

# Growing Math Minds with Picture Books

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**Growth Mindset** means intelligence is not a fixed trait. Effort, persistence, and appropriate challenges in math are the keys to success rather than innate ability. Teachers who nurture a math-positive classroom create a foundation for future math learning and longstanding academic success.

### Why Use Books in Math?

- Books with contexts rich in number, measurement, geometry, and problem solving connect to children's interests, prior knowledge, and new schema for mathematics content, vocabulary, and processes.
- Young children don't differentiate between math time and reading time.

### How to Prepare Take-Home Book Bags

1. Choose a high-quality mathematics picture book. 2. Suggest simple hands-on activities with few materials. Samples available on Carrie's website [www.carriecutler.com](http://www.carriecutler.com) 3. Set up a check-out system that works for you. Note: This is one way to get books and mathematics into the homes of low-income families.

**Mathical Book Prize** - [www.mathicalbooks.org](http://www.mathicalbooks.org) --Use as a source of high-quality titles. Awarded by the **Mathematical Sciences Research Institute** (MSRI), in partnership with the **National Council of Teachers of English** (NCTE) and the **National Council of Teachers of Mathematics** (NCTM), and in coordination with the **Children's Book Council** (CBC).

### Book Titles, Mathematics Concepts, and Teaching Suggestions

Source: "Get the Picture: Connecting Young Children to Mathematics through Books," by Carrie Cutler, in *Deepening Children's Mathematical Understanding with Children's Literature* Monroe, Young, Fuentes, Dials (Eds.), NCTM, forthcoming

### Books and Activities that Teach and Practice Counting and Operations

Book	Brief Summary	Mathematics Teaching Idea
Bajaj, Varsha. <i>How Many Kisses Do You Want Tonight?</i> illust. Ivan Bates. New York: LB Kids, 2007.	COUNTING SEQUENCE This book counts from 1 to 10 as animal children request bedtime kisses from their parents. Readers might be surprised by the number of kisses requested by the human children in the story.	<a href="#">Young children put bright colored lip balm on their lips, kiss an index card, and count the kisses. Older children kiss the card, cover the kiss with split peas and count to find the area of their kiss.</a>
Franco, Betsy. <i>Zero Is the Leaves on the Tree.</i> illus. Shino Arihara. Berkeley: Tricycle Press, 2009.	This book shows the concept of zero: the absence of sound when a snowflake lands or the empty bike rack when school is over for summer.	Send children on a classroom hunt for items easily counted (e.g., chairs). Count these. Then ask them to identify something that would be counted as 0 in their classroom (e.g., tigers)
Hindley, Judy. <i>Eyes, Nose, Fingers and Toes: A First Book All About You</i> , illus. Brita Granström. Cambridge, MA: Candlewick, 1999.	Using rhyme and large graphic illustration, this book shows the purposes for different body parts.	Point out body parts that are singles, pairs, and other sets. Count the children's noses, eyes, and fingers. Play "Simon says" with counting instructions (e.g., clap your hands 3 times; stomp your left foot 5 times.)
Gayzagian, Doris K., <i>One White Wishing Stone: A Beach Day Counting Book</i> , illus. Kristina	A girl gathers items at the beach to decorate her sand castle. Waves wash	Fill the sensory table with sand and hide beach-themed objects in it (e.g., small shells, pebbles, feathers). Have children find the items and count

Swarner. Washington, DC: National Geographic, 2006.	away her castle, but she saves a few treasures to take home.	them, then use them to decorate a sand castle art project made by adding sand to poster paint.
Jay, Alison. <i>1 2 3: A Child's First Counting Book</i> . New York, NY: Dutton children's Books, 2007.	Illustrated with scenes from familiar fairy tales, this book counts from 1 to 10 and back again and connects mathematics to stories children know well.	Identify numbers in favorite nursery rhymes and fairy tales. Make a class book called <i>Numbers in Nursery Rhymes</i> .
Maloney, Peter, and Felicia Zekauskas. <i>One Foot Two Feet: An Exceptional Counting Book</i> . New York: G.P. Putnam's Sons, 2011.	This counting sequence has a twist: a die-cut window framing a single object that, when the page turns, becomes a common irregular plural noun (e.g., mice, dice, oxen or octopi).	Have children make mice by pressing their thumb onto an ink pad and adding ears, eyes, and tail with a marker. Children can count to see how many mice fit on an index card.
Rubinger, Ami. <i>Dog Number 1. Dog Number 10</i> . New York: Abbeville Kids, 2011.	During a read aloud, preschoolers can call out the missing numbers in this rhymed counting book.	Make up a rhyme that children complete using a number: for example, A dog like me can itch a flea. I am dog number ____.
	<b>ORDINAL NUMBERS</b>	
Carle, Eric. <i>Ten Little Rubber Ducks</i> . New York: Harper Collins, 2005.	Based on a true story, ten ducks fall from a ship during a storm and drift off in different directions.	With string mark a finish line across the end of the sensory table. Add water and rubber ducks. With straws children blow the ducks toward the finish line. Note which duck crosses first, second, third, etc.
Larios, Julie Hofstrand. <i>On the Stairs</i> , illus. Mary Hofstrand. Ashville, NC: Front Street, 1999.	Rhyming text introduces twelve activities mouse siblings do on the steps leading to the second floor of their home.	Children describe the order of actions taken during favorite activities like making a sandwich or jumping rope. Make a rebus story using pictures as words to show the sequence.
Martin, Bill, Jr. <i>Ten Little Caterpillars</i> , illus. Lois Ehlert. New York: Beach Lane Books, 2011.	The first through ninth caterpillars make their way across a garden, but the tenth caterpillar climbs a tree and waits patiently for something amazing to happen.	Write the ordinal numbers on clothespins. Children color caterpillars to match those in the book, then hang them on a clothesline with the clothespins matching their order in the story.
Robinson, Michelle. <i>How to Wash a Woolly Mammoth</i> , illus. Kate Hindley. New York: Henry Holt, 2013.	Follow ten steps to a sparkling clean woolly mammoth.	Use sticky notes to replace Step 1 with <i>first</i> , Step 2 with <i>second</i> etc. Children create their own step-by-step process for a familiar activity like getting ready for bed.

## Books and Activities that Teach and Practice Shapes and Spatial Reasoning

Book	Brief Summary	Mathematics Teaching Idea
Bertier, Anne. <i>Wednesday</i> . New York: Enchanted Lion Books, 2014.	<p style="text-align: center;"><b>GEOMETRIC SHAPES</b></p> Friends Little Round and Big Square decompose and join together to make interesting images.	Help children cut apart circles and squares to make designs. Glue the shapes onto paper, laminate, and use to illustrate a class book.
Carter, David, A. <i>Who?</i> New York: Simon and Schuster, 2007.	Children lift flaps of cut-out shapes to discover animals made from them.	Children use pattern blocks or tangrams to create animal shapes.
Hall, Michael. <i>Perfect Square</i> . New York: Greenwillow Books, 2011.	A square transforms into a variety of creative pictures including a fountain, a park, a garden, and a mountain.	Give children paper shapes to combine in interesting ways to create designs. Have children glue their favorite designs to paper and make a class book.
Intriago, Patricia. <i>Dot</i> . New York: Margaret Ferguson Books, 2011.	A single dot can convey unique messages by simple manipulation. It can look yummy or yucky, heavy or light, and more.	Children create dot pictures that convey messages (e.g., excited and bored or high and low.)
Light, Steve. <i>Have You Seen My Monster?</i> Cambridge, MA: Candlewick Press, 2015.	Shapes of all sorts (including nonagons and heptagons) appear at the fair. But where is the monster?	<a href="#">Children use stickers to label shapes found in the environment—dot stickers for circles, square sticky notes for squares, rectangular sticky notes for rectangles.</a>
Schoonmaker, Elizabeth. <i>Square Cat</i> . New York: Aladdin, 2011.	Eula, a square cat, feels out of place in a world of donuts and hoop earrings. She learns that being different is not necessarily a bad thing.	Ask “What if there were no circles?” Children can draw a picture or describe what bicycles or cars would look like.
George, Lindsay Barrett. <i>Inside Mouse. Outside Mouse</i> . New York, NY: Greenwillow Books, 2004.	<p style="text-align: center;"><b>POSITIONAL WORDS</b></p> Two mice live in different environments (inside and outside) of a house but share similar behaviors.	Children use stuffed animals or felt pieces to act out the movements of the mice in the story. Emphasize the positional words.
Redding, Sue. <i>Up Above and Down Below</i> . San Francisco: Chronicle Books, 2006.	Rhyming text reveals the animal and human inhabitants in varied environments. Dogs go for a stroll above the subway lines and scarecrows keep guard above a rabbit family’s burrow.	Children go on a scavenger hunt to find out what is (a) above the sink, (b) under the teacher’s desk, (c) inside the filing cabinet drawer, (d) outside the school’s front door, and (e) on top of the playground slide. At the last stop there is a surprise such as a treat or book to be read.
Schaefer, Lola M. <i>What’s Up, What’s Down?</i> illus. Barbara Bash. New York: Greenwillow Books, 2002.	Children take the perspective of different animals as they look up (as if they were a mole) and down (as if they were a bird) to view the world.	Have children sit under a table/at the top of the slide and look up and tell what they see. Discuss how their perspective changes with different views.