

Math Engaged

Building a Mathematical Mindset through Engagement and Creative Play in Mathematics

Card Games

A simple deck of traditional cards can yield countless math games for students at varying skill levels. Every game offers the flexibility to make the play easier, harder, or more complex – you get to decide! And with just standard deck of cards, you can bring math learning with you anywhere you go: car trips, restaurants, or just relaxing at home!

We found many of our favorite card games [here](#); the following list is our recommended selection plus variation options, as well as a few of our own ideas!

Note: For these games, Aces = 1, and Jacks, Queens, Kings, and jokers are removed, unless otherwise specified.

Ten or Twenty

Practice Concept(s): Addition

Each player is dealt five cards and the remaining cards are placed face down in a pile at the center of the table. Flip over the top card from the pile and place it face up next to the pile; this will be the start of the discard pile. On each player's turn, the player may pick up the top card in the face-down pile or one card from the discard pile, and that player must use exactly three cards to add up to ten or twenty. If a player cannot make a set adding up to ten or twenty on their turn, that player discards one card in the discard pile and the next player goes. If the player can make a set of cards with a sum of ten or twenty, they place down that set on their turn, pick up three new cards from the face-down pile, and discards one card to end their turn. (Players should end the turn with three cards.) The player with the most number of sets at the end of the game wins.

Closest To

Practice Concept(s): Place Value

This game is a great opportunity for early math learners to practice comparing ones-place, tens-place, hundreds-place, and as high up as you'd like! Starting with two digit numbers, deal out two cards per player. Each player takes the cards in their hand and rearranges the digits to create a number that is closest to 50. The players show each other their hands and the player who is closest to 50 wins the set of all of the players' cards. Deal another two

cards to each player and keep going until the deck is exhausted. The player with the most number of sets at the end of the game wins.

Change it up:

Do it for three digit numbers: Deal out three cards to each player on each turn and players are trying to create numbers closest to 500.

Four digit numbers: Deal out four cards to each player and the target number is 5000.

Go as high as you can!

Change it up again:

Pick different target numbers rather than 50, 500, 5000, etc. Try unusual numbers, such as 92, or 348, or 6,381.

Make 25 with 5

Practice Concept(s): Addition

Players are dealt five cards each and the remaining cards are stacked face down in a pile in the middle of the table. Players must use all five cards to create a sum of exactly 25. Players go around in a circle and on each turn, they pick up a new card either from the face-down pile or from the discard pile. Players discard one card per turn. First player to create a sum of 25 wins.

Change it up:

Make the game more challenging by changing the rules to include, or even exclude, certain operations. You can start by allowing subtraction, then bringing in multiplication and division.

Rule of 24 Card Game

Practice Concept(s): Arithmetic (Addition, Subtraction, Multiplication, Division)

Each player is dealt four cards from the deck and they must use all four cards to create an equation with a solution of 24 using elementary operations (+ – x ÷). This is a great game that encourages use of all four operations plus parentheses and the use of PEMDAS.

Math War

Practice Concept(s): Addition, Arithmetic

This game is a simple revision of the traditional card game of war. This fast-paced card game challenges players to quickly perform mathematical operations in their head to beat their opponent. Each player is dealt an equal number of cards from the deck, which they keep face down in a pile. When the players say “Go!”, each player flips over the top card from their own deck and show each other their card. The first player to call out the sum of the cards takes the set of cards and sets them aside. The players

immediately flip over the next top cards in their deck and repeat. The player with the most amount of cards when the decks are exhausted wins.

If there is a tie, perform the traditional War Tie Breaker Rules: Each player draws three cards from their deck and places them face down, then each player draws a fourth card and the first person to call out the sum of the new cards wins *all* of the cards.

Change it up:

Make the game more challenging by changing the rule from addition to subtraction. Also try multiplication and -if you're daring - division!

Math Memory

Practice Concept(s): Arithmetic (Addition, Subtraction, Multiplication, Division)

Lay all of the cards down on the table face-down in a grid. Players take turns flipping over three cards and seeing if they can make an equation with the face-up cards. Younger players can try using addition and subtraction, and older players can also try using multiplication and division. Players are challenged to remember what cards every player has flipped to help them create equations on their own turn. The player with the most amount of cards at the end of the game wins.

Change it up:

Make the game more challenging by using all of the cards: add in the Jack, Queen, and King (J=10, Q=11, and K=12).

Math Boggle

Practice Concept(s): Arithmetic (Addition, Subtraction, Multiplication, Division)

If you've already played the regular game of Boggle (finding words in multiple directions from a set of 16 letter cubes) learning this game will be a cinch. For this game, each player will also need a pad of paper and a pencil. Lay 16 cards down on the table face-up in four rows and four columns. Set a timer and when you call "Go!", players look to see where they can find equations among the sixteen different cards. Players can write down equations that go vertically, horizontally, diagonally, and even zig-zag, so long as the cards are in order and are touching at a side or corner. For example, if a player finds a 4, 3, and 1 next to each other, they can write " $4 - 3 = 1$ " as an equation, or " $1 + 3 = 4$ " as another equation. However, if the player finds a 3, 4, and 1 in a row, they cannot rearrange the numbers to make " $4 - 3 = 1$ " or " $1 + 3 = 4$ ". (Comparison: if you find TAC on a Boggle Board, you can read the word backwards to make CAT. However, if you find CTA on a Boggle Board, you cannot make "CAT" going forward or backwards, so you cannot make the word.) For starting players, allocate more time, such as five or seven minutes. For more

experienced players, begin reducing the time down to as little as two minutes.

Change it up:

Make the game more challenging by using all of the cards: add in the Jack, Queen, and King (J=11, Q=12, and K=13).

Target Number

Practice Concept(s): Arithmetic (Addition, Subtraction, Multiplication, Division)

The goal of this game is to create an equation with playing cards to get as close as possible to a target number. This game is fantastic practice for all operations as well as order of operations (PEMDAS).

To start: Select the target number by rolling two dice: roll one die for the tens place, and roll the second die for the ones place. (Ex: if you roll a 4 first, and then a 6, the target number is 46.)

Players are dealt five cards each and the remaining cards are set aside. Players may use whatever cards in their hand that they can to create an equation that gets as close as possible to the target number. Once all players are ready, each player reveals their equation to the other players. Whichever player created the equation that gets them closest to the target number wins this round, and collects all of the cards that were played by all players

during this turn.

The dealer then re-deals out cards to each player such that each player has five cards again. Repeat until the entire deck has been used up. The player with the most amount of cards at the very end of the game wins.

If there is a tie, players set aside all of the cards in a “winner’s pot” on the table, and whoever wins the next round will win that round’s set of cards PLUS the winning pot from the first round.

Players do not have to use all of the cards in their hand, but playing more cards means collecting more cards if they win the round, which means the player is closer to winning the full game. This encourages players to get more creative with their equations.

Younger students: Use addition and subtraction.

Students who are learning multiplication tables and up: Use addition, subtraction, multiplication, and division, and PEMDAS (order of operations.)

Change it up:

Roll two dice for the tens place and take their sum, and roll two dice for the ones place and take their sum. (Ex: If you roll a 3 and a 4, the tens place is now 7, and if you roll a 7 and a 2, the ones place is 9.) (Additional note: If you roll a 3 and a 4 for the tens, then a 7 and a 4 for the ones, you have 7 tens and 11 ones – which is 7 tens + 1 ten + 1 one 81! This is a great practice for gaining a more

intuitive feel for placeholders.)

Change it up even more:

You can also add more dice to roll for hundreds place.

Closest To: Comparing Fractions

Practice Concept(s): Fractions

The purpose of this game is to engage in a discussion of comparing fractions of different numerators and denominators. Start by setting the target number to zero, and the player that can make the smallest fraction (closest to zero) will win the hand. Deal each player three cards. Players must select two of their cards to create a fraction: one card for the numerator, the other card for the denominator. Players go around and show their hands, and they discuss who has the lowest fraction and why. The player who has the lowest fraction collects everyone's cards as points and sets them aside. Deal out three cards to everyone again and repeat.

Change it up:

Advance the gameplay as players become more comfortable by using any of the following ideas:

→ Allow players to use two cards to create a new numerator or denominator by adding or subtracting. Ex: If a player is dealt 4, 6, and 8, they can make a smaller fraction by creating $(6-4)/8$ than if they just used two of the cards.

→ Deal four cards to each player and specify that players must use

all four cards creatively.

–> Change to the goal to make the target number 1, where the player closest to 1 without going over wins.

–> Change the goal yet again to make the target number 1, but players can go over one (thus creating improper fractions.)

–> Design your own goals! (Target number = 2, 1.5, etc.)

Tip:

Try not to use paper and pencil for drawing or writing the fractions down during gameplay. The purpose of this game is to have students think intuitively about how differences in the numerators and denominators changes the value of the fraction. Drawing pictures is helpful for students who are beginning to learn fractions, but as game play advances, encourage students to visualize the fraction solely in their minds and explain it in words. This promotes a deeper, more intuitive understanding of fractions that will be beneficial when students are required to compare numerical fractions on paper.

Advice for Playing Any Math Game

Be flexible with the rules: Start with any of these games and play by the rules listed here, but make the game more accessible and more interesting by changing the rules. For example, in “Make 25 with 5”, you can make the game more challenging by using other operations than just addition. You can also make the game more

accessible by relaxing the rule of using all 5, especially for younger players, encouraging them to make 25 with any number of cards.

Relaxing rules like “you must use all x cards” makes a game less intimidating and – more importantly – more engaging for players. A child who sees a sum of 25 with three cards instead of all 5 should be encouraged to recognize and explain that equation. You can then offer bonus points for using more cards and more equations. This is also ideal if you are playing with children of varying skill levels. Approaching games like these with higher opportunities for success, plus opportunities for more epic successes, is tremendously more rewarding than approaching games with only occasional successes and more frequent failures.

More Ideas?

Do you know of a fun and rewarding math game using a deck of cards?

[Contact us](#) to share your idea with other students, parents, and educators!