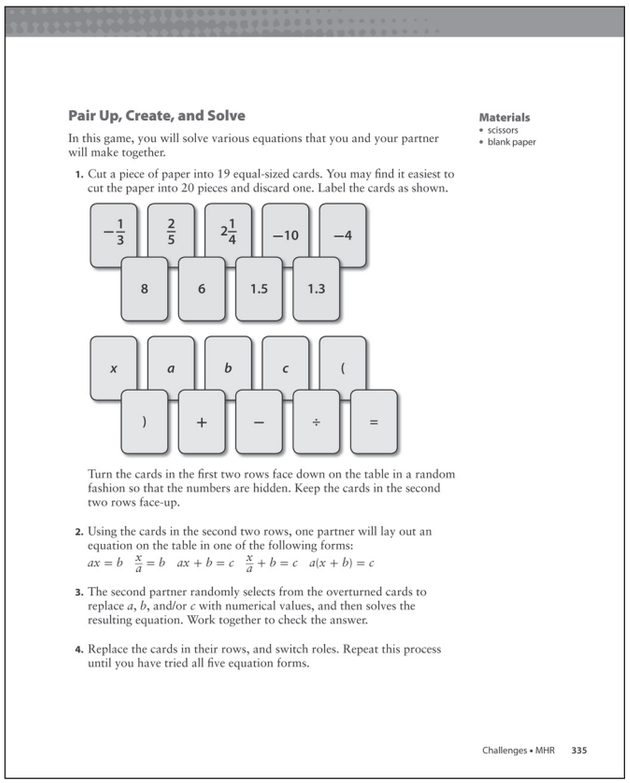

Pair Up, Create, and Solve

Materials
- scissors
- blank paper

In this game, you will solve various equations that you and your partner will make together.

1. Cut a piece of paper into 19 equal-sized cards. You may find it easiest to cut the paper into 20 pieces and discard one. Label the cards as shown.

Turn the cards in the first two rows face down on the table in a random fashion so that the numbers are hidden. Keep the cards in the second two rows face-up.

2. Using the cards in the second two rows, one partner will lay out an equation on the table in one of the following forms:
$ax = b$ $\frac{x}{a} = b$ $ax + b = c$ $\frac{x}{a} + b = c$ $a(x + b) = c$

3. The second partner randomly selects from the overturned cards to replace a, b, and/or c with numerical values, and then solves the resulting equation. Work together to check the answer.

4. Replace the cards in their rows, and switch roles. Repeat this process until you have tried all five equation forms.

Planning Notes: Pair Up, Create, and Solve

With the class, read through the instructions for the game. Have students find a partner. Explain to students that they should start by laying out all of the cards in the rows, as shown. You may want to have students scatter the value cards in a more random fashion, and perhaps even mix them up after each turn. Instruct students to write down the equation and make their calculation and checks on scrap paper.

Meeting Student Needs

- Some students may benefit from trying the game a few times using whole numbers. Work with them to create this alternative set of cards. Have them move on to the suggested card set after going through all the equation forms with whole numbers.

***MathLinks 9*, page 335**

Suggested Timing
30–40 minutes

Materials
- scissors
- stopwatch per pair of students (optional)

Blackline Masters
Master 1 Project Rubric

Specific Outcomes
PR3 Model and solve problems using linear equations of the form:
- $ax = b$
- $\frac{x}{a} = b, a \neq 0$
- $ax + b = c$
- $\frac{x}{a} + b = c, a \neq 0$
- $ax = b + cx$
- $a(x + b) = c$
- $ax + b = cx + d$
- $a(bx + c) = d(ex + f)$
- $\frac{a}{x} = b, x \neq 0$

where a, b, c, d, e and f are rational numbers.

Gifted and Enrichment

- Encourage students to model more complex forms, such as equations with variables on both sides. This will require that they make more variable cards (and possibly more value cards as well).
- Perhaps have students create their own set of value cards. They can then switch these with other teams to vary the equations. You will want to place some parameters on the values that can be included (e.g., between −10 and 10, with three fraction cards and three decimal cards). The limitations will depend on the ability level of the students you are teaching.
- Students could modify the game so that it involves timed responses:
  – Partners could time each other to see who solved all five equations the quickest. There could be a time penalty for incorrect answers.
  – Partners could agree on a time limit for solving a problem. A point is scored each time a player solve an equation before time runs out.

This Challenge can be used for either Assessment *for* Learning or Assessment *of* Learning.

Assessment	Supporting Learning
Assessment *for* Learning	
Have students play the game with a classmate of similar ability.	• Students who are having difficulty with the concepts should not use a timed approach. Rather, they should be given as much time as necessary to complete each model.