

## Face Up and Face Down Cards Trick

### What the audience sees.

There are some cards on the table. Some are face up and some are face down. You explain to the audience that after your assistant blindfolds you, you will separate the cards into two piles, and the two piles will have a matching number of cards that are face up. Sounds impossible. Your assistant blindfolds you and then mixes up the cards. You come to the table, still blindfolded, and separate the cards into two piles. You call two volunteers from the audience to count the number of cards face up in each pile. They count, and the numbers match.

### How you do it.

In the beginning, 10 of the cards were face up. It doesn't matter how many cards were face down. After you are blindfolded and the cards are mixed up, you take 10 of them and flip them over before putting them on the table. This is one pile. The remaining cards make the second pile.

### Why it works.

Of course, when you are blindfolded you don't know which cards you will take. Suppose that of the 10 cards that you picked,  $x$  are face up and  $10 - x$  are face down. Since there were a total of 10 face up cards on the table,  $10 - x$  face up cards are still there. After you flip over the cards you picked,  $10 - x$  of them will be face up. So each pile will have  $10 - x$  cards face up.

- Initial pile: 10 face up, some face down
- You take:  $x$  face up,  $10 - x$  face down
- Left on the table:  $10 - x$  face up, some face down
- After turning over the cards you took:  $x$  face down,  $10 - x$  face up