Solving Problems Using Unit Fractions

We will watch videos of children solving problems involving unit fractions. We would like to give you an opportunity to solve the same problems below.

$\mathbf{4} - \frac{\mathbf{1}}{\mathbf{8}} =$

$\boldsymbol{a} \times \frac{\mathbf{1}}{\mathbf{4}} = \mathbf{2}\frac{\mathbf{1}}{\mathbf{4}}$

If you had 4 sandwiches, and you ate 1/3 of a sandwich, how many sandwiches would you have left?

14 pizzas are being made for us. Each pizza takes 1/6 cup of cheese. How much cheese will we need for all of the pizzas?

Children's Unit Fraction Strategies

What are the mathematical details of Matthew's strategy? $\mathbf{4 - \frac{1}{8} =}$

What are the mathematical details of Matthew's strategy? $\mathbf{4 - \frac{1}{3} =}$

What are the mathematical details of Rosie's strategy? $\boldsymbol{a} \times \mathbf{\frac{1}{4} = 2\frac{1}{4}}$

Looking at Student Work

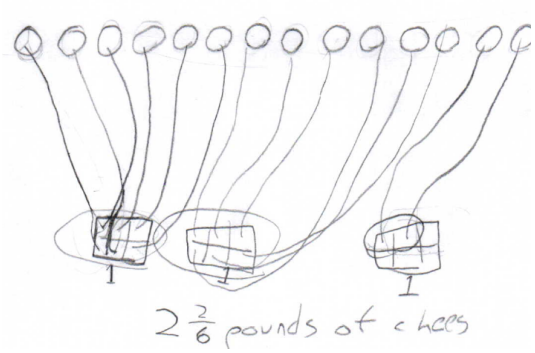
Directions: You are given a set of student work from 3rd, 4th, and 5th grade classrooms. Sort the student work based on how you and your partner(s) think the students are *representing and grouping unit fractions* in their strategy.

Problem: *A chef is making 14 pizzas. Each pizza takes 1/6 of a pound of cheese. How much cheese will the chef need to make all of the pizzas?*

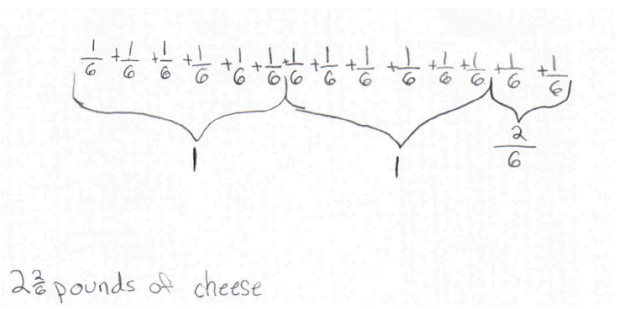
As you examine each piece of student work, here are some things to consider:

- Did the child represent all of the unit fractions?
- Did the child group unit fractions to make a whole?

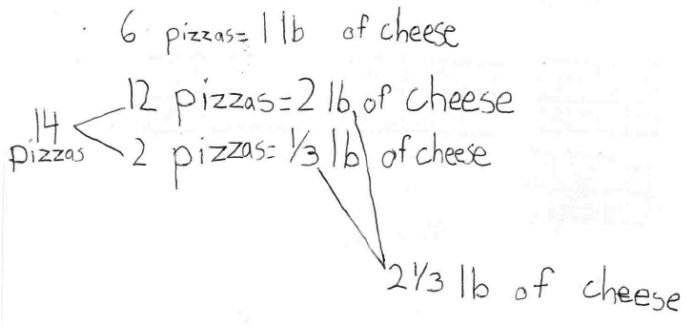
Maggie



Pedro



Karisma

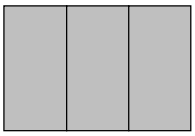


Big Ideas

- Importance of unit-fraction quantities in children's understanding
- Continuum of children's understanding of unit-fraction quantities
- Power of story problems to build children's understanding

Unit-Fraction Quantities in Children's Understanding

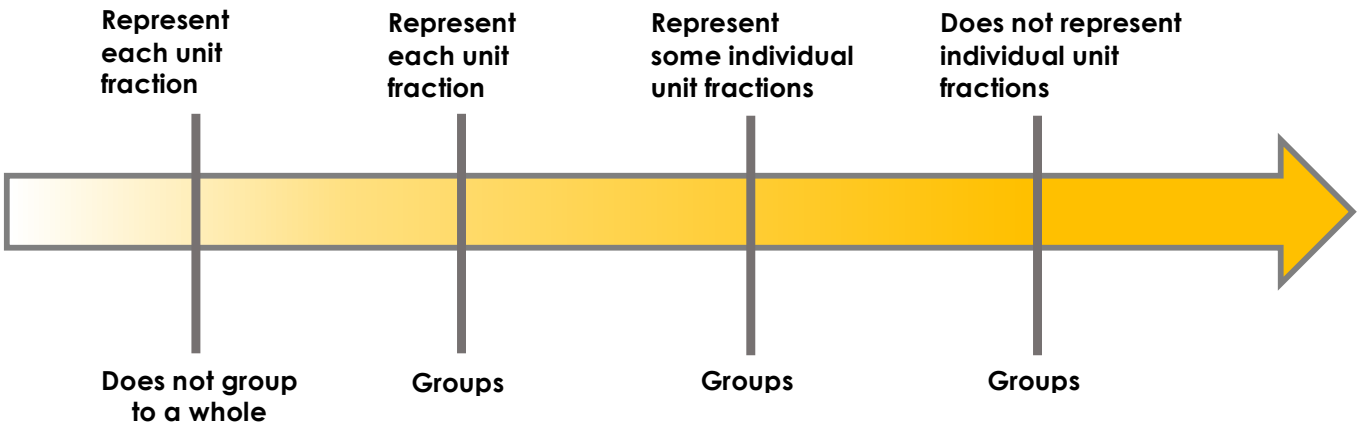
The relationship between unit fractions and a whole is represented in a variety of ways through children's strategies.

A whole is a grouping of same-sized unit-fraction quantities		
Verbal description	*Drawn model*	*Equations*
1 sandwich (a whole) is the same as 3 one-third sandwiches		1 = 1/3 + 1/3 + 1/ 3 1 = 3 x 1/3

Feel free to contact us for additional questions

- D'Anna Pynes – dannapynes@utexas.edu
- Gladys Krause – gladyshrueda@utexas.edu
- Susan Empson – empsons@missouri.edu

Continuum of Unit Fraction Understanding



Sample Problems to Explore and Develop Children's Understanding of Fractions

When you pose these problems to children, keep in mind that in order to engage in problem solving, each child needs a just-right challenge. Sometimes you may need to adjust the number choices to make the problem easier or harder. Sometimes you may need to pose a different type of problem. Have fun exploring children's thinking!

MULTIPLICATION

A. There are 8 children who want a snack. If each child gets 1/4 of a peanut butter and jelly sandwich for a snack, how many sandwiches do they need altogether?

B. Mr. Zapata is planting his garden. Each tomato plant needs 1/10 of a bag of soil. How many bags of soil does he need for 25 tomato plants?

DIVISION

A. Ellie has 4 granola bars. If she wants to give each of her friends 1/2 of a granola bar, how many friends can she serve?

B. It takes 1/5 of a gallon of paint to paint one doghouse. How many doghouses can you paint with 4 3/5 gallons of paint?