

### 3.1 Using Models to Multiply Fractions and Whole Numbers – Notes

Repeated addition can be written as multiplication.

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

and

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

Multiplication and addition are Commutative which mean you can change the order and still get the same answer.

Division and subtraction are NOT Commutative.

"of" → multiply

make a whole # a fraction

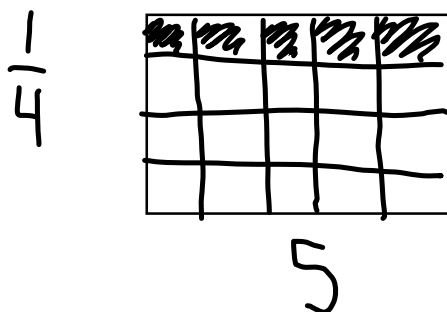
$$4 = \frac{4}{1}$$

write as a fraction over 1.

#### Using MODELS to Multiply a Whole Number by a Fraction:

##### 1. Area Model

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



Answer: How many fourths do you have shaded? 5

$$\text{So, } \frac{5}{4} = 1\frac{1}{4}$$

$$\frac{10 \div 2}{8 \div 2} = \frac{5}{4}$$

## 2. Fraction Circles.

To make a pitcher of freshly squeezed orange juice you need  $\frac{5}{6}$  of a bag of oranges.

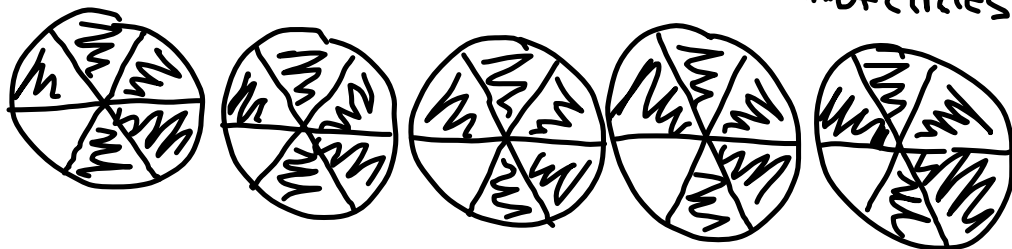
Each bag contains 5 oranges. How many oranges are use?

$$\frac{5}{6} \text{ of } 5 \rightarrow \frac{5}{6} \times 5 = 5 \times \frac{5}{6}$$

← # Shaded of each circle.

# of circles

← # of sections



$$\frac{25}{6} = 4\frac{1}{6}$$

Example:

New flooring has been installed in two-thirds of the rooms in a building. The building has six rooms. How many room have new flooring? Use a model of your choice. Make sure you state your answer.

$$\frac{2}{3} \text{ of } 6 \rightarrow \frac{2}{3} \times 6 = 6 \times \frac{2}{3} = \frac{12}{3} = 4$$

