Building Fluency

Math is everywhere. It's in everything we do, whether we're estimating the money we'll make this summer or the number of stars in the sky. That's why *Eureka Math2*® teaches students to experience math, to understand it conceptually and in application.

***Eureka Math2* card games are intended to help build fluency in math in a fun and engaging way. The games also encourage conversations about mathematics with peers or at home.**

Math Games with Playing Cards

Here you will find the rules and instructions for some math games using our *Eureka Math2* deck of cards or any standard deck of playing cards. The games are appropriate for a wide range of skill levels, and all have an educational math twist.

1 MORE, 1 FEWER

2 Players | Grade Levels K–1

This game develops fluency with counting forward and backward by ones.

PREPARING TO PLAY

- Shuffle a full deck of cards. Place two cards face down next to each other in the playing area with at least a card's width between them. Each card should be within equal reach of the two players.
- Divide the remaining cards equally between the two players. Players pick up the first five cards from their own pile to hold in their hand, and they leave the rest of their cards in a pile, facedown, in front of them.
- To begin, each player turns over one of the two facedown cards in the playing area. These two faceup cards establish the two playing piles.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.

PLAYING THE GAME

- Instead of taking turns, students try to play their cards as quickly as possible.
- At any time, either player can play a card from their hand on either of the two playing piles in the center. The value of the card played must be either 1 more or 1 fewer than the value of the card on top of the pile. For example, if the top cards are a 12 and an 8, only a 13 or an 11 can be played on the 12, and only a 7 or a 9 can be played on the 8.
- Since there is no number card larger than 13, when a 13 card is faceup on the playing pile, a 12 card or a 0 card may be played.
- A player can only play from the five cards in their hand. Each time they play a card from their hand, they replace it with the top card in their pile.
- A player can lay down only one card at a time. For example, if a 3 is on top of a playing pile and a player holds two 2's and a 3, they must lay the cards down individually—the first 2, the 3, and then the second 2—not as a stack of three cards.
- If no one can play a card that is 1 more or 1 fewer, players can reset the game by each taking the top card from their pile and placing it faceup on one of the two playing piles. Players repeat the process until a player has a card that can be played.

WINNING THE GAME

The first player to play all the cards in their pile wins.

VARIATION

- To support the development of fluency with addition or subtraction, play 2 (or 3) more, 2 (or 3) fewer instead of 1 more, 1 fewer.

MAKE TEN

2 Players | Grade Levels K–2

This game develops fluency with identifying number compositions that make 10.

PREPARING TO PLAY

- Remove the 10's, jacks, queens, and kings from the deck, and shuffle the remaining cards (aces through 9's).
- The suits are not important; only the numbers matter.
- Lay 10 cards face up in a single row, without overlapping them.

PLAYING THE GAME

- Players search the row of cards for a pair that combine to make 10. When a player finds such a pair, they say, "I made 10!"
- Play pauses while the player pulls the two cards that make 10, allows the other player to confirm that the sum is 10, and places the two cards in their own pile.
- Two new cards are pulled from the pile to replace the pair taken and play resumes.
- Play continues until all the cards have been pulled and all combinations that make 10 have been found.

WINNING THE GAME

The player who finds the most pairs that make 10 wins.

VARIATIONS

- Rather than playing for speed, invite players to take turns throughout the game.
- Rather than make 10, pair cards to make 6, 7, 8, or 9. (Remove all cards larger than the selected sum.) Alternatively, consider larger totals, as well as using more than 2 cards to make the chosen sum. The game ends when there are no more cards that can be played.

BASIC TOP IT

2 Players | Grade Levels K–2

This game develops students' fluency by comparing two numbers within 12.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards equally between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, the ace = 1, jack = 11, queen = 12, king = 13, and joker = 0.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.

PLAYING THE GAME

- Each player picks a card off the top of their pile and places it faceup in the middle of the playing area. The player who placed the card with the greatest value takes both the cards played and places them at the bottom of their pile.
- If both players' cards have the same value, another round ensues and the player with the card of the greatest value takes all four cards.

WINNING THE GAME

The player with the most cards wins the game.

VARIATIONS

- Invite students to write a comparison statement, such as $4 > 3$ or $5 < 7$, by using the numbers from each round.
- Players can determine the difference between the two numbers being compared by using card images, cubes, fingers, or whiteboards. To assist students or children who are still learning math terms or English, consider providing this sentence stem to support precise mathematical language, such as, " ___ is more/fewer than ___."

PLACE VALUE TOP IT

2 Players | Grade Levels 1–5

This variation of the Basic Top It game reinforces fluency with place value when comparing larger numbers.

PREPARING TO PLAY

- Remove the 10's, jacks, queens, and kings from the deck and shuffle the remaining cards (aces through 9's). Consider using joker cards to include the digit 0 in the game.
- Note: If using a standard deck of cards, aces have a value of 1.
- Divide the cards equally between the players. Each player keeps their cards in a single pile, facedown.
- This game can be played to the tens, hundreds, or thousands place. Decide whether the game will be played using two-, three-, or four-digit numbers.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Consider providing place value charts to invite students to show numbers using place value drawings or place value disks.

PLAYING THE GAME

- Each player picks the designated number of cards off the top of their pile. The designated number of cards should match the number of digits in the numbers they will make— two cards if playing to the tens place, three playing to the hundreds place, and four cards playing to the thousands place.
- Players place their cards faceup in the middle of the playing area.
- Each player arranges their cards in place value order to form a number with the greatest value possible. For example, if the game is using three-digit numbers and a player has a 2, a 3, and a 9, they should form 932. Consider providing each student with place value charts to help them arrange their cards. When players finish arranging their cards, the player who formed the number with the greatest value takes all the cards played and places them at the bottom of their pile.
- If players create numbers with the same value, a top it ensues. Each player places three cards face up in the playing area and works to form a new number with the greatest possible value. The player whose new number has the greatest

value collects all the cards in the playing area, placing them at the bottom of their pile.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATIONS

- Invite students to write a comparison statement, such as 342 > 243 or 21 = 21, by using the numbers from each round.
- Adapt this game to help students build fluency with place value in decimal numbers. To compare decimals, have each partner add an index card with a black dot. Determine the digits to be used, for example ones, tenths, or hundredths.
- Players can determine the difference in the two numbers being compared by using card images, cubes, fingers, or whiteboards. Consider providing a sentence stem to support language, such as, “ ___ is more/fewer than ___.”

ADDITION TOP IT

2 Players | Grade Levels 2+

This variation of Basic Top It builds fluency with addition skills.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards equally between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Consider providing tools such as cubes, whiteboards, and place value charts to support students.

PLAYING THE GAME

- Each player picks two cards off the top of their pile and places them faceup in the middle of the playing area.
- Each player adds the values of the cards and states the sum. Each player then checks the other player's sum.
- The player with the greatest sum takes all the cards played and places them at the bottom of their own pile.
- If the sums are the same, a top it ensues. A second round is played, and the player with the greatest sum takes all the cards played from both rounds.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATIONS

- Engage students in working with more addends by choosing multiple cards. (e.g., 3+4+7=__)
- Alternatively, to work with two- or three-digit addends, students may use 4–6 cards instead of two (e.g., 34+71=__)
- To add decimals, have each partner add an index card with a black dot.

MULTIPLICATION TOP IT

2 Players | Grade Levels 3+

This variation of Basic Top It builds fluency with multiplication skills.

PREPARING TO PLAY

- Remove the 10's, jacks, queens, and kings from the deck, and shuffle the remaining cards (aces through 9's). Consider using joker cards to include the digit 0 in the game.
- Note: If using a standard deck of cards, aces have a value of 1.
- Place the remaining cards in a single pile, facedown.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Consider providing tools such as cubes or whiteboards to support students. If needed, remove the highest value cards.

PLAYING THE GAME

- Each player picks two cards from the top of their pile and places them faceup in the middle of the playing area.
- Each player multiplies the values of their cards and states the product. Each player then checks the other player's product. The player whose cards form the greatest product takes all the cards played and places them at the bottom of their pile.
- If the products are the same, resulting in a tie, a second round is played. The player with the greatest sum takes all the cards played from both rounds.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATIONS

- Invite students to write a corresponding division fact (e.g., $5 \times 6 = 30$ and $30 \div 6 = 5$).
- To engage students in multiplication of multi-digit numbers, play using a full deck of cards.

FRACTIONS TOP IT—FRACTIONS LESS THAN 1

2 Players | Grade Levels 3+

This variation of Basic Top It builds fluency with comparison of fractions less than 1.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards evenly between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Players may use number lines, fraction bars, whiteboards, etc.

PLAYING THE GAME

- Each player picks two cards off the top of their pile and places them faceup in the middle of the playing area.
- Each player arranges their cards as a fraction, using the smaller of the two cards as the numerator and the larger as the denominator. A pencil may be used as the fraction bar.
- Each player calls out their fraction. The player whose fraction has the greatest value takes all the cards played and places them at the bottom of their pile.
- If the fractions are the same, or equivalent, a top it ensues. A second round is played, and the player with the greatest fraction takes all the cards played from both rounds.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATION

- Invite students to write a comparison statement, such as $4/5 > 2/8$, using the numbers from each round.

FRACTIONS TOP IT—FRACTIONS GREATER THAN 1

2 Players | Grade Levels 4+

This is a variation of Basic Top It that builds students' fluency with comparison of fractions greater than 1.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards evenly between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Players may use number lines, fraction bars, whiteboards, etc.

PLAYING THE GAME

- Each player picks two cards off the top of their pile and places them faceup in the middle of the playing area.
- Each player arranges their cards as a fraction. This time, players may use either card as the numerator; the goal is to form a fraction with the greatest possible value. The player whose fraction has the greatest value takes all the cards played and places them at the bottom of their pile.
- If the fractions are the same, or equivalent, a top it ensues. A second round is played, and the player with the greatest fraction takes all the cards played from both rounds.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATION

- Invite students to write a comparison statement, such as $10/5 < 15/5$, using the numbers from each round.

INTEGER ADDITION TOP IT

2 Players | Grade Levels 7+

This variation of Basic Top It builds students' fluency with addition with integers.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards evenly between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- If using *Eureka Math*^{2} cards, orange suits represent negative integers. If using standard playing cards, red suits represent negative integers. Consider having each partner add an index card with a black minus symbol to help identify negative integers.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Players may use number lines, whiteboards, etc.

PLAYING THE GAME

- Each player picks two cards off the top of their pile and places them faceup in the middle of the playing area.
- Each player adds the values of their cards and states the sum. Each player then checks the other player's sum. The player whose cards form the greatest sum takes all the cards played and places them at the bottom of their pile.
- If the sums are the same, a top it ensues. A second round is played, and the player with the greatest sum takes all the cards played from both rounds.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATION

- Increase the number of addends by having students lay down more than two cards.

INTEGER MULTIPLICATION TOP IT

2 Players | Grade Levels 7+

This variation of Basic Top It builds student fluency with multiplication with integers.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards evenly between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- If using *Eureka Math*^{2} cards, orange suits represent negative integers. If using standard playing cards, red suits represent negative integers. Consider having each partner add an index card with a black minus symbol to help identify negative integers.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Players may use number lines, whiteboards, etc.

PLAYING THE GAME

- Each player picks two cards off the top of their pile and places them faceup in the middle of the playing area.
- Each player multiplies the values of their cards and states the product. Each player then checks the other player's product. The player whose cards form the greatest product takes all the cards played and places them at the bottom of their pile.
- If the products are the same, a top it ensues. A second round is played, and the player with the greatest product takes all the cards played from both rounds.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATION

- Invite students to write a corresponding division fact.

OPERATIONS TOP IT

2 Players | Grade Levels 8+

This variation of Top It builds students' fluency with operations with rational numbers, including exponentiation and mathematical reasoning, revealing the relative impact of each operation on positive and negative operands.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards evenly between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- If using *Eureka Math2* cards, orange suits represent negative integers. If using standard playing cards, red suits represent negative integers. Consider having each partner add an index card with a black minus symbol to help identify negative integers.
- Decide how long the game will last and set a timer. Alternatively, play continues until one player holds all the cards.
- Players may use number lines, whiteboards, etc.
- Consider providing writing materials and a calculator for equations involving exponentiation with higher card values.

PLAYING THE GAME

- Each player picks two cards off the top of their pile and places them faceup in the middle of the playing area for all to see.
- Each player chooses any operation to use with their two cards—addition, subtraction, multiplication, division, or exponentiation—and computes the resulting value, aiming for the greatest possible value.
- If the two players have created expressions with equal value, a top it ensues. Each player places four (or five) new cards to form a new expression of the greatest possible value. The player whose new expression has the greatest value collects all the cards in the playing area, placing them at the bottom of their own pile.

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATION

- Players can choose multiple cards from the top of their pile to increase the number of terms in the equation, applying the Order of Operations. Players can apply parentheses in equations by using their writing materials or by adding two index cards with a black parenthesis.

HIT THE TARGET

2–4 Players | Grade Levels 4+

This game builds students' fluency with the four basic operations and the order of operations. The game also exercises students' mathematical reasoning skills.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards evenly between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- Provide each group with a timer and set it for 2 minutes. Each round of play will last 2 minutes.
- Provide each student with writing materials to write their expressions and tally their scores.

PLAYING THE GAME

- Select a player to be the first game leader.
- The game leader selects and announces a target number between 1 and 30, lays out five cards faceup, and starts the timer for 2 minutes.
- Using any combination of numbers on those five cards, along with parentheses, operation symbols, and understanding of order of operations, each player works to write at least one expression that equals the target number.
- During the 2-minute round, players should record as many expressions that equal the target number as they can. Each correct expression is worth 1 point.
- At the end of the round, players tally their scores. The player with the highest score will begin the next round by selecting a new target number.

WINNING THE GAME

At the end of the game, players tally their scores from each round. The player with the highest total score wins.

VARIATIONS

- Consider inviting players to take turns selecting a new target number each round.
- For younger students, play by using only addition and subtraction. Students may show their thinking in one step or multiple steps. For example, the target number is 9, and the five cards shown are 12, 10, 4, 8, and 3. Players may write:

12 – **3** = 9	**8** + **4** = 12 12 – **3** = 9	**12** – **4** = 8 8 + **8** = 16 16 – **10** = 6 6 + **3** = 9

NUMBERS UP

3 Players | Grade Levels 2+

This game builds students' fluency with finding an unknown total or part.

PREPARING TO PLAY

- Remove the jacks, queens, and kings from the deck, and shuffle the remaining cards (aces through 10's). Consider using jokers to include the digit 0 in the game.
- Note: If using a standard deck of cards, aces have a value of 1.
- Assign roles to each player: Player A is one part, player B is one part, and player C is the total.
- Divide the cards evenly between players A and B. Each player keeps their cards in a single pile, facedown.
- Decide how long the game will last and set a timer. Alternatively, play continues until all the cards have been used.
- Players may use the numeral dot cards, cubes, fingers, or whiteboards to determine the number on their card.

PLAYING THE GAME

- Players A and B each pick a card off the top of their pile and hold it on their own foreheads so they can't see the number.
- Player C looks at both cards and says the total.
- Players A and B find the number on their own card, based on the total and the other part. Player C confirms the two parts.
- The player who finds the number on their card first takes all the cards played, places them to the side, and becomes player C (the total).

"The total is 8"

Player C

If the total is 8, and my partner has3, I must have 5.

Player A

If the total is 8, and my partner has 5, I must have 3.

Player B

WINNING THE GAME

The player with the most cards at the end of the designated time wins.

VARIATIONS

- Invite students to write a number sentence by using the numbers from each round.
- For older students, play using multiplication and division: player A is a factor, player B is a factor, and player C is the product.
- To support younger students, consider using fewer factors. For example, you might limit some groups' decks to cards with 0–5 and 10 at first and then gradually add more factors. Alternatively, consider including the deck of Multiples of 10 cards for additional challenge.

"The product is 15."

Player C

The product is 15 and my partner has 3.

15 ÷ 3 = 5

I must have 5.

Player A

My partner has 5. 5 times what number equals 15?

5 x 3 = 15
I must have 3.

Player B

GET TO 100

2 Players | Grade Levels 1+

This game builds students' fluency with addition to 100.

PREPARING TO PLAY

- Provide each student with writing materials.
- Shuffle and place a full deck of cards in a single pile, facedown.
- Note: If using a standard deck cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- Decide how long the game will last and set a timer. Alternatively, play continues until all the cards have been used.

PLAYING THE GAME

- Each player chooses two cards and places them side by side in front of them.
- Rather than taking turns, this game invites players to add quickly.
- Players find the total of their cards and use writing materials to record the total. They can show their work in any way they choose (equations, quick tens, arrow way, number bonds, etc.)
- Each player continues choosing one card at a time.
- With each new card, players add the amount on the new card to the previous total as quickly as possible.

WINNING THE GAME

The first player to reach or pass 100 wins the game.

VARIATIONS

- Invite players to compare totals to see which is greater (or less).
- Consider modifying the ending total. For example, players play until they reach or pass 20 or 50.
- Place all cards faceup in the playing area. Ask players to strategically choose cards to get as close to 100 as they can without going over 100.
- Invite players to start with 20, 50, or 100 and subtract to reach or pass a target number, such as 0 or 10.

HIT THE TARGET

2–4 Players | Grade Levels 4+

This game builds students' fluency with the four basic operations and the order of operations. The game also exercises students' mathematical reasoning skills.

PREPARING TO PLAY

- Shuffle a full deck of cards. Divide the cards evenly between the players. Each player keeps their cards in a single pile, facedown.
- Note: If using a standard deck of cards, ace = 1, jack = 11, queen = 12, king = 13, joker = 0.
- Provide each group with a timer and set it for 2 minutes. Each round of play will last 2 minutes.
- Provide each student with writing materials to write their expressions and tally their scores.

PLAYING THE GAME

- Select a player to be the first game leader.
- The game leader selects and announces a target number between 1 and 30, lays out five cards faceup, and starts the timer for 2 minutes.
- Using any combination of numbers on those five cards, along with parentheses, operation symbols, and understanding of order of operations, each player works to write at least one expression that equals the target number.
- During the 2-minute round, players should record as many expressions that equal the target number as they can. Each correct expression is worth 1 point.
- At the end of the round, players tally their scores. The player with the highest score will begin the next round by selecting a new target number.

WINNING THE GAME

At the end of the game, players tally their scores from each round. The player with the highest total score wins.

VARIATIONS

- Consider inviting players to take turns selecting a new target number each round.
- For younger students, play by using only addition and subtraction. Students may show their thinking in one step or multiple steps. For example, the target number is 9, and the five cards shown are 12, 10, 4, 8, and 3.
  Players may write:

12 – **3** = 9	**8** + **4** = 12 12 – **3** = 9	**12** – **4** = 8 8 + **8** = 16 16 – **10** = 6 6 + **3** = 9

READY, SET, FLIP

2 Players | Grade Levels 3+

This game builds students' fluency with multiplication skills.

PREPARING TO PLAY

- Remove the 10's, jacks, queens, and kings from the deck, and shuffle the remaining cards (aces through 9's). Consider using jokers to include the digit 0 in the game.
- Note: If using a standard deck of cards, aces have a value of 1.
- Divide the remaining cards evenly among the players. Each player keeps their cards in a single pile, facedown.
- Decide how long the game will last and set a timer. Alternatively, play continues until all the cards have been used.

PLAYING THE GAME

- Each player will say "ready, set, flip" as they choose one card from the top of the pile and place it face up in the middle of the playing area. Players should flip cards at the same time.
- The first player to correctly multiply the numbers wins and collects both cards from the round.
- Play continues until all cards have been played.

WINNING THE GAME

The player with the most cards wins the game.

VARIATIONS

- For younger students, play using only addition.
- To engage students in multiplication of multi-digit numbers, play by using a full deck of cards.