Multiplication with Fractions

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Words and Math

- Before you begin instruction, you may need to review the different ways the operation of multiplication is referred to in word problems

- Some key phrases to look for include:
  - Multiplied by
  - Times
  - Product
  - Groups of

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Rules for multiplying two rational numbers

- Before you begin, you should review rules for multiplying 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)

- It may also be helpful to review the various symbols that represent multiplication
  - For example: X, *, x(x)

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Multiplying fractions

Don't forget to review the rules for multiplying positive and negative numbers

Step 1: multiply numerators

$$-\frac{3}{5} * -\frac{1}{4} = \frac{3}{20}$$

Step 2: multiply denominators

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Multiplying an integer by a fraction

Note: Whole numbers have a denominator of 1. Since any number multiplied by 1 equals that number, it is often not shown when multiplying fractions by integers.

$$6 * \frac{2}{3}$$

$$\frac{6 * 2}{3}$$

$$\frac{12}{3}$$

Step 1: multiply numerators

Step 2: simplify improper fraction → 4

Helpful Hint: Don't forget to review how to simplify improper fractions (See addition PowerPoint)

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Multiplying an integer by a mixed number

$$-2 * 3\frac{1}{5} =$$

$$-2 * \frac{3 * 5 + 1}{5} =$$

Step 1: convert mixed number to an improper fraction

$$-2 * \frac{16}{5} =$$

$$-\frac{32}{5}$$

Step 2: multiply numerators

$$-6\frac{2}{5}$$

Step 3: simplify improper fraction to a mixed number

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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 double or triple the recipe to make enough for the class.

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Making connections

- Multiplying fractions address the following 5th and 6th 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
    - 6.NO.2c3 Solve one step addition, subtraction, multiplication, or division problems with fractions or decimals
    - 6.NO.2c4 Solve word problems involving the addition, subtraction, multiplication, or division of fractions

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