The Fitch Cheney Five-Card Trick

You hand a deck of cards to an audience and tell them to choose any five cards they wish. You collect the five cards, look at them quickly, and then ask a volunteer to hide one of the cards after showing it to the audience. You place the remaining four cards face up in a line.

You then tell someone in the room to go to the door and fetch your partner, who has been waiting outside. You take a seat in the back of the room somewhere out of sight. Your partner enters, takes a look at the four cards displayed, and correctly calls out the hidden card! Applause follows.

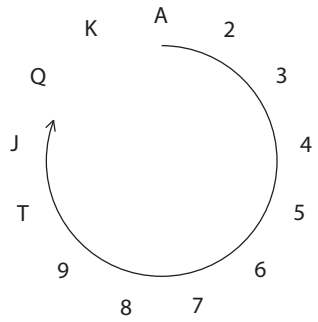
How is this possible? Read on, once you've tried to figure it out for yourself . . .

One Possible Technique – Shhhhhh!

- **Step 1**: If you have any five cards, two of the cards *must* be of the same suit, because there are only four different suits! You are going to place one of those two special cards face-up on the left, and the other card will be hidden.

- **Example**: If the five cards are $K\spadesuit$, $4\heartsuit$, $5\diamondsuit$, $5\spadesuit$, $6\heartsuit$, then the two special cards could be $4\heartsuit$ and $6\heartsuit$. (You could chose the two spades instead, if you wanted to.)

- **Step 2**: Which of the two special cards should be hidden? Find the two cards on this clockwise cycle:



  Then find the shortest arc around the cycle from one of the two cards to the other: the card beginning that arc will go face-up on the left, and the card ending that arc will be the one to guess.

- **Example**: If the special cards are $4\heartsuit$ and $6\heartsuit$, put $4\heartsuit$ face-up on the left and let $6\heartsuit$ be the one to guess. Why? The arc from 4 to 6 is shorter on the clockwise cycle than the really long arc from 6 to 4.

- **Step 3**: But how does the special card that is face-up on the left help you guess the hidden card? The *other* three cards tell you the value!

  Find the other three cards on this list of all 52 cards:

  2♣, 2♢, 2♡, 2♠, 3♣, 3♢, 3♡, 3♠, 4♣, 4♢, 4♡, 4♠, 5♣, 5♢, 5♡, 5♠, 6♣, 6♢, 6♡, 6♠, 7♣, 7♢, 7♡, 7♠, 8♣, 8♢, 8♡, 8♠, 9♣, 9♢, 9♡, 9♠, T♣, T♢, T♡, T♠, J♣, J♢, J♡, J♠, Q♣, Q♢, Q♡, Q♠, K♣, K♢, K♡, K♠, A♣, A♢, A♡, A♠

  One of those three cards will appear First on this list, another one Second, and the other one Third. Arrange these three cards according to the amount you want to *add* to the value of the card face-up on the left:

  First-Second-Third means add 1

  First-Third-Second means add 2

  Second-First-Third means add 3

  Second-Third-First means add 4

  Third-First-Second means add 5

  Third-Second-First means add 6

- **Example**: Find K♠, 5♢, and 5♠ on the list: 5♢ is First, 5♠ is Second, and K♠ is Third. Since we want to add 2 to 4♡ to get 6♡, put the other three cards in the order First-Third-Second. Here's what the final order of the four face-up cards looks like:

  4♡, 5♢, K♠, 5♠

  Ta-Da! The face-down card must be a heart because the left-most card is a heart, and the value must be 6 because we add 2 to 4. The hidden card is 6♡!

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