

Packet 3: Fraction Multiplication and Division

Dear Parents/Guardians,

Fractions: Packet 3 explores multiplication and division of fractions and mixed numbers. In Lesson 1, students connect pictures to the multiply-across rule to multiply fractions and mixed numbers. In Lesson 2, students use the inverse relationship between multiplication and division to explore the divide-across rule to divide fractions. In Lesson 3, students compare the divide-across rule to the multiply by the inverse rule and divide fractions and mixed numbers.

Fraction Multiplication

Students draw pictures to model multiplication with fractions to make sense of the multiply across rule.

Expression	Picture	Product
$\frac{1}{2} \cdot 4$ <i>1-half of four.</i>		$\frac{1}{2} \times 4 = 2$
$\frac{1}{2} \cdot \frac{1}{4}$ <i>1-half of a group of 1-fourth.</i>		$\frac{1}{2} \times \frac{1}{4} = \frac{1 \times 1}{2 \times 4} = \frac{1}{8}$

Fraction Division: Divide-Across Rule

Students draw pictures to model division with fractions to make sense of the divide-across rule.

Expression	Diagram	Divide Across Rule
$\frac{3}{8} \div \frac{3}{4}$ <i>How many 3-fourths are in 3-eighths?</i>		$\frac{3}{8} \div \frac{3}{4} = \frac{3 \div 3}{8 \div 4} = \frac{1}{2}$ There is 1-half of the 3-fourths in 3-eighths.
$\frac{1}{2} \div \frac{2}{3}$ <i>How many 2-thirds are in 1-half?</i>		$\frac{1}{2} \div \frac{2}{3} = \frac{3}{6} \div \frac{4}{6}$ $\frac{3}{6} \div \frac{4}{6} = \frac{3}{4} = \frac{3}{4}$ There is 3-fourths of a 2-thirds in 1-half.

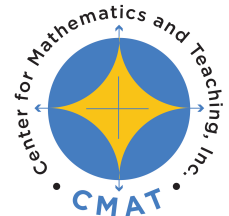
Fraction Division: Multiply-by-the-Reciprocal

Students compare their quotients using the divide across rule with the multiply by the inverse rule, noting the results are the same.

Example: $\frac{7}{8} \div \frac{1}{4}$

Divide-across rule: $\frac{7}{8} \div \frac{1}{4} = \frac{7}{8} \div \frac{2}{8} = \frac{7}{2}$

Multiply-by-the-inverse rule: $\frac{7}{8} \div \frac{1}{4} = \frac{7}{8} \times \frac{4}{1} = \frac{28}{8} = \frac{7}{2}$



FRACTIONS PACKET 3

By the end of the packet, your student should know...

- How to model fraction multiplication and division with pictures *Lessons 3.1 and 3.2*
- How to use the fraction multiplication rule to solve problems *Lesson 3.1*
- How to make sense of and use the two fraction division rules, divide across and multiply by the reciprocal *Lessons 3.2 and 3.3*
- How to use the inverse relationship between multiplication and division to make sense of the multiply by the reciprocal rule for dividing fractions *Lesson 3.3*

Additional Resources

- For definitions and additional notes please refer to section 3.5.