

# Division with Fractions



National Center and State Collaborative

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# Words and Math

- Before you begin instruction, you may need to review the different ways the operation of division is referred to in word problems
- Some key phrases to look for include:
  - Divided by
  - Quotient
  - Divided into

# Rules for dividing two rational numbers

- Before you begin, you should review rules for dividing positive and negative rational numbers
  - Positive \* Positive = Positive ( $1 * 1 = 1$ )
  - Negative \* Negative = Positive ( $-1 * -1 = 1$ )
  - Positive \* Negative = Negative ( $1 * -1 = -1$ )
  - Negative \* Positive = Negative ( $-1 * 1 = -1$ )
- To divide fractions, you will use the reciprocal or multiplicative inverse of the fractions

# Reciprocals or Multiplicative inverse

To find the reciprocal of a fraction, switch the numerator and denominator.

*The reciprocal of  $\frac{2}{3}$  is  $\frac{3}{2}$*

*The reciprocal of 6 is  $\frac{1}{6}$*

**Note:** Whole numbers have a denominator of 1. Most often, this is not written, for students that are confused by this, please add the denominator of 1 for clarification.

# Dividing fractions

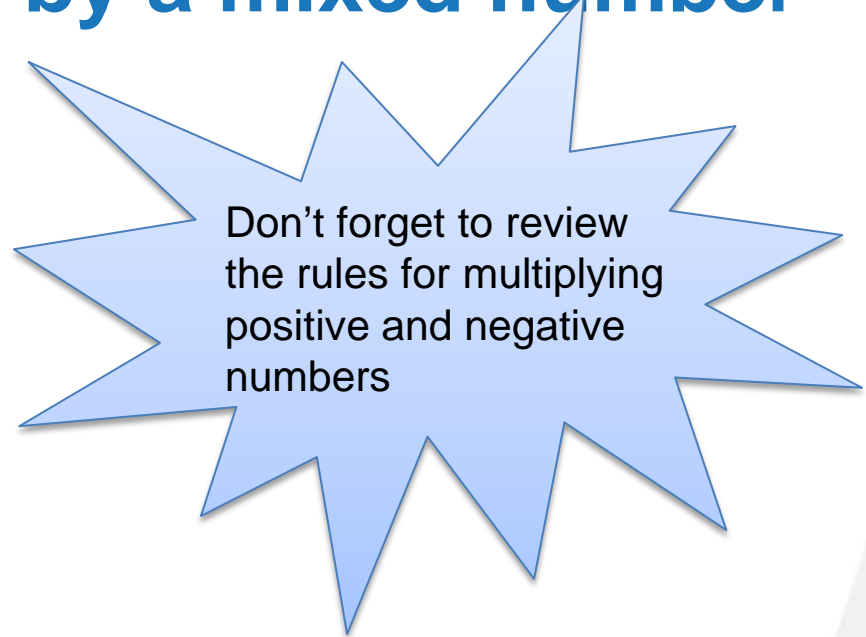
**Step 1:** find the reciprocal of original problem

$$\frac{1}{7} \div \frac{4}{5} = \frac{1}{7} * \frac{5}{4}$$

$$\frac{1}{7} * \frac{5}{4} = \frac{5}{28}$$

**Step 2:** multiply numerators and denominators

# Dividing an integer by a mixed number



**Step 1:** convert mixed number to an improper fraction

$$5\frac{1}{3} \div -7$$



$$\frac{16}{3} \div -7 \cong$$

**Step 2:** find the reciprocal

$$\frac{16}{3} * -\frac{1}{7} = -\frac{16}{21}$$

**Step 3:** multiply numerators and denominators

# Ideas for application

- Begin instruction using visual models
- Start with a recipe, identify how many portions the recipe makes (For example, this makes enough for 4). Create a word problem or scenario that requires students to divide the recipe in half for fewer people.

# Making connections

- Dividing fractions address the following 5<sup>th</sup> grade Core Content Connectors
  - 5.NO.2b3 Multiply or divide fractions
  - 5.NO.2c2 Solve word problems involving the addition, subtraction, multiplication, or division of fractions