adding pattern blocks

LEARNING GOAL

The goal of this activity is for students to understand how to add and subtract fractions with like denominators by understanding that the denominator does not change because the size of the part remains the same.

SUGGESTED USE

Whole Group	Small Group	Partners	Independent
○	○	☑	☑

This activity was designed to be used early on in students' learning of adding and subtracting fractions with like denominators in order to develop the algorithm through hands-on, visual work.

MATERIALS & PREP

- **Activity Pages**
- **Pattern Blocks**

Print one set of activity pages for each student and provide students with a small container of pattern blocks in order to complete the activity.

DIRECTIONS

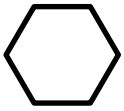
In this activity, students will be combining or adding pattern blocks to find the total value of a given number of parts. Once students have their activity pages and pattern blocks, they can begin completing the activity and filling out the equations to match their models. While students likely do not know an algorithm for adding and subtracting fractions yet, this activity helps students develop an algorithm and understand why it works.

Often times, students will add the denominators when adding and subtracting fractions. When students truly understand what the denominator represents (the size of the part in relation to the whole) and have a visual tool like the pattern blocks, it's easier to point out why the denominator doesn't change--because the size of the part/block doesn't change, only the number of parts/blocks! This is the *aha!* moment we want students to takeaway from this activity.

NAME: _____

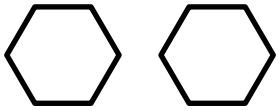
adding pattern blocks

Directions: Use your pattern blocks to model and solve each problem. Write an equation to represent your work.

 = 1

The value of the hexagon is one whole.

Alex ate 1 cookie and Liam ate 1 cookie. How many cookies did they eat?

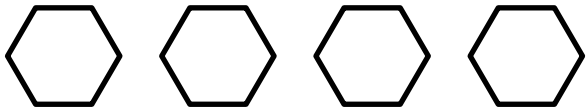


☐ + ☐ = ☐

Alex ate ⅓ of a cookie and Liam ate another ⅓ of the cookie. What fraction of the cookie did they eat?

☐/☐ + ☐/☐ = ☐/☐

Alex, Liam, Kate, and Zoey each ate 1 cookie. How many cookies did they eat?



☐ + ☐ + ☐ + ☐ = ☐

Alex, Liam, Kate, and Zoey each ate ½ of a cookie. How many cookies did they eat?

☐/☐ + ☐/☐ + ☐/☐ + ☐/☐ = ☐/☐

How is addition with fractions similar to addition with whole numbers? What is different?

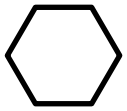
_____

_____

NAME: _____

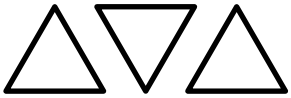
adding pattern blocks

Fill in the equations to answer the questions below.

 = 1

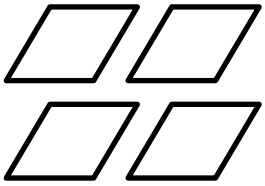
The value of the hexagon is one whole.

1. What is the value of three triangles?



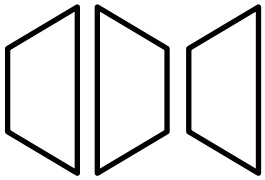
$\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

2. What is the value of four rhombi?



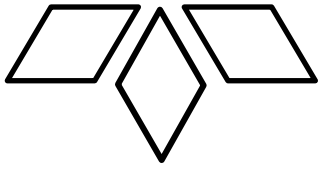
$\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

3. What is the value of three trapezoids?



$\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

4. What is the value of three rhombi?



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NAME: _____

adding pattern blocks

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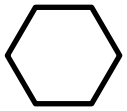
 = 1

The value of the hexagon is one whole.

1. What is the value of two trapezoids?

$\frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

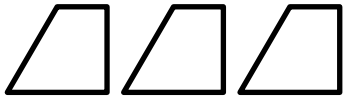
2. What is the value of four right triangles?

$\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

3. What is the value of four triangles?

$\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

4. What is the value of three quadrilaterals?



$\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

REFLECTION

NAME: _____

ADDING pattern blocks

What does the denominator represent?

_____

What does the numerator represent?

_____

Why does the denominator stay the same, but the numerator changes when you add fractions?

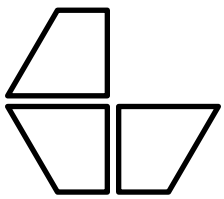
_____

_____

_____

Can you use what you learned about addition with fractions to subtract with fractions? Use the model below to solve the problem:

Alex had ¾ of a cookie. He gave ¼ of the cookie to Liam and ¼ of the cookie to Kate. What fraction of the cookie does Alex have left?



_____ = _____

REFLECTION

NAME: _____

ADDING pattern blocks

What does the denominator represent?

_____

What does the numerator represent?

_____

Why does the denominator stay the same, but the numerator changes when you add fractions?

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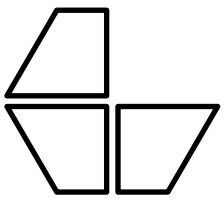

_____ = _____

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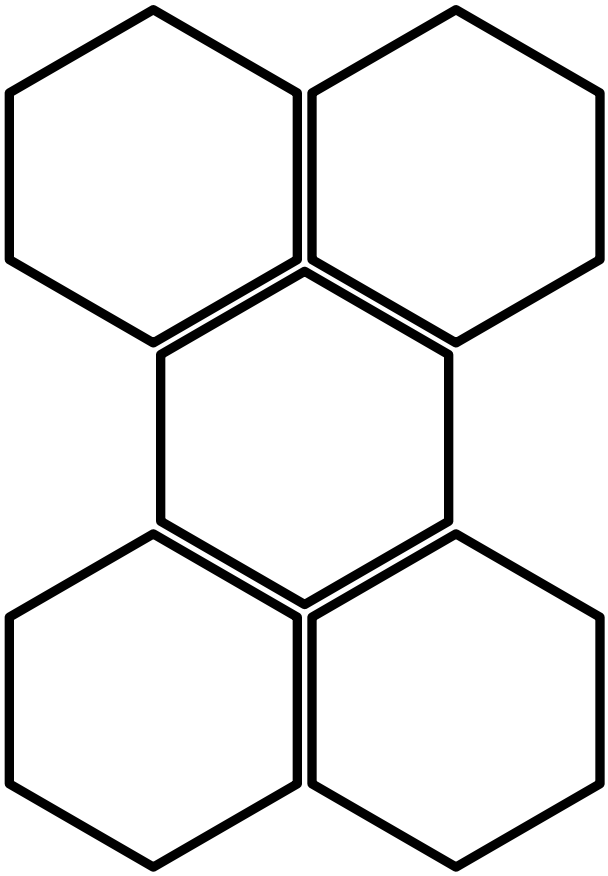
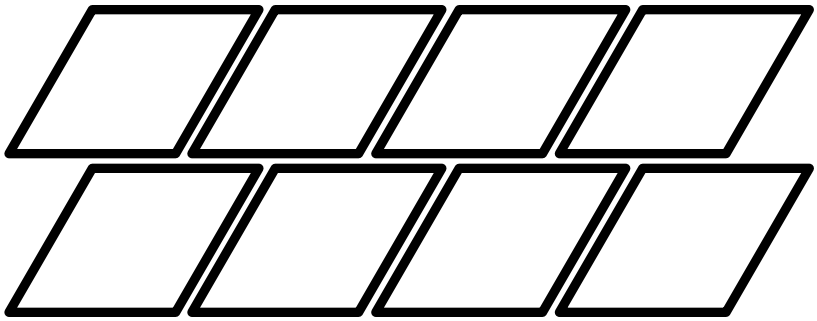
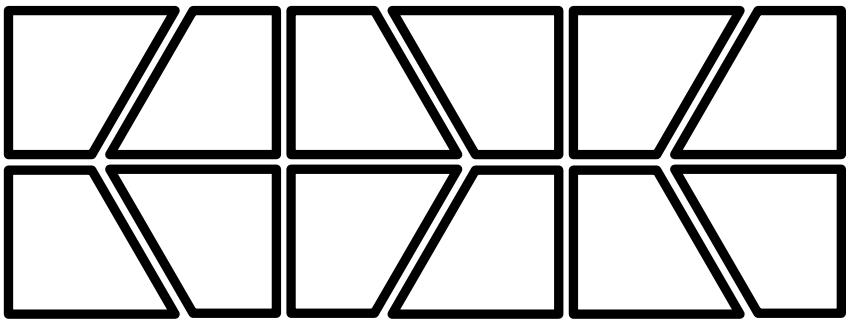
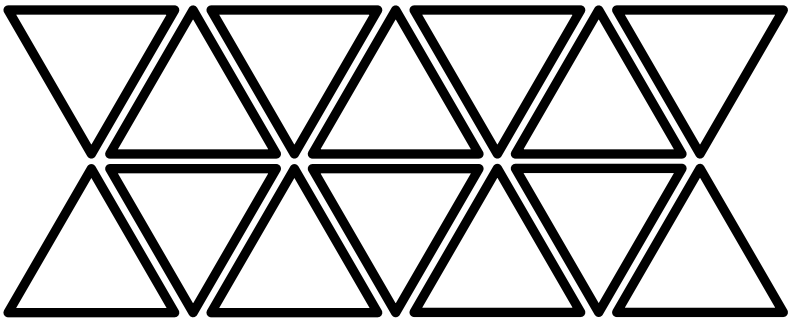
pattern blocks

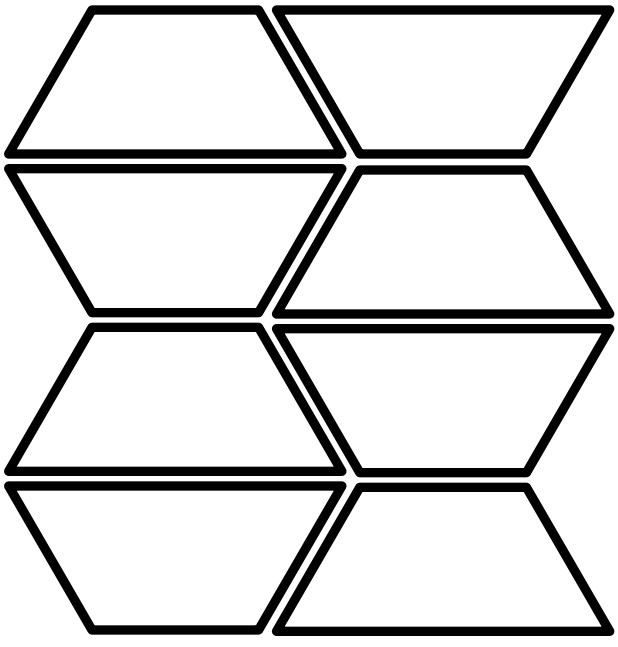
Print the pattern blocks on thick cardstock.
Laminate then cut each piece out.

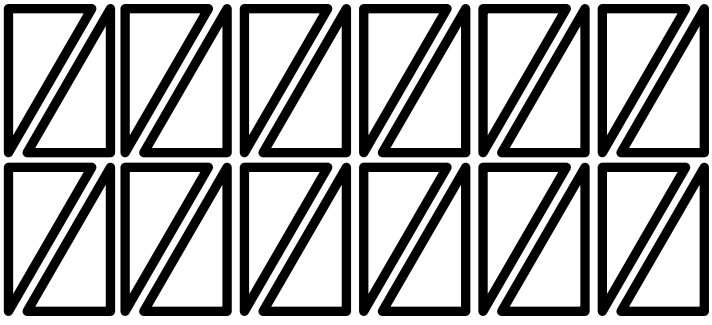










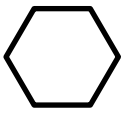


ANSWER KEY

NAME: _____

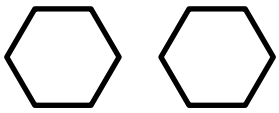
adding pattern blocks

Directions: Use your pattern blocks to model and solve each problem. Write an equation to represent your work.

 = 1

The value of the hexagon is one whole.

Alex ate 1 cookie and Liam ate 1 cookie. How many cookies did they eat?

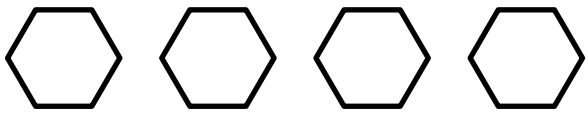


1 + 1 = 2

Alex ate ⅓ of a cookie and Liam ate another ⅓ of the cookie. What fraction of the cookie did they eat?

$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

Alex, Liam, Kate, and Zoey each ate 1 cookie. How many cookies did they eat?



1 + 1 + 1 + 1 = 4

Alex, Liam, Kate, and Zoey each ate ½ of a cookie. How many cookies did they eat?

Model 4 trapezoids

$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{4}{2}$

How is addition with fractions similar to addition with whole numbers? What is different?

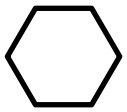
You're still combining units/numbers. It is different because you are combining parts instead of wholes.

ANSWER KEY

NAME: _____

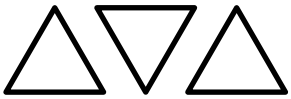
adding pattern blocks

Fill in the equations to answer the questions below.

 = 1

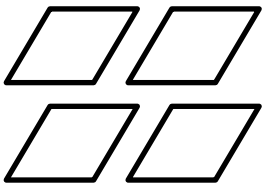
The value of the hexagon is one whole.

1. What is the value of three triangles?



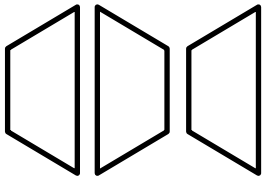
$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6}$

2. What is the value of four rhombi?



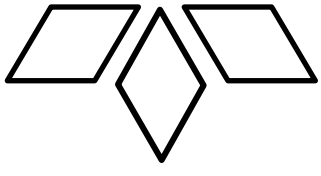
$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{4}{3}$

3. What is the value of three trapezoids?



$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{3}{2}$

4. What is the value of three rhombi?



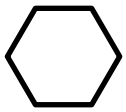
$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3}$

ANSWER KEY

NAME: _____

adding pattern blocks

Fill in the equations to answer the questions below.

 = 1

The value of the hexagon is one whole.

1. What is the value of two trapezoids?

$\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$

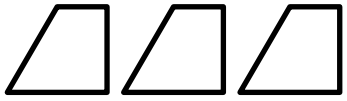
2. What is the value of four right triangles?

$\frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = \frac{4}{12}$

3. What is the value of four triangles?

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

4. What is the value of three quadrilaterals?



$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$

ANSWER KEY

REFLECTION

NAME: _____

ADDING pattern blocks

What does the denominator represent?

The size of the part

What does the numerator represent?

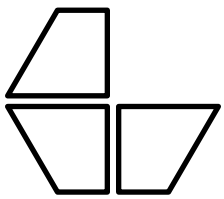
The number of parts I need

Why does the denominator stay the same, but the numerator changes when you add fractions?

The size of the parts doesn't change but how many parts you are adding or taking away does change.

Can you use what you learned about addition with fractions to subtract with fractions? Use the model below to solve the problem:

Alex had ¾ of a cookie. He gave ¼ of the cookie to Liam and ¼ of the cookie to Kate. What fraction of the cookie does Alex have left?



¾ – (¼ or ¼ – ¼) = **¼**

REFLECTION

NAME: _____

ADDING pattern blocks

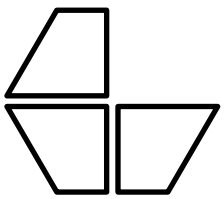
What does the denominator represent?

What does the numerator represent?

Why does the denominator stay the same, but the numerator changes when you add fractions?

Can you use what you learned about addition with fractions to subtract with fractions? Use the model below to solve the problem:

Alex had ¾ of a cookie. He gave ¼ of the cookie to Liam and ¼ of the cookie to Kate. What fraction of the cookie does Alex have left?



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