

## Helper Cards Trick

### What the audience sees.

You have a shuffled deck of cards. First you take two cards and put them aside, face down, saying that these are your helper cards that you will use later. You ask a volunteer from the audience to think of a number from 1 and 10 and take that number of cards from the deck so that you do not see them. You explain that you will show the cards one at a time, counting “one,” “two,” etc. and ask the volunteer to memorize the card you show when you call out his/her number. You show the cards to the volunteer without looking at them yourself and put them in a stack face down. After that you ask the volunteer to put his/her cards on top of that stack also. You turn over your prediction cards. Their values are, say, 4 and 9, which you add up to get 13, and say that the volunteer’s card must then be the 13th card in your stack. You count off the first 12 cards and show the 13th card. Indeed, it is the card that the volunteer memorized.

### How you do it.

You must prepare your deck so that the top two cards (when the deck is face down) have values 4 and 9 (or 5 and 8, or 6 and 7 – the values must add up to 13). The rest of the deck should be shuffled. Spread the deck face up in your hands to demonstrate to the audience that it is shuffled without revealing those two cards. Turn the deck face down and put the two top cards aside. Ask a volunteer to think of a number from 1 to 10, but not tell you the number. Give him/her the deck and ask him/her to take that number of cards. This should be done so that you do not see how many cards the volunteer took. Next, explain that you will show the cards one at a time, counting “one,” “two,” etc. and ask the volunteer to memorize the card you show when you call out his/her number. Keep the deck face down in your hand, and as you show each card to the volunteer, put it in a stack face down again on the table. Since you don’t know the volunteer’s number, you obviously must go through 10 cards. However, don’t stop at 10, show also the next card and say “eleven,” and then, as you put the 12th card on the table, say “oh, I’m past 10 already. So, have you memorized the card with your number? OK, good.” Put the stack on the table on top of the stack you are still holding in your hand. Then, ask the volunteer to put his/her cards on top as well. Now say that you will consult your helper cards to predict the position of the card the volunteer memorized. Turn over your two prediction cards and add up their values: the sum is 13. Therefore, you say, the 13th card is the one. Count off the first 12 cards, face down, and show the 13th one.

### Why it works.

Suppose the volunteer took  $x$  cards. Then he/she memorized the  $x$ -th card you showed. When you put a total of 12 cards in the stack on the table, there were  $12 - x$  cards on top of the one the volunteer memorized. The  $x$  cards that the volunteer was holding were added to the stack, so then there were 12 cards on top of the one the volunteer memorized.

