NF.1 SMP2 SMP3 SMP4 SMP5 SMP6	SAB p13 (E) SAB p14 (E) HW p9 (NE) R p10 (NE)	
	Lesson 1.5 Notes			
Quiz 1			AG p16 (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Big Idea 2: Addition and Subtraction of Fractions

- About 9 days. Suggested date of completion:

Vocabulary: add on, benchmark, estimate, line plot, regroup, round, situation equation, solution equation, ungroup

Common Core State Standards for Math [CCSS-M]	Common Core Standards of Mathematical Practices [SMPs]
CC.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.)	CC.K-12.MP.1: Make sense of problems and persevere in solving them.
CC.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.	CC.K-12.MP.2: Reason abstractly and quantitatively.
	CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others.
CC.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.	CC.K-12.MP.4: Model with math.
	CC.K-12.MP.5: Use appropriate tools strategically.
	CC.K-12.MP.6: Attend to precision.
	CC.K-12.MP.7: Look for and make use of structure.
	CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM And SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
1.6 TE p43-50	**I can** • add and subtract mixed numbers with like denominators. **Formative Assessment:** Ask students how they subtract two like mixed numbers when the fraction part of the first number is less than the fraction part of the second. Students should say that they ungroup the whole number part to get 1 whole and then add that whole to the fraction part. Then the fraction part of the first number will be greater than the fraction part of the second number o they can subtract.	NF.2 SMP3 SMP4 SMP6	SAB p15 (E) SAB p16 (E) HW p11 (NE) R p12 (NE)	
	Lesson 1.6 Notes			
1.7 TE p51-60	**I can** • add fractions with different denominators. **Formative Assessment:** Ask student to explain why it is necessary to write fraction with a common denominator before adding them. Students should mention that to add fraction, the unit fractions (or equal parts)	NF.1 NF.2 SMP1 SMP2 SMP3 SMP4 SMP6 SMP8	SAB p17 (E) SAB p18 (E) HW p13 (NE) R p14 (NE)	

	they are made of must be the same size. The numerator of the sum I the total number of these same-size unit fractions that are combined when you add the fractions. The denominator represents the unit fraction.			
	Lesson 1.7 Notes			
1.8 TE p61-66	**I can** • subtract fractions with different denominators. **Formative Assessment:** Ask students to use an example to explain a method for subtracting fraction with unlike denominators. Students should mention that to subtract fraction, the unit fractions they are made of must be the same size. The numerator of the difference is the number of these same-size unit fractions that are left when you take the unit fractions for the second fraction from the unit fractions for the first fraction. The denominator represents the unit fraction.	NF.1 NF.2 SMP1 SMP2 SMP3 SMP4 SMP6 SMP8	SAB p19 (E) SAB p20 (E) HW p15 (NE) R p16 (NE)	
	Lesson 1.8 Notes			

1.9 TE p67-74	**I can** • add and subtract mixed numbers with unlike denominators. **Formative Assessment:** Ask students in what situations they need to ungroup in order to subtract mixed numbers. Students should state that they must ungroup when the fraction in the top number is less than the fraction in the bottom number. Then ask in what situations they need to regroup after adding mixed numbers. Students should say that regrouping is necessary when the sum of the fraction parts is greater than or equal to 1.	NF.1 NF.2 SMP1 SMP3 SMP4 SMP6 SMP7 SMP8	SAB p21 (E) SAB p22 (E) HW p17 (NE) R p17 (NE)	
	Lesson 1.9 Notes			
1.10 TE p75-80	**I can** • add and subtract mixed numbers with unlike denominators. **Formative Assessment:** Ask students to make a list of the most important ideas to remember when adding and subtracting mixed numbers. Ideas should include ungrouping the first number in a subtraction problem if the fraction part is too small and regrouping a sum if the fraction part I greater than or equal to 1.	NF.1 NF.2 MD.2 SMP3 SMP6 SMP7 SMP8	SAB p23 (E) SAB p24 (E) HW p19 (NE) R p20 (NE)	

	Lesson 1.10 Notes			
1.11 TE p81-86	**I can** estimate sums and differences of fractions and mixed numbers and decide whether answers are reasonable. **Formative Assessment:** Ask students to explain a method for mentally estimating sums and differences of fractions and mixed numbers and to illustrate the method with examples.	NF.1 NF.2 SMP3 SMP6	SAB p25 (E) SAB p26 (E) HW p21 (NE) R p22 (NE)	
	Lesson 1.11 Notes			
1.12 TE p87-92	**I can** use estimates to determine whether answers to word problems are reasonable. **Formative Assessment:** Ask students to describe any strategies they find helpful when solving word problems. Ask how they check to make sure their answer to a word problem is reasonable. Students might mention using benchmark or rounding to the nearest whole number.	NF.1 NF.2 SMP1 SMP3 SMP4 SMP6 SMP7	SAB p27 (E) SAB p28 (E) HW p23 (NE) R p24 (NE)	

	Lesson 1.12 Notes			
1.13 TE p93-98	Mathematical Practices	NF.1 NF.2 SMP1 SMP2 SMP3 SMP4 SMP5 SMP6 SMP7 SMP8	SAB p29 (E) SAB p30 (E) HW p25 (NE) R p26 (NE)	
	Lesson 1.13 Notes			
Quiz 2			AG p17 (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Unit 1: Enrichment/Intervention Loop
• About 3-5 days. Suggested date of completion:
Unit Test Objectives
● 1A Create equivalent fractions by multiplying or dividing numerators and denominators of given fractions by the same number.
● 1B Compare fractions using a variety of strategies including by rewriting them with a common denominator.
● 1C Add and subtract fractions and mixed numbers with like and unlike denominators.
● 1D Make reasonable estimates of sums and differences of fractions and mixed numbers.
● 1E Solve real world problems.
Day 1: Final Formative Assessment - SAB p31-32
Day 2-4: Reteaching Activities – TE p100-102
Day 5: Assessment - Unit 1 Test AG p23-25

Alpena Montmorency Alcona Educational Service District
05 Pacing Guide
Unit 2: Addition and Subtraction with Decimals **16-18 Days**

Math Background:
- Research - TE p103OT-103P
- Background - TE p103Q-103JJ

Learning Path:
- **Students expand their understanding of the base-ten system to decimals to the thousandths place. They:**
  - observe that the process of composing and decomposing a base-ten unit is the same for decimals as for whole numbers
  - observe that the same methods of recording numerical work can be used with decimals as with whole numbers.

Big Idea 1: Read and Write Whole Numbers and Decimals
- About 4 days. Suggested date of completion:

Vocabulary: decimal, equivalent decimal, expanded form, hundredth, notation, power of ten, standard form, tenth, thousandth, word form

Common Core State Standards for Math [CCSS-M]	**Common Core Standards of Mathematical Practices [SMPs]**
CC.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. **CC.5.NBT.3:** Read, write, and compare decimals to thousandths. **CC.5.NBT.3a:** Read, write, and compare decimals to thousandths. 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). **CC.5.NBT.3b:** Read, write, and compare decimals to thousandths. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	CC.K-12.MP.1: Make sense of problems and persevere in solving them. CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others. CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision. CC.K-12.MP.7: Look for and make use of structure. CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints

2.1	**I can**
	• understand decimals as equal divisions of whole numbers.
	
	Formative Assessment: Ask student to write an example of a decimal number, write an equivalent fraction for that decimal umber, and explain what they represent. The explanations should include the following points:
	
	    -The numbers after the decimal point correspond to the numerator in the fraction. The denominator of the fraction and the place value of the right-most digit of the decimal tell me how many equal parts there are in the whole group. The numerator of the fraction and the digits after the decimal point represent the number of those equal parts I have.
	
	    -The place value of the right-most digit of the decimal number tells us what the denominator of the fraction should be and also how to name the decimal number.
	
	    -Both the decimal number and the fraction represent the same part of a whole or objects in a set.
		NBT.3
		NBT.3a
		
		SMP2
		SMP3
		SMP6
		SMP7
		SMP8
			SAB p35 (E)
			SAB p36 (E)
			HW p27 (NE)
			R p28 (NE)	

2.2	**I can** • read, write, and model whole and decimal numbers.	NBT.1 NBT.3 NBT.3a	SAB p37 (E) SAB p38A-D (E) SAB p38 (E)	

			HW p29 (NE) R p30 (NE)	
	Formative Assessment: Ask students to write a 6 digit decimal number in thousandths in expanded form using powers of ten. Have them explain their answers.	SMP2 SMP3 SMP5 SMP6 SMP8		
2.3	**I can** • model and identify equivalent decimals. **Formative Assessment:** Ask students to write 3 different decimal numbers using the same 4 digits by moving the location of the decimal point. Students should compare the numbers and explain how they arrived at their comparisons.	NBT.1 NBT.3 NBT.3a NBT.3b SMP2 SMP3 SMP5 SMP6 SMP7 SMP8	SAB p39 (E) SAB p40 (E) HW p31 (NE) R p32 (NE)	
Quiz 1			AG p29 (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Big Idea 2: Addition and Subtraction

- About 5 days. Suggested date of completion:

Vocabulary: Associative Property of Addition, break apart drawing, centimeter (cm), Commutative Property of Addition, decimeter (dm), Distributive Property of Multiplication Over Addition, grouping, meter (m), millimeter (mm), ungroup/ing

Common Core State Standards for Math [CCSS-M]	Common Core Standards of Mathematical Practices [SMPs]
CC.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. **CC.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.	CC.K-12.MP.1: Make sense of problems and persevere in solving them. CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others. CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision. CC.K-12.MP.7: Look for and make use of structure. CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
2.4	**I can** • model adding and subtracting decimals. **Formative Assessment:** Ask students to describe how they would add and subtract decimals. Description should include the ideas of aligning the place values and writing the decimal point in the sum or difference.	NBT.7 MD.1 SMP1 SMP2 SMP3 SMP4 SMP5 SMP6 SMP7	SAB p41 (E) SAB p42 (E) HW p33 (NE) R p34 (NE)	
2.5	**I can** • add whole numbers and decimals to hundredths. **Formative Assessment:** Ask students how adding whole numbers I different then adding decimal numbers. Students' explanations should include the idea that decimal numbers add just like whole numbers but a decimal point is placed in the sum.	NBT.7 SMP2 SMP3 SMP6	SAB p43 (E) SAB p44 (E) HW p35 (NE) R p36 (NE)	
2.6	**I can** • subtract whole and decimal numbers to hundredths. **Formative Assessment:** Write the problem 6.02 – 2.89 on the board. Ask students to explain how to find the difference using *Ungrouping Place by Place* or *Ungroup All at Once.* Students' explanation should use language involving place values.	NBT.7 SMP1 SMP3 SMP5 SMP6	SAB p45 (E) SAB p46 (E) HW p37 (NE) R p38 (NE)	

2.7	**I can** • use the Commutative, Associative, and Distributive Properties to compute mentally. **Formative Assessment:** Ask students to explain how they would use the properties to help them solve mentally. Students should explain that they could use the properties to move (Commutative) and group (Associative) numbers so that they were easier to add.	NBT.7 SMP3 SMP6 SMP7 SMP8	SAB p47 (E) SAB p48 (E) HW p39 (NE) R p40 (NE)	
Quiz 2			AG p30	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Big Idea 3: Round and Estimate with Decimals

- About 4 days. Suggested date of completion:

Vocabulary: estimate, round

Common Core State Standards for Math [CCSS-M]	**Common Core Standards of Mathematical Practices [SMPs]**
CC.5.NBT.3b: Read, write, and compare decimals to thousandths. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. **CC.5.NBT.4:** Use place value understanding to round decimals to any place. **CC.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.	CC.K-12.MP.1: Make sense of problems and persevere in solving them. CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others. CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision. CC.K-12.MP.7: Look for and make use of structure. CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
2.8	**I can** • estimate decimal sums and differences. **Formative Assessment:** Ask students to list the steps they would take to estimate the solution to an addition or subtraction problem. Ideas should include identifying the rounding place and the place value to its right, the size of the digit, and how that would affect how the numbers were rounded.	NBT.4 SMP1 SMP2 SMP3 SMP5 SMP6 SMP8	SAB p49 (E) SAB p50 (E) HW p41 (NE) R p42 (NE)	
2.9	**I can** • read graphs with decimal scales and decimal numbers. • construct graphs with decimal scales and decimal numbers. **Formative Assessment:** Ask students to describe a bar graph and explain how it is used to display numerical data. Descriptions and explanations should demonstrate the understanding that a bar graph uses different length bars to compare discrete numeric data. The intervals between each number on the scale should be equal.	NBT.3b NBT.4 SMP1 SMP3 SMP4 SMP6	SAB p51 (E) SAB p52 (E) HW p43 (NE) R p44 (NE)	
2.10	Mathematical Practices	NBT.7 SMP1-8	SAB p53 (E) SAB p54 (E) HW p45 (NE) R p46 (NE)	

Quiz 3			AG p31 (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Unit 2: Enrichment/Intervention Loop • About 3-5 days. Suggested date of completion:
Unit Test Objectives • 2A Read, write, and identify the places of decimal numbers and whole numbers. • 2B Compare decimal numbers. • 2C Round numbers and estimate sums and differences. • 2D Add and subtract decimals to hundredths. • 2E Solve problems involving addition and subtraction of decimals.
Day 1: Final Formative Assessment - SAB p55-56
Day 2-4: Reteaching Activities – TE p184-186
Day 5: Assessment - Unit 2 Test AG p36-39

Alpena Montmorency Alcona Educational Service District 05 Pacing Guide
Unit 3: Multiplication and Division with Fractions 20-22 Days

Math Background:
- Research - TE p187Q-187R
- Background - TE p187S-187LL

Learning Path:
- **Students connect fractions with division. They connect their understanding:**
  - of multiplication by a fraction to generalize a formula for the product of two fractions.
  - of division as equal sharing to fractions.

Big Idea 1: Multiplication with Fractions

- About 7 days. Suggested date of completion:

Vocabulary: area model for multiplication, comparison bars, factor, fraction-bar model for multiplication, multiplicative comparison, Multiply and Simplify Method, product, Simplify and Multiply Method, Unit Fraction Method

<u>**Common Core State Standards for Math [CCSS-M]**</u>	<u>**Common Core Standards of Mathematical Practices [SMPs]**</u>
CC.5.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. **CC.5.NF.4a:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. 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.) **CC.5.NF.4b:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. 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. **CC.5.NF.5:** Interpret multiplication as scaling (resizing). **CC.5.NF.5a:** Interpret multiplication as scaling (resizing), by: 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. **CC.5.NF.5b:** Interpret multiplication as scaling (resizing), by: 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. **CC.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.	CC.K-12.MP.1: Make sense of problems and persevere in solving them. CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others. CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision. CC.K-12.MP.7: Look for and make use of structure. CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
3.1	**I can** • connect multiplying by 1/n to dividing by *n*. • use this idea to make multiplicative comparisons. **Formative Assessment:** Ask students to use an example to show how multiplying by a unit fraction is equivalent to dividing by a whole number.	NF.4 NF.4a NF.5 NF.5b NF.6 SMP1 SMP3 SMP4 SMP6 SMP7	SAB p59 (E) SAB p60 (E) SAB p61 (E) SAB p62 (E) HW p47 (NE) R p49 (NE)	Read 187BB-187DD Use groups of instead of the word of when talking multiplication. Might want to ask questions like if ¼ of 8 should be greater or less than 8 – show with numbers as you talk about it. Comparison bars are the same as the "tape diagram" shown in the CCSS -OA progressions.
3.2	**I can** • interpret a/b times a quantity as a of b equal parts of that quantity. **Formative Assessment:** Ask students to describe how to multiply a whole number by a non-unit fraction. They should give examples to help them explain. Students might describe finding a/b times a number by finding 1/b of the number (that is, by dividing the number by b) and then multiplying the result by a.	NF.4 NF.4a NF.6 SMP1 SMP3 SMP4 SMP6 SMP7 SMP8	SAB p63 (E) SAB p64 (E) HW p49 (NE) R p50 (NE)	Read 187BB-187DD 196 IMPORTANT NOTE!!!! Use manipulatives only if necessary to understand the drawing (197). Vocabulary is important!
3.3	**I can** • multiply a whole number by a fraction to produce a fraction. **Formative Assessment:** Ask students to explain why they can find 1/d x n by adding	NF.4 NF.4a NF.6 SMP1 SMP2	SAB p65 (E) SAB p66 (E) HW p51 (NE) R p52 (NE)	Read 187BB-187DD Builds on prior knowledge of multiplying (Unit 1). If confused remind them how to use repeated addition to multiply whole numbers and then unit

	together n copies of 1/d. Suggest that they use a specific example, such as ¼ x 3. Encourage students to make an area diagram like the ones in Activity 1. The diagram should be divided into 3 sections vertically and 4 sections horizontally. The diagram illustrates that taking ¼ times the entire area (that is, times 3) is the same as taking ¼ of each 1 whole and then adding.	SMP3 SMP5 SMP6 SMP8		fractions then go on.
3.4	**I can** multiply any two fractions. **Formative Assessment:** Ask students to state a rule for multiplying two fractions and to give an example to demonstrate the rule. Students should use words or symbols to indicate that the product of two fractions is the product of the numerators over the product of the denominators.	NF.4 NF.4a NF.4b NF.6 SMP1 SMP2 SMP3 SMP4 SMP5 SMP6 SMP7 SMP8	SAB p67 (E) SAB p68 (E) SAB p69 (E) SAB p70 (E) HW p53 (NE) R p54 (NE)	Read: 187EE-187FF Have students try to figure out what fraction you made – don't tell them – then have the student explain. Awesome read on 211 learning community. Connecting area to bar model is great. 215 teaching note!!!
3.5	**I can** compare and apply strategies for multiplying fractions. **Formative Assessment:** Ask students how they can tell when they can simplify a fraction multiplication problem before multiplying. Ask them to give an example and explain how to simplify it. Students should recognize that the problem can be simplified if there is a whole number that divides evenly into one of the numerators and one of the denominators of the	NF.4 NF.4a NF.6 SMP1 SMP2 SMP3 SMP6	SAB p71 (E) SAB p72 (E) HW p55 (NE) R p56 (NE)	Read: 187EE-187FF 220 teaching note!

	factors.			
3.6	**I can** • multiply with mixed numbers. **Formative Assessment:** Ask students how multiplying mixed numbers is similar to multiplying fractions and how it is different. Students should state that it is different because you must first rewrite the factors as fractions. It is similar because, once you have rewritten the factors, you can multiply numerators and multiply denominators as you do with fractions.	NF.4 NF.4b NF.5 NF.5a NF.5b NF.6 SMP1 SMP2 SMP3 SMP6 SMP7 SMP8	SAB p73 (E) SAB p74(E) HW p57 (NE) R p58 (NE)	Read: 187EE-187FF So much easier to understand when taught using the area model!! Some kids might not need the picture – but teachers should always use one.
Quiz 1			AG p43 (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Big Idea 2: Multiplication Links

- About 4 days. Suggested date of completion:

Vocabulary: Associative Property, Commutative Property, Distributive Property,

Common Core State Standards for Math [CCSS-M]	Common Core Standards of Mathematical Practices [SMPs]
CC.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.)	CC.K-12.MP.1: Make sense of problems and persevere in solving them.
CC.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.	CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others.
CC.5.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	
CC.5.NF.4a: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. 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.)	CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision.
CC.5.NF.5: Interpret multiplication as scaling (resizing).	CC.K-12.MP.7: Look for and make use of structure.
CC.5.NF.5a: Interpret multiplication as scaling (resizing), by: 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.	CC.K-12.MP.8: Look for and express regularity in repeated reasoning.
CC.5.NF.5b: Interpret multiplication as scaling (resizing), by: 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.	

CC.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.	

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
3.7	**I can** • relate operations with fractions and whole numbers. • discuss properties of arithmetic. **Formative Assessment:** Ask students whether the product of two fractions less than 1 will be greater than or less than their sum. The sum will be greater because we are combining the fractions. For the product, we are taking part of one of the fractions.	NF.1 NF.2 NF.4 NF.4a NF.5 NF.5a NF.5b NF.6 SMP1 SMP2 SMP3 SMP6 SMP7 SMP8	SAB p75 (E) SAB p76 (E) SAB p77 (E) SAB p78 (E) HW p59 (NE) R p60 (NE)	Read: 187GG-187HH Read Note 236 Properties are important!
3.8	**I can** • add, subtract, compare, and multiply fractions to solve word problems. **Formative Assessment:** Ask students which rows of a fraction box require them to find a common denominator. Comparing, adding, and subtracting require a common denominator.	NF.1 NF.2 NF.4 NF.5 NF.5a NF.6 SMP1 SMP2 SMP3 SMP6	SAB p79 (E) SAB p80 (E) HW p61 (NE) R p62 (NE)	Read: 187GG-187HH Importance of understanding mult. Is different from add or sub (all about the denominator differences).
3.9	**I can** • predict the size of a product relative to the size of one factor based on the size of another factor.	NF.4 NF.5 NF.5a NF.5b	SAB p81 (E) SAB p82 (E) HW p63 (NE) R p64 (NE)	Read: 187II Distributive property helps understand mult by a

	Formative Assessment: Ask students to imagine that they are multiplying some number n by another factor. How can they predict whether the product will be greater than, less than, or equal to n? Students should state that if the factor is less than 1, the product will be less than n. If it is equal to 1, the product will be equal to n. If it is greater than 1, the product will be greater than n.	NF.6 SMP1 SMP3 SMP6 SMP8		number greater than 1.
Quiz 2			AG p44 (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Big Idea 3: Division with Fractions

- About 6 days. Suggested date of completion:

Vocabulary: decimal fraction, dividend, divisor, quotient

Common Core State Standards for Math [CCSS-M]	Common Core Standards of Mathematical Practices [SMPs]
CC.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.) **CC.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. **CC.4.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? **CC.5.NF.4:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. **CC.5.NF.4a:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. 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.) **CC.5.NF.5:** Interpret multiplication as scaling (resizing). **CC.5.NF.5a:** Interpret multiplication as scaling (resizing), by: Comparing the size of a product to the	CC.K-12.MP.1: Make sense of problems and persevere in solving them. CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others. CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision. CC.K-12.MP.7: Look for and make use of structure. CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

CC.5.NF.5b: Interpret multiplication as scaling (resizing), by: 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.

CC.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.

CC.5.NF.7: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

CC.NF.7a: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 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.

CC.NF.7c: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 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?

CC.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.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
3.10	**I can** • relate division by a unit fraction or whole number to multiplication. **Formative Assessment:** Ask students to explain how to divide a whole number by a unit fraction and a unit fraction by a whole number.	NF.3 NF.4 NF.4a NF.7 NF.7a NF.7b NF.7c SMP1-8	SAB p83 (E) SAB p84 (E) SAB p85 (E) SAB p86 (E) HW p65 (NE) R p66 (NE)	Read: 187JJ-187KK Great note 256 Building concepts!! 258
3.11	**I can** • write and solve division word problems. **Formative Assessment:** Ask students how dividing a whole number by a unit fraction is different from dividing a unit fraction by a whole number. Encourage them to use situations or diagrams to explain. Students should mention that dividing a whole number by a unit fraction means finding how many of the unit fractions are in that number. The result is greater than the whole number. Dividing a unit fraction by a whole number splits the unit fraction into that whole number of pieces, making a smaller unit fraction.	NF.3 NF.7 NF.7a NF.7b NF.7c SMP1 SMP2 SMP3 SMP4 SMP5 SMP6	SAB p87 (E) SAB p88 (E) HW p67 (NE) R p68 (NE)	Read: 187JJ-187KK Let students come up with solutions – note 264.
3.12	**I can** • determine whether solving a word problem requires multiplication or division. **Formative Assessment:** Ask students to	NF.4 NF.5 NF.5a NF.5b NF.6 NF.7	SAB p89 (E) SAB p90 (E) SAB p91 (E) SAB p92 (E) HW p69 (NE) R p70 (NE)	Read: 187JJ-187KK Relate info to real life to help students understand what they are doing.

	explain why multiplying a number n by a unit fraction gives a number less than n, but dividing n by a unit fraction gives a number greater than n. Students should mention that a unit fraction is less than 1, so multiplying by a unit fraction is taking less than all of n. For division, they might explain that because there is more than 1 unit fraction in each whole, there are more than n unit fractions in n weeks.	NF.7a NF.7b NF.7c SMP1 SMP2 SMP3 SMP6 SMP8		Property discussion again helps.
3.13	**I can** • solve numerical involving all four operations with fractions. • solve word problems involving all four operations with fractions. **Formative Assessment:** Ask students to choose any two unlike fractions and then compare, add, subtract, and multiply them. When subtracting, students must be sure to subtract the lesser fraction from the greater fraction.	NF.1 NF.2 NF.3 NF.4 NF.5 NF.5a NF.6 NF.7 NF.7a NF.7b NF.7c MD.2 SMP1 SMP3 SMP6 SMP8	SAB p93 (E) SAB p94 (E) HW p71 (NE) R p72 (NE)	Read: 187JJ-187KK Review!! Dot plots are taught in 3rd grade!! Students should know how to do these and apply what they know from past grades (similar to what *might* be seen on SBAC).
3.14	Mathematical Practices	NF.3 NF.45a NF.6 NF.7c SMP1-8	SAB p95(E) SAB p96 (E) HW p73 (NE) R p74 (NE)	

Quiz 3			AG p45 (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Unit 3: Enrichment/Intervention Loop
- About 3-5 days. Suggested date of completion:

Unit Test Objectives
- 3A Multiply a fraction, whole number, or mixed number by a fraction or a mixed number.
- 3B Divide a whole number by a whole number in cases where the quotient is a fraction or a mixed number.
- 3C Divide a unit fraction by a whole number or a whole number by a unit fraction.
- 3D Predict how a product will compare to one factor based on the size of the other factor.
- 3E Solve real world problems.

Day 1: Final Formative Assessment - SAB p97-98

Day 2-4: Reteaching Activities – TE p290-292

Day 5: Assessment - Unit 3 Test AG p50-53

Alpena Montmorency Alcona Educational Service District
05 Pacing Guide

Unit 4: Multiplication with Whole Numbers and Decimals
17-19 Days

Math Background:
- Research - TE p293O-293P
- Background - TE p293Q-293HH

Learning Path:
- **Students multiply whole numbers and decimals. Their work involves:**
  - finding the products of two-digit whole numbers and decimals both less than 1 and greater than 1.
  - estimating products by rounding factors.

Big Idea 1: Multiplication with Whole Numbers

- About 6 days. Suggested date of completion:

Vocabulary: shift, base, exponent, exponential form, power of ten, even, odd, partial products, Place Value Sections, Expanded Notation, New Groups Below, Place Value Rows, Short Cut

Common Core State Standards for Math [CCSS-M]	Common Core Standards of Mathematical Practices [SMPs]
CC.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. **CC.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. **CC.5.NBT.5:** Fluently multiply multi-digit whole numbers using the standard algorithm. **CC.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.	CC.K-12.MP.1: Make sense of problems and persevere in solving them. CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others. CC.K-12.MP.4: Model with math. CC.K-12.MP.5: Use appropriate tools strategically. CC.K-12.MP.6: Attend to precision. CC.K-12.MP.7: Look for and make use of structure. CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
4.1	**I can** • understand the shift pattern when multiplying by 10, 100, 1000. **Formative Assessment:** Ask students to explain in general what happens when a number is multiplied by 10 or 100. They can give examples to illustrate.	NBT.1 NBT.2 NBT.7 SMP1-8	SAB p101 (E) SAB p102 (E) SAB p103 (E) SAB p104 (E) SAB p105 (E) SAB p106 (E) SAB p107 (E) SAB p108 (E) HW p75 (NE) R p76 (NE)	Read 293Z-293BB Place value language is very important Saying that multiplying by 10 shifts the digits left one place rather than it shifts the decimal point is important – because the decimal point always stays between the ones place and the tenths CCSS doesn't take you to the thousandths – but it helps to emphasize the pattern for multiplying by a power of ten Read 300 teacher note Remind kids that the exponent is the number of times the base is used as a factor and that it is not a factor itself
4.2	**I can** • understand that multiples of 5 need extra attention in the zeros pattern. **Formative Assessment:** Ask students to summarize the fives pattern in general and to give examples. Students should mention that 5 times an even number will have an "extra" 0 because the basic fact will end in a 0.	NBT.2 SMP3 SMP4 SMP6 SMP7 SMP8	SAB p109 (E) SAB p110 (E) HW p77 (NE) R p78 (NE)	Read 293Z-293BB Using a pattern of 0's to predict the number of zeros in a product requires special attention for some combinations of factors – this lesson is all about being away that using patterns of zeros must be done with care!!! Activity 1--DO NOT EXLPAIN … let kids discuss and come up with understanding!! The next

				exercised are designed to clarify the issue in a more formal way!!
4.3	**I can** • understand how a place value model can be used to solve multidigit multiplication problems. **Formative Assessment:** Ask students how the Place Value Sections and Expanded Notation methods are alike and how they are different. Student explanations should include the following main point: Expanded Notation and Place Value Sections are both methods of getting the 4 partial products when multiplying a two-digit number by a two-digit number. Each partial product is an area of one place value section. The final product is the sum of the areas of those sections.	NBT.1 NBT.5 SMP1 SMP2 SMP3 SMP4 SMP6	SAB p111 (E) SAB p112 (E) HW p79 (NE) R p80 (NE)	Read 293CC Important to analyze, discuss, draw models for the context Place value sections shows the relationship the distributive property shares with multiplication Some students may need to be reminded of array model and how it led to place value sections After this lesson students can use any method including the traditional one. But if confused have them stick with place value sections At start even students that use numeric method should initially use the rectangle drawings as a check for their work – lesson 4 will have more complex but more efficient methods
4.4	**I can** • solve two-digit multiplication problems using various methods. **Formative Assessment:** Ask students to demonstrate how to use the Place Value Rows method to multiply two 2-digit numbers. Ask them how it is similar to and different from the Place Value Sections method.	NBT.5 SMP3 SMP6 SMP7	SAB p113 (E) SAB p114 (E) SAB p115 (E) SAB p116 (E) HW p81 (NE) R p82 (NE)	Read 293CC

4.5	**I can** • practice multiplying multidigit numbers. **Formative Assessment:** Ask students to explain the difference between multiplication of a 2-digit number by a 2-digit number and by a 1-digit number. Students should be able to verbalize that with 2-digit by 2-digit multiplication there will be more partial products as a result of multiplying by a digit in the tens place.	NBT.5 SMP6	SAB p117 (E) SAB p118 (E) HW p83 (NE) R p84 (NE)	
Quiz 1			AG p (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Big Idea 2: Multiplication with Decimal Numbers
- About 8 days. Suggested date of completion:

Vocabulary: Commutative Property of Multiplication, Associative Property of Multiplication, Distributive Property of Multiplication over Addition

Common Core State Standards for Math [CCSS-M]	Common Core Standards of Mathematical Practices [SMPs]
CC.5.NF.5: Interpret multiplication as scaling (resizing).	
CC.5.NF.5a: Interpret multiplication as scaling (resizing), by: 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.	CC.K-12.MP.1: Make sense of problems and persevere in solving them.
CC.5.NF.5b: Interpret multiplication as scaling (resizing), by: 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 $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	CC.K-12.MP.2: Reason abstractly and quantitatively. CC.K-12.MP.3: Construct viable arguments and critique the reasoning of others.
CC.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.	CC.K-12.MP.4: Model with math.
CC.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.	CC.K-12.MP.5: Use appropriate tools strategically.
CC.5.NBT.3: Read, write, and compare decimals to thousandths.	CC.K-12.MP.6: Attend to precision.
CC.5.NBT.3b: Read, write, and compare decimals to thousandths. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	CC.K-12.MP.7: Look for and make use of structure.
CC.5.NBT.4: Use place value understanding to round decimals to any place. Perform operations with multi-digit whole numbers and with decimals to hundredths.	CC.K-12.MP.8: Look for and express regularity in repeated reasoning.

Lesson	Learning Target	CCSM and SMPs	Additional Resources Essential (E) Non-essential (NE)	Hints
4.6	**I can** • solve multiplication problems in which one factor is a decimal number. **Formative Assessment:** Ask students to explain how to place the decimal point in the product in a problem with decimal and whole number factors. Explanations should include the idea that the product will have the same number of decimal places as the decimal factor.	NBT.2 NBT.7 SMP1 SMP3 SMP4 SMP6 SMP7 SMP8	SAB p119 (E) SAB p120 (E) SAB p121 (E) SAB p122 (E) HW p85 (NE) R p86 (NE)	Read 293DD-293GG Students compute decimal products symbolically and explore shit patterns in those products – use addition to verify the relationship Be sure students see and articulate that the product has the same number of decimal places as the decimal factor Main point to understand is that each decimal factor has two decimal places (cents) so the produce also has two decimal places
4.7	**I can** • solve multiplication problems in which at least one factor is a decimal number. **Formative Assessment:** Ask students to explain how multiplying a decimal number by a decimal number is like multiplying a whole number by a decimal number and how it is different. Explanations should include the idea that they are alike except both factors will have places to the right of the decimal point that need to be counted so the decimal point can be placed in the product.	NBT.1 NBT.2 NBT.7 SMP1 SMP2 SMP3 SMP6 SMP7 SMP8	SAB p123 (E) SAB p124 (E) SAB p125 (E) SAB p126 (E) SAB p127 (E) SAB p128 (E) HW p87 (NE) R p88 (NE)	Read 293DD-293GG This lesson give additional opportunities to explore shift patterns of decimals The real world problems and symbolic activities will help students infer the number of decimals places in a product is the same as the total number of decimal places in the factors Correct language and vocabulary is very important!

4.8	**I can** • multiply with decimal numbers greater than 1. **Formative Assessment:** Ask students how to multiply two decimal numbers that are both greater than one. Explanations should include how the position of the decimal point is determined.	NBT.5 NBT.7 SMP1 SMP3 SMP6 SMP7 SMP8	SAB p129 (E) SAB p130 (E) SAB p131 (E) SAB p132 (E) HW p89 (NE) R p90 (NE)	Read 293DD-293GG This lesson gives students an opportunity to practice and apply the decimal shift patterns learned in lesson 7 Use all properties!! Multiplying decimals is like multiplying fractions!
4.9	**I can** • understand and apply shift patterns when multiplying by 10, 100, 1000, 0.1, or 0.01. **Formative Assessment:** Ask students to explain how to multiply a decimal number by 10, by 100, and by 1,000. Their explanations should include the concept of moving the digits of the decimal number to the left the appropriate number of places. The number of places moved is based on the power of ten or the number of zeros in the power.	NBT.1 NBT.2 NBT.7 SMP2 SMP3 SMP6 SMP7 SMP8	SAB p133 (E) SAB p134 (E) SAB p135 (E) SAB p136 (E) HW p91 (NE) R p92 (NE)	Read 293DD-293GG Students compare and contrast shift patterns of whole number multipliers (10 and 100) to those of decimal multipliers (0.1 and 1.01) Students extend what they learned from lesson 7 Incorrect placement of decimal is common – encourage estimating to check 358 read teacher note
4.10	**I can** • round whole numbers and decimal numbers to estimate the product in a multiplication problem. **Formative Assessment:** Ask students to describe a method for estimating the product of two decimal numbers. Have them give an example to illustrate their estimation method.	NBT.4 NBT.7 SMP2 SMP3 SMP6	SAB p137 (E) SAB p138 (E) HW p93 (NE) R p94 (NE)	Read 293GG-293HH Use all the strategies kids know 364 building concepts good read

	They should explain each step of their method. Explanations should include the place value they rounded to and how they rounded.			
4.11	**I can** • perform multidigit multiplication with decimal numbers. **Formative Assessment:** Ask students to choose a pair of 2-digit whole numbers. Then students write and solve all the possible equations that can be made from that pair and which would result in whole-number products and decimal products in tenths and hundredths. For example: 42 x 72 = 3,024 4.2 x 72 = 302.40 4.2 x 7.2 = 30.24 42 x 0.72 = 30.24 0.42 x 72 = 30.24	NBT.5 NBT.7 SMP1 SMP2 SMP3 SMP6 SMP8	SAB p139 (E) SAB p140 (E) HW p95 (NE) R p96 (NE)	Read 293GG-293HH This lesson gives kids the opportunity to put all of unit 4 concepts together
4.12	Mathematical Practices	NF.5 NF.5a NF.5b NBT.3 NBT.5 NBT.7 SMP1-8	SAB p141 (E) SAB p142 (E) HW p97 (NE) R p98 (NE)	Read 293HH

Quiz 2			AG p (E)	
Reteach			To reteach, use the resources listed above (Essentials and Non-Essentials) as well as the Response to Intervention Resource Books.	

Unit 4: Enrichment/Intervention Loop
- About 3-5 days. Suggested date of completion:

Unit Test Objectives
- 4A Multiply whole numbers by powers of ten with and without exponents.
- 4B Multiply multidigit whole numbers fluently.
- 4C Multiply decimals by powers of ten with and without exponents.
- 4D Multiply decimal numbers.
- 4E Solve real world problems.

Day 1: Final Formative Assessment - SAB p143-144

Day 2-4: Reteaching Activities – TE p382-384

Day 5: Assessment - Unit 4 Test AG p