Math Magic
– *Find the card* -

Materials:

- Video of the trick
- 1 deck of cards

How to perform the trick

GOAL:
Find the card selected by the spectator.

PREPARATION:

Remove the jokers from the deck.

PERFORMANCE :

1. The spectator shuffles the cards.

2. The magician asks the spectator to remove 9 cards and to pick one of them to memorize. The selected card is placed at the top of the 9 cards and returned to the magician.

3. The magician places the 9 cards at the **bottom** of the deck.

4. The magician deals out 4 piles. While dealing each pile, the magician counts down from 10 to 1. If the number on the card dealt matches the number said by the magician, the magician stops dealing that pile, and restarts the next pile at 10. If the magician reaches 1 without having a card match, the magician turns over the pile and starts a new one.

5. Once 4 piles have been dealt as described in step 4, the magician adds the values of the cards on the top of each pile. A flipped over pile is counted as 1.

6. With the cards left in the deck, the magician deals out the cards revealing the spectator's card at the position of the number obtained in step 5.

Why the trick works

First, note that a deck of cards contains 52 cards. Therefore, once the pack of 9 cards is placed at the bottom of the deck, the spectator's card is at the 44th position.

The point of this trick is to count to the 44th position, in a way that seems random.

If 4 piles are dealt, and we want to divide the 44 cards equally, then each pile will have to cause 11 cards to be dealt.

When dealing out the piles counting down from 10 to 1, there are two possible situations.

The card dealt never matches the number said

If the card dealt never matches the number said, then 10 cards are dealt and the pile is flipped over. When doing step 5, this pile will count as 1. The 10 cards dealt into this pile, plus the 1 card this pile causes to be dealt in step 6, is 11.

The card dealt matches the number said

If the card matches the number said, the combined value of the card and the number of cards in the pile will be 11.

For example, if the card matches at 2, then 9 cards have already been dealt into the pile. The value of the top card will add 2 to the sum in step 5. Therefore, this pile causes 11 cards to be dealt in total (9 in step 4 and 2 in step 6).

All the other numbers work as well because as the number that the card matches at increases by 1, the number of cards dealt into that pile decreases by 1. In other words, for every card not dealt into the pile, an additional card will be dealt at the end of the trick.

This means that each of the 4 piles will cause 11 cards to be dealt as we originally wanted, and the selected card at the 44th position will be revealed every time.