Pizza Split

Activity

Mena knows that 8 x 2 has the same answer as 2 x 8.
She wonders whether the order matters for division.

> Does 8 ÷ 2 have the same answer as 2 ÷ 8?

Mena and Zac decide to check this out by making pizzas out of fraction pieces.

> 8 pizzas between 2 people is 4 pizzas each.

1. Next, Mena and Zac each share 2 pizzas among 8 people.
    Zac shares his pizzas like this:

> 4 people share each pizza. That's $\frac{1}{4}$ of a pizza each.

Mena shares her 2 pizzas among 8 people like this:

> I'll give each person 1 piece from each pizza. That's $\frac{1}{8} + \frac{1}{8} = \frac{2}{8}$

Are Mena and Zac right? How do you know?

2. a. Does the order matter for division?
    b. Complete Mena's equations:
 $8 \div 2 = \square$; $2 \div 8 = \square$

3. Mena and Zac then investigate 3 pizzas divided among 4 people and 4 pizzas divided among 3 people.

a. Mena wants to show 3 pizzas divided among 4 people. She starts like this:

  i. How many quarters of pizza are there?

  ii. How many quarters of pizza does each person receive?

  iii. Use fraction pieces or draw a diagram to show how the 3 pizzas are divided among the 4 people. Discuss what you have done with a classmate.

  iv. Write the fraction that completes this equation: $3 \div 4 = \square$
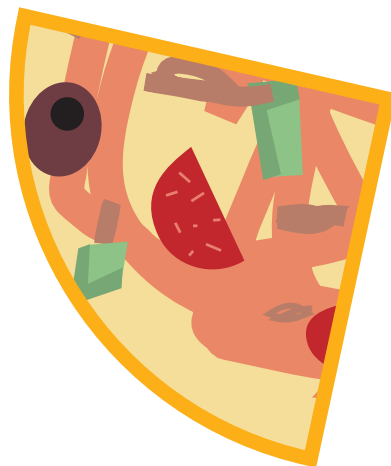
b. Zac's diagram to show 4 pizzas divided among 3 people starts like this:

  i. Use fraction pieces or draw a diagram to show how the 4 pizzas are divided among 3 people. Discuss what you have done with a classmate.

  ii. Write the fraction that completes this equation: $4 \div 3 = \square$

4.

> The number of pizzas gives the numerator, and the number of people gives the denominator. So $2 \div 3 = \frac{2}{3}$.

Does Mena's pattern work for 5 pizzas shared by 2 people and 2 pizzas shared by 5 people? Check with fraction pieces. Why does it work?

5.

> But $8 \div 2 = 4$, and $2 \div 8 = \frac{2}{8}$. That's different!

> Ah, I think you can write $\frac{2}{8}$ as $\frac{1}{4}$.

Do Zac's answers for $8 \div 2$ and $2 \div 8$ follow the pattern? Explain.

6. Does Mena's pattern work for all other division problems? For example, does $15 \div 2 = \frac{15}{2}$ and $2 \div 15 = \frac{2}{15}$? Make up three division problems and test the pattern. Compare your problems and solutions with a classmate's.