

Math Games Based on Children's Literature

Making Math Games

1. Select a book based on math concepts children are ready to learn or for the book's storyline or content.
2. Determine the target players' ages or developmental levels.
3. Select the style or type of game
 - **Lotto games:** Let children use matching skills, practice one-to-one correspondence, and build early counting skills
 - **Short path games:** Have only 10-20 spaces, but provide children with initial experiences in turn taking as they follow a pathway with a counter game piece. Following a path requires more abstract thinking than does collecting and matching game pieces (e.g., Snail's Pace Race).
 - **Circular path games:** Allow for turn taking and following rules, without the distracting element of competition. Instead of moving to the end of a path, children move their counters in a circle around the board and play until they have achieved the goal of the game (an adult version is Trivial Pursuit). Teachers can omit competition by setting a collective goal that all the children can work together to accomplish.
 - **Long path games:** Adds the element of many counters moving on the same path and the possibility of adding more complex elements, such as landing on a special space and then moving forward to a designated space (e.g., Candyland game).
 - **Tug-of-War games:** Provide an additional element of deciding which direction to move along the same path, with the starting space in the middle of the path, and two ending spaces at either end of the path.
4. **How do they support the development of math concepts?**
 - Moving from space to space supports one to one correspondence
 - Dice allows for counting with meaning
 - Spinner with numeral allows for numeral recognition and counting practice
 - Encourages social interaction and turn taking
 - Incorporates thinking strategies that are needed for more difficult problems
5. **What are the rules of the path games?**
 - There are no specific rules for path games
 - Children are encouraged to decide among themselves as long as all children agree
 - Rules can be changed to increase level of difficulty
6. **Create your game.** Make it flexible. Some games can grow with the children or be used with various age groups by adding simple things like different spinners or cards. If possible, include features that help children learn more than one concept while playing.

How to Make Your Own Path Games

- Place dots in a path on a piece of poster board. Path should be clear and not confusing.
- The path can have as many “spaces” as you want. Level of difficulty can be determined by how many paths and the length of path.
- Use dice to determine how many “spaces” the child moves. You can also use cards with dots on them.
- Decorate the game with stickers or other items you find that would make the pathway look fun, but not confusing.

7. To add challenges to the games:

- Provide cards that children draw at the beginning of each turn.
- Perform additional steps if they land on specially-designated spaces on the board.
- Provide two spinners, one with colors, and one with numbers.
- Provide two dice so children can add up to 12 and subitize.
- Add a combination of spinners and dice.
- Make dice or cards with fewer or more dots.

8. **Make multi-use game boards** by attaching clear plastic packets with Velcro to board to insert different items or instruction cards.

9. Be sure to **laminates or make your pieces sturdy** for repeated use.

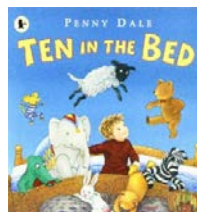
There Was an Old Woman Who Swallowed a Fly

- This book is good as a lotto game.
 - Make multiple picture lotto game grids using standard letter-sized sheets of card stock divided into grids with nine windows.
 - Glue on copies of characters she swallowed from the book onto the nine windows.
 - Make matching card sets using the same characters she swallowed from the book.
- To play:
 - Each player has a game grid.
 - Children take turns selecting a card to see what the old lady will eat.
 - They cover the matching character on their grid with the matching card they selected.
 - Play continues until one player has covered his entire game board with matching cards.
- Playing this game helps children learn about one-to-one correspondence and pattern discrimination.



Ten in the Bed by Penny Dale

- Talk about family size and sleeping arrangements.
- Use your creativity to create a game or flannel board.



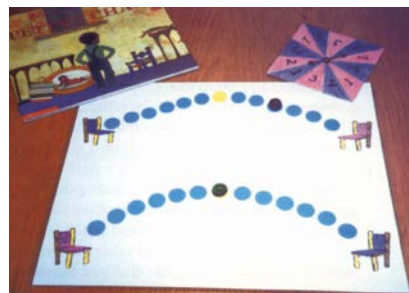
Inch by Inch by Leo Lionni

- This circular path game focuses on measurement.
- Game preparation:
 - A 16 by 20 inch piece of tag board is needed.
 - The circular game path is made up of purple and orange stickers, with eight purple stickers spread evenly throughout the circle.
 - Pastels create a tall grass effect for the inchworms to crawl through, as illustrated in the book.
 - The measurement tools are small pipe-cleaner inchworms (cut to 1 inch).
 - A spinner with dots (numbered 1-5) indicates the number of spaces to move.
 - Large cards feature various types of birds. The bird images were taken from computer clip-art files and printed on card stock.
- To Play:
 - Players spin the spinner and move the designated number of spaces.
 - When players land on a purple dot, they choose a card.
 - The player estimates the bird's length, then measures the bird using an inchworm. If the estimate is correct, the child keeps the card.
 - Playing continues until all the cards are used or the children tire of the game.
- This game teaches children about number and operations, measurement, and data analysis and probability.

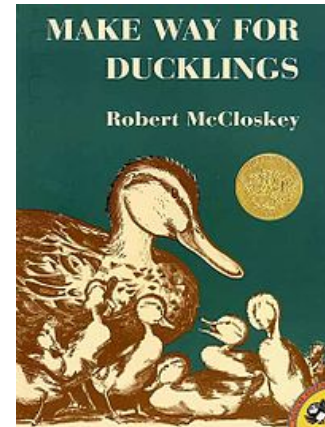


Peter's Chair by Ezra Jack Keats

- This is a two-person game.
- A tug-of-war design is used because the characters in the book struggle to make a decision: Should Peter paint his chair pink for his new baby sister or leave it purple?
- Game board has two identical paths, with 13 dots (or spaces) in each.
 - Center dot on each path is a different color from the rest.
 - There are chairs at each end of the path. One is purple and one is pink.
- The spinner indicates the direction to move (pink or purple), and the number of spaces (from 1-3). Each player has a "Peter counter" to move along the path.
- To play the game:
 - Children place their Peter counter on the colored dot in the middle of their assigned path.
 - The players take turns flicking the spinner and moving the Peter counter accordingly.
 - Children continue to move back and forth along the path until each reaches a pink or purple chair and thus "decides" the color Peter should paint his sister's chair.

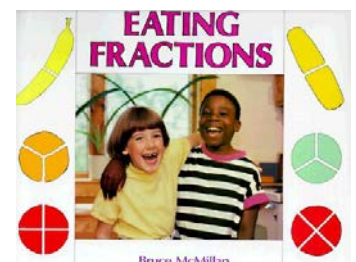


- Playing this game familiarizes children with the concepts of number and operations and with patterns, functions, and algebra. **Make Way for Ducklings by Robert McCloskey**
- Meeting Jack, Kack, Lack, Mack, Nack, Ouack, Pack, and Quack is a great way to enhance children's emergent literacy and counting skills.
- This is a long path game.
- To Make:
 - Board includes a long pathway with spaces that indicate story line items such as cars in the street, trees in the park, or bridges to cross.
- Goal of the game:
 - Help Mrs. Mallard move her eight ducklings from the river, past Officer Michael and all the cars, and over to the pond in the city park.
- Younger children use a spinner with dots to determine how far to move the Mallard family on each turn. Older children can do additional counting or simple addition and subtraction by picking up game cards along the way.
- To play:
 - The game cards ask children to put cars on the roadway, trees in the grass, people in the park, or to remove these items.
 - This engages children in meaningful addition and subtraction using the objects and events the ducklings encounter in the book.
 - Children can work on sequences of events as they tell and retell the story using the game board:
 - "Where did the ducklings go first?"
 - "Then what did they do?"
 - "Who or what did they see next?"
- Playing this game allows children to learn about number and operations, patterns, functions, and algebra.



Eating Fractions

- In this book, children eat foods in wholes, halves, thirds, and fourths.
- Younger children especially enjoy this book and manipulative game.
- Laminated food pieces are divided in sections to match the fractions of food shown in the book.
- Each child receives a set of food pieces to manipulate while reading the book.
- This is a good hands-on way to introduce fractions to children in a meaningful context.



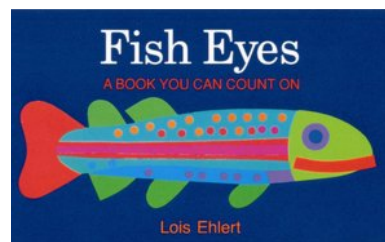
Corduroy by Don Freeman

- Short path game that incorporates seriation in the game even though the plot does not address this concept.
- Game has
 - Four short paths using bear paw prints as spaces along the paths
 - Game is played in two ways:
 - Children work on numeral recognition by using a spinner with the numerals 1-4 and moving a plastic bear the designated number of spaces along the short path
 - Children may work on sequencing skills by moving a set of differently-sized bears along a short path with the use of two spinners, one indicating the number of spaces and the other indicating the size of bear to move.
 - Goal is to find each bear's button at the end of the short path.
 - Playing this game gives children experiences with number and operations: patterns, functions, and algebra; and data analysis and probability.



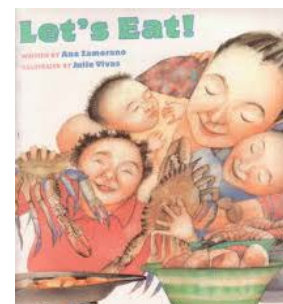
Fish Eyes by Lois Ehlert

- This counting book invites children to swim “like fish “down the river and splash “in the sea” to spot various groups of fish and counting their eyes.
- The book is extremely appropriate for teaching one-to-one correspondence because the eyes for the fish are cut-out holes on each page.
- This manipulative game for preschool and school-age children includes a set of plastic jewels for eyes, laminated paper fish, and a 16-by-20-inch piece of tag board with an underwater sea scene.
- Children use the plastic jewels to cover each fish eye as they count how many are on each page.
- The children can also sort, classify, or arrange the laminated fish by size, color, or pattern. Using the game pieces, children can also count out the number of fish on each page of the book.



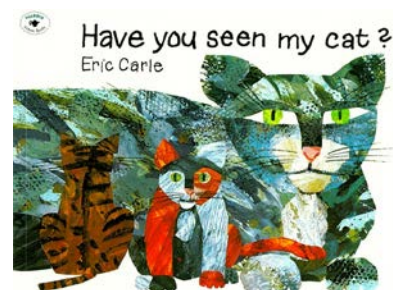
Let's Eat by Ana Zamorano

- Think about all the math-related topics covered in this story.
- There are some great opportunities to expand on adding and taking away.
- There is some nice patterning with language, sequencing and reference to days of the week and time.
- Use your creativity to create a game or flannel board



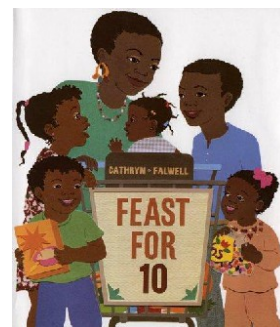
Have You Seen My Cat by Eric Carle

- In this book a child travels the world asking various people from different countries if they have seen his cat.
- This long path game for preschool and school-age children uses a board from an old commercial game covered with plain contact paper.
- At intervals along the path, there are loop-sided pieces of self-stick Velcro.
- Hand-drawn and laminated paper cats (matching the cats in the book) have hook-side pieces of Velcro on the back and are attached to the corresponding Velcro pieces on the game board.
- The spinner shows numbers from three to ten and dots of corresponding amounts. Small rubber cats and baskets round out the game pieces.
- Children play the game by using the spinner and moving game pieces accordingly.
- When children land their game pieces on spaces with cats, they collect a small rubber cat to put in their basket. At the end of the game, children count the number of rubber cats in their baskets.
- They can also classify the cats using common traits such as color, markings, or pose.
- This game helps children with one-to-one correspondence, counting, classification, and matching.
- In addition, children can predict which cat they will come to first, second, or third as they retell the story while playing the game.



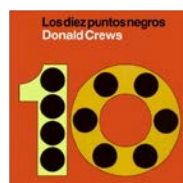
Feast for 10 by Cathryn Falwell

- This counting book about a family grocery-shopping trip features family members adding items to the shopping cart in groups from one to ten.
- Preschoolers can play a manipulative game based on this book. Game pieces include four shopping carts made from six-by-eight-inch tag board. Each cart has a slot in the front.
- A piece of tag board on the back creates a pocket, so children can insert laminated paper food items glued on tag board.
- A spinner indicates the number and kinds of items to add to the cart.
- While reading the story, children twirl the spinner then add the appropriate type and number of food items to a cart.
- Another way to play is to use just the spinner to determine what to put in the cart.
- This game improves children's one-to-one correspondence and counting skills.



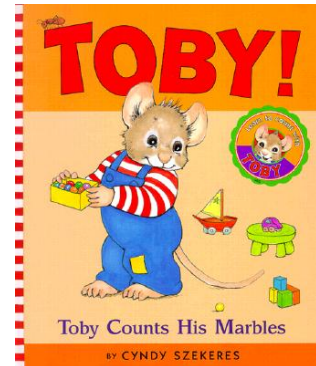
10 Black Dots by Donald Crews

- Make it into a class book
- Have the children make pictures with stickers dots
- Use your creativity to create a game or flannel board



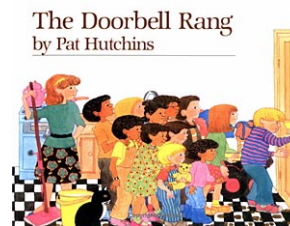
Toby Counts His Marbles by Cyndy Szederes

- In this story, Toby searches his room to find his lost marbles.
- A long path game design is a perfect way for preschool and school-age children to help Toby find and count all of his lost marbles.
- Children roll a die to determine the number of spaces to move their plastic Toby tokens along the path.
- They visit all the places where Toby looks for his marbles in the book.
- As Toby finds his marbles in the book, children collect the appropriate number of laminated paper or real marbles at each site along the path.
- Children each have a little bag to keep their marbles in as they play.
- At the end of the game, children count how many marbles they have found. They may also sort and organize their marble collections.
- As older children move along the path, they can use additional interaction cards that support problem solving or performing simple number operations.
- This game helps children in counting from 1 to 10 and classification.



The Doorbell Rang by Pat Hutchins

- Measuring
- Problem solving
- Discussion about emotions
- Use your creativity to create a game or flannel board



Trust in your own creativity!

For more book game ideas, refer to: Developing Math Games Based on Children's Literature handout, NAEYC 2003 (MathGames.pdf)