Next Steps and Instructional Moves

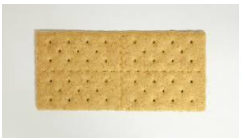
The intended purpose of this document is to provide teachers with a tool to determine student understanding and suggest instructional moves that may help guide a student forward in their learning of a concept or standard. This guide is not an exhaustive list of strategies.

<table>
<tr><th colspan="2">Third Grade: Cluster 7
Number and Operations- Fractions
Extending Understanding of Fractions</th></tr>
<tr><td colspan="2">NC.3.NF.1 Interpret unit fractions with denominators of 2, 3, 4, 6, and 8 as quantities formed when a whole is partitioned into equal parts;
• Explain that a unit fraction is one of those parts.
• Represent and identify unit fractions using area and length models.
NC.3.NF.2 Interpret fractions with denominators of 2, 3, 4, 6, and 8 using area and length models.
• Using an area model, explain that the numerator of a fraction represents the number of equal parts of the unit fraction.
• Using a number line, explain that the numerator of a fraction represents the number of lengths of the unit fraction from 0.
NC.3.NF.3 Represent equivalent fractions with area and length models by:
• Composing and decomposing fractions into equivalent fractions using related fractions: halves, fourths and eighths; thirds and sixths.
• Explaining that a fraction with the same numerator and denominator equals one whole.
• Expressing whole numbers as fractions and recognize fractions that are equivalent to whole numbers.
NC.3.NF.4 Compare two fractions with the same numerator or the same denominator by reasoning about their size, using area and length models, and using the >, <, and = symbols. Recognize that comparisons are valid only when the two fractions refer to the same whole with denominators: halves, fourths and eighths; thirds and sixths.</td></tr>
<tr><td rowspan="2">Not Yet</td><td>Students that are consistently scoring “Not Yet” on fraction tasks could have a variety of errors. Errors often include student misconceptions about basic fraction concepts, fractions as numbers, equivalence, and comparing. It is important that instruction for students includes models all year long and in a variety of visual and hands-on experiences. Another important instructional note is that students should only be working with wholes, halves, thirds, fourths, sixths, and eighths.</td></tr>
<tr><td><u>Next Steps:</u>
For students having trouble with initial fraction concepts:
● Build initial fraction knowledge from students understanding of sharing. Ask them to fairly share whole objects that are usually found in the real world. Ask students to share the objects (between 2, 3, 4, 6 or 8 people only) and then define what fraction each person receives. The real-world contexts should include sets of objects that can be evenly divided among sharers, so there are no remaining objects that need to be partitioned into fractional pieces.</td></tr>
</table>

Next Steps and Instructional Moves

Not Yet (Cont.)



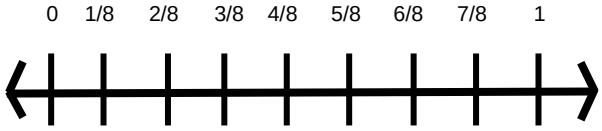



- Provide opportunities for students to explore ways to partition 1 real-life object. Ex: Hershey bars, graham crackers and pizza. Begin by having students partition into 2 equal parts then 4 equal parts. Discuss the idea that fourths can be made by cutting each half into half. Likewise, eighths can be created by partitioning each fourth in half.
- While working with thirds and sixths provide opportunities for students to partition a whole into three parts and explore how to create sixths.
- Students should not be sharing multiple objects among people, such as 2 cookies between 4 people. This work is done in Grade 5.

For students having trouble understanding that fractions are numbers:

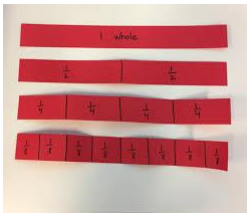
- Provide opportunities for students to extend counting with whole numbers to counting with fractions (e.g., counting by ⅛). While counting, showing jumps on a number line will help to reinforce the idea that counting on is like moving on a number line.

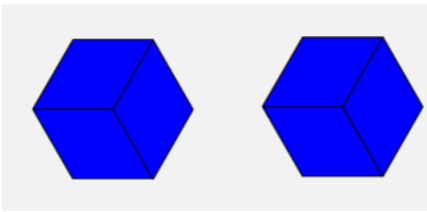
Say- *one eighth, two eighths, three eighths, four eighths, five eighths, six eighths, seven eighths, eight eighths (one whole)*



For students struggling with equivalent fractions:

- Pose tasks where students construct and use fraction strips or fraction bars to reason about equivalent fractions (see pictures).
- Have students make their own set of fraction strips. This will allow them to use the strips in a variety of ways to experience equivalence.
- Engage students in number talks and routines about the similarities and differences between equivalent fractions, such as ½ and 2/4.
- During the exploration of tasks and discussions, pose questions to help students see connections between equivalent fractions in both area models (rectangles and circles) and length models (number lines).
- Fractional parts of rectangles lesson
- When exploring equivalent values such as 6/3 and 2/1 use pattern blocks to model where a hexagon would be 1, a trapezoid would be ½, a rhombus would be ⅓, and a triangle would be ⅙. E.g.: Pose a task such as 1 rhombus has a value of 1/3. How many wholes are 6 rhombuses equal to?





Next Steps and Instructional Moves

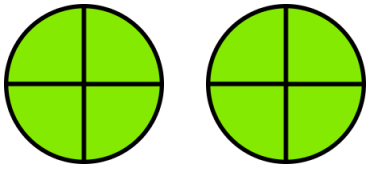
Not Yet (Cont.)	**For students struggling with comparing fractions:** ● Pose tasks that require students to use student-made fraction strips or student-made representations to compare fractions. ● Provide ample opportunities for students do number talks and routines about fractions with the same numerator and different denominators or different numerators and the same denominator are cornerstone for sense making. ● Students also may think about comparing fractions based on how the numerator is related to the denominator. At the "not yet" level, focus on unit fractions (½, ⅓, ¼, etc.) when comparing fractions with same numerators. This allows student to reason about size to make comparisons.

Progressing	**Students that are consistently scoring "Progressing" have a strategy to use with fractional concepts; however, they have not mastered this strategy or may also still struggle with some fractional concepts.**
	<u>Next Steps:</u> **For students having trouble with initial fraction concepts:** ● Students who are progressing have strategies for understanding fractional concepts using

Next Steps and Instructional Moves

manipulatives. Provide opportunities to work on fractions that are not unit fractions as well as fractions that are equivalent to whole numbers greater than one (3.NF.3).

- Given this picture or the fraction 8/4, students may want to start by drawing 8 wholes. Discuss with students that the denominator has the most influence on how we represent fractions since that tells us how many equal parts are in 1 whole. As students then consider what ¼ looks like and then start to shade in more pieces they begin to make sense of the idea that 4/4 is 1 whole and since they need to represent 8/4 they need to draw another whole. Avoid the strategy of teaching "8 divided by 4 equals 2 so we know the answer is 2 wholes." The goal in Third Grade is to develop a conceptual understanding of fractions by using models.



- Students may have difficulty with determining how many parts to partition based on the word problem. Ex: Kari and three friends are going to share a chocolate pie. What fraction of the pie will each friend receive? While Kari does have three friends, the pie needs to be partitioned into four equal sections. A misconception would be that only three people are going to share the pie. When students determine that three people are sharing the pie the fractional piece would be ⅓. In this example, the students need to understand that Kari and three friends will determine that four people are going to share the pie. However, the correct answer is ¼ because there are four people that are sharing.
- Students may also misinterpret the word problem about whether the answer should be the amount shaded or not shaded. Pose tasks in which the answer sometimes is the amount not shaded (amount left) as well as the amount shaded (amount eaten or used). Provide multiple discussions for students to reason about where the answer is within the representation that they have made.

For students having trouble understanding fractions as numbers:

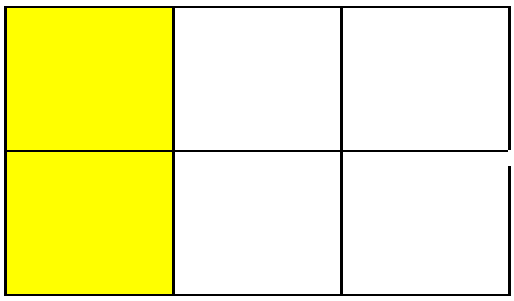
- Engage students in number talks and routines that involve skip counting by a unit fraction (e.g., ¼) to have them consider how counting can occur by fractions just as it does with whole numbers.
- Provide multiple opportunities for students to locate fractions on a number line. Using a clothesline number line in your classroom is a great way to have an interactive tool for instruction.

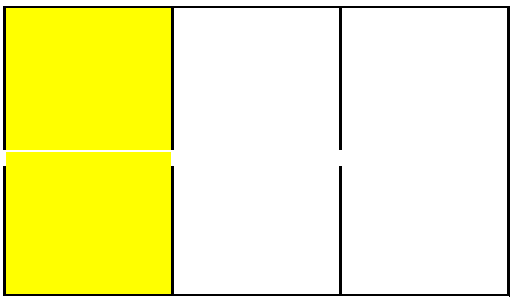
For students struggling with equivalent fractions:

- Pose tasks where students construct and use fraction strips or fraction bars to reason about equivalent fractions (see pictures).
- Have students make their own set of fraction strips. This will allow them to use the strips in a variety of ways to experience equivalence.
- Engage students in number talks and routines about the similarities and differences between equivalent fractions, such as ½ and 2/4.
- During the exploration of tasks and discussions, pose questions to help students see connections between equivalent fractions in both area models (rectangles and circles) and length models (number lines).
- Provide opportunities for students to explore equivalent fractions by partitioning rectangles on graph paper. "Can you show me ⅓?" Now if we wanted to partition our whole into

Next Steps and Instructional Moves

sixths, “How many sixths would be shaded?”

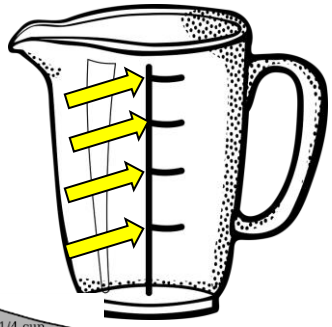
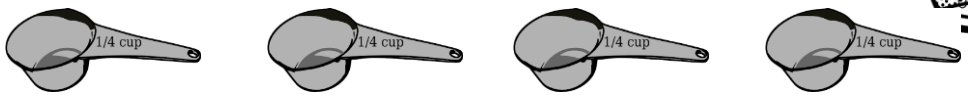




For students struggling with comparing fractions:

- Pose tasks that require students to use student-made fraction strips or student-made representations to compare fractions.
- Provide ample opportunities for students do number talks and routines about fractions with the same numerator and different denominators or different numerators and the same denominator are cornerstone for sense making.

Next Steps and Instructional Moves

Meets Expectation	**Students that are consistently scoring "Meets Expectation" on fractional concepts and have a good command of fractional size, fractional notation, equivalence and comparing fractions.**
	Next Steps: ● Cluster 8 is the measurement unit for third grade math. To link fractional understanding to measurement, allow students the opportunity to experiment with customary measurement while reinforcing fractional understanding. This will help students use measurement as a context for understanding fractions as numbers. Give numerous experiences with measuring cups (dry and liquid) and rulers. Ask students to scoop and dump while using counting with fractions.   ● Begin to pose tasks to students that involve the joining of fractions with the same denominator. "Tomas has ⅜ of a bag of candy. Suzette has 2/8 of a bag of candy. How much of a bag if they put their candy together?"