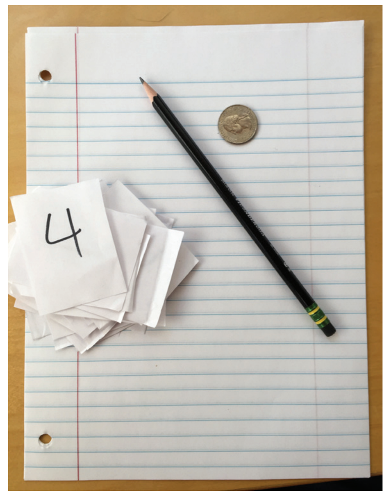
Heads or Tails Multiplication

Object of the Game

Each round, players flip a coin to determine if they're playing for a product that is greater than or less than the other player's product. Players take five cards and use four of them to create a 2-digit by 2-digit multiplication combination. Players solve their combinations using the standard algorithm or other appropriate strategies, and then compare their results. The winner (greater or lesser, based on the coin flip) receives a point for that round. After three rounds, the player with more points wins the game.

Materials



- Coin
- A set of Number Cards (four each of the numbers 1–9)
  Print the cards, make your own, or use the 2–9 cards and aces for 1s from a deck of standard playing cards.
- Pencils or pens
- Paper to keep track of the game

Skills

This game helps us practice

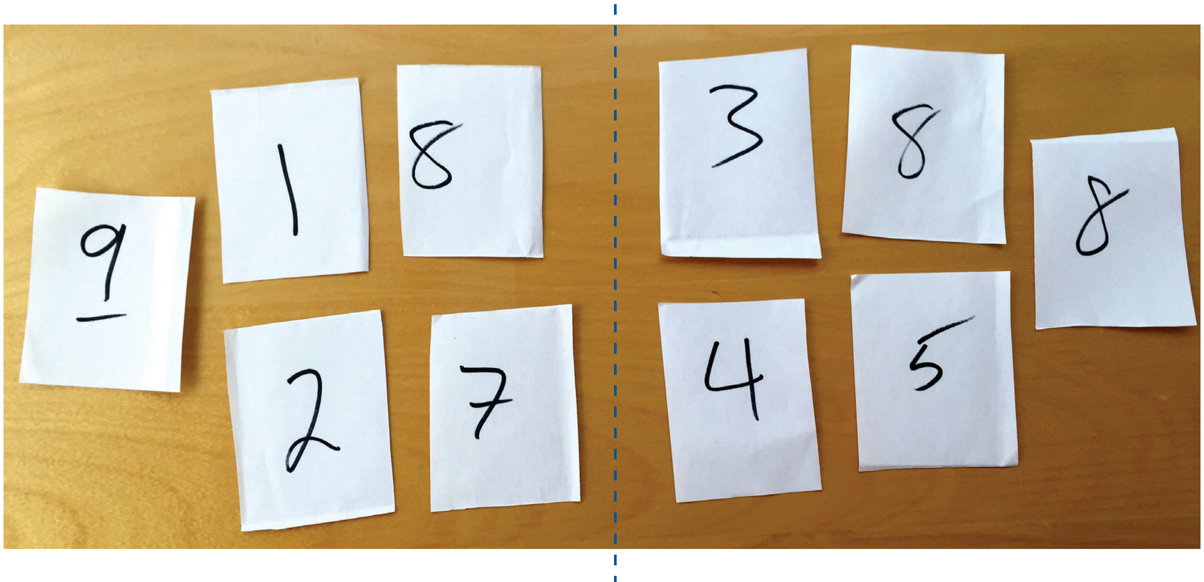
- 2-digit by 2-digit multiplication using the standard algorithm or other appropriate strategies

How to Play

1. Flip a coin to begin each round. If it lands on heads, you're playing to make the greater product (answer to a multiplication problem). If it lands on tails, you're playing to make the lesser product.

Ashley: *It's tails! We're playing to make the lesser product.*

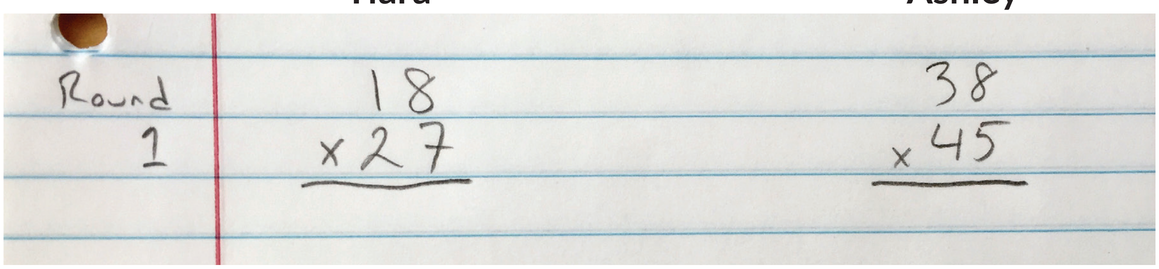
2. Mix up the cards and place them face down in a pile. Players take turns drawing cards until each player has five cards.



Tiara's Cards　　　　*Ashley's cards*

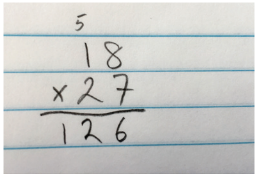
3. Players choose four of their cards to make two 2-digit numbers. The goal is to make numbers that will have a product (a total when multiplied) either as large or as small as possible, depending on the coin flip.

Tiara　　　　**Ashley**

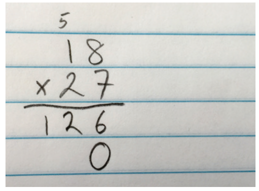


Tiara did not use her 9 and made this combination.
Ashley did not use her second 8 and made this combination.

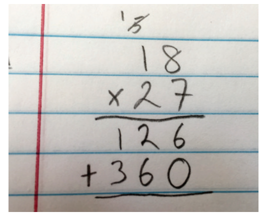
4. Players multiply their numbers using the standard algorithm (or other appropriate strategies) and compare their results.



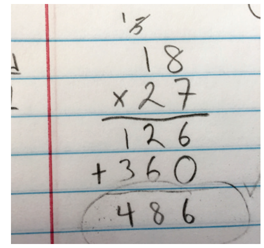
Tiara: First, I multiplied the 18 by the 7 from 27, regrouping the 5 tens from 7 × 8 = 56 into the tens column. That partial product was 126.



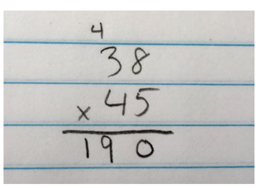
Then, I knew that the 2 in 27 is 20, so the answer will be a multiple of 10, and end in a zero, so I wrote a zero in the ones place of the second partial product.



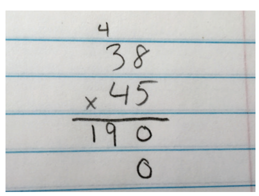
Next, I multiplied 18 by the 2, or 20, in 27. 2 tens times 8 equals 16 tens. 6 tens go in the tens column, and 10 tens is regrouped as 1 hundred, and added to the 2 hundreds from multiplying 20 times 10 (or 2 × 1). This partial product was 360.



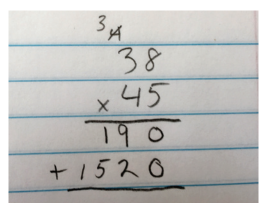
Finally, I added the partial products and got 486.



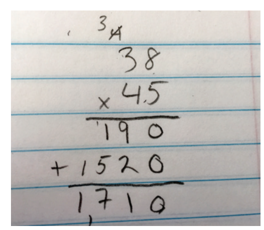
Ashley: First, I multiplied 38 by the 5 from 45, regrouping the 4 tens from 8 × 5 = 40 into the tens column. The partial product was 190.



Then, I knew that the 4 in 45 is 40, so the answer will be a multiple of 10, and end in a zero, so I wrote a zero in the ones place of the second partial product.

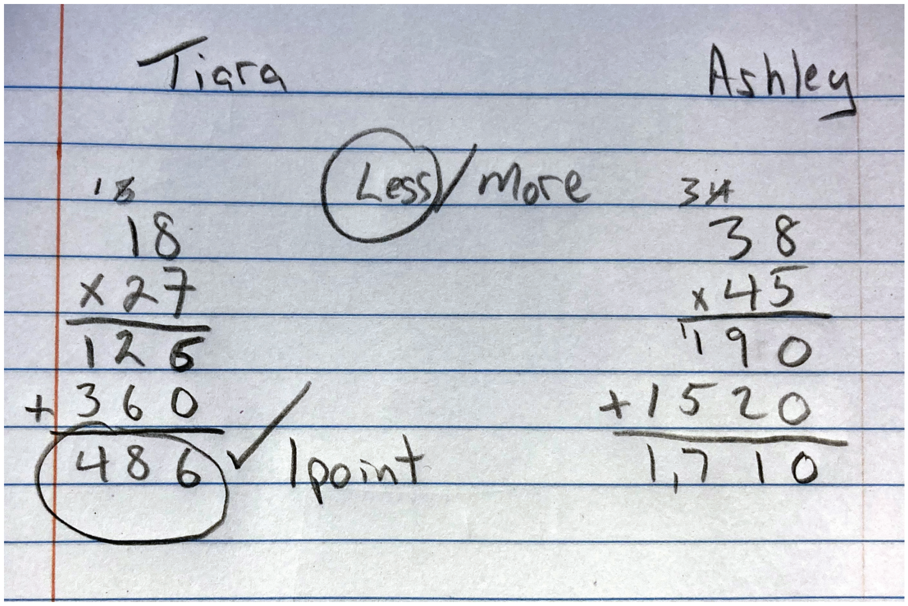


Next, I multiplied 38 by the 4, or 40, in 45. 4 tens times 8 equals 32 tens. 2 tens go in the tens column, and 30 tens are regrouped as 3 hundreds, and added to the 12 hundreds from multiplying 40 times 3 (or 4 × 3). This partial product was 1,520.



Finally, adding the partial products gave me a total product of 1,710.

5. Depending on the coin flip, either the greater or lesser product wins the round and that player gets a point.



Tiara: *We got tails on the coin toss, so we were playing for less. I get a point because 486 < 1,710.*

6. Play continues for three rounds. Each round, the coin is flipped and players take turns drawing five new cards.

7. The player with more points at the end of three rounds wins.

Tips for Families

- After drawing your five cards, talk about how you could arrange them.
  - » Which numbers should you put in the tens place if you want the greater product?
  - » What if you want the lesser product?
  - » How does the arrangement of the tens and ones impact the product. For example, if you want the lesser product, would you choose 18 × 27 or 17 × 28?
- This is a game to practice multiplication strategies, including the standard algorithm for multiplication, which is a fifth grade standard. It's probably the method you learned when you were in school, but it might be a strategy your child is still learning. If they need help, go slow and understand that some of the vocabulary used to describe the algorithm may be different. For instance, your child might not be familiar with the term "carrying" and use the term "regrouping" instead.

Change It Up

Making even small changes to a game can invite new ways of thinking about the math. Try making one of the changes below. How did it change your strategy for winning the game?

- Instead of discarding all five cards, keep the one card you didn't use in a round, and take four more the next round.
- Take a different number of cards, either four or six, for instance.
- Play with four cards, but only take one card at a time. Decide where that number will go in the multiplication combination before taking the next card. Numbers cannot be moved once the next card is taken.
- Change the set of cards you're using.
    - » Include 0s.
    - » Take out the 1s, 2s and 3s for a challenge.
    - » Include more of a certain card to practice your facts.
    - » Add Wild Cards that can represent any digit. If you're using playing cards, choose one of the face cards to be the Wild Cards (Kings, Queens, or Jacks).

Print 4 copies.

1	2	3
4	5	6
7	8	9