

# Perfect Pairs

Multiplying using compatible pairs

2 players

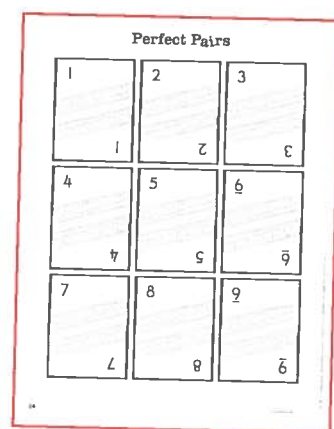
## Purpose

In this game, the students practice choosing and using compatible pairs to find the product of three numbers.

## Materials

Each pair of players will need

- One (1) set of numeral cards. Make four copies of page 34 (shown below). Cut out and laminate all the cards to make one set.



## How to Play

The aim is to finish with the greater number of cards.

- The cards are shuffled and dealt face up into three equal stacks.
- The first player calculates the product of the three numbers on the top cards. If he or she is successful and can explain how the product was calculated, the player removes and keeps all three cards. A calculator can be used if an answer is disputed.

**Example:** The top three cards show 3, 5, and 6. Dominic calculates the product is 90. He explains that he multiplied  $5 \times 6$  first, then multiplied the answer by 3.

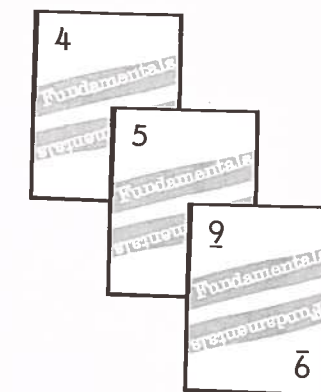
- If the player is unsuccessful, the other player has a turn using the same three cards.
- If both players cannot calculate the product of any three cards, one card is removed from one stack and placed underneath.
- Play alternates until all the cards have been removed from the stacks.
- The player with the greater number of cards is the winner.

## Reading the Research

There is clear evidence that many students are capable of devising sophisticated mental strategies to compute. These strategies have the potential for expanding and enriching their knowledge of mathematics at the conceptual level (Reys & Barger, 1994).

## Before the Game

Randomly draw three cards from the stack and place them for the students to see (as shown). Challenge the students to calculate the product and share the mental strategies they use. It is likely that the students will use a range of different strategies. Encourage them to move the cards around to place them in an order that is easier to multiply. For example, with the numbers shown at right, some students may prefer to calculate  $4 \times 5 \times 9$ . Explain how 4 and 5 are a nice pair that work together to make the computation easier. Repeat this for other sets of three numbers before explaining the rules of the game.



## During the Game

Make sure the players share their strategies, particularly for the second stage of the calculation. For example, here are some possible strategies for the three numbers shown above:

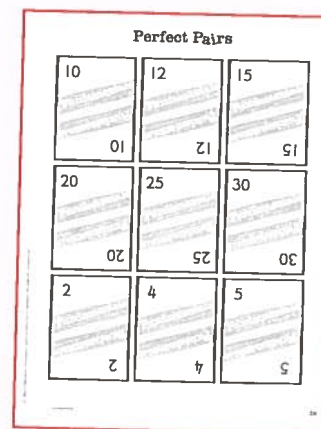
**Toni:** 4 times 5 is 20. I know 2 times 9 is 18 so 20 times 9 must be 180.

**Tim:** 4 times 9 is 36. I don't know 36 times 5 but I do know that 36 times 10 is 360. The answer must be one half of 360. That's 180.

**Tara:** I know 9 times 5 is 45. Then I double and double again to multiply by 4. Double 45 is 90 and double 90 is 180.

## After the Game

Lead a discussion about the strategies they used. Did they tend to use the same strategy as their opponent? Did the students use the same strategy for each set of three numbers? What strategy was used most often? What numbers were best suited to making use of compatible pairs? Have the students name any sets of numbers for which neither player could find an easy way to calculate the product mentally. Discuss different ways to figure out the answer.



## Beyond the Game

- Extend the game by adding another set of cards. Make two copies of page 35 (illustrated). Cut out and laminate all the cards to make a second set. The rules are the same.
- Vary the game by changing the rules. Both the main game and the one described above can be played using four stacks of cards. In doing so, the students can use compatible pairs to find the product of four numbers.