

## Grade 5

Exploring Fractions and Problem Solving

### Pulse check

- 1) In what topics are you seeing the most growth and learning with your students?
- 2) What topics do you feel you need to revisit before the end of the year?

### Our Plan

Explore Multiplication of Fractions Tasks  
 Analyze Standards  
 Explore Fractions Measurement Tasks  
 Explore Possibilities for Lesson Structures  
 Look at Resources  
 Plan a Lesson that you will teach

### Let's get warmed up

Count around the class—  $\frac{3}{8}$ ths

What number do you think we will end on?  
 Why?

Let's count.

### Count Around the Class

$\frac{3}{8}$	$\frac{27}{8}$	$\frac{51}{8}$	$\frac{75}{8}$
$\frac{6}{8}$	$\frac{30}{8}$	$\frac{54}{8}$	$\frac{78}{8}$
$\frac{9}{8}$	$\frac{33}{8}$	$\frac{57}{8}$	$\frac{81}{8}$
$\frac{12}{8}$	$\frac{36}{8}$	$\frac{60}{8}$	$\frac{84}{8}$
$\frac{15}{8}$	$\frac{39}{8}$	$\frac{63}{8}$	$\frac{87}{8}$
$\frac{18}{8}$	$\frac{42}{8}$	$\frac{66}{8}$	$\frac{90}{8}$
$\frac{21}{8}$	$\frac{45}{8}$	$\frac{69}{8}$	$\frac{93}{8}$
$\frac{24}{8}$	$\frac{48}{8}$	$\frac{72}{8}$	$\frac{96}{8}$

- Which simplify to whole numbers?
- Which simplify to fractions with  $\frac{1}{2}$ ?
- Which simplify to fractions with  $\frac{1}{4}$  or  $\frac{3}{4}$ ?
- Which simplify to fractions with either  $\frac{1}{4}$ ,  $\frac{3}{4}$ , or  $\frac{1}{2}$ ?

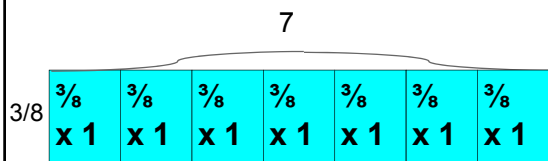
### Roast Beef Sandwiches

You put  $\frac{3}{8}$  pounds of roast beef on each sandwich. At the start of the party there are 7 sandwiches on the platter. How many pounds of roast beef were on the platter?  
 Use manipulatives and pictorial drawings to model this.

**Roast Beef**

What do your representations look like?

How do your representations match the problem context?

**Area Model for how much roast beef****Area Model for how much roast beef**

$\frac{3}{8}$  added together 7 times... what grade is this introduced?

**Roast Beef Part Duex**

At the end of the party there were 2 and  $\frac{3}{4}$  sandwiches left. Remember there was  $\frac{3}{8}$  of a pound of roast beef on each sandwich. How much roast beef is left? How much roast beef was eaten?

Use manipulatives and pictorial drawings to solve this task.

$\frac{3}{4}$  of  $\frac{3}{8}$  with area model  
 4 columns, 8 rows  
 shaded 3 of 4 and 3 of the 8  
 overlap– 9 rectangles of 32  
 2 groups of  $\frac{3}{8}$  ...  $\frac{6}{8}$

**Roast Beef**

What do your representations look like?

How do your representations match the problem context?

**Area Model for how much was left**

**Area Model for how much was left**

2 and  $\frac{3}{4}$

$$\frac{3}{8} \begin{array}{|c|c|c|} \hline \frac{3}{8} \times 1 & \frac{3}{8} \times 1 & \frac{3}{8} \times \frac{3}{4} \\ \hline \end{array}$$

**What about how much was eaten?**

**What about how much was eaten?**

$$7 - 2\frac{3}{4} = \underline{\quad}$$

$$\underline{\quad} \times \frac{3}{8} = \underline{\quad}$$

Representations?

**Things to consider...**

How is  $\frac{3}{8} \times 7$  different from  $\frac{3}{8} \times 2\frac{3}{4}$  for your students?

What are easier numbers than  $\frac{3}{8} \times 7$  that involve multiplying a fraction by a whole number?

**Juicing it Up**

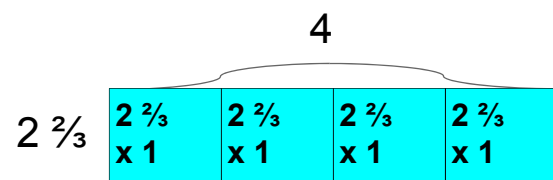
There are 2 and  $\frac{2}{3}$  cups of juice concentrate in each bottle. The rest of the bottle is filled with water. If there are 4 bottles how much juice is there?

Use manipulatives and pictures to solve this task.

**Juicing it Up**

What do your representations look like?

How do your representations match the problem context?

**Area Model for how much juice****Area Model for how much juice**

Mixed number by a whole number... what grade is this introduced?

**Juicing it Up**

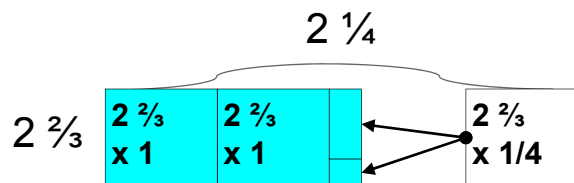
What do your representations look like?

How do your representations match the problem context?

**Juicing it Up**

After children drink some there is enough liquid left to fill  $2 \frac{1}{4}$  bottles. How much juice concentrate is left? How much juice concentrate did students drink?

**Area model for how much juice left**

**Area Model for how much juice left**

Mixed number by a mixed number... what grade is this introduced?

 **$2 \frac{2}{3} \times 2 \frac{1}{4}$  -- area model?**

	$2$	$2/3$
$2$	$2 \times 2$	$2 \times 2/3$
$1/4$	$2 \times 1/4$	$1/4 \times 2/3$

**What order makes sense for multiplication?**

Mixed number by mixed number- 5th  
 Fraction less than 1 by fraction less than 1- 3rd  
 Mixed number times whole number- 2<sup>nd</sup>  
 Fraction less than 1 by whole number- 1st  
 Fraction less than 1 by mixed number- 4th

Whole divided by unit  
 Unit divided by whole

Total amount divided by (size of group or number of groups)

**Multiplication with fractions**

Look at the unpacking document  
 5.NF Domain

**5.MD.... fractions are here?**

**5.MD.... fractions are here?**

5.MD.2. Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ). Use operations on fractions for this grade to solve problems involving information presented in line plots.

What operations?

**Let's measure**

Using a ruler measure the size of the bugs to  $\frac{1}{8}$  of an inch.

Make a line plot of the bugs that you have.

**Line Plot**

On your line plot add:

4 more data points (X's) on the  $\frac{1}{8}$  of an inch mark  
3 more data points (X's) on the  $\frac{4}{8}$  of an inch mark.

Operations-

Think of 3 questions that you could ask that would involve operations with the fractional values on the line plot.

**Line Plot**

Be careful of...

Questions that require Students to add up multiple data points

Questions that require Students to find an average  
(total is 25 inches and there are 12 data points:  
25 inches divided by 12 or 2 and  $\frac{1}{12}$  inches

**My students don't understand fractions...**

Where should you focus?

Grade 1 and 2

- Take a rectangle and fold it into 2 equal pieces
- How do you know you have 2 equal pieces?
  
- Do the same with 4 equal pieces
- How do you know you have 4 equal pieces?

**My students don't understand fractions...**

Where should you focus?

Grade 3

- Take a piece of paper and think of the top edge as a number line- 0 is the left corner and 1 is on the right corner
- Fold the paper into 2 equal pieces
- Fold the paper into half again
- Fold the paper into half again

**Fractions: CRA**

- Concrete- folding paper or partitioning regions with folding/cutting
- Representational- drawing pictures or number lines
- Abstract- equations and numbers

**Let's consider a lesson on fractions**

What types of activities go on during the explain section?

What types of activities go on during the elaborate section?

When could students be informally assessed?

**What a lesson *could* look like**

- Opening ten minute math/number talk- whole class works in pairs/small groups
- Opening discussion about concepts
- Task to explore while the teacher poses questions
- Discussion (explanation from students about strategies), possible teaching by teacher
- Follow up tasks or activities- possible small group instruction or support
- Closing discussion

**Questions?**

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