Grade 5 - Fractional Reasoning

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📋 Developmental Tracking Sheet

What to look for from the end of Grade 4	**Diagnostic Thinking Tasks:** (sample tasks to uncover students' current understandings)
Looking back: ● **Represent** fractions using drawings, tools, and standard fractional notation (from halves to tenths) and **explain** the meanings of the denominator and the numerator ● Use drawings and models to **represent, compare,** and **order fractions** that are the individual portion results from two different fair-share scenarios (involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers) ● **Count** to 10 by halves, thirds, fourths, fifths, sixths, eighths, and tenths, with and without the use of tools ● **Describe** relationships and **show** equivalences among fractions and decimal tenths	Choose two fractions where one is a lot less than the other. Represent these two fractions using a drawing or a tool to show how you know that this is true about them. Can you also find two fractions that are very close in size? Represent them to show how you know that they are close in size! Why this task? ● It is inherently differentiated by allowing students to generate their own fraction pairs, based on their understanding. ● It has a natural extension by allowing students to continue finding pairs of fractions to compare. ● It is easily differentiated further by providing parameters or eliminating the student choice (“Choose a unit fraction that is a lot less than another unit fraction…” OR “Is one third a lot less than three-quarters? Represent these two fractions to show how you know!”) ● creates an opportunity for the teacher to observe: ○ What representations are students already comfortable with (partitioning their own area models, building with manipulatives like fraction tiles, relational rods, etc.) ○ Are students bumping into the commutative property? (The idea that 6x4 is equal to 4x6 by changing the orientation of the array.) ○ How comfortable are students with standard notation, and are any misconceptions apparent? (reversing numerator/denominator, etc.) ○ Which denominators are students most familiar with? **Alternate task**: - explore the Diagnostic Assessments included in the MathUP topics listed below

Next Steps for Learning:

- Based on what you saw and heard, what is next for you and your students?
- Does a starting point now stand out in the grade-level sample problems or MathUP Connections?

Resources to Address Grade Level Expectations:

MathUP Connections

Note: To ensure the links below work, first sign into MathUP in a separate tab

- Representing, Comparing, and Ordering Fractions, Lessons 1-5
- Representing Decimal Numbers, Lesson 3

Building Fluency Lessons

MathUP Number Talks:

- Number Talks 7, 11, 12, 15, 27, 47, 52, 55, 60, 61, 64, 69

FractionTalks.com

- many visual representations of fractions for conversations & around partitioning, determining and naming size of parts, etc.

Number Talks - Fractions, Decimals, and Percents (Parrish):

- Area Model - pg. 75-82
- Set Model - pg. 89
- Linear Model - pg. 93-96
- Comparing and Ordering - pg. 99-110

Sample Problems and Explorations:

Explore different models:

- Area Model: If a blue rhombus, from our pattern blocks, is worth ¼, create a shape with the value of 2 ¼. Sketch your shape and label the fractional parts.
- Length Model: If the green relational rod is worth 1 whole, what are the values of one red rod, one light green rod, the white rod, and the dark brown rod?
- Set Model: There are 45 grade 5 students in total. Exactly ⅗ of the grade 5 students signed up for hockey intramurals. How should I set up the teams?

Choose an improper fraction. Create three or more representations of that fraction. At least two of the representations should be similar. Tell why these representations are similar.

Identify a fraction between $\frac{3}{2}$ and $1\frac{3}{4}$ and represent it two different ways.

How does each representation prove that it is between $\frac{3}{2}$ and $1\frac{3}{4}$?

You want to bake chocolate chip cookies but you only have a $\frac{1}{4}$ measuring cup.

How can you use your measuring cup to gather each of these ingredients accurately?

$\frac{3}{4}$ cup of butter $1\frac{1}{2}$ cup brown sugar $\frac{3}{4}$ cup of flour $\frac{1}{2}$ cup cocoa $2\frac{1}{4}$ cups of chocolate chips

Equivalence Comparisons: Are $\frac{2}{6}$ and $\frac{4}{12}$ equal? Show your thinking.

(Alternative comparisons: $\frac{3}{4}$ and $\frac{15}{20}$, $\frac{2}{6}$ and $\frac{3}{9}$)

Encourage students to use grid paper, manipulatives, rulers...etc. to represent their thinking.

Provide students with the following set of fractions (adapt as needed).

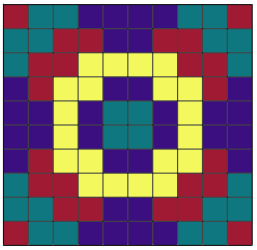
Ask students to place this set of fractions on a number line. They can use more than one number line if needed.

($\frac{8}{6}$, $1\frac{2}{6}$, $1\frac{1}{3}$, $\frac{4}{3}$, $\frac{5}{8}$, $\frac{2}{8}$, $\frac{1}{4}$, $\frac{1}{3}$) OR ($\frac{2}{4}$, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{6}$, $\frac{3}{4}$, $\frac{6}{8}$, $\frac{5}{10}$, $\frac{3}{9}$)

Consolidation:

- How did you decide if you needed more than one number line?
- Which fractions were easy to place?
- What did you find challenging?
- What did you learn about equivalent fractions?
- What questions do you still have about equivalent fractions?

Create a personal icon/avatar using at least 4 colours on the 100 grid.



- What fraction of each colour makes up your personal icon?
- What percentage of the total area (100 units) is taken up by each colour?
- If the grid has a value of 1 whole, what decimal values does each colour represent?

Consolidation - emphasize the relationship between fractions, decimals and percents (all representing the part to whole for each colour choice)

Mr. Khan and Ms. Lang surveyed their classes to find out where they should go for the final school trip. Their responses are listed below:

Class and students	**ROM**	**Canada's Wonderland**	**Conservation Area**
Mr. Khan (25 students)	10 students	8 students	7 students
Ms. Lang (20 students)	25% of students	45% of students	30% of students

Based on the survey results, which class trip is the most popular. Justify your thinking.

The Contest - A Guide to Effective Instruction in Mathematics - Decimals pg 67-75. During this learning sequence, students investigate the relationships among fractions, decimal numbers and percents.

Models and Tools

Concrete Learning Resources Tools:

- pattern blocks
- counting (Cuisenaire) rods
- snap cubes
- tiles
- number lines
- tenths grids
- counters
- fraction strips
- geoboards
- base ten blocks

Virtual Learning Resources and Tools:

- pattern blocks
- counting (cuisenaire) rods
- snap cubes
- tiles
- number lines
- counters
- fraction strips
- fraction bars/circles
- geoboards
- base ten blocks

Expectation Cluster:

B1. Number Sense: demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

B1.3 represent equivalent fractions from halves to twelfths, including improper fractions and mixed numbers, using appropriate tools, in various contexts

B1.4 compare and order fractions from halves to twelfths, including improper fractions and mixed numbers, in various contexts

B1.7 describe relationships and show equivalences among fractions, decimal numbers up to hundredths, and whole number percents, using appropriate tools and drawings, in various contexts

Process Expectation Focus : Representing, Reasoning and Proving