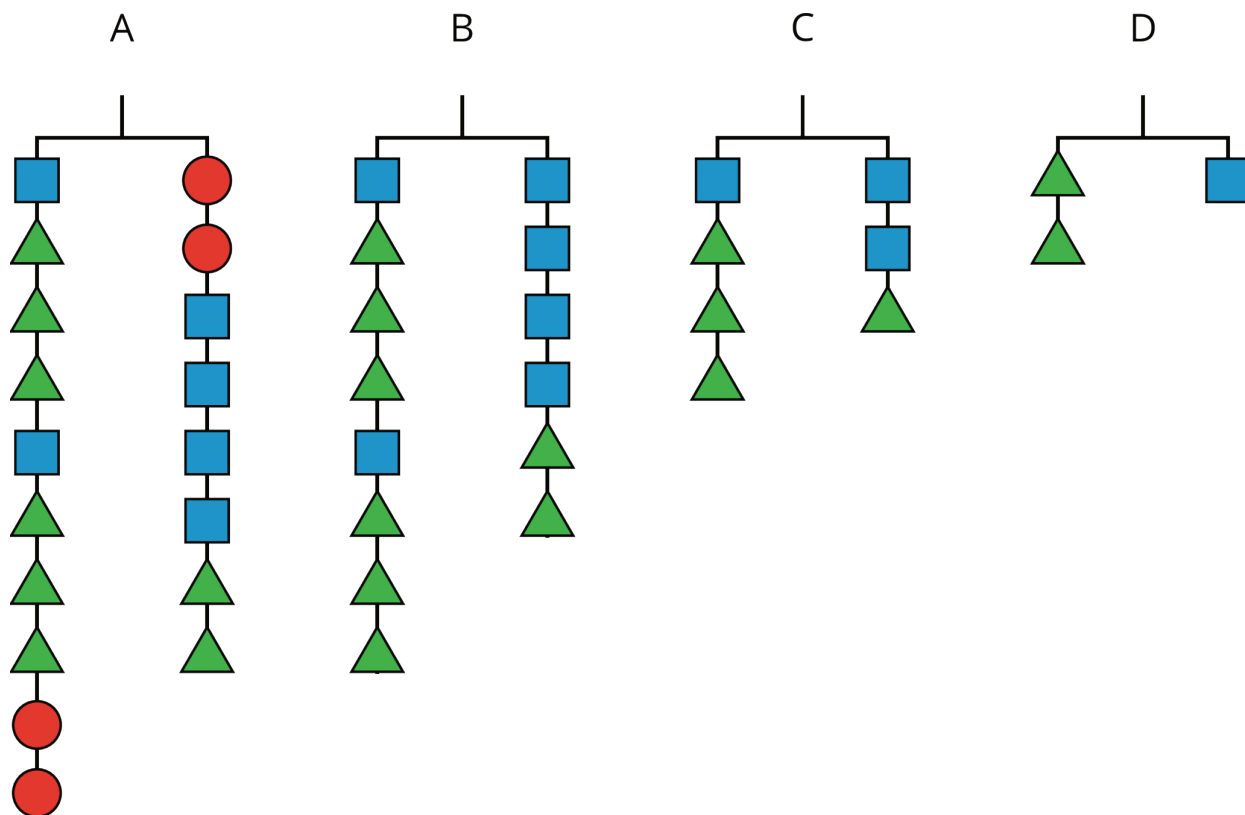# Unit 4 Lesson 12: Balanced Moves

1 Matching Hangers (Warm up)

Student Task Statement

Figures A, B, C, and D show the result of simplifying the hanger in Figure A by removing equal weights from each side.

Here are some equations. Each equation represents one of the hanger diagrams.

$$2(x + 3y) = 4x + 2y$$
$$2y = x$$
$$2(x + 3y) + 2z = 2z + 4x + 2y$$
$$x + 3y = 2x + y$$

1. Write the equation that goes with each figure:

   A:

   B:

   C:

D:

2. Each variable (x, y, and z) represents the weight of one shape. Which goes with which?

3. Explain what was done to each equation to create the next equation. If you get stuck, think about how the hangers changed.

2 Matching Equation Moves

Student Task Statement

Your teacher will give you some cards. Each of the cards 1 through 6 show two equations. Each of the cards A through E describe a move that turns one equation into another.

1. Match each number card with a letter card.

2. One of the letter cards will not have a match. For this card, write two equations showing the described move.

3 Keeping Equality

Student Task Statement

1. Noah and Lin both solved the equation $14a = 2(a - 3)$.
   Do you agree with either of them? Why?

   Noah's solution:

   $$14a = 2(a - 3)$$
   $$14a = 2a - 6$$
   $$12a = \text{-}6$$
   $$a = \text{-}\frac{1}{2}$$

   Lin's solution:

   $$14a = 2(a - 3)$$
   $$7a = a - 3$$
   $$6a = \text{-}3$$
   $$a = \text{-}\frac{1}{2}$$

2. Elena is asked to solve $15 - 10x = 5(x + 9)$. What do you recommend she does to each side first?

3. Diego is asked to solve $3x - 8 = 4(x + 5)$. What do you recommend he does to each side first?