## Lesson 4: How Many Groups? (Part 1)

Let’s play with blocks and diagrams to think about division with fractions.

### 4.1: Equal-sized Groups

Write a multiplication equation and a division equation for each sentence or diagram.

1. Eight $5 bills are worth $40.
2. There are 9 thirds in 3 ones.
3. 

### 4.2: Reasoning with Pattern Blocks

Your teacher will give you pattern blocks as shown here. Use them to answer the questions.



1. If a hexagon represents 1 whole, what fraction does each of the following shapes represent? Be prepared to show or explain your reasoning.
	* 1 triangle
	* 1 rhombus
	* 1 trapezoid
	* 4 triangles
	* 3 rhombuses
	* 2 hexagons
	* 1 hexagon and 1 trapezoid
2. Here are Elena’s diagrams for $2⋅\frac{1}{2}=1$ and $6⋅\frac{1}{3}=2$. Do you think these diagrams represent the equations? Explain or show your reasoning.
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1. Use pattern blocks to represent each multiplication equation. Remember that a hexagon represents 1 whole.
	1. $3⋅\frac{1}{6}=\frac{1}{2}$
	2. $2⋅\frac{3}{2}=3$
2. Answer the questions. If you get stuck, consider using pattern blocks.
	1. How many $\frac{1}{2}$s are in 4?
	2. How many $\frac{2}{3}$s are in 2?
	3. How many $\frac{1}{6}$s are in $1\frac{1}{2}$?

### Lesson 4 Summary

Some problems that involve equal-sized groups also involve fractions. Here is an example: “How many $\frac{1}{6}$ are in 2?” We can express this question with multiplication and division equations. $?⋅\frac{1}{6}=2$ $2÷\frac{1}{6}=?$

Pattern-block diagrams can help us make sense of such problems. Here is a set of pattern blocks.



If the hexagon represents 1 whole, then a triangle must represent $\frac{1}{6}$, because 6 triangles make 1 hexagon. We can use the triangle to represent the $\frac{1}{6}$ in the problem.



Twelve triangles make 2 hexagons, which means there are 12 groups of $\frac{1}{6}$ in 2.

If we write the 12 in the place of the “?” in the original equations, we have: $12⋅\frac{1}{6}=2$

$2÷\frac{1}{6}=12$



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