

Sec 3.1 Using Models to Multiply Whole Numbers and Fractions**1. Investigation 3.1**

Anna, Sam, Mattias, and Ethan would like to make some orange juice. Each person needs $\frac{5}{6}$ (five sixths) of a bag of oranges to make a pitcher of freshly squeezed orange juice. Each bag contains 12 oranges. How many BAGS of oranges are used? How many oranges are left over? Write down some facts about the problem. Draw a model to represent the problem.

Important Facts about the Problem	Fraction strip

The models show that multiplying a whole number by a fraction can be expressed as a **repeated addition**.

2. How to Model Whole Number x Fraction

There are several methods to model this. Here are three:

Methods	$3 \times \frac{3}{4}$
Number line <ul style="list-style-type: none"> - make “whole number” parts - split the line into “denominator” parts - make “numerator” jumps 	
Fraction Circles/Strips <ul style="list-style-type: none"> - draw “whole number” circles - split circle into “denominator” parts - shade in “numerator” parts on each circle - combine to determine “wholes” 	

Practice Questions

1) Determine $4 \times \frac{2}{5}$ using a model.

2) Ms. Lo was making chocolate mini-cakes. The recipe asked for 4 cups of flour but this would make 10 mini-cakes! This was too much dessert for one night so she decided to make only $\frac{2}{3}$ of the recipe.

a) How many cups of flour does Ms. Lo need? *Use a model to show your answer.*

b) How many mini-cakes does she now make? *Write a repeated addition statement and a multiplication statement for this problem.*

3) Multiplying a fraction and a whole number in either order gives the same result.

a) $2 \times \frac{5}{6}$

b) $\frac{5}{6} \times 2$

c) $4 \times \frac{2}{3}$

d) $\frac{2}{3} \times 4$