

## Parent Resource

### Title: Helping Your Child See and Show Mathematical Ideas



“Did you see that?” four-year-old Ilyana asks as she points to a squirrel high on a branch. “That squirrel ran so fast and climbed so high!”

Without thinking, Ilyana gestures with her arm and hand to show the squirrel’s path, indicating the animal’s speed and direction.

Ilyana’s lively gestures are a powerful example of how children show excitement and interest in the world around them. This scenario, like so much indoor and outdoor conversation and play, connects to math in more ways than you might imagine.

Develop your eyes and ears for math concepts

At a young age, children notice big and small, slow and fast, more and less. Through both her words and her motions, Ilyana referred to the squirrel’s distance, speed, location, and height in the tree. These too are math concepts.

Noticing when your child brings mathematical words and ideas like these into conversation or play can be a jumping-off point for helping him or her get a head start on understanding math. In the adult–child dialogue between Ilyana and her dad that follows, math ideas come to life in meaningful ways:

“Ilyana, that’s amazing! I wonder why that squirrel climbed up so high.”

“’Cause squirrels live in trees that are tall, so they can hide.”

“How can the squirrel stay on that thin branch without falling?”

“I wonder if squirrels fall. They are small.”

“Do you think he always moves that quickly?”

“They have to move fast, or else they could get hurt.”

Promote the use of fingers to see, show, and solve

In addition to using fingers to point and gesture, children can—and should!—use their fingers for counting, arranging (ordering), and adding and subtracting (computing).

At a very young age, children recognize fingers as important visual aids. In fact, recent research tells us that using fingers is one of the best ways to learn numbers: the part of the brain that recognizes fingers as helpful thinking tools continues to find such tools useful well into adulthood. Here are some examples of how you can use fingers to teach a young child about counting, putting things in order, and computing.

“Ilyana, let’s play a game. I’m going to hold up some fingers. See if you can tell me how many fingers there are. Are you ready? You’ll have to look here.” [Ilyana’s dad shows three fingers in a row on one hand.]

“Five!”

“Hmm . . . Here are my fingers. Let’s try again.” [The dad uses his other hand to point to each finger as he counts aloud with Ilyana.] “One, two, three. How many fingers are there?”

“Three!”

“You got it! I showed you three fingers, all on this hand. Now, can you show me four fingers?” [Ilyana uses one hand to touch and count the four raised fingers on the other hand.] “Great! I see four fingers.” [Her dad counts aloud to reinforce that one number word goes with one finger as he counts from one to four.] “One, two, three, four.”

If a child is having difficulty displaying the correct number of fingers, the adult can model, physically help the child, or have the child use the adult’s hand rather than his or her own.

“Let’s try to show four another way. Watch this.” [Dad shows two fingers on one hand and two on the other. He holds both hands fairly close to each other.] “Are there four fingers here?”

“There’s two!”

“Let’s see. How many fingers am I showing? Let’s count them together.” [He wiggles each finger as they count aloud.] “One, two, three, four. There are four fingers here, but this time I used two fingers on this hand and two fingers on this hand to show four. So that’s neat. We can show four in different ways.”

You can play variations of this game with children from ages 3 and 4 years through third grade and beyond. An important goal for the end of kindergarten is to know the partners of 10 (as in  $9+1$ ,  $8+2$ ,  $7+3$ , and so on). It is easy to see, show, and solve by using the 10 fingers we've already got built in:

"Show me one finger up. How many fingers are down? Show me two fingers up. How many fingers are down? If I have four fingers down, how many do I have up?"

Taking this further, children in kindergarten and first grade can develop tens and ones knowledge by quickly flashing 10 fingers and adding one more to see how  $11 = 10 + 1$ . Young children love it when you flash them small two-digit numbers and they have to see and say the quantity:

"I'm going to use my fingers to flash a number. You tell me what number it is." [Flash a number using your fingers and allow the child to tell you how many.]

"You're right! I flashed 10, then another 10, and then 3 ones. That is 23. Let's count as I flash." [Flash 10 fingers.] "10." [Flash another 10 fingers.] "20." [Flash three fingers.] "23."

Encourage reenactments and make simple drawings together  
Sometimes there's nothing more informative than asking a child to show you how she understands what she is seeing and saying. When asked to show, many children will demonstrate with their bodies and gestures. As they get older, children can make drawings too. Parents, caregivers, siblings, and teachers get the child thinking more when a request to visualize and show are part of the equation:

"Ilyana, can you show me how the squirrel moved across the grass and up the tree?"

"He was like this." [Ilyana moves her body to demonstrate.]

“Oh, I see. So he sort of jumped and ran, but then he stopped and twitched. And then he jumped and ran again. Wow! Do you think he always moves like that?”

“I’ve seen a lot of squirrels today! Some in trees and some on the ground.”

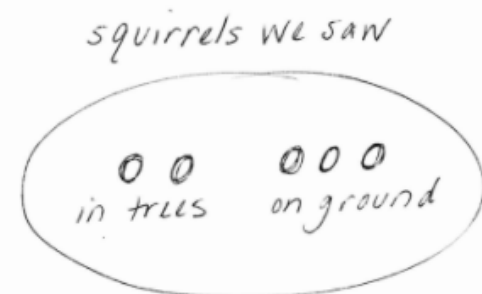
“Me too! I saw two in trees and three on the ground. How many is that altogether? Let’s make a drawing to figure it out. First, we’ll draw two circles to show the two squirrels in the trees. [Ilyana’s dad draws two circles and labels them “In trees.”] Then how many on the ground?”

“Three.”

“Oh, right. So let’s draw three circles for those squirrels.” [He draws and labels three circles.] Now, if we want to know how many altogether [draws a big circle to group the five together], we can see them here and count them. Let’s do that.”

“One, two, three, four, five. We saw five squirrels altogether.”

Counting how many squirrels have been seen



Children who use drawings to see and show quantities can use letters and words as labels and other symbols to show groups. The drawings will help them see mathematical situations more clearly and take meaningful actions that help them make sense of and solve problems. A drawing of a child's thoughts is also a very useful tool for looking into what a child is thinking and learning.

Source: NAEYC

Link: <https://www.naeyc.org/our-work/families/help-child-see-math>