Adding Fractions with Pattern Blocks

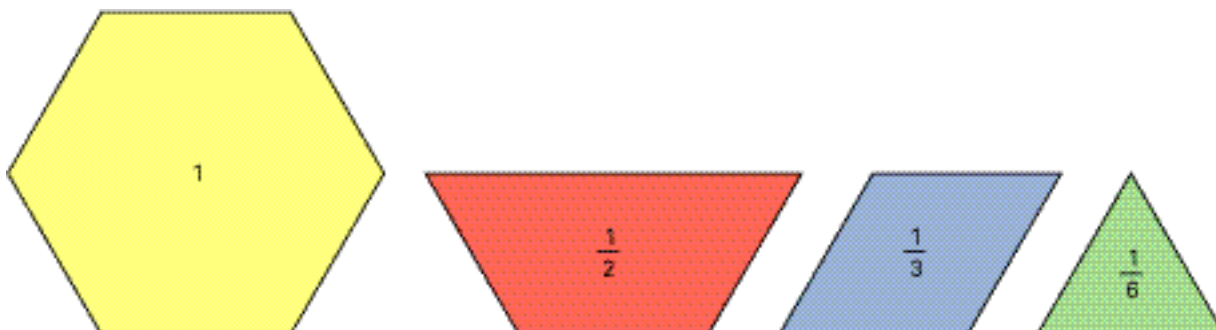**You will need**
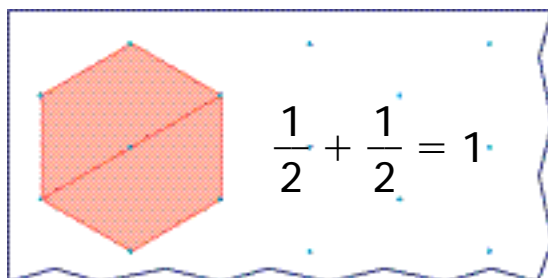- pattern blocks
- large triangle dot paper

▶ **GOAL**

Add fractions that are less than 1 using concrete materials.

Explore the Math

Yuki and Ryan are playing a fraction game. Working individually, they cover a hexagon using any of these pattern blocks. Then they write an equation to describe each combination. The player who writes more equations wins.

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

? How many different combinations of shapes can you use to cover a hexagon?

A. Play Yuki and Ryan's game with a partner, using the same pattern blocks they used. Draw all your combinations on dot paper.

B. Write an equation to describe each combination.

C. What is the fewest number of blocks you can use to cover the hexagon? Explain how you know that this is the fewest number of blocks.

Communication Tip

You can remember the names for the parts of a fraction by thinking "the denominator is down."

D. What is the greatest number of blocks you can use? Explain how you know that this is the greatest number of blocks.

E. Can you use every number of blocks between the least number and greatest number to cover the hexagon? Explain.

F. Look at your combinations and your partner's combinations. How many different combinations do you have? Have you used all the possible combinations to cover the hexagon? Explain how you know.

Reflecting

1. Yuki put together two trapezoids and wrote $\frac{1}{2} + \frac{1}{2} = 1$. Explain why she could have written $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$.

2. Ryan wrote two different equations, like Yuki's, that involved adding fractions with the same denominator. What were these equations?
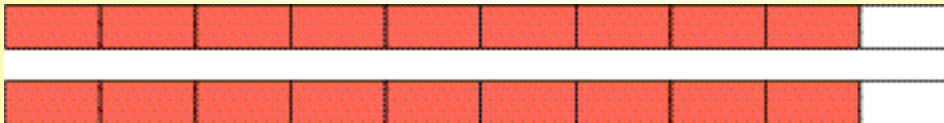

Mental Math

MULTIPLYING A DECIMAL CLOSE TO A WHOLE NUMBER

You can multiply decimals close to a whole number by multiplying and then subtracting.

To multiply 2×0.9, think of 2 groups of 1s instead of 2 groups of 9 tenths.

Calculate $2 \times 1 = 2$. Then subtract 2 tenths or 0.2.

$$2 \times 0.9 = (2 \times 1) - (2 \times 0.1)$$
$$= 2 - 0.2$$
$$= 1.8$$

1. Why do you subtract 0.2?

2. Suppose that you used this strategy to multiply 4×2.98. What would you subtract after multiplying 4×3? Explain your thinking.

3. Multiply.

a) 4×0.9	**c)** 3×1.9	**e)** 8×2.9	**g)** 3×1.99
b) 7×0.8	**d)** 5×1.8	**f)** 6×3.9	**h)** 5×2.98