



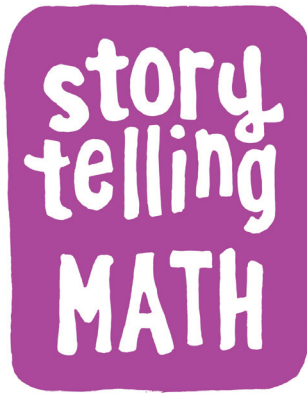
# story telling MATH

## Activity Guide

**Celebrate diversity, math, and the power of storytelling!**

Joyful stories and hands-on activities  
make it easy for kids and their grown-ups  
to explore everyday math together.



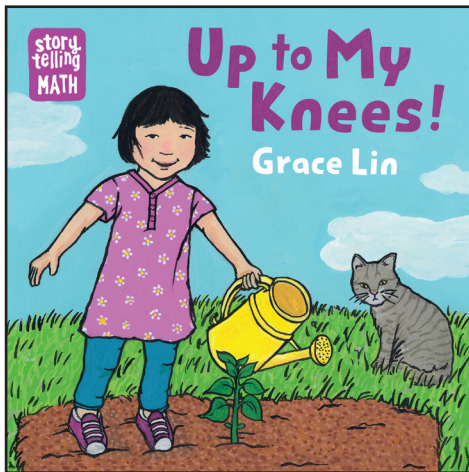


Storytelling Math celebrates children using math in their daily adventures as they play, build, and discover the world around them. Joyful stories and hands-on activities make it easy for kids and their grown-ups to explore everyday math together.

[www.charlesbridge.com/storytellingmath](http://www.charlesbridge.com/storytellingmath)

# Up to My Knees!

Math activities by Marlene Kliman, TERC



978-1-62354-123-1 BD  
e-book available

## About the Book

Time to garden! Mei plants a seed and watches it grow. Soon the little plant is up to her toes, then her knees, then her waist. How tall will it get?

## About the Math

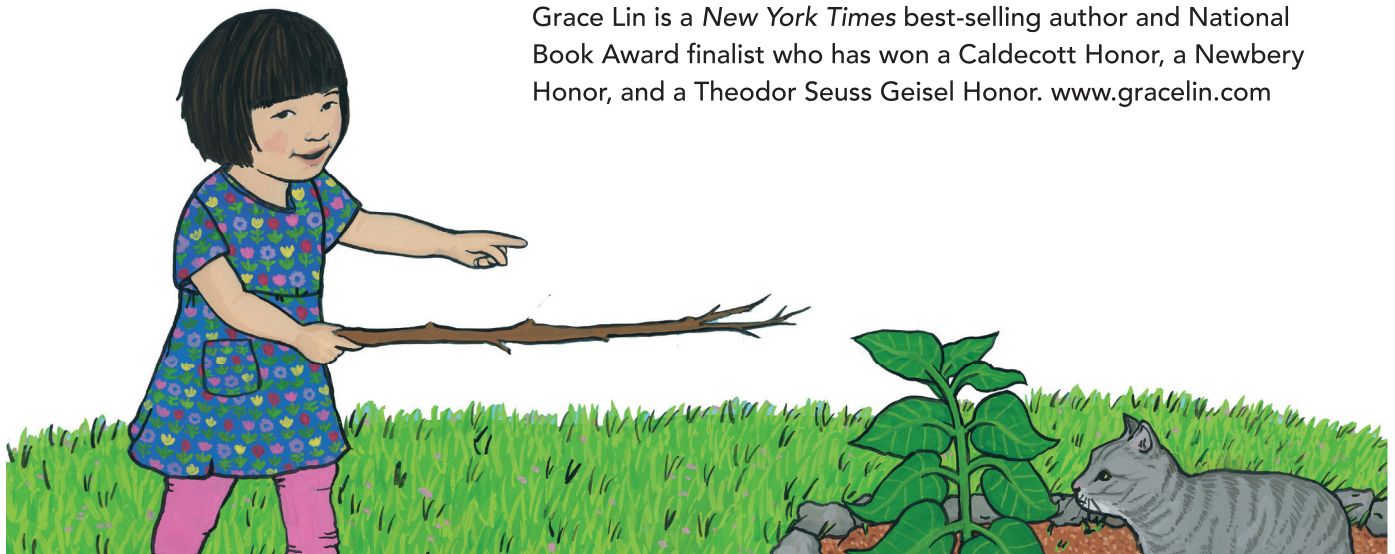
Young children learn about measurement as they compare the sizes of things around them. In this story, Mei explores measurement as she compares the height of the plant to the height of her toe, knees, waist, and shoulders. At the end of the story, she finds that the plant is even taller than she is! Experiences like these help children make sense of rulers and yardsticks in later years.

*Douglas Clements*

*Kennedy Endowed Chair in Early Childhood Learning, executive director of the Marsico Institute for Early Learning and Literacy, and Distinguished University Professor, University of Denver*

## About the Author-Illustrator

Grace Lin is a *New York Times* best-selling author and National Book Award finalist who has won a Caldecott Honor, a Newbery Honor, and a Theodor Seuss Geisel Honor. [www.gracelin.com](http://www.gracelin.com)



## Math Activities

Explore measurement with these activities!



### A Tower as Tall as I Am

Help children use blocks or empty boxes to build a tower as tall as they are. As children build, wonder out loud, "How can we tell if the tower is as tall as you?" Have children stand next to the tower to compare.

### Up to My Knees

Visit a park or green space to find a plant as high as your child's knee. Return to visit the plant every few weeks and ask: "Is the plant still as high as your knee? How can you tell if the plant is growing?"

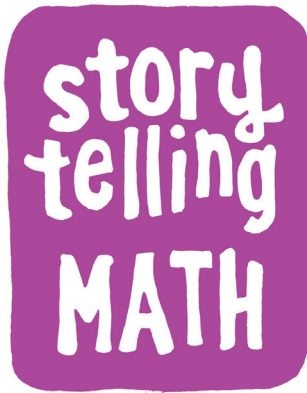
### Hands Together

Hold your hand up against your child's hand. Talk together about how your hands compare in size, using words such as *wider*, *longer*, *taller*, *smaller*, and *thinner*. Point out that both hands have the same number of fingers!



### Talk About Tall

Help children notice heights in everyday life. Look for opportunities to compare heights of familiar things. "The baby doll is taller than the giraffe!" "That shelf is over your head, but you can reach it by stretching your arm up!"



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# Circle! Sphere!

Math activities by Marlene Kliman, TERC



978-1-62354-124-8 BD  
e-book available

## About the Book

Time to blow bubbles! Manny's wand is a circle. Olivia's wand is a triangle. Mei's wand is a heart. What shape will their bubbles be?

## About the Math

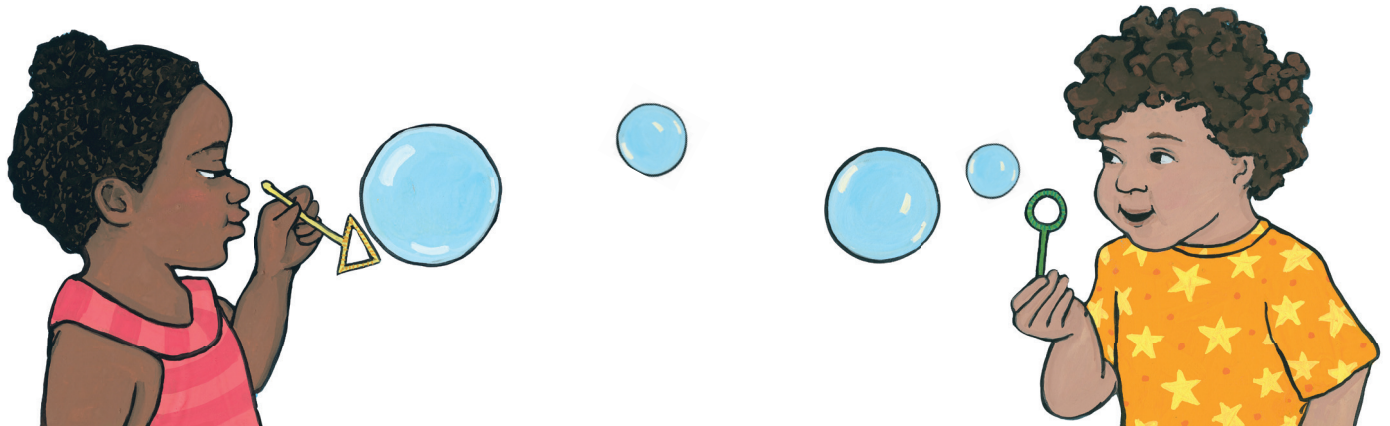
Young children learn about shapes as they explore everyday objects. They discover that cereal boxes stack because of their flat sides, that balls roll because they are round all over, and that paper-towel tubes are open on both ends. Like Manny, Olivia, and Mei, they find that some things, such as wands, are flat, while others, such as bubbles, are not. These kinds of experiences give children a hands-on foundation for later study of geometry.

*Douglas Clements*

*Kennedy Endowed Chair in Early Childhood Learning, executive director of the Marsico Institute for Early Learning and Literacy, and Distinguished University Professor, University of Denver*

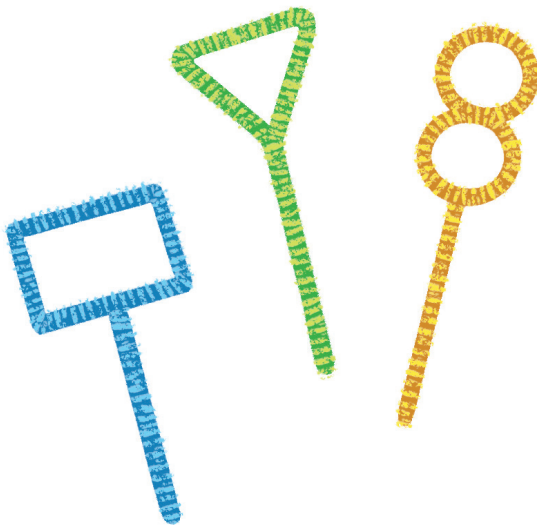
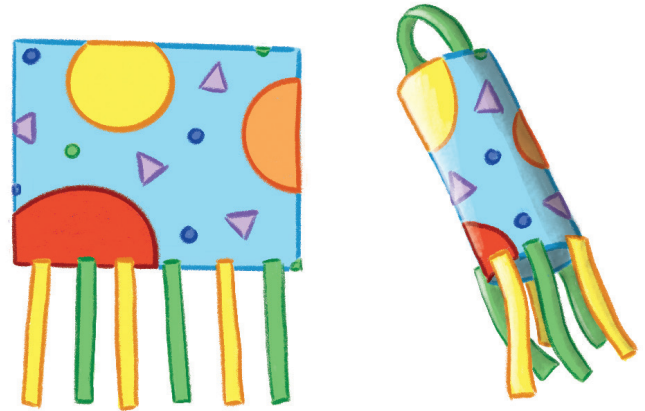
## About the Author-Illustrator

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### Make a Windsock

Help children decorate a sheet of paper and glue long, thin strips along the bottom. Wonder out loud: "How can we make this flat piece of paper into a tube? What will happen if we put these edges together?" Tape the edges together and add a handle. Ask: "What will happen if we blow on our windsock?" Try it to find out!



### Bubble Up!

Gather a variety of bubble blowers: straws, kitchen spatulas with holes, and wands of different sizes and shapes. You can also make wands from pipe cleaners. For each blower, ask children to predict: "What shape do you think the bubbles will be? What size?" Then have them try it!

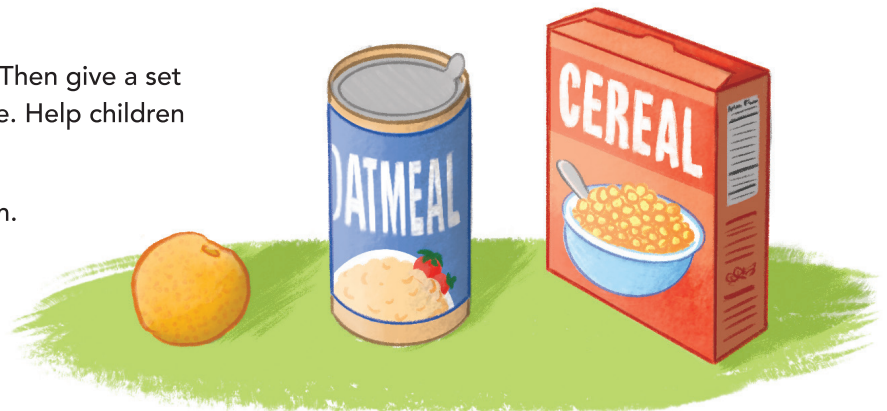
### Squash It!

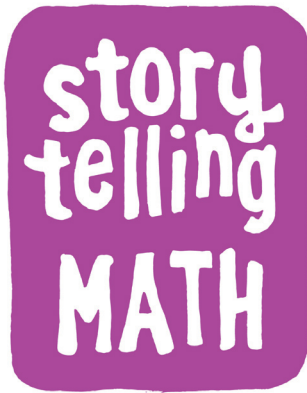
Help children make a ball, donut, or other shape with play dough. Then wonder together: "What shape do you think this will be if you squash it flat? Why do you think so?" Invite children to squash it. Describe the resulting shape. "Look, it's a flat circle!"

### Play the Shape Game

Secretly choose an object in the room. Then give a set of clues, including some about its shape. Help children find the object.

- I'm thinking of something in the room.
- It's flat on the top.
- It's flat on the bottom.
- It's curved on the sides.



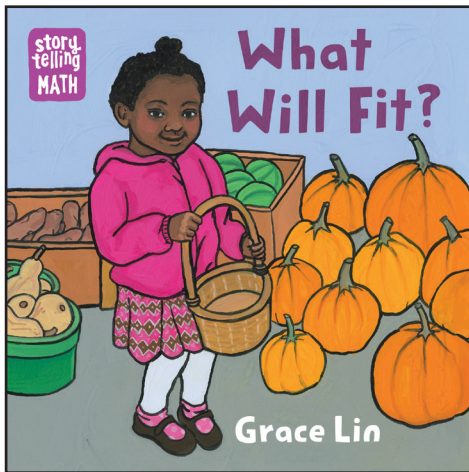


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# What Will Fit?

Math activities by Marlene Kliman, TERC



978-1-62354-125-5 BD  
e-book available

## About the Book

Time for the farmers' market! Olivia is searching for something to fill her basket. What will fit just right?

## About the Math

As children figure out "what will fit," like Olivia does in this story, they build their spatial sense. They learn how shapes fit together in different ways. Spatial sense is important in science, math, and everyday life. We use spatial sense when we read maps, figure out how to fit a container in a refrigerator, and decide if two shoes in different positions are a pair.

*Douglas Clements*

*Kennedy Endowed Chair in Early Childhood Learning, executive director of the Marsico Institute for Early Learning and Literacy, and Distinguished University Professor, University of Denver*

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## Math Activities

Explore spatial sense with these activities!

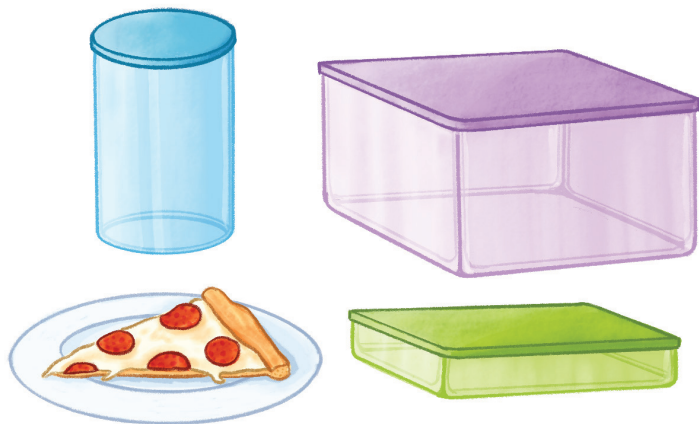


### Piggy Bank

Cut a slot about  $1\frac{1}{4}$ " x  $2\frac{1}{4}$ " (about 3 cm x 5.5 cm) in the lid of an empty oatmeal container. Snap the lid back on. Gather a few small items—some that fit through the slot and some that are a little too large. As children investigate what fits, draw their attention to sizes and positions. "The crayon doesn't fit when it's sideways. What will happen if you turn it?"

### Save it for Later

Got leftovers? Put them on the table with a few clear plastic containers of different sizes and shapes. Invite children to predict which containers are too small to hold the leftovers, which are way too big, and which are about right. Then experiment together to find the container that works best.



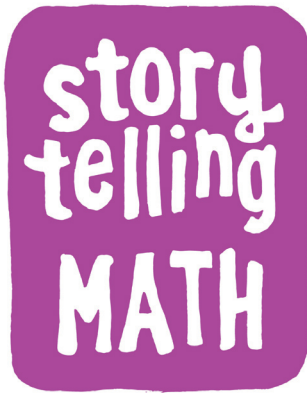
### Find a Fit

Gather a few plastic cups of different sizes and encourage children to explore what fits inside them. "Could that green ball fit inside the red cup?" "Do you think your hand could fit inside that tiny cup?" Try it and see!

### Shake It!

Talk about *empty*, *half*, and *full* as you make a shaker together. You'll need a clear plastic container with a very secure lid, a bowl of dried beans, and a scoop. Help children scoop beans into the container until it is about half full. Secure the lid and invite children to shake the shaker to music!





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# The Last Marshmallow

Math activities by Marlene Kliman, TERC



978-1-62354-126-2 BD  
e-book available

## About the Book

Time for cocoa! Olivia and Mei have three big marshmallows to share. Olivia gets one, and Mei gets one. How will they share the last marshmallow?

## About the Math

“One for you, one for me, and one more . . .” As Olivia and Mei discover, sometimes sharing fairly can be a challenge. If one child ends up with one marshmallow and the other with two, they know it’s not fair, even if they can’t count yet! When children find ways to share, they begin to develop real-world understanding of division and fractions.

*Douglas Clements*

*Kennedy Endowed Chair in Early Childhood Learning, executive director of the Marsico Institute for Early Learning and Literacy, and Distinguished University Professor, University of Denver*

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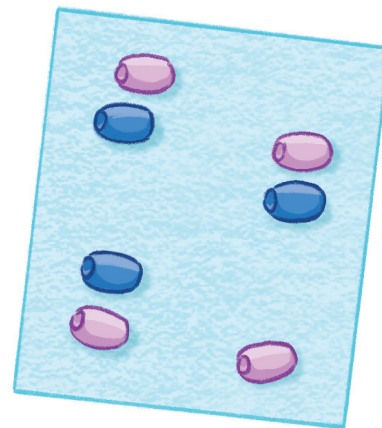
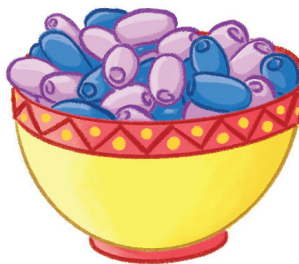


## Math Activities

Explore sharing equally with these activities!

### More, Less, or Same?

Fill a small bowl with large beads in two colors. (Pompoms, beans, or other small objects work, too.) Ask children to take a handful. Wonder together about whether you have more of one color. Then help children match the beads up to check.

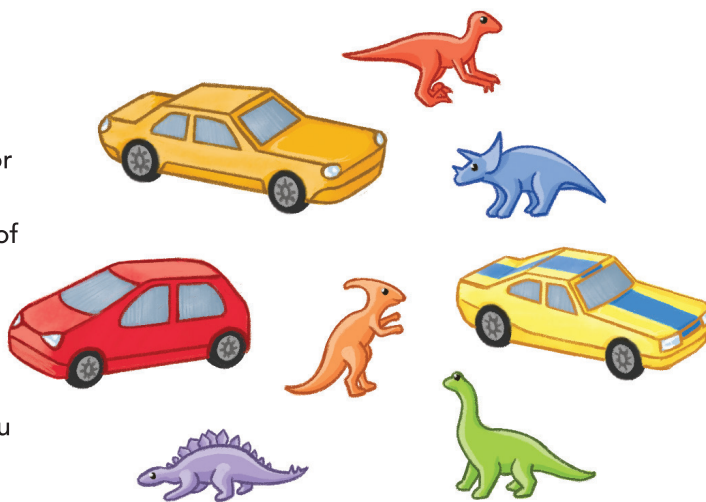


### Take One and Pass it Around

Gather a few people around a table and put out a plate with two more muffins than people. (Any snack-sized food will do.) Invite children to predict: "Are there enough for everyone to have one? Will there be any left over?" Pass the plate around and try it!

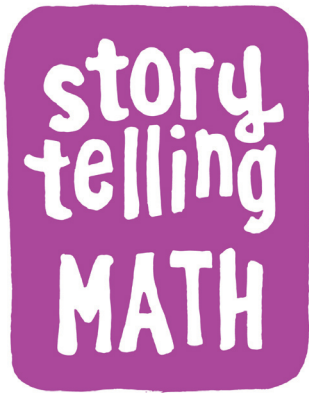
### Match Up

During playtime, look for opportunities to invite children to match items one for one. "Do we have enough hats for each teddy to get one? Show me." "The dinosaurs are going on a trip. Can we put one in each car, or do some of them need to double up?"



### Point Out Pairs

From bicycle tires to socks, pairs are all around us. As you go about the day with children, describe the pairs you see and wonder together about any extras: "These two chopsticks make a pair. There's another chopstick all by itself. Let's look for its partner."



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# The Animals Would Not Sleep!

Math activities by Marlene Kliman, TERC



978-1-62354-128-6 HC  
978-1-62354-197-2 PB  
e-book available

## About the Book

It's bedtime for Marco and his stuffed animals, but the animals have other ideas. When Marco tries to put them away, they fly, swim, and slither out of their bins. Can Marco sort the animals so everyone is happy?

## About the Math

Marco wants to organize his animals so they are comfortable at bedtime. He first sorts them by how they move. He then sorts by color and size. Different ways of sorting yield different results. When he sorts by color, friends Zebra and Giraffe are tearfully separated. When he re-sorts by size, they are reunited. In the end Marco finds a solution that works for everyone.

As children explore sorting, they are thinking mathematically. They learn that they can sort sets—or organize data—in different ways. They also discover that the way they choose to sort matters.

*Karen Economopoulos*

*Co-Director of the Investigations Center for Curriculum and Professional Development, TERC*

## About the Author

Sara Levine is a veterinarian, educator, and author whose picture books include *Flower Talk* and *Bone by Bone*. She lives in Cambridge, Massachusetts. [www.saralevinebooks.com](http://www.saralevinebooks.com)

## About the Illustrator

Marta Álvarez Miguéns has illustrated many picture books, including *Dinosaur Lady* and *Shark Lady*. She lives in Spain. [www.martalvarez.com](http://www.martalvarez.com)



## Math Activities

Explore sorting and classifying with these activities!



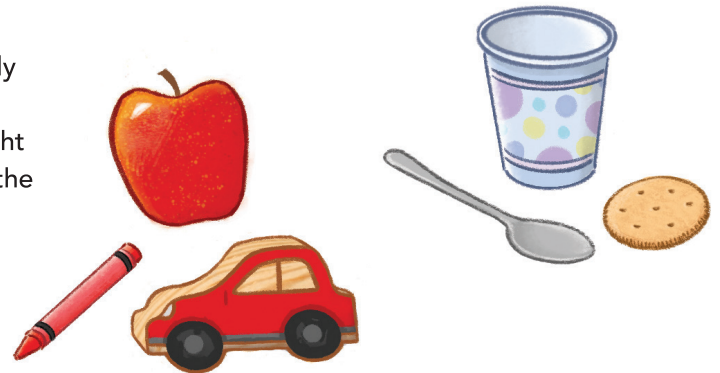
### Secret Sort

Play a sorting game with six to ten objects. One person sorts the objects into two groups but doesn't tell anyone how they sorted. The others guess how the objects were sorted. They keep going until they figure it out. Next time, someone else sorts.



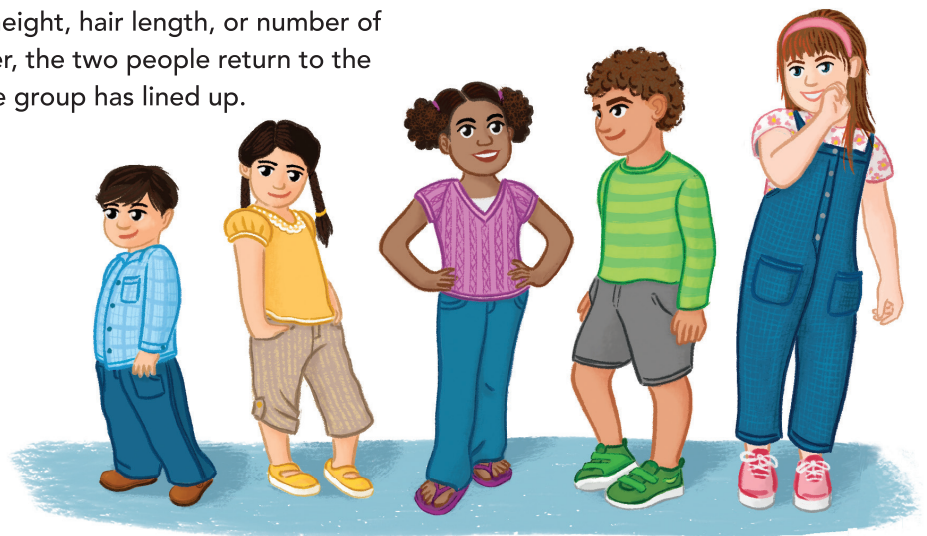
### Secret Selection

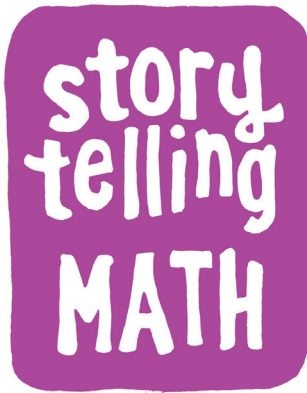
Sharpen observation skills with a game based on "Twenty Questions." Lay out five to ten objects. One person secretly chooses an object. The others ask yes-no questions to rule out as many items as possible. For example, a guesser might ask, "Is it red?" If the answer is no, the person who chose the object removes all the red items. Keep going until only the secret selection remains.



### Guess Our Lineup

Try this game with five to ten people. Two people leave the room, while the others pick a category to line up by. It should be something everyone can easily compare or count, like height, hair length, or number of pockets. When everyone is in order, the two people return to the room and try to figure out how the group has lined up.





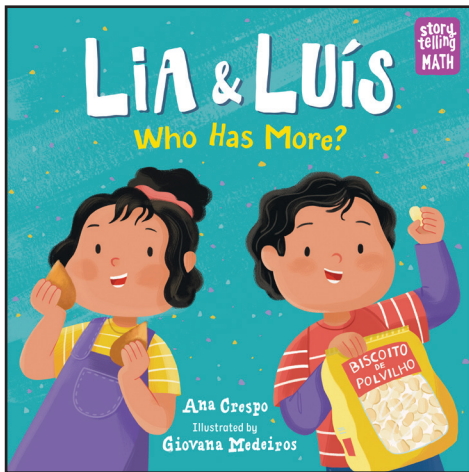
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# LIA & LUÍS

## Who Has More?

Math activities by Marlene Kliman, TERC



978-1-62354-127-9 HC  
978-1-62354-185-9 PB  
e-book available

### About the Book

Twins Lia and Luís love Brazilian snacks! But when Luís starts bragging that he has more treats, the two begin to argue. How can they tell who has more?

### About the Math

Lia and Luís explore the math of comparing and measuring. As they try to figure out who has more, they discover many ways to compare. When they compare by size, Luís appears to have more—his bag is taller, wider, and deeper. When they count, Luís also has more. But when they compare by weight, Lia wins.

When children compare amounts, they build their understanding of quantity, weight, and other measurable features. They also develop a foundation for measuring in school and in daily life.

*Sara Cordes, PhD*  
Associate professor of psychology, Boston College

### About the Author

Ana Crespo is the author of several picture books, including *The Sock Thief: A Soccer Story*, winner of an International Latino Book Award. Originally from Brazil, she now lives in Colorado.  
[www.anacrespobooks.com](http://www.anacrespobooks.com)

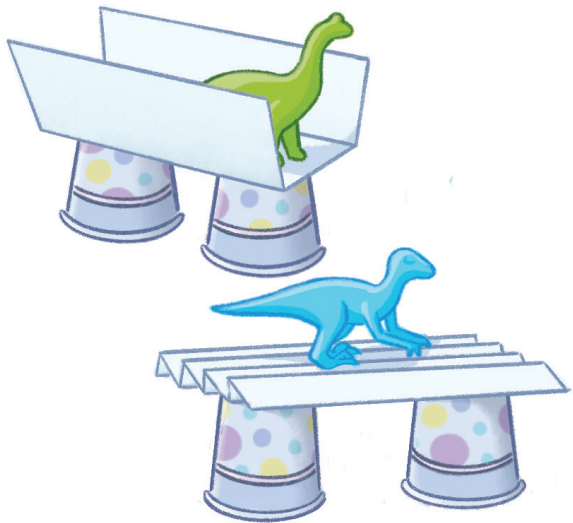
### About the Illustrator

Giovana Medeiros is the illustrator of *Running on Sunshine* and many other books. Born and raised in Brazil, she is now based in Lisbon, Portugal. [www.giovanamedeiros.com](http://www.giovanamedeiros.com)



## Math Activities

Explore comparing and measuring with these activities!



### Build a Bridge

Investigate weight! Help children build a bridge strong enough for a few toy animals to “walk” across. Use just one sheet of paper and two paper cups for the bridge. Encourage children to explore folding the paper to create a stronger bridge. (Have a few pieces of paper available in case children want to try folding paper in different ways.) For more challenge, use toilet paper tubes instead of paper cups.

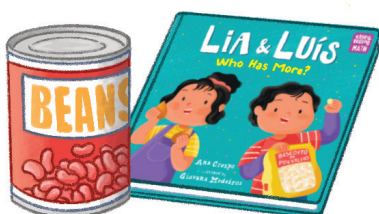
### Compare Out Loud

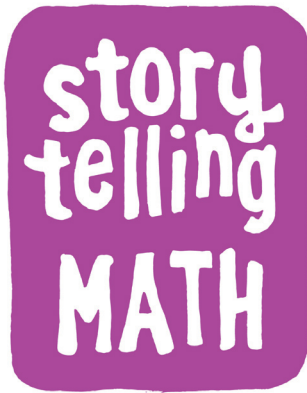
As you go about the day with children, look for opportunities to compare based on size, weight, and amount. “This package contains one hundred cotton balls, but it’s so light! This bag of three oranges is much heavier—and smaller, too.” Invite children to handle the objects and describe what they notice.



### Order by Weight

Gather three or four objects of different weights. Include a small, heavy item and a large, light one. Take turns picking up the objects and talking about how heavy or light they feel. Then invite children to try to put them in order by weight.



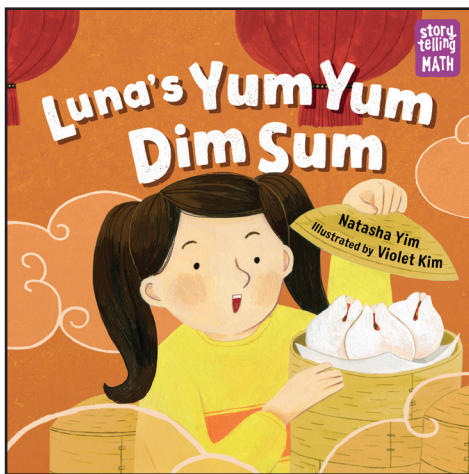


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# Luna's Yum Yum Dim Sum

Math activities by Marlene Kliman, TERC



978-1-62354-130-9 HC  
978-1-62354-199-6 PB  
e-book available

## About the Book

On Luna's birthday the family goes out for Chinese dim sum. There are six fluffy pork buns for Luna and her two brothers to share. But then *splat!* Luna drops one. How can three children share five buns fairly?

## About the Math

As children find ways to divide up amounts fairly, they begin to make sense of division, fractions, and the notion of parts and wholes. For example, as Luna and her brothers look for a way to share equally, they cut buns in half and consider cutting a half into two or three parts. They recognize that half of a half is a small part and that a half divided into three yields even smaller parts.

As children decide how to share, encourage them to explain their thinking. Although they may not yet use the words *division* and *fraction*, they are learning about those concepts!

Angela Chan Turrou  
Senior Researcher and Teacher Educator,  
UCLA Graduate School of Education

## About the Author

Natasha Yim was born in the Year of the Tiger in Malaysia, grew up in Singapore and Hong Kong, and now lives in California. She is the author of many picture books, including *Goldy Luck and the Three Pandas*. Her favorite dim sum is egg custard tarts.

## About the Illustrator

Violet Kim was born in the Year of the Ox in South Korea, studied illustration at Rhode Island School of Design, and now lives in Taiwan. She is the illustrator of *The Little Gray Bunny* and many other picture books. Her favorite dim sum is shrimp dumplings.

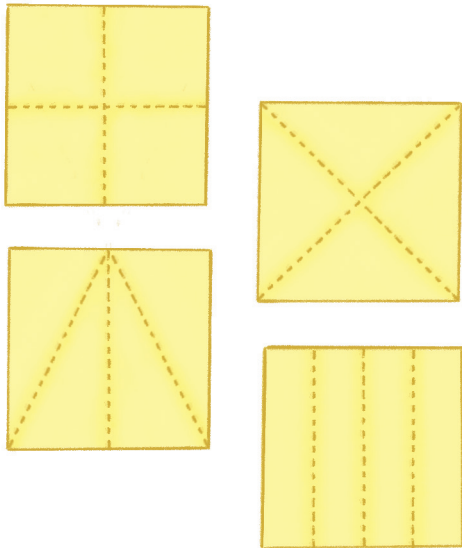


## Math Activities

Explore division and fractions with these activities!

### Dim Sum Division

Invite children to pretend they're at a dim sum restaurant. Put out a plate with fewer bao than people. (The bao can be real or play dough.) Before children take any food, ask them to decide together: "How can we share the buns fairly?" When everyone has agreed, serve and eat!



### Fold into Four

Help children explore dividing by four. Ask: "How many ways can we fold a piece of paper into four equal parts? How can we tell that each part is the same size?" Try it with different-size pieces of paper.

### Half and Half

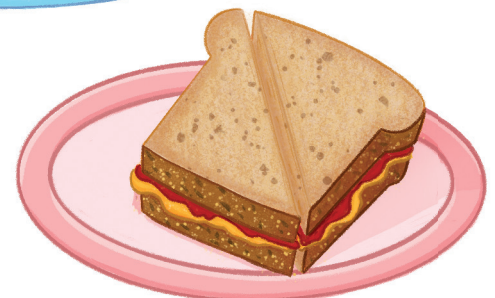
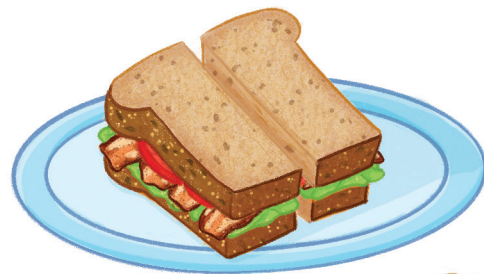
As you go about the day with children, point out opportunities to find halves:

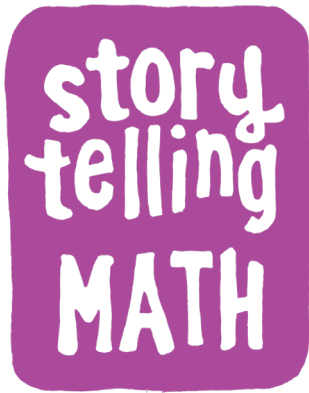
"How can we cut this sandwich into two equal pieces?"

"Give your cousin half the stickers in the pack."

"How can the two of us divide up the lemonade equally?"

Encourage children to explain their thinking.





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# BRACELETS for BINA'S BROTHERS

Math activities by Marlene Kliman, TERC



978-1-62354-213-9 HC  
978-1-62354-214-6 PB  
e-book available

## About the Book

Bina wants to give her brothers bracelets with special patterns for the Raksha Bandhan holiday. She wants to make them all by herself, but it's harder than she thought. Can Bina figure it out on her own?

## About the Math

Bina makes a special bracelet for each of her brothers. She recognizes that although the colors differ, each bracelet has an "every-other-one" (alternating) pattern. Children who can create, describe, and compare patterns do better in math.

As children explore patterns, encourage them to compare and contrast. "How are these patterns alike? How are they different?" Ask them to explain how they can tell if something is a pattern.

*Bethany Rittle-Johnson  
Professor and Anita S. and Antonio M. Gotto Chair in Child Development,  
Vanderbilt University*

## About the Author

Rajani LaRocca is the author of *Seven Golden Rings: A Tale of Music and Math*. She was born in India, raised in Kentucky, and now lives in the Boston area. [www.rajaniarocca.com](http://www.rajaniarocca.com)

## About the Illustrator

Chaaya Prabhat is a graphic designer, illustrator, and lettering artist. She lives and works in Chennai, India. [www.chaayaprabhat.com](http://www.chaayaprabhat.com)





## Math Activities

Explore patterns with these activities!

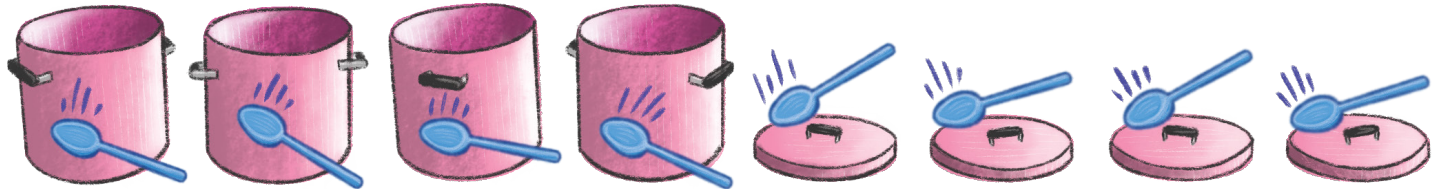
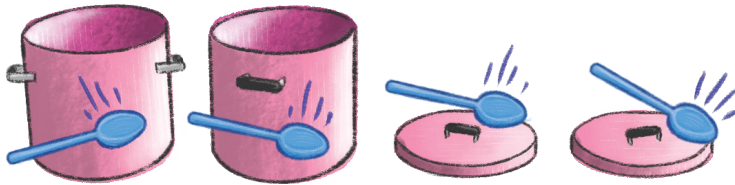
### Share the Pattern

Choose three words to repeat, such as "yummy purple slime." Then take turns saying the words "yummy," "purple," "slime," "yummy," "purple," "slime," and so on. Keep going for a few rounds. Then ask, "How did you know what word to say when it was your turn?"



### Double the Pattern

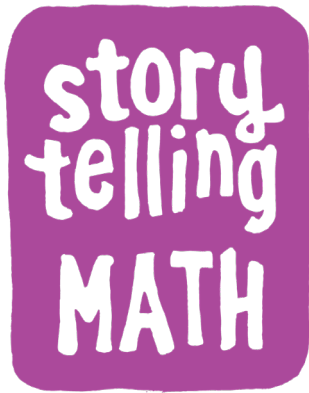
Come up with a two-part sound pattern (tap a kitchen pot, tap a pot lid). Everyone repeats the pattern a few times. Then double it (pot, pot, lid, lid). Try doubling it again! Or try this with an action pattern (clap, jump).



### Make My Pattern

One person secretly draws a pattern and then describes it aloud. "Two purple dots, a yellow dot—repeat." The others try to draw the pattern from the description. Compare what each person drew. Take turns secretly drawing and describing patterns.



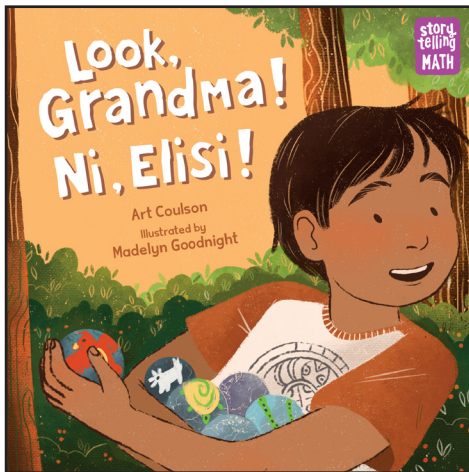


Storytelling Math celebrates children using math in their daily adventures as they play, build, and discover the world around them. Joyful stories and hands-on activities make it easy for kids and their grown-ups to explore everyday math together.

[www.charlesbridge.com/storytellingmath](http://www.charlesbridge.com/storytellingmath)

# Look, Grandma! Ni, Elisi!

Math activities by Marlene Kliman, TERC



978-1-62354-203-0 HC  
978-1-62354-204-7 PB  
e-book available

## About the Book

Bo is finally old enough to sell his homemade marbles at the Cherokee National Holiday. He finds the perfect tray to hold them all. But Grandma says it will take up too much space on the table in the family booth! How can something take up less space but still hold all the marbles?

## About the Math

Bo explores the math of volume, capacity, and area while participating in an important community tradition. As he searches for a container that holds all of his marbles and takes up just a little table space, he discovers that containers of different shapes can hold the same amount. Hands-on learning like this can help all children build math skills for school and daily life.

Look for opportunities for children to help you fill backpacks, lunchboxes, and other containers. Maybe you can ask them for help the next time you pack up leftovers!

*Dr. Sharon Nelson-Barber, Rappahannock descent  
Director, Culture & Language in STEM Education, WestEd*

## About the Author

Art Coulson is Cherokee from Oklahoma and the author of several children's books, including *Unstoppable: How Jim Thorpe and the Carlisle Indian School Football Team Defeated Army*. He lives with his family in Minneapolis, Minnesota. [www.artcoulson.com](http://www.artcoulson.com)

## About the Illustrator

Madelyn Goodnight is a member of the Chickasaw Nation. She lives in Oklahoma and is the illustrator of *The Pear Tree*. [www.madelyngoodnight.com](http://www.madelyngoodnight.com)



# Look, Grandma! Ni, Elisi!

## Math Activities

Explore volume, capacity, and area with these activities!

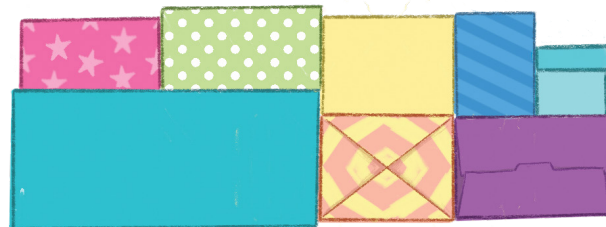
### Perfect Fit

Help children gather about twelve objects, such as small toys, to “sell” at a pretend craft booth. Ask them to find a container that holds all the objects snugly and takes up no more table space than a potholder.



### Same Boxes, Different Shape

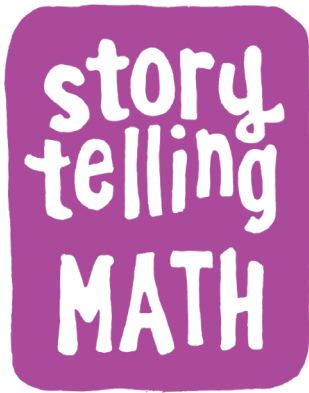
Encourage children to use boxes or blocks to build a tower. Then have them use the same boxes or blocks to make something else. “You’ve made a very tall tower! Let’s see if we can use the same boxes to make a two-story building, like your school.”



### Which Holds the Most?

Gather three empty plastic containers with different shapes. Ask children: “Which do you think will hold the most water?” Explore ways to check their ideas. For instance, if children fill the container they think holds the most, what will happen when they try to pour the water into a smaller container?





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Math activities by Marlene Kliman, TERC



978-1-62354-202-3 HC  
978-1-62354-201-6 PB  
e-book available



## About the Book

When sisters Usha and Aarti look up at the same seven stars, they see different things. Aarti sees the Big Dipper, but Usha sees the Big DIGGER! And cousin Gloria sees the Big Kite! What's going on?

## About the Math

Aarti, Usha, and Gloria eventually figure out that they see different things in the stars because they are looking at the sky from different points of view. As the girls turn and change positions, they explore rotation, orientation, perspective, and other geometric and spatial concepts. Young children with strong spatial skills can do better in math and science in school.

As you go about the day with children, look for opportunities to point out how perspective can affect what we see. What's right side up looks upside down when you stand on your head!

*Geetha Ramani, PhD*  
Associate Professor, Department of Human Development  
and Quantitative Methodology, University of Maryland

## About the Author

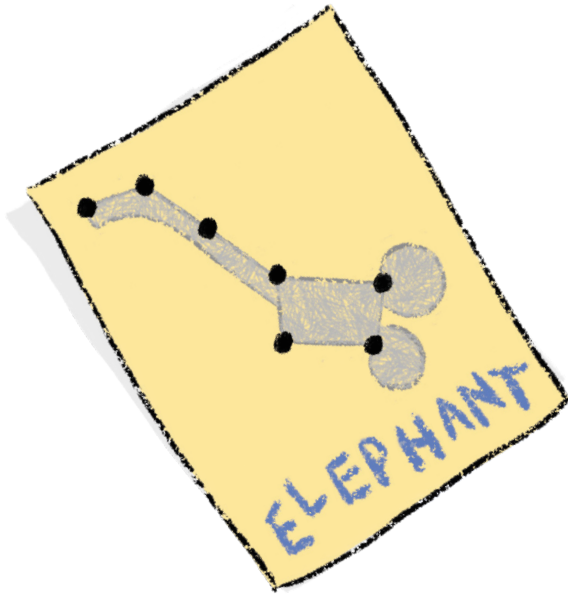
Amitha Jagannath Knight grew up in Texas and Arkansas and now stargazes with her family in Massachusetts. This is her debut book. [www.amithaknight.com](http://www.amithaknight.com)

## About the Illustrator

Sandhya Prabhat has illustrated more than a dozen picture books. Originally from India, she now lives in the Bay Area of California. [www.sandhyaprabhat.com](http://www.sandhyaprabhat.com)

## Math Activities

Explore geometry and spatial sense with these activities!

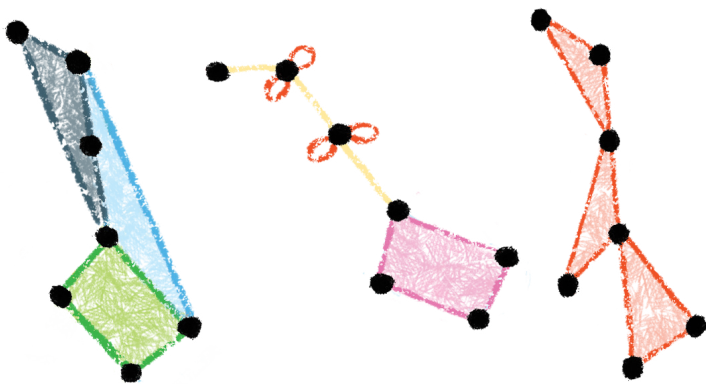
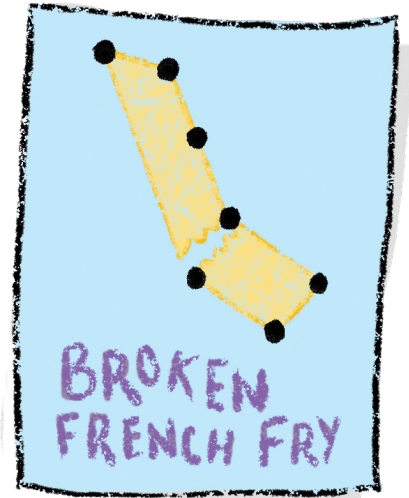


### Dipper Picture

Print a copy of "Big Dipper Dots" for each person. Ask children to connect the dots to show what they see in the stars.

### Make My Picture

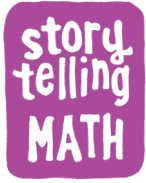
Print two or three copies of "Big Dipper Dots" for each person. One person secretly draws a Dipper Picture and describes it aloud. Then everyone else tries to connect the dots from just the description. When everyone is done, show the original picture.



### Connect the Dots

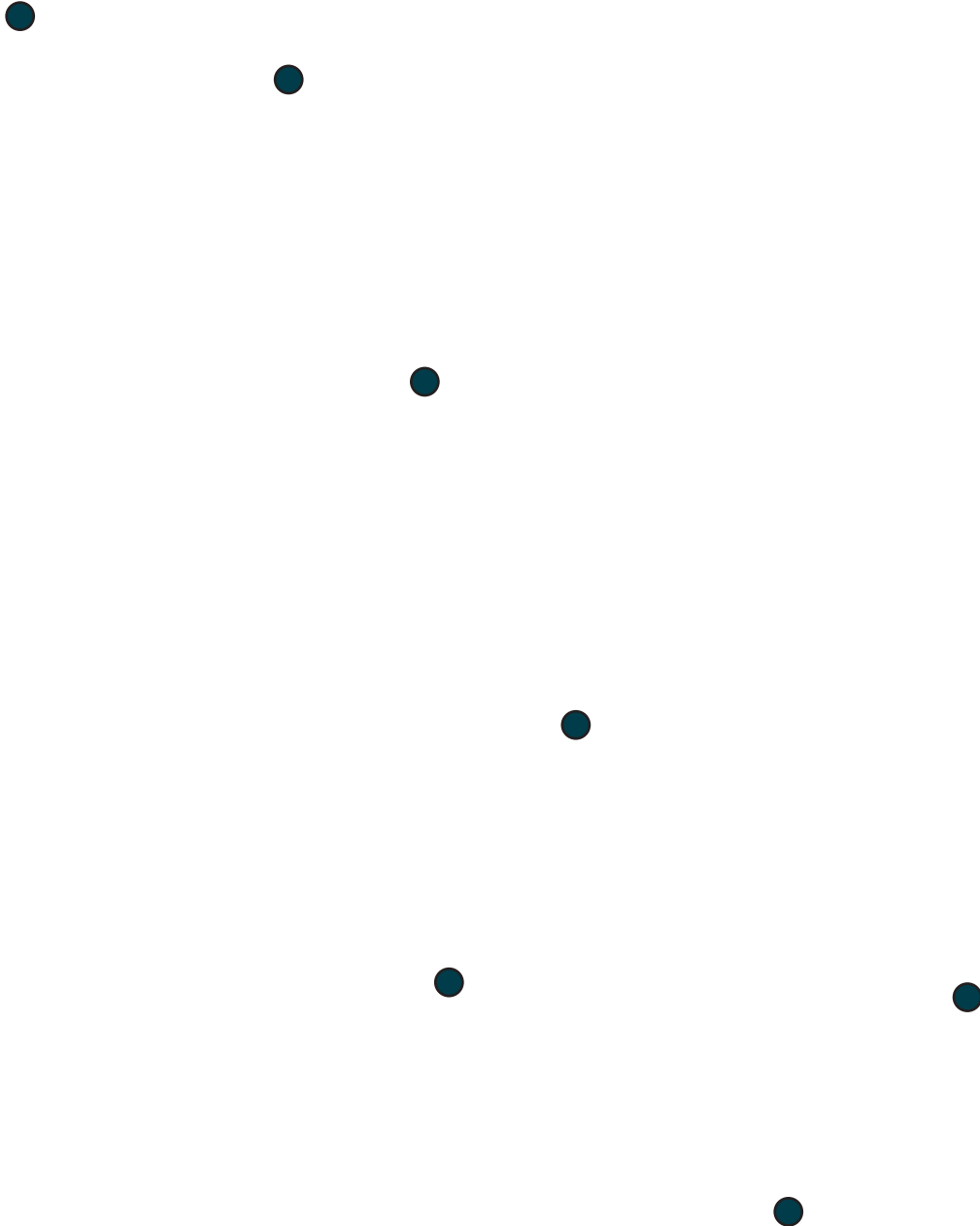
Print two or three copies of "Lots of Dipper Dots" for each person. Ask children: "How many different ways can you connect the Big Dipper dots?" After they've tried it, have them compare with someone else. "Did you connect the dots in the same ways? Can you find more ways to connect the dots?"

*The author of Usha and the Big Dipper had fun finding these different pictures in the Big Dipper!*



# USHA and the BIG DIGGER

## Big Dipper Dots



## Lots of Dipper Dots

