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:

\[2\spadesuit, 2\heartsuit, 2\clubsuit, 2\diamondsuit, 3\spadesuit, 3\heartsuit, 3\clubsuit, 3\diamondsuit, 4\spadesuit, 4\heartsuit, 4\clubsuit, 4\diamondsuit, 5\spadesuit, 5\heartsuit, 5\clubsuit, 5\diamondsuit, 6\spadesuit, 6\heartsuit, 6\clubsuit, 6\diamondsuit, 7\spadesuit, 7\heartsuit, 7\clubsuit, 7\diamondsuit, 8\spadesuit, 8\heartsuit, 8\clubsuit, 8\diamondsuit, 9\spadesuit, 9\heartsuit, 9\clubsuit, 9\diamondsuit, T\spadesuit, T\heartsuit, T\clubsuit, T\diamondsuit, J\spadesuit, J\heartsuit, J\clubsuit, J\diamondsuit, Q\spadesuit, Q\heartsuit, Q\clubsuit, K\spadesuit, K\heartsuit, K\clubsuit, A\spadesuit, A\heartsuit, A\clubsuit, A\diamondsuit\]

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 \(K\spadesuit, 5\diamondsuit, \) and \(5\spadesuit\) on the list: \(5\diamondsuit\) is First, \(5\spadesuit\) is Second, and \(K\spadesuit\) is Third. Since we want to add 2 to \(4\heartsuit\) to get \(6\heartsuit\), 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:

\[4\heartsuit, 5\diamondsuit, K\spadesuit, 5\spadesuit\]

**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 \(6\heartsuit\)!

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