Make It, Break It, and Solve It
Name _____

Use an area model to solve the problem $56 \; x \; 23$:

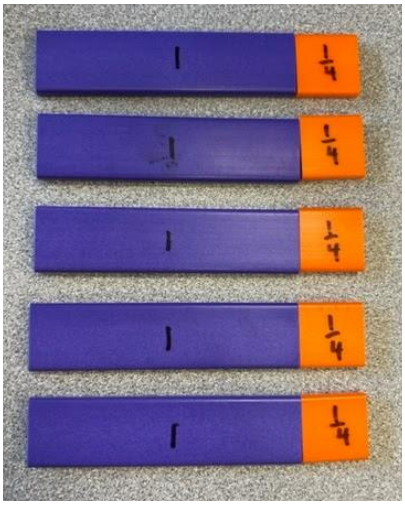
Proficiency:
Multiplicative Reasoning with Rational Numbers
Learning Target:
I can decompose numbers to solve multiplication problems.

Check in with a partner. Did you solve it the same way? Did you get the same answer?

➔ Just like we can *decompose* (break apart) whole numbers to make a math problem easier, we can also decompose fractional numbers.

Example:

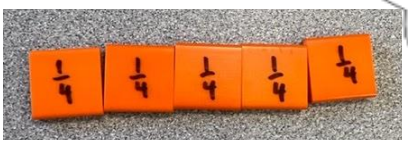
$5 \; x \; 1\frac{1}{4}$



Examine the model. Does it match the equation $5 \; x \; 1\frac{1}{4}$?

Why or why not?

Julia re-grouped her bar models like this:



"I have 5 groups of 1 and 5 groups of ¼. This is the same as $5 \; + \; 1\frac{1}{4}$. So my answer is $6\frac{1}{4}$."

$(5 \; x \; 1) \; + (5 \; x \; \frac{1}{4})$

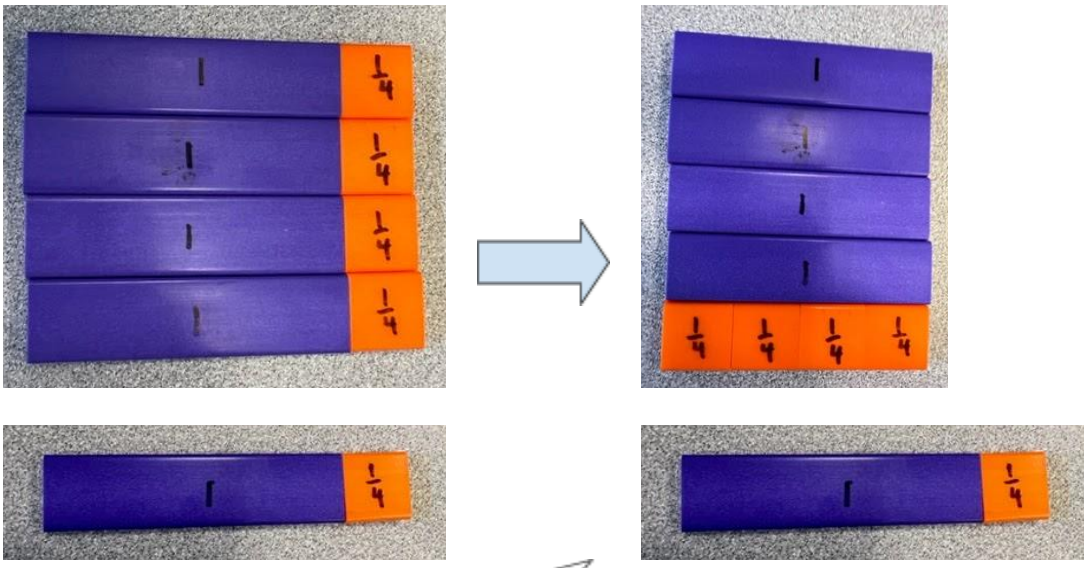
$5 \; + \frac{5}{4}$

$5 \; + \; 1\frac{1}{4}$

Adapted from Figuring Out Fluency M&D with F&D Activity 2.1

$6\frac{1}{4}$

Martin re-grouped his bar models like this:



"I have 4 groups of $1\frac{1}{4}$ and 1 group of $1\frac{1}{4}$. 4 groups of $1\frac{1}{4}$ Is the same as 5. So I have $5 + 1\frac{1}{4}$, which is $6\frac{1}{4}$."

$(4 \times 1\frac{1}{4}) + (1 \times 1\frac{1}{4})$

$5 + 1\frac{1}{4} = 6\frac{1}{4}$

➔ Use your bar models to try both Julia and Martin's re-grouping strategy. Which one do you like best? Why?

Your Turn

- ➔ Use your bar models to build the following multiplication problems.
- ➔ For each problem, break apart the fractions into "friendly" groups.
- ➔ Draw your groupings, then show or explain how these groupings help you solve the problem.
- ➔ ***Challenge***: Can you group the pieces differently and still arrive at the same answer?

1. $3 \times 1\frac{3}{8}$

2. $2 \times 2\frac{1}{2}$

3. $4 \times 1\frac{3}{4}$