

MATH CARDS (LEVEL 0)

Description	Learners will make cards to play multiple games gaining a deeper sense of numbers, greater – lesser, addition – subtraction, sequences and patterns.
Leading Question	Can you make your own card games?
Total Time Required	4 hours over 4 days
Subjects	Numeracy, Art & Design
Resources Required	Paper, pens, scissors and colors
Supervision	Medium
Learning Outcomes	<p>By the end of this project, learners will be able to:</p> <ol style="list-style-type: none"> 1. Develop a deeper understanding of the relationship between numbers and quantities. 2. Apply basic arithmetical functions, such as addition and subtraction, in different problem-solving situations. 3. Apply and practice game behavior, including understanding the concept of taking turns, following rules, and working towards specific goals. 4. Improve algebraic thinking skills by recognizing and generating number patterns. 5. Identify and compare the quantity of objects in one group to another, determining whether one group has more or fewer objects than the other. 6. Recognize and analyze patterns in the number system, such as sequences and other numerical relationships.
Previous Learning	<ol style="list-style-type: none"> 1. Writing numbers (1-20) 2. Understanding addition and subtraction

DAY 1- *Today you will think about designing your own games and play a few card games.*

Time	Activity and Description
30 minutes	<p><u>Warm-up: Activate prior knowledge:</u></p> <ul style="list-style-type: none"> • Let's start a discussion! Think about the following questions: <ul style="list-style-type: none"> - Have you ever played a card game before? - If yes, what are some of the things you have observed before that you will need to think through as you design your own card game? (Possible answers: counting, cards, color, rules of the game, etc.) • <u>Let's make our own playing cards:</u>

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	<ul style="list-style-type: none"> - Draw rectangular cards that are approximately the size of your palm (or any other shape of your own choice). - If you do not have a ruler to draw the lines, you can use any box cover or book to draw the lines. - The shorter side can be the length of your thumb, and the longer side the length of your palm . - Cut out 40 such cards (if you can't count to 40, We can do two groups of 20). - Color each of the cards in one of 4 colors – You can choose any colors of your choice or do them in red, yellow, green, and blue. ● Answer the following question: If we have 10 cards in yellow and want to have an equal number of cards in each color – how many cards will we have in blue? Green? Red? Or other colors? <p><i>Tip - “Math Talk”: discuss with the learners possible ways of getting to this answer. The key here is to engage in discussion, not a rapid fire answer. Give learners enough time to work out the problem on their own. You can use prompts such as “How could you sort this?”, “How could you sort this differently?” or “I wonder what would happen if you put ____ and ____ together”</i></p> <ul style="list-style-type: none"> ● Write the numbers 1 – 20 on each of the cards in bold letters in the middle of each of the cards. ● Make 2 cards with each of the numbers and make sure that no two numbers are on the same color card e.g., if there is a 3 in the yellow card, the other 3 should be on a blue card etc. ● Design the other side of the card with a logo, name or initial. <div style="display: flex; justify-content: space-around; text-align: center;"> <div style="width: 40px; height: 40px; background-color: blue; color: white; font-size: 24px; line-height: 1;">Front 3</div> <div style="width: 40px; height: 40px; background-color: blue; color: white; font-size: 10px; line-height: 1;">Back Name, logo, initials</div> <div style="width: 40px; height: 40px; background-color: yellow; color: black; font-size: 24px; line-height: 1;">Front 3</div> <div style="width: 40px; height: 40px; background-color: yellow; color: black; font-size: 10px; line-height: 1;">Back Name, logo, initials</div> </div>
<p>15 minutes</p>	<p>Game 1: Snap</p> <p>Goal: Win all the cards by quickly identifying matching cards</p> <p>Rules:</p> <ul style="list-style-type: none"> ● Step 1: Shuffle the cards and divide the cards equally between all the players ● Step 2: Each player opens a card from their deck each turn and this is laid open on the table ● Step 3: If the two cards have matching numbers, the players will say “snap” and the first person to say snap will take all the open cards underneath ● If two cards of the same color are opened, the players can say snap, and take the two matching color cards ● You get a point for each card you receive.

	<ul style="list-style-type: none"> ● If there are no matching cards through the entire play, the game will be discarded and restarted ● The player with the most cards at the end will win the game 												
15 minutes	<p>Game 2: Memory Match</p> <ul style="list-style-type: none"> ● First, play a memory game – in this game, mix up all the cards and face the number side down. <p>Goal: Get as many points as possible by remembering and opening the correct matching card numbers.</p> <p>Rules:</p> <ul style="list-style-type: none"> ● Step 1: arrange the shuffled cards in 5 rows of 8 cards each or arrange the shuffled cards in 8 rows of 5 cards each. ● Step 2: Player 1 opens one card, ● Step 3: Player 1 opens another card. ● Step 4: think about how you reward points to players for remembering and opening the correct matching card numbers. For example, <ul style="list-style-type: none"> - If the 2 cards are the same matching number, you can take the cards out of the rows and you get 2 points in your column - If the 2 cards have a matching color but not a matching number, you get 1 point in your column and can close the cards putting them back in the same place in the arrangement - If the 2 cards are not the matching number or color, you get no points and just close the cards in the arrangement ● Step 5: Player 2 opens one card ● Step 6: Player 2 opens another card ● Add the number of points in both columns and whoever has more points is the winner of the game. ● Use a score sheet like the one below: <table border="1" data-bbox="375 1230 1317 1381"> <thead> <tr> <th>Player's name/Initials</th> <th>Number of points</th> <th>Opponent's name/initials</th> <th>Number of points</th> </tr> </thead> <tbody> <tr> <td>Ali</td> <td>2</td> <td>Dad</td> <td>3</td> </tr> <tr> <td>Faith</td> <td>5</td> <td>Mum</td> <td>3</td> </tr> </tbody> </table>	Player's name/Initials	Number of points	Opponent's name/initials	Number of points	Ali	2	Dad	3	Faith	5	Mum	3
Player's name/Initials	Number of points	Opponent's name/initials	Number of points										
Ali	2	Dad	3										
Faith	5	Mum	3										
15 minutes	<p>Reflection: 3-2-1</p> <ul style="list-style-type: none"> ● Talk to your friends/family members to reflect on the day's activities. ● Thinking about the activities from the card games played today, can you tell us: <ul style="list-style-type: none"> - Three things you have learned from today's games - Two things you found interesting - One thing that you still have a question about 												

DAY 2- Today you will design two new games to understand the concept of greater and smaller than numbers.

Time	Activity and Description								
20 minutes	<p>Game 3: Greater Alligator</p> <p>Goal: Get the most points after 5 rounds by having the highest card (a card with the highest number) - (a variation of the same game can be played for the winner being the one with the smallest card)</p> <p>Rules:</p> <ul style="list-style-type: none"> ● Step 1: Shuffle the cards and deal 2 cards per player ● Step 2: think about how you reward points to players for having the highest number card. For example, each player will play their highest card and the person with the highest card will win e.g., Player 1 has 3, 12 and Player 2 has 4, 8, and Player 3 has 9, 20 then player 3 is the winner for having the card 20. The winner of each round will get 2 points, and the final winner is the one that has the most points at the end of 5 rounds ● Think about how you reward points to two players for having the same highest number card for example, if two players have the same high card, they both can get to play their next highest card and whoever's second card is the highest will win. ● Play the game and write the score on a points sheet. ● Use a score sheet like the one below: <table border="1" data-bbox="375 1024 1321 1234"> <thead> <tr> <th>Player Name/Initials</th> <th>Number of points</th> </tr> </thead> <tbody> <tr> <td>Ali</td> <td>3</td> </tr> <tr> <td>Faith</td> <td>5</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> ● Write the numbers using the greater than sign for each of the rounds for the 3 cards played e.g., 20 greater than 12 greater than 8 	Player Name/Initials	Number of points	Ali	3	Faith	5		
Player Name/Initials	Number of points								
Ali	3								
Faith	5								
20 minutes	<p>Game 4: Larger Numbers</p> <p>Goal: Get the most points after 5 rounds by having the largest sum in your cards</p> <p>Rules:</p> <ul style="list-style-type: none"> ● Step 1: Shuffle the cards and deal 3 cards per player ● Step 2: Each player will add the numbers dealt with their cards ● Step 3: think about how you reward points to players for having the largest sum in your cards. For example, Players will each say the total number and the highest number will win. Example: Player 1 has 4, 11, 16 and Player 2 has 16, 9, 2 – so Player 1's total is 31 and Player 2's total is 27 so Player 1 wins the game. ● The winner of each round gets 2 points, and the final winner is the one that has the most points at the end of 5 rounds ● Think about how you reward points to two players for having the same largest sum of cards. For example, if two players have the same largest sum for their cards, 								

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	<p>they will each pick up one more card from the deck and add that to the sum and whoever has the highest total will win</p> <ul style="list-style-type: none"> ● Play the game and write the score on a points sheet which has a column for each of the players with their initials / full name on it. ● Use a score sheet like the one below: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Player Name/Initials</th> <th>Number of points</th> </tr> </thead> <tbody> <tr> <td>Ali</td> <td>3</td> </tr> <tr> <td>Faith</td> <td>5</td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> <ul style="list-style-type: none"> ● Also, write the 3 sums for each of the rounds for the 3 cards played on a sheet of paper e.g. <ul style="list-style-type: none"> - Player 1: $4 + 11 + 16 = 31$ - Player 2: $16 + 9 + 2 = 27$ - Final: 31 is greater than 27 so player 1 is the winner. 	Player Name/Initials	Number of points	Ali	3	Faith	5		
Player Name/Initials	Number of points								
Ali	3								
Faith	5								
15 minutes	<p>Reflection: 3-2-1</p> <ul style="list-style-type: none"> ● Talk to your friends/family members to reflect on the day's activities. ● Thinking about the activities from the card games played today, can you tell us: <ul style="list-style-type: none"> - Three things you have learned from all the today's activities - Two things you found interesting - One thing that you still have a question about 								

DAY 3- Today, you will continue to play games on subtraction and sequences.

Time	Activity and Description
20 minutes	<p>You will continue to explore subtraction and sequences .</p> <p>Game 5: Closest Number</p> <p>Goal: Get the most points after 3 to 5 rounds by having the total number closest to the open card (a variation of the same game can be played for the winner being the one with the further number)</p> <p>Rules:</p> <ul style="list-style-type: none"> ● Step 1: Shuffle the cards and deal 3 cards per player ● Step 2: Each player will add the numbers on the cards that were dealt to them e.g., if Player 1 gets 4, 11, 16 ($4+11+16=31$) with their cards ● Step 3: Pick a random card from the deck and lay deck lay this card open on the table, whichever player has a number that is closest to the opened number wins the game. ● Think about how you reward points to players for having the total number closest to the open card. For example, Player 1's total is 31 and Player 2's total is 27 – if the card opened if 17 then Player 2 wins. The winner of each round gets 2

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	<p>points, and the final winner is the one that has the most points at the end of 5 rounds.</p> <ul style="list-style-type: none"> Also, think about how you reward points to two players for having the same total number closest to the open card. For example, if two players have the same high number, they will each pick up one more card from the deck and add that to the sum and whoever has the highest total will win. Play the game and write the score on a points sheet which has a column for each of the players with their initials / full name on it. Use a score sheet like the one below: <table border="1" data-bbox="407 562 1349 808"> <thead> <tr> <th>Player name/Initials</th> <th>Number of points</th> </tr> </thead> <tbody> <tr> <td>Ali</td> <td>3</td> </tr> <tr> <td>Faith</td> <td>5</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> Also, write the 4 sums for each of the rounds for the 3 cards played e.g. <ul style="list-style-type: none"> Player 1: $4 + 11 + 16 = 31$ Player 2: $16 + 9 + 2 = 27$ Comparison: $27 - 17 = 10$ and $31 - 17 = 14$ Final: 14 is greater than 10 so 10 is the winner since it is closer 	Player name/Initials	Number of points	Ali	3	Faith	5				
Player name/Initials	Number of points										
Ali	3										
Faith	5										
<p>20 minutes</p>	<p><u>Game 6: Sequence - Numbers</u></p> <p>Goal: Get the most points after 5 rounds by making sequences of numbers</p> <p>Rules:</p> <ul style="list-style-type: none"> Step 1: Shuffle the cards and deal 3 cards to each player and keep the others as a closed deck Step 2: Players will each have a turn where they get to either pick up a card either from the deck or the discarded pile and they also discard a card The player who is the first to get a sequence of 3 numbers that follow each other will win the game e.g., 1, 2, 3 or 11, 12, 13 Play the game and write the score on a points sheet which has a column for each of the players with their initials / full name on it. Use a score sheet like the one below: <table border="1" data-bbox="407 1465 1349 1642"> <thead> <tr> <th>Player name/Initials</th> <th>Number of points</th> </tr> </thead> <tbody> <tr> <td>Ali</td> <td>3</td> </tr> <tr> <td>Faith</td> <td>5</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <p>Learners will also write the entire numerical sequence of the different sequences formed as they play the game.</p>	Player name/Initials	Number of points	Ali	3	Faith	5				
Player name/Initials	Number of points										
Ali	3										
Faith	5										
<p>15 minutes</p>	<p><u>Reflection: 3-2-1</u></p> <ul style="list-style-type: none"> Talk to your friends/family members to reflect on the day's activities. 										

	<ul style="list-style-type: none"> Thinking about the activities from the card games played today, can you tell them about: <ul style="list-style-type: none"> Three things you have learned from all the today's activities Two things you found interesting One thing you would like to hear more or learn more about
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DAY 4- Today, you will present your work.

Time	Activity and Description
60 minutes	<ul style="list-style-type: none"> On the last day, you are encouraged to invite your family members to come play the games. Present the games' rules to everyone and show everyone how it can be played. The family members will be divided equally in groups to interact with everyone and play different games. A big competition is held for all of the games and winners will be announced.

Additional Enrichment Activities	<ul style="list-style-type: none"> Math Stories: Encourage learners to create short stories or scenarios using the numbers and sequences on their cards. This helps them apply mathematical concepts in real-world situations and enhances their storytelling skills. Create a Math Board Game: Challenge learners to collaborate and create a board game that incorporates the math concepts they've learned. This could involve a game board, additional cards, and maybe even dice or other elements. It promotes teamwork and creativity. Math Song or Rhyme: Challenge learners to create a catchy song or rhyme related to the math concepts they've learned. This adds a musical and creative dimension to their learning experience.
Modifications for Simplification	<ul style="list-style-type: none"> In game 1, Snap, use numbers 1-5 for simplicity.

ASSESSMENT CRITERIA

By the end of the project, most of the learners were able to:

- Design math cards to use them to play games.
- Apply the rules of the game correctly.
- Play the games and apply the functions of memory, greater / smaller than, proximity, addition-subtraction, and sequences.

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