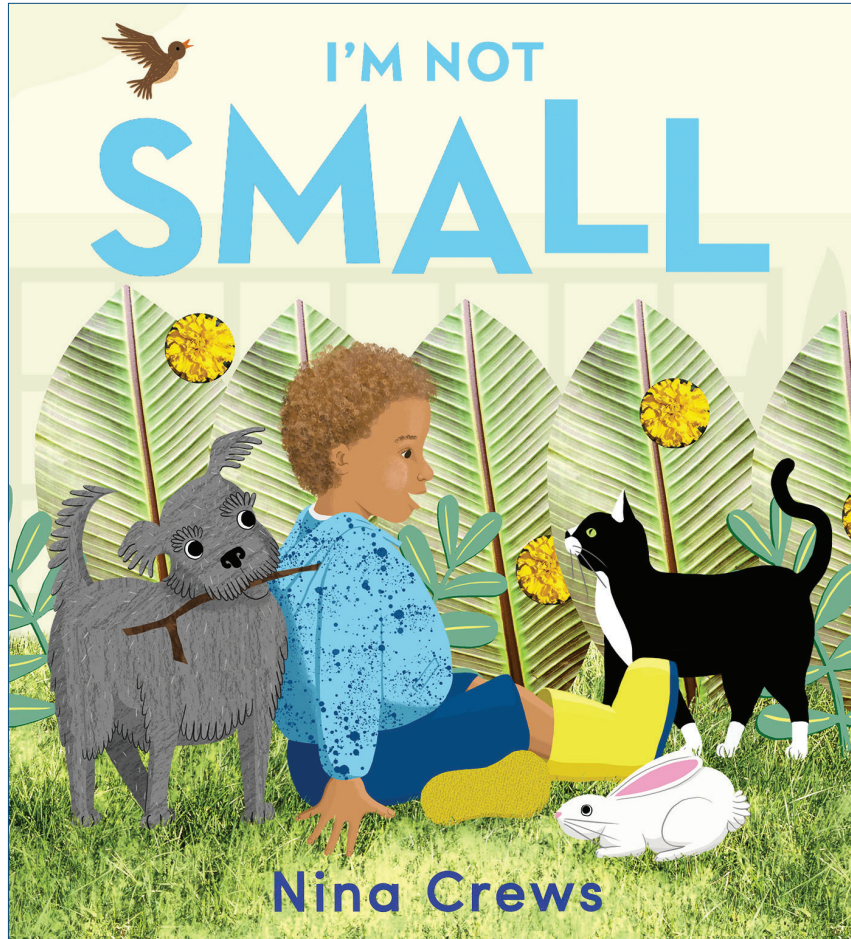




# A TEACHER'S GUIDE TO MATH CONCEPTS



for grades PreK through Grade 1

*"Completely relatable for all viewers, big or small." The Horn Book (starred review)*

*"A nice addition to story hours about relativity, size comparisons, and schoolyard science lessons." School Library Journal*

Board Book:  
ISBN: 9780063058279  
ISBN 10: 0063058278  
Greenwillow Books  
Age: Newborn to 4

Hardcover  
ISBN: 9780063058262  
ISBN 10: 006305826X  
Greenwillow Books  
Age: 4 to 8

## About this book

**I'm Not Small** tells the story of a preschooler's first solo adventure in his backyard. Is he ready for this big step? He is big enough, old enough, to explore the garden alone, but still small enough, young enough, to need reassurances and a hug from his mom.

This story of milestones and mastery provides exceptional context for young children to learn math skills. Just as the book's character notices, observes, and measures his world, teachers can guide their students to explore math concepts such as measurement, organizing data, patterns, comparison, and problem solving.

In this guide, teachers can find ideas for their PreK and Kindergarten classrooms. First grade standards are also included.

## Measurement and Data/Comparison

### In the book...

The boy in this story realizes that he is bigger than many other animals. He compares the sizes of his pets as well as other animals he finds in his backyard.

### In the math classroom...

Children learn to describe their world using specific vocabulary to describe measurable attributes (height, weight, length). They compare and tell what's taller or shorter, heavier or lighter, and so on.

In addition, children use precise vocabulary to compare quantities. They use greater than (more than) and less than (fewer than). In first grade, children extend this comparison skill to using the symbolic ( $>$ ,  $<$ ,  $=$ ) when comparing.

In addition, first graders record and interpret data, such as measurement data, in the form of graphs.



### PreK

- PK.MD.1 Identify measurable attributes of a objects, such as length or weight, and describe them using appropriate vocabulary.
- PK.CC.5 Recognize whether the number of objects in one group is more than, fewer than, or equal to (the same as) the number of objects in another group.



Give students a handful of crayons, toys, etc. Have students make a real world size chart by putting the objects in order from longest to shortest.

## Kindergarten

- K.MD.A.1 Describe measurable attributes of an object(s), such as length or weight, using appropriate vocabulary.
- K.MD.A.2 Directly compare two objects with a common measurable attribute and describe the difference.
- K.CC.C.6 Identify whether the number of objects in one group is greater than (more than), less than (fewer than), or equal to (the same as) the number of objects in another group.



Let's go outside! Collect items from outside. Have students fill up a small container with stones, fallen leaves, dandelions, etc. Then use these items as a counting collection back inside. Finally compare your collections.

Describe relative measurements. Make observations in your classroom. What is taller than the boy? What is shorter than the boy?

Go on a hunt. Find something heavy, find something tall, find something...

Continue your hunt. Work with a partner and find two \_\_\_\_\_ (flowers, stones, insects, etc). Compare your items. "My flower is taller than/shorter than my partner's."

## Grade 1

- 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.



Use animals from the book to tell big, bigger, biggest; small, smaller, smallest. Choose an animal not in the book.

Choose an animal not in the book. Complete the idea - A \_\_\_\_\_ is bigger than a \_\_\_\_\_ but smaller than a \_\_\_\_\_. I am big! I am taller than a \_\_\_\_\_. I am shorter than a \_\_\_\_\_.

- 1.MD.A.2 Measure the length of an object using same-size "length units" placed end to end with no gaps or overlaps.



Measure animals in the book using counting cubes.

- 1.MD.C.4 Organize, represent, and interpret data with up to three categories.



Make a real world graph. Go outside and collect 10 natural items. Arrange them in columns to show how many of each item you found. Which has the most? Which has the least?

1.NBT.B.3

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols  $>$ ,  $=$ , and  $<$ .



Make picture inequalities. Using pictures of animals and nature, have children use greater than or less than symbols to compare.



## Patterns

### In the book...

The boy in this story notices many things while he is outside. He listens to the sounds of the sparrows and the buzzing bees. The boy also notices growing patterns. As he explores and notices his surroundings, he sees animals around him that are smaller and smaller.



### In the math classroom...

Children notice patterns. They duplicate and extend them. While math students generally make patterns with concrete objects, this book gives the opportunity for sound patterns. In addition, finding and replicating patterns is part of the Standards of Mathematical Practices - looking for and making use of structure.

### PreK and Kindergarten

PK.OA.2 Duplicate and extend simple patterns using concrete objects.

K.OA.6(NY) Duplicate, extend, and create simple patterns using concrete objects.



What does being outside sound like? Brainstorm the noises that the animals in the book make. (Tweet, buzz, etc.) Make animal noise patterns - tweet, tweet, buzz, tweet, tweet, buzz.

Let's go outside! Collect items like pine cones, leaves, blades of grass, etc. Come inside and arrange the items in patterns.

K.OA.A.1 Represent addition and subtraction using objects, fingers, pennies, drawings, sounds, acting out, verbal explanations, expressions, equations, or other strategies.



Model the boy's explorations as a context for minus one pattern. Start with 7 snap cubes to represent the boy. Then make a tower of one less (6) to represent the dog. Then make a tower of one less (5) to represent the cat. And so on with each animal that is smaller (rabbit, sparrow, bee, ant). Set up the cube towers to show a shrinking pattern.

## Grade 1

1.OA.C.5      Relate counting to addition and subtraction.



Model the boy's explorations as a context for minus one pattern. Start with 7 snap cubes to represent the boy. Then make a tower of one less (6) to represent the dog. Then make a tower of one less (5) to represent the cat. And so on with each animal that is smaller (rabbit, sparrow, bee, ant). Set up the cube towers to show a shrinking pattern. Represent each animal's being smaller with a minus 1 equation.

## Convergent Problem Solving

### In the book...

The boy in this story spends time observing, noticing, and gathering information. The observations the boy makes help him become less anxious about playing outside on his own.

### In the math classroom...

Students in all grades K-12 engage in relevant problem solving. The Standards of Mathematical Practice apply to students in all grade levels. Students observe and gather information and data together to come to a solution to a problem. Students persevere in solving problems. Students reason abstractly and quantitatively. Students model with mathematics. Students use appropriate tools.



*The classroom activities in this section can be used with children in any grade as you explore being a mathematician in context.*

### Problems to investigate in your PreK, Kindergarten, or Grade 1 classroom

Design a home for an ant to keep it safe. Find materials outside in nature to use for your project. Will your ant home be big or small? How can you make it strong?

- *Teachers, this activity can be an opportunity to discuss proportional reasoning. An ant is small, is your house the same size as the ant?*

What do birds like to eat? Brainstorm different things birds might eat. Put selections of these foods outside your classroom. Observe the birds and see what they like the best. What observations help you conclude that a bird likes the food?

- *Teachers, the opportunity here to gather data and make decisions based on the data collected is a very powerful mathematical idea.*



Make a milk carton bird feeder. You will have to observe and gather facts before you begin. What type of bird is your feeder for? How big is that bird? What size milk container would fit the bird best? How big does the opening need to be for the bird to reach the food? How much food is best to put in the feeder? Where (how high) should the feeder be placed and why?

- *Teachers, notice the different measurable attributes discussed in this project - dimensions of a milk container (length, width, height), weight of bird seed, height of feeder.*

Is there a kindergarten playground and a “big kid” playground at your school? How are they different? How are they the same? Do you think you’re ready for the big kid playground? Work with your class to make observations and gather evidence. Then write to your principal explaining why your class is big enough for the big kid playground!

- *Teachers, this is an outstanding opportunity to make math relevant. Once students decide how and what they can measure, mathematical data becomes their proof that they can get something they want.*

Make a home for a toy. Have your class bring in a small doll, super hero, or stuffed toy from home. Provide a selection of containers - shoe boxes, cereal boxes, cleaned food containers, gift bags, etc. Direct students to experiment with the different containers to find the perfect home for their friend. Which home is just the right size? Students should cite evidence from their observations to back up their choice.

- *Teachers, there is opportunity here to apply the concepts of 3D shapes. A 2D shape cannot be a home - we need height. Can a home be a sphere, a pyramid, a cube?*



## About the author

Nina Crews is the author and illustrator of *I’m Not Small* and *One Hot Summer Day* and the illustrator of *Not Done Yet: Shirley Chisholm’s Fight for Change* by Tameka Fryer Brown, *Seeing Into Tomorrow: Haiku* by Richard Wright, *A Girl Like Me* by Angela Johnson and *The Neighborhood Mother Goose*. Nina is the recipient of the 2023 New York Library Association Empire State Award. Her work has been recognized by the ALA Notable Committee, The Horn Book, Junior Library Guild, New York Public Library, Chicago Public Library, Bank Street College of Education and many others. Nina lives in Brooklyn, NY with her husband and son. You can visit her online at [www.ninacrews.com](http://www.ninacrews.com).



*This teaching guide was created by Nicole Sosler, Math Coach at Berea Elementary School, Montgomery, New York. Nicole is an enthusiastic math teacher, an avid reader, a nature lover, and a bird watcher. She frequently saves spiders and other creatures smaller than she.*