

Grade 4

Problem Solving and Exploring Fractions

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 Fractions Tasks
 Analyze Standards
 Explore Measurement Fractions Tasks
 Dive into an Investigations Unit

Let's get warmed up

Count around the class– $\frac{2}{8}$ ths

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

Let's count.

Count Around the Class

$\frac{2}{8}$	$\frac{18}{8}$	$\frac{34}{8}$	$\frac{50}{8}$
$\frac{4}{8}$	$\frac{20}{8}$	$\frac{36}{8}$	$\frac{52}{8}$
$\frac{6}{8}$	$\frac{22}{8}$	$\frac{38}{8}$	$\frac{54}{8}$
$\frac{8}{8}$	$\frac{24}{8}$	$\frac{40}{8}$	$\frac{56}{8}$
$\frac{10}{8}$	$\frac{26}{8}$	$\frac{42}{8}$	$\frac{58}{8}$
$\frac{12}{8}$	$\frac{28}{8}$	$\frac{44}{8}$	$\frac{60}{8}$
$\frac{14}{8}$	$\frac{30}{8}$	$\frac{46}{8}$	$\frac{62}{8}$
$\frac{16}{8}$	$\frac{32}{8}$	$\frac{48}{8}$	$\frac{64}{8}$

- 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 $\frac{1}{2}$?

Leftover Pizza

You host a pizza party. The next morning there is $\frac{3}{8}$ of a pepperoni pizza, $\frac{7}{8}$ of a mushroom pizza, 1 and $\frac{2}{8}$ cheese pizza, $\frac{7}{8}$ of a sausage pizza.
 How much total pizza is left?

Leftover Pizza- Part 2

If you give away the cheese pizza
how much pizza do you have left?

$$3 \frac{3}{8} - 1 \frac{2}{8}$$

$$3 \frac{1}{8} - 1 \frac{2}{8}$$

Roast Beef Sandwiches

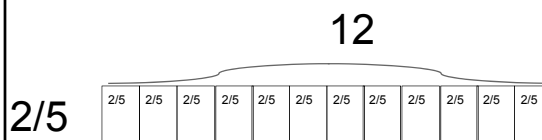
You put $\frac{2}{5}$ pounds of roast beef on each sandwich. At the start of the party there are 12 sandwiches on the platter. How many pounds of roast beef were on the platter? Use manipulatives and pictorial drawings to model this.

Made 12 groups with 2 cubes and 3 on other ($\frac{2}{5}$)
Went back and pulled out the 12 2's
Counted 24 cubes
Converted... into groups of 5.... 4 $\frac{4}{5}$

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**

$\frac{2}{5}$ added together 12 times... what grade is this introduced?

Roast Beef Part Duex

At the end of the party there were 5 sandwiches left. Remember there was $\frac{2}{5}$ 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.

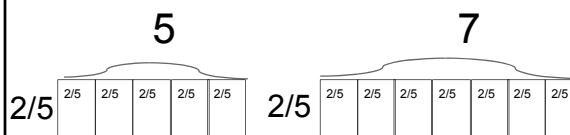
Roast Beef

What do your representations look like?

How do your representations match the problem context?

Area Model for how much was left

Area Models for part two



Which is easier? Why?

What about how much was eaten?

What about how much was eaten?

$$12 - 5 = \underline{\quad}$$

$$\underline{\quad} \times \frac{2}{5} = \underline{\quad}$$

Representations?

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 concentrate is there?

Use manipulatives and pictures to solve this task.

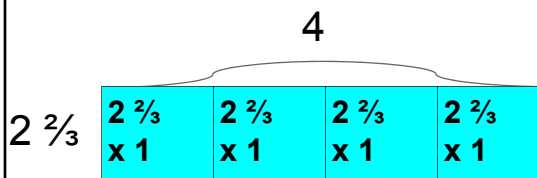
Juicing it Up

What do your representations look like?

How do your representations match the problem context?

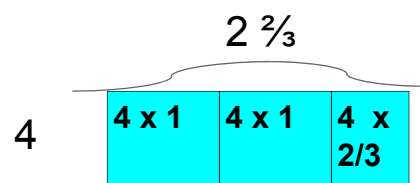
Area Model for how much juice

Area Model for how much juice



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

Area Model for how much juice



How is this model different?

Juicing it Up

What do your representations look like?

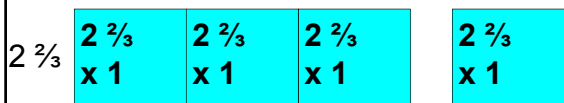
How do your representations match the problem context?

Juicing it Up

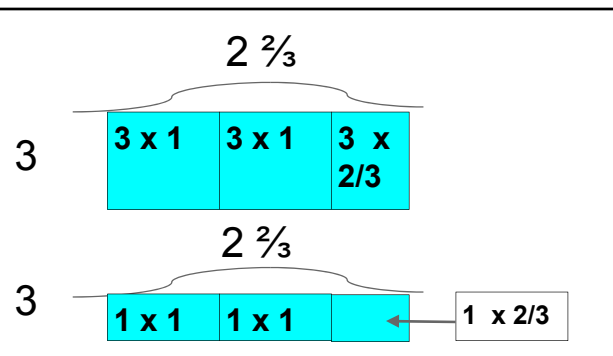
After children drink some there is enough liquid left to fill 1 bottle. How much juice concentrate is left? How much juice concentrate did students drink?

Area model for how much juice left

Area Model for how much juice left



How does this model reflect the action in the problem?



What order makes sense for multiplication for 4th grade?

- Fraction less than 1 by whole number that gets mixed number answer
- Mixed number by whole number that gets a whole number answer
- Fraction less than 1 by whole number that gets whole number answer
- Fraction less than 1 by fraction less than 1
- Mixed number by whole number that gets mixed number answer
- Fraction less than 1 by whole number that gets answer less than 1

Multiplication with fractions

Look at the unpacking document
4.NF Domain

What strategies are shared?

4.MD.... fractions are here?**4.MD.... fractions are here?**

4.MD.4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

Why is this difficult for students?

Let's plot some data

1 and $\frac{1}{4}$ inches	1 inch
1 and $\frac{3}{4}$ inches	2 inches
1 and $\frac{2}{4}$ inches	1 and $\frac{2}{4}$ inches
1 and $\frac{1}{4}$ inches	1 and $\frac{2}{4}$ inches
1 and $\frac{1}{4}$ inches	1 and $\frac{3}{4}$ inches
1 and $\frac{1}{4}$ inches	1 and $\frac{1}{4}$ inches
1 and $\frac{3}{4}$ inches	

Line Plot

Be careful of...

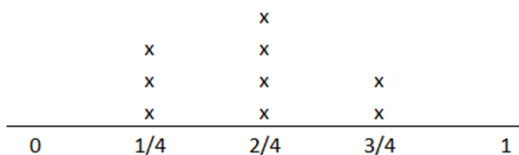
Mark's bug collection has a total length of 9 inches. How much longer or shorter is Mark's bug collection compared to the total length of the bugs that you measured?

What is the combined length of all of the bugs that measured $\frac{1}{2}$ of an inch or more?

Line Plot

Be careful of...

What is the total length of the string?

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

Where should you start?

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 start?

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

Apple Orchard Bags

In one day at Honeysweet Apple Orchard, workers picked 1,549 apples. They want to put them in bags of 6. How many bags can they make?

Apple Orchard Bags

$$6 \times 200 = 1,200 \quad 1,549 - 1,200 = 349$$

$$6 \times 50 = 300 \quad 349 - 300 = 49$$

$$6 \times 8 = 48 \quad 49 - 48 = 1$$

What is my quotient?

Apple Orchard Bags

$$6 \times 100 = 600 \quad 1,549 - 600 = 949$$

$$6 \times 100 = 600 \quad 949 - 600 = 349$$

$$6 \times 50 = 300 \quad 349 - 300 = 49$$

$$6 \times 5 = 30 \quad 49 - 30 = 19$$

$$6 \times 3 = 18 \quad 19 - 18 = 1$$

What is my quotient?

Apple Orchard Bags

What would an array model of 1,549 divided by 6 look like?

Unit 8

Turn to lesson 3.5A

What do you notice about what students are doing?

What is the role of the teacher in this lesson?

Let's look at some strategies

Turn to p. 123 of unit 8
Read it

What jumps out at you as you begin to teach these concepts?

Units → Test Prep

For the content that is in this unit what is your plan for preparing students for the End of Year test?

What are your plans for building on your students' prior knowledge about mathematics?

Effective Test Prep

What should students be doing?
What is the role of the teacher?
What should be the emphasis/focus?

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?

Drew.polly@uncc.edu
<http://elemath.pbworks.com>