Next Steps and Instructional Moves

The intended purpose of this document is to provide teachers with a tool to determine student understanding and suggest instructional moves that may help guide a student forward in their learning of a particular concept or standard. This guide is not an exhaustive list of strategies.

Fifth Grade: Cluster 5
Number and Operations- Fractions
Using Models to Add and Subtract Decimals and Fractions

NC.5.NF.1 Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths.
- Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
- Solve one- and two-step word problems in context using area and length models to develop the algorithm. Represent the word problem in an equation

NC.5.NBT.7 Compute and solve real-world problems with multi-digit whole numbers and decimal numbers.
- Add and subtract decimals to thousandths using models, drawings or strategies based on place value.
- Multiply decimals with a product to thousandths using models, drawings, or strategies based on place value. (strikethrough)
- Divide a whole number by a decimal and divide a decimal by a whole number, using repeated subtraction or area models. Decimals should be limited to hundredths. (strikethrough)
- Use estimation strategies to assess reasonableness of answers.

NC.5.OA.2 Write, explain, and evaluate numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving:
- Parentheses, using the order of operations.
- Commutative, associative and distributive properties.

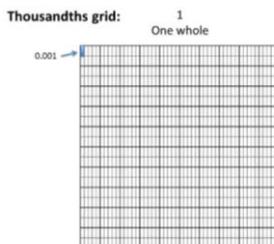| Not Yet	Students that are consistently scoring "Not Yet" on these concepts could have a variety of errors. Primarily students struggle to interpret a word problem, choose an appropriate operation, and apply an appropriate strategy. While students may also demonstrate gaps with computational fluency, gaps in conceptual understanding such as choosing the correct operation and an appropriate strategy should take priority.
	<u>Next Steps:</u> **For students struggling with solving word problems involving the addition and subtraction of fractions with unlike denominators (NC.5.NF.1):** ● For students who read a word problem and do not know how to select an appropriate operation or strategy, spend time with them discussing the action of the problem and how that action can be shown in an area or length model. For example, the task, "Yani ate ⅜ of a pizza and Susan ate ¼ of a pizza. How much pizza is left?" Discuss with students how they could use an area or length model to represent the problem. For two-step problems such as the one above, students should have opportunities to discuss the various parts of the task and whether their answer to step one and step two are reasonable.
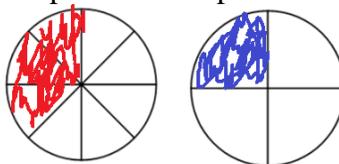
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- Start by posing tasks that involve only halves and fourths that can be easily modeled on graph/grid paper or fraction bars. Provide students with opportunities to discuss and reason about how they used an area or length model to help them rename equivalent fractions, such as ½ into 2/4.

- Avoid using strategies such as finding a common denominator in Grade 5. Strategies should be focused on using equivalent fractions and the relationship between denominators in order to rename fractions prior to adding or subtracting fractions.
- Finding the Common Denominator Instructional and Assessment Task is a great opportunity for students to reason about the denominators.

For students finding difficulty adding and subtracting decimals (NC.5.NBT.7):
- Pose tasks and have students model the action in the problems in order to determine if they are adding or subtracting decimals.
- Pose tasks and provide opportunities for students to use 10 x 10 grids in order to model the addition and subtraction of decimals to the hundredths and thousandths place. For the thousandths place, the Batting Averages lesson includes thousandths grids which can be used.

- Provide opportunities for students to use expanded form to support addition and subtraction work. For example, the sum of 0.528 and 0.432 could be found by adding $0.5 + 0.4 + 0.02 + 0.03 + 0.008 + 0.002$.
- For subtraction tasks, discuss with students the idea of starting with the number being subtracted and add up in parts until you reach the number you are subtracting from.
  Example: 0.903 - 0.685 could be solved in the following way:
    $0.685 + \mathbf{0.005} = 0.690$
    $0.690 + \mathbf{0.2} = 0.890$
    $0.890 + \mathbf{0.01} = 0.900$
    $0.900 + \mathbf{0.003} = 0.903$
      The numbers I added represent the total answer: $0.005 + 0.2 + 0.01 + 0.003 = 0.218$
- Batting Averages Instructional and Formative Assessment Task helps students reason about subtraction of decimals.

For students struggling with order of operations and evaluating expressions (NC.5.OA.2):
- Support students by posing expressions that involve only addition and multiplication such as $3.15 + 4 \times 5$. Have students explore the answer without parentheses, as well as how the answer changes based on the placement of parentheses, such as around the $(3.15 + 4) \times 5$. This standard is used integrated with addition and subtraction of whole numbers, fractions and decimals within this cluster. See Cluster 2 where the standard was first introduced.

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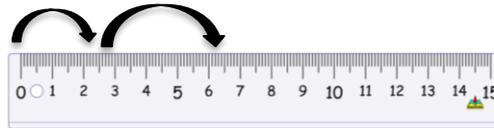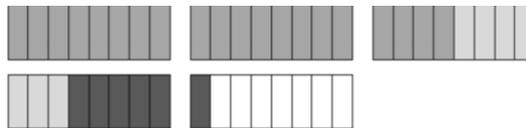| Progressing	Students that are consistently scoring "Progressing" may still have confusion on how to use an appropriate strategy and accurately find the answer to a problem.
	<u>Next Steps:</u> **For students struggling with solving word problems involving the addition and subtraction of fractions with unlike denominators (NC.5.NF.1):** ● If students are unable to rename a fraction as an equivalent fraction before adding or subtracting, pose tasks to provide students with opportunities on using area models to find equivalent fractions that have related denominators. **Baking Cookies** Joe and Grace are baking cookies. They need a total of 2 cups of sugar for the recipe. Joe has $\frac{9}{8}$ cups of sugar and Grace has $\frac{3}{4}$ of a cup of sugar. Without solving the problem, do they have enough sugar? Explain your thinking. Cluster 5 Instructional and Assessment Task Found to Tools4NCTeachers ● Use a ruler as a number line to help students add fractions. Solve using addition and subtraction of fractions using fractional amounts with fourths and halves. $$2 ½ + 3 ¾ = 6 ¼$$ ● If students can successfully represent the problem and solve it, but struggle to rename an improper fraction as a mixed number, encourage students to use an area model to represent the improper fraction and determine how to rename it as a mixed number. Support students in the discussion of the reasonableness of their answer. There is some ham in the refrigerator. Tyrisha uses ¾ of a pound to make sandwiches and Jacquel uses 7/8 of a pound to make sandwiches. If there is now 2 ½ pounds of ham left over, how much ham was there before Tyrisha and Jacquel used some. From NCDPI Unpacking ● For students who read a word problem and do not know how to select an appropriate opportunity or strategy, spend time with them discussing the action of the problem and how that action can be shown in an area or length model. For example, the task, "Yani ate ⅜ of a pizza and Susan ate ¼ of a pizza. How much pizza is left?" Discuss with students how they could use an area or length model to represent the problem. For two-step problems such as the one above, students should have opportunities to discuss the various parts of the task and whether their answer to step one and step two are reasonable.

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	For students finding difficulty adding and subtracting decimals (NC.5.NBT.7):
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	● Provide opportunities for students to use expanded form to support addition and subtraction work. For example, the sum of 0.528 and 0.432 could be found by adding 0.5 + 0.4 + 0.02 + 0.03 + 0.008 + 0.002.
	● For subtraction tasks, discuss with students the idea of starting with the number being subtracted and add up in parts until you reach the number you are subtracting from. Example: 0.903 - 0.685 could be solved in the following way:
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	For students struggling with order of operations and evaluating expressions (NC.5.OA.2):
	● Support students by posing expressions that involve only addition and multiplication such as 3.15 + 4 x 5. Have students explore the answer without parentheses, as well as how the answer changes based on the placement of parentheses, such as around the (3.15 + 4) x 5. This standard is used integrated with addition and subtraction of whole numbers, fractions and decimals within this cluster. See Cluster 2 where the standard was first introduced.

Meets Expectation	**Students that are consistently scoring "Meets Expectation" have a good understanding of the concepts in this Cluster. Students can also provide**
	Next Steps: **For students who have demonstrated proficiency solving word problems involving the addition and subtraction of fractions (NC.5.NF.1):** ● Pose tasks with unrelated denominators within the range (halves, fourths, eighths, thirds, sixths, twelfths, fifths, and tenths). Use teacher judgement so that the equivalent fractions are reasonable and able to be modeled. ● Provide one-step and two-step equations to students and have them write word problems that match the equations. Students can trade problems with classmates and then solve them. **For students who have demonstrated proficiency with addition and subtraction involving decimals (NC.5.NBT.7):** ● Provide one-step and two-step equations to students and have them write word problems that match the equations. Students can trade problems with classmates and solve them. **For students who have demonstrated proficiency with order of operations and evaluating expressions (NC.5.OA.2):** ● Also provide tasks in which students must place parentheses in various places of an expression and determine all of the possible solutions based on the placement of the parentheses. Example: For the expression 8.25 - 5 x 4 put parentheses in all of the possible places. For each describe how the placement of parentheses influences the order that you evaluate the expression and how it influences the answer.