AR Remediation Plan – Practical Application – Rational Numbers and Proportional Reasoning

Adding and Subtracting Fractions – Using Patterns Blocks

STRAND: Computation and Estimation

STRAND CONCEPT: Practical Application – Rational Numbers and Proportional Reasoning

SOL 4.5b,c, 5.6a, 6.5b

Remediation Plan Summary

Using pattern blocks, student get a better understanding of how and why equivalent fractions are needed when adding and subtracting fractions.

Common Misconceptions

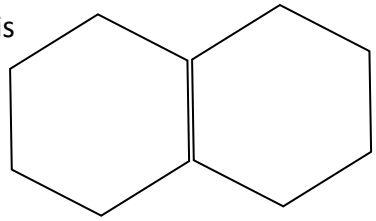
- Students who treat fractions as two distinct numbers will add or subtract the numerators and add or subtract the denominators to determine the sum or difference.
- Students who struggle with equivalency will add the numerators and leave the denominator the same.

Materials

- Pattern blocks or attached template, Fraction Addition and Subtraction Handout

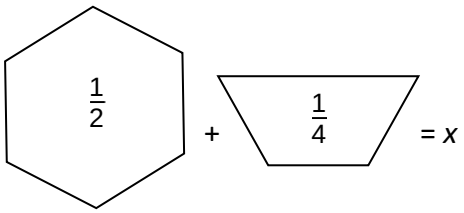
Introductory Activity

Hand students a set of pattern blocks. Tell the students that for this lesson, two hexagons together will represent one whole (shown at right). Have students model one whole using the polygon pieces. Ask them to name the fraction of the whole represented by each of the pieces. They should decide that the hexagon is $\frac{1}{2}$ of the whole, the trapezoid is $\frac{1}{4}$, the parallelogram is $\frac{1}{6}$, and the triangle is $\frac{1}{12}$.



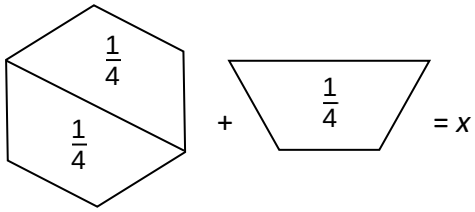
Plan for Instruction

1. Using the relationships established in the warm-up, have the students use the polygon pieces to model the equation $\frac{1}{2} + \frac{1}{4} = x$.



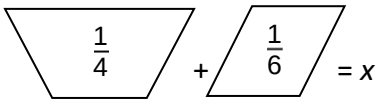
2. Tell students that since these two shapes (hexagon and trapezoid) are not identical, they cannot be readily combined. However, if there is a shape that is common to both of

them, they *can* be combined. Ask students whether there is such a shape. Lead them to see that the hexagon is made up of two trapezoids and, therefore, the equation can be rewritten as $\frac{2}{4} + \frac{1}{4} = x$. Have students model this equation with polygon pieces.

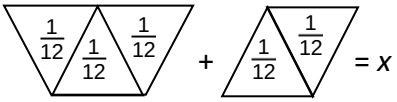


3. Explain to students that finding common shapes is the same as finding equivalent fractions with common denominators. Thus, in the above example, $\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$.

4. Have the students use the same process with the polygon pieces to model the equation $\frac{1}{4} + \frac{1}{6} = x$.

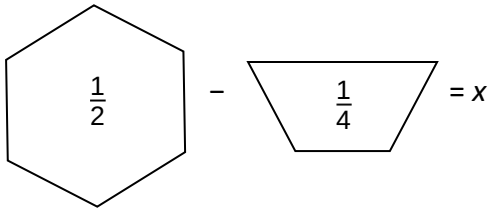


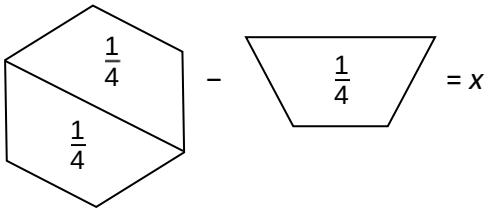
Since these two shapes (trapezoid and parallelogram) are not identical, they cannot be readily combined, and students must find a shape that is common to both of them. Students should come to see that the trapezoid is made up of three triangles and the parallelogram is made up of two triangles. Therefore, the equation can be rewritten as $\frac{3}{12} + \frac{2}{12} = x$.



Thus, $\frac{1}{4} + \frac{1}{6} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$.

5. Have the students use the same process with the polygon pieces to model the equation $\frac{1}{2} - \frac{1}{4} = x$.





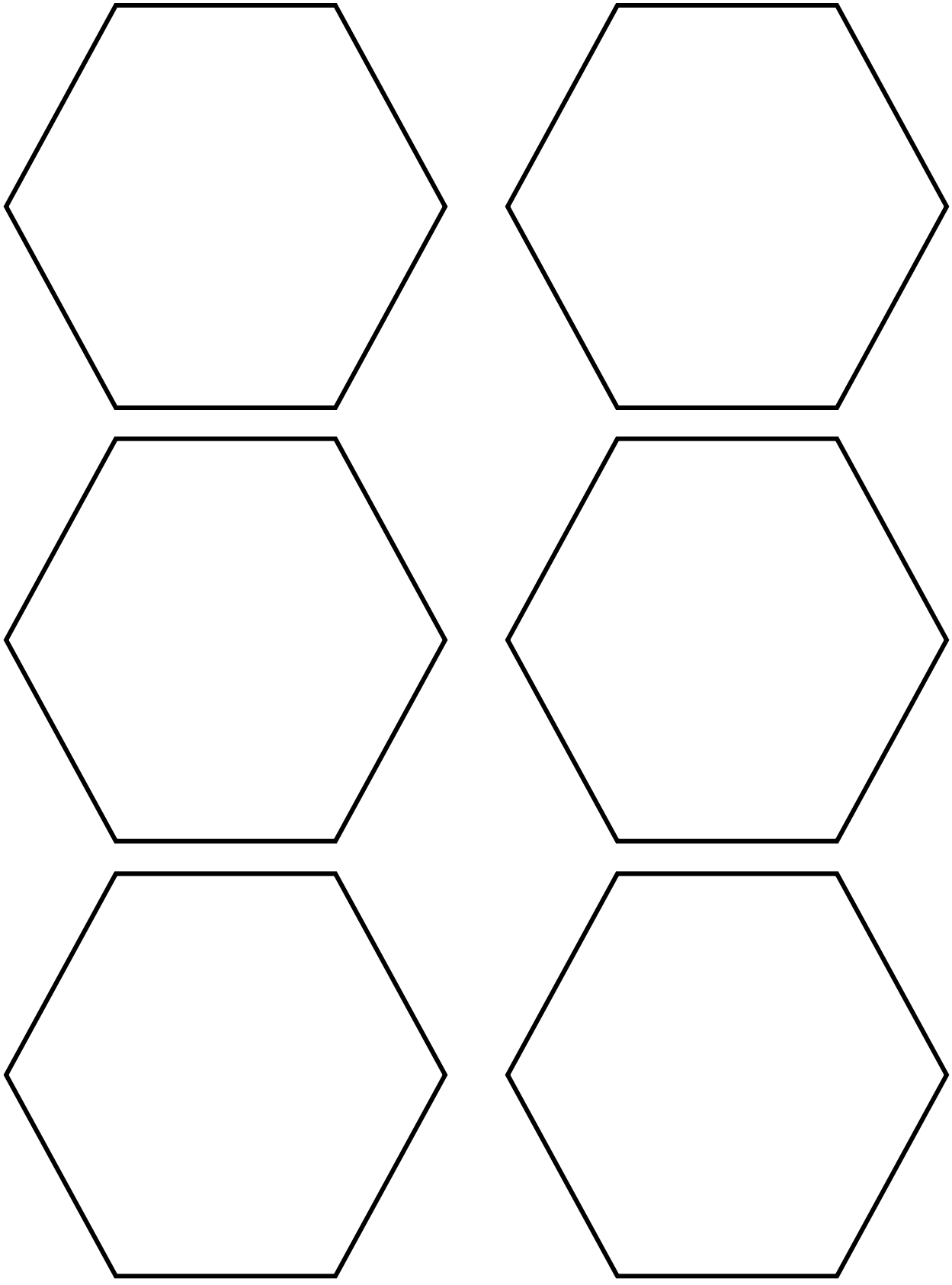
Thus, $\frac{1}{2} - \frac{1}{4} = \frac{2}{4} - \frac{1}{4} = \frac{1}{4}$.

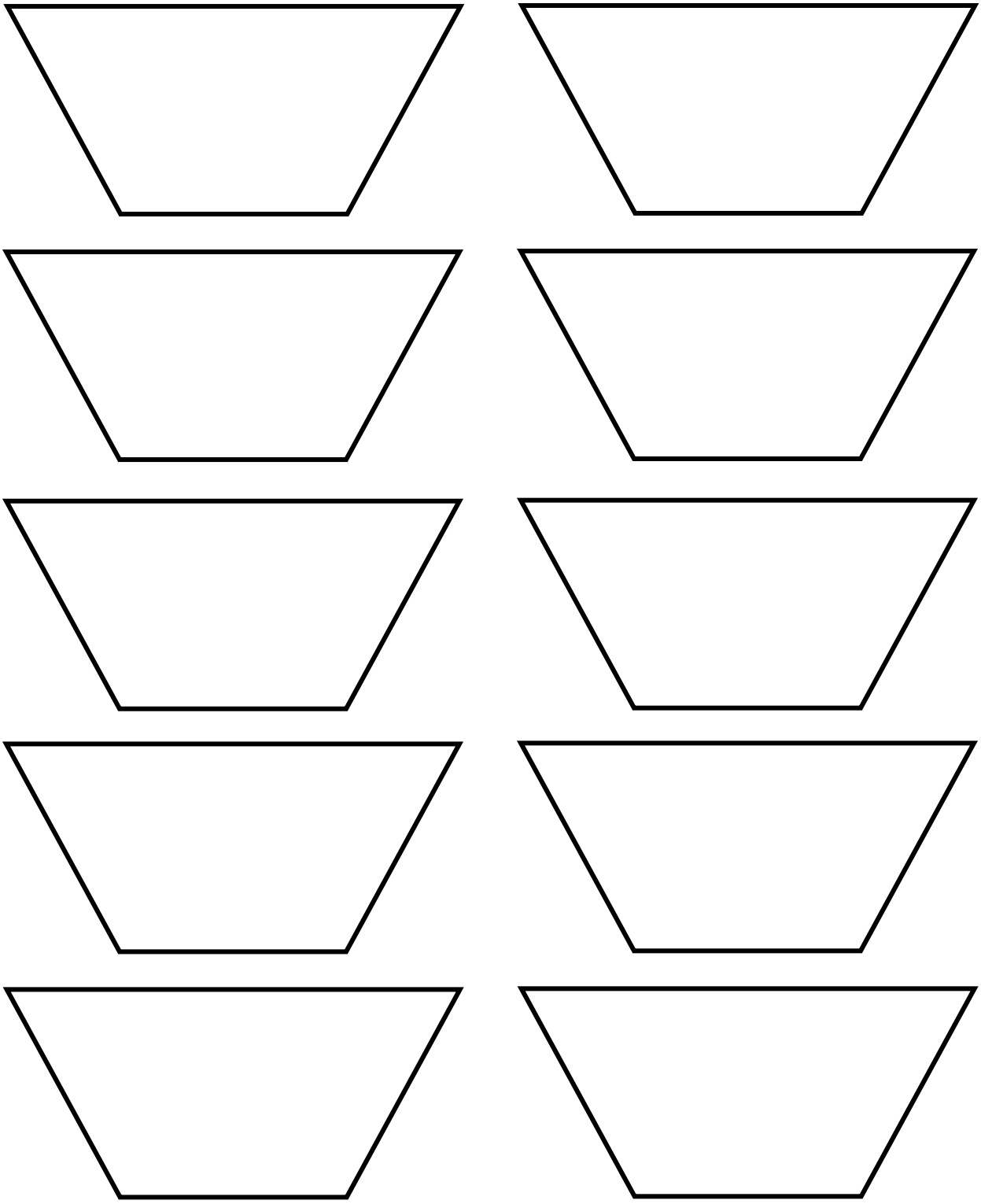
6. Have the students use the same process with the polygon pieces to model the equation $\frac{1}{2} - \frac{1}{12} = x$. Provide assistance as needed.
7. Distribute copies of the "Fraction Addition and Subtraction" handout, and have students complete it. They should draw their models to record how they solved each equation. Provide assistance as needed.

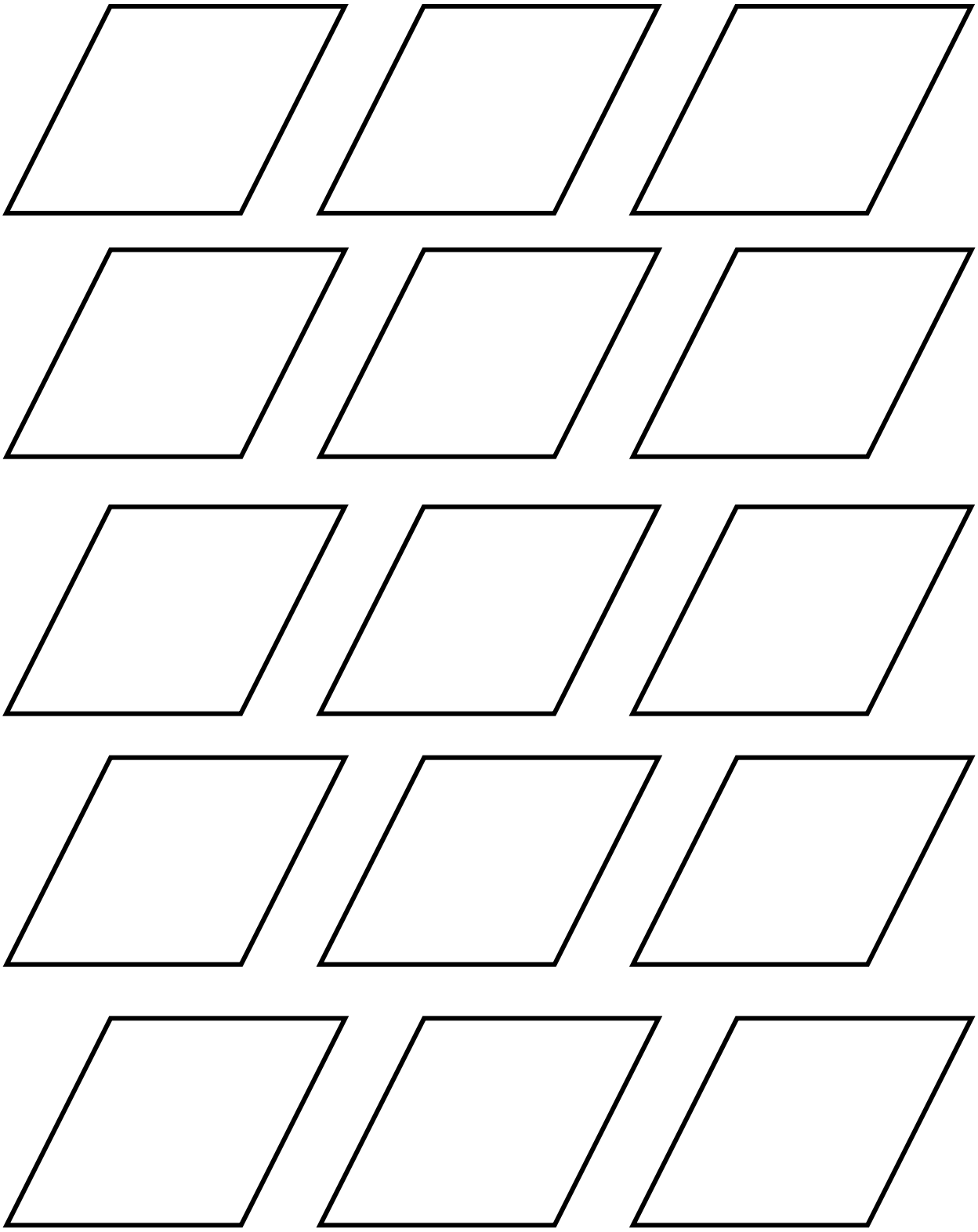
Pulling It All Together (Reflection)

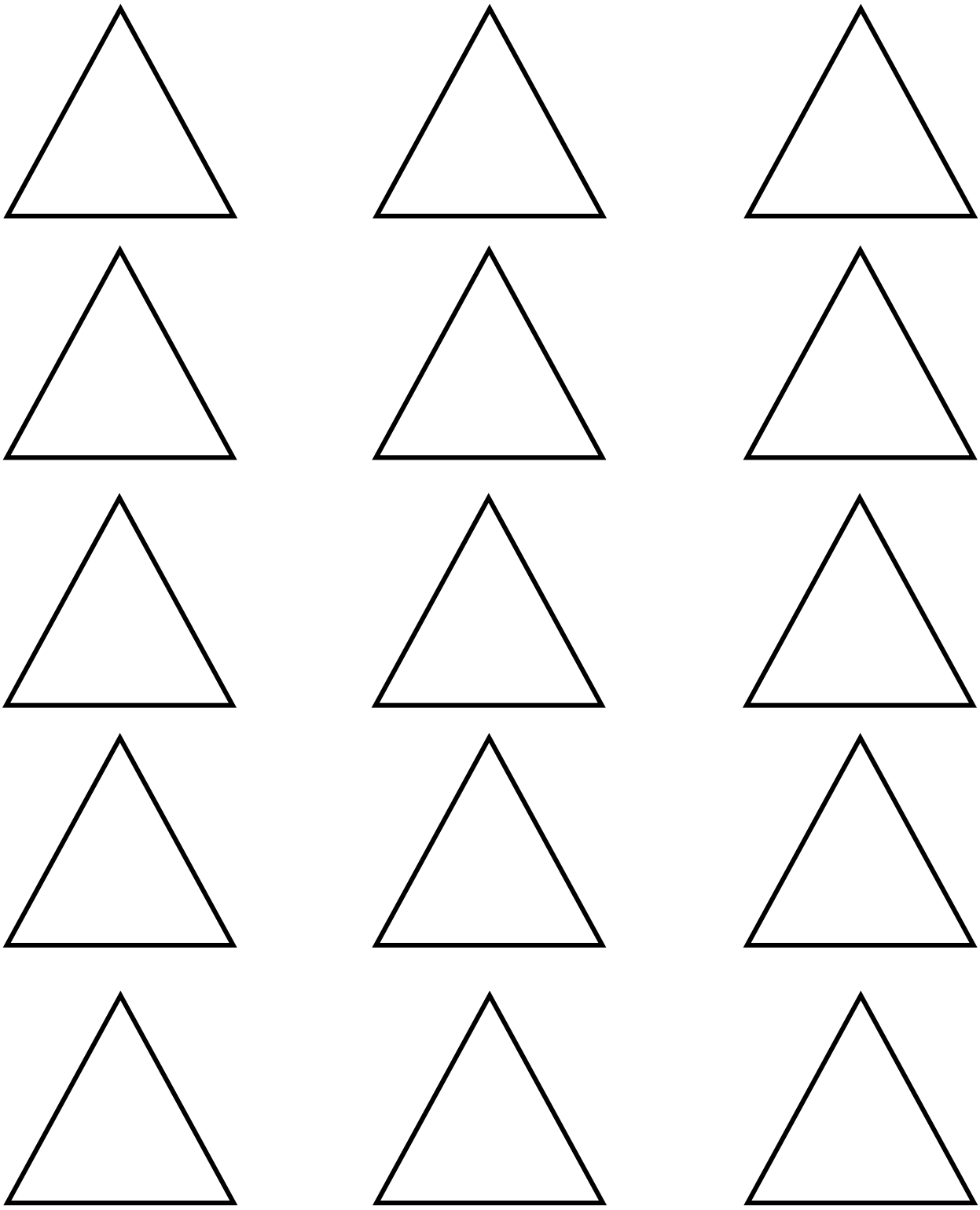
1. Using the pattern blocks, explain how you could create 2 different models that show the sum of ½ and ¾.
2. Explain how a model could help you add 4/5 and 1/10.

Note: The following pages are intended for classroom use for students as a visual aid to learning.









Fraction Addition and Subtraction – Pattern Blocks

Use your polygon pieces (pattern blocks) to find the answer for each equation. Draw the polygon pieces you used to model the operation in each equation.

1. $\frac{1}{2} + \frac{1}{6} = x$

2. $\frac{1}{12} + \frac{1}{4} = x$

3. $\frac{1}{6} + \frac{5}{12} = x$

4. $\frac{1}{2} - \frac{1}{6} = x$

5. $\frac{1}{6} - \frac{1}{12} = x$

6. $\frac{2}{6} - \frac{1}{12} = x$