

#MicDropMath Card Tricks (Practicing 10)

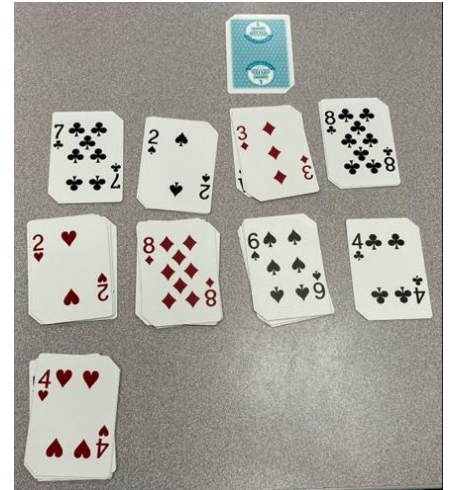
NOTE: Children should always be given ample time to experiment, notice, and wonder before they are provided an explanation.

Always engage children with our two favorite questions:

What do you notice?

What do you wonder?

Resist the urge to answer any questions children have while exploring. Instead, respond back with questions to children and let them make sense of the world. Sample questions you might use: What do you think? Do you notice any patterns? What could we change? Can we test something else? What can we try next? If children ask a testable question, which they could answer by doing an experiment, talk through with them how they might design a test to help answer their question. As much as possible and within reason, let them test their questions by trying the experiments they propose.



Key Question

How can we use math to entertain our family and friends with card tricks they think are magic?

Learning Objectives

Children will...

- learn the steps for performing two different self-working card tricks
- practice counting to 10
- learn pairs of numbers that add up to ten

Vocabulary

Self-working	Clubs	Jack
Sleight of hand	Spades	Ace
Hearts	King	Piles
Diamonds	Queen	Target

Materials

A deck of regular playing cards for each child

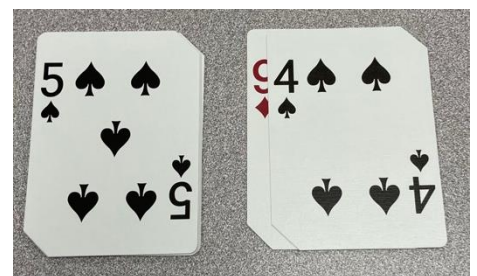
Developmentally Appropriate Practice for Count Up Card Trick

1. Have children sort out all the face cards (King, Queens, and Jacks) from the deck of cards. There should be four of each or 12 total face cards. For extra practice counting, you could have the children verify they have 12 face cards. (Keep Ace-10 only. Double check there are 40 cards in this reduced deck.)



2. Count Up Card Trick Steps

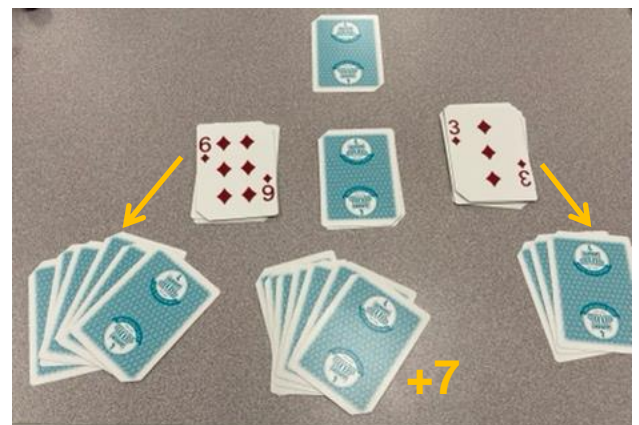
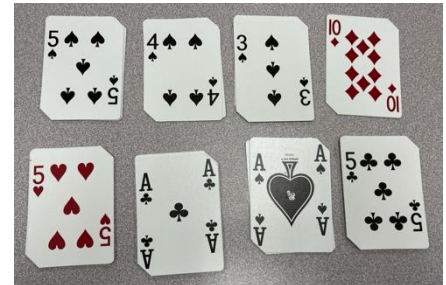
- Shuffle the cards.
- Put the first card face up to start a pile.
- From the value of that card, place cards on top of it (also face up) and count up to ten.
 - Example: If the card you placed face up first was a 6, then you would put cards on top of them face up and count for each one, 7, 8, 9, 10. So, four more cards would be face up on top of the 6. The values on the face of these cards does not matter. Just put the next four on top of the six one at a time until you have counted up to 10.
- Place another card face up to start a new pile. Again, place cards on top of it face up and count up to ten from the value of the card at the bottom of that pile.
 - NOTE: If the card you place face up to start a new pile is a 10, then you are already to ten and can immediately start another new pile.
 - NOTE: If the card you place face up to start a new piles is an Ace, the Ace has a value of one so you would count up from one to ten as you put cards on top of it.



- Keep making new piles like this until you don't have enough cards left to make piles.

- NOTE: If you started a pile at the end and could not count all the way up to ten, then pick up that pile and keep those extra cards in your hand.

- If there are any piles which are just 10's, pick those up and put them with the extra cards in your hand.
- Now, have the person who you are doing this trick on (the target) turn over any three piles they want while you look away. Be sure to instruct them to turn the entire pile over without rearranging the cards. You may want to demonstrate this to them.
- Look away and let the target turn over three piles of cards.
- When they are done, turn back around and collect all the piles they did not turn over and put those cards with the others in your hand.
- Now instruct the target to choose the top card off any one of the remaining piles to be their card. They should pick the card up and not reveal it to you.
- Flip the top cards of the two piles the target did not select over so they are now face up on top of those piles.
- From the cards in your hand, start making a new pile of cards (either face up or face down) by counting out the number of cards that correspond to the value of the cards that are now face up on top of the two piles.
 - Example: If the two cards are 6 and 3, then first you would count six cards out and then right on top of them another three cards.
- Now count out an extra SEVEN cards on top of the same cards you just counted out. Based on the mathematics of this trick, you always need to count out an extra seven cards to make the self-working trick actually work.



- Finally, count the cards you have remaining in your hand and you should now have the value of their card.
 - Example: If after all these steps, you have seven cards left in your hand, then they have a 7, as shown to the right. If you have five cards left in your hand, then they have a 5, and so on.



3. Hints and tips for teaching the steps of the Count Up Card Trick.
 - Acquaint children with the Ace being worth a value of 1. You could practice by putting cards down face up and having children recite the value of the cards. When you get to an Ace, make sure they say “one”.
 - Practice the counting up skill before you try to do the entire trick. Have children place a card face up and then put cards on top of it face up while they count from the value of the first card up to ten.

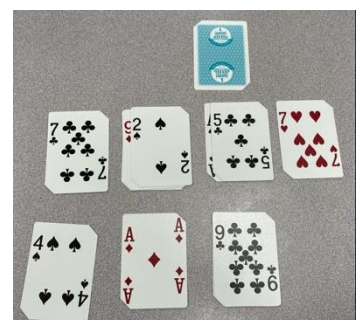
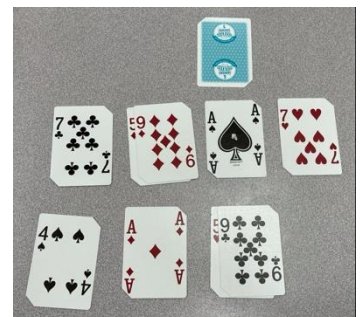
Developmentally Appropriate Practice for Ten Buddies Card Trick

1. Have children sort out all the face cards (King, Queens, Jacks, and 10) from the deck of cards. There should be four of each or 16 total face cards and 10s. For extra practice counting, you could have the children verify they have 16 face cards. (Keep Ace-9 only. Double check there are 36 cards in this reduced deck.)

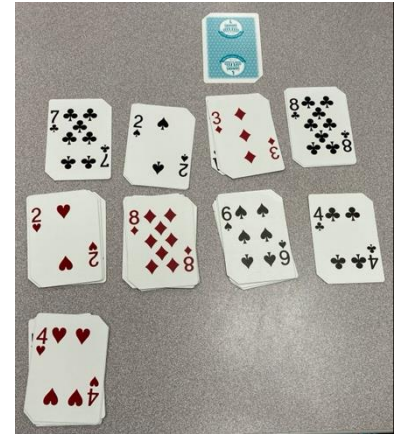


2. Ten Buddies Card Trick Steps

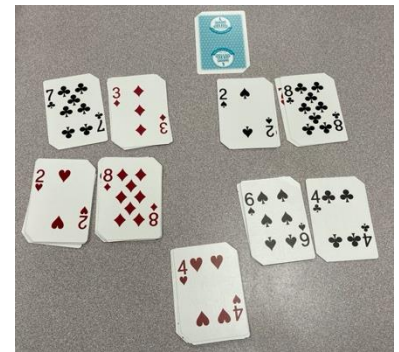
- Shuffle the cards.
- Have the target of the card trick, “pick a card, any card”. Help children think about the showmanship of this part of the trick by fanning out the cards or spreading them out on a table. The target should not show the card to the MicDropMath card trickster.
- Place seven cards out facing up, as shown to the left.
- Then, look for pairs of cards that add up to 10. These are “Ten Buddies”. This will take more time at first until children start to know the Ten Buddies by heart. It is worth the time to let them count out what each buddy is and then see if it is out there.
- If a Ten Buddy pair of cards is facing up (1-9, 2-8, 3-7, 4-6, 5-5), then the next two cards from the dealing deck should be placed on top of them to cover them up. Note how the 5-5 is a Ten Buddy and has been covered up with the next two cards in the dealing deck in the next image.
- Once those cards are covered up with new cards facing up on top them, then you can look for another Ten Buddies pair. If one is located, cover it up with the next two cards facing up from the dealing deck. Note how one of the 1(A)-9 pairs has been covered up in the next image.
- If there is not a pair of Ten Buddies in the piles, add new piles by placing another card face up to start a pile from the dealing deck until you recognize a pair of Ten Buddies. (Note: It is okay to help children by recognizing there is a pair and helping them find it.)



- When either the last cards from dealing deck have been used to cover up Ten Buddies or you have one card left in the dealing deck, which should just be place face up to create a final pile of upward facing cards, then the next phase of the trick begins. (As a check, you should have an uneven number of piles as shown to the right.)



- Now the trickster needs to pair off piles of cards whose top cards are Ten Buddies. They can move the piles around to make it obvious they are paired up.
- Once they have paired up all the piles, there should be one pile left without its Ten Buddy. The card the target has is the Ten Buddy of this card. So, if the only pile without a Ten Buddy is 4 then the target has a 6, as shown to the left. If the only card without a Ten Buddy is a 7 then the target has a 3 and so on. At this point, you will know the value of the card. In the example, a 4 is unpaired so the target must have a 6.



- To figure out the suit, the trickster should now look for the other three cards they have in the piles that match the value of the card they know the target has. For example, if you know the card the target has is a 6, find the other 6s. Once all three have been found, then the suit of the card is the one missing. So, if you find a 6 of hearts, a 6 of clubs, and 6 of spades, then the card the target has is a 6 of diamonds.



Extensions for Additional Learning

As always, ask the children throughout the experiment what they notice and what they wonder. If their wonder questions are testable, as much as possible and within reason, let them actually test their questions by trying new experiments.

See below for examples of what they might wonder and experiments they might do to test their wonderings.

- I wonder if you can do the trick with the whole deck?
 - For older students, let them see if they can figure it out. For younger students, you can look up how to do these tricks with the full deck of cards here: <https://stemazing.org/micdropmath-playing-card-tricks/>
 - Let them try it!
- I wonder how to improve the showmanship of the tricks?
 - Let them try it! Give children some hints about how to make the tricks more exciting and then let them run with new ways to improve the showmanship of them.

AZ Early Learning Standards

Math Standard- Strand 1: Counting & Cardinality Concept 4: Counts to Tell

Number of Objects: The child uses number words and counting to identify quantity

Math Standard- Strand 2: Operations & Algebraic Thinking Concept 1: Explores

Addition and Subtraction: The child recognizes addition as adding to and subtraction as taking away from.

Math Standard - Strand 2: Operations & Algebraic Thinking- Concept 2:

Patterning: The child recognizes, fixes, duplicates, extends, describes, and creates patterns.