

Summer Learning Spotlight

Math

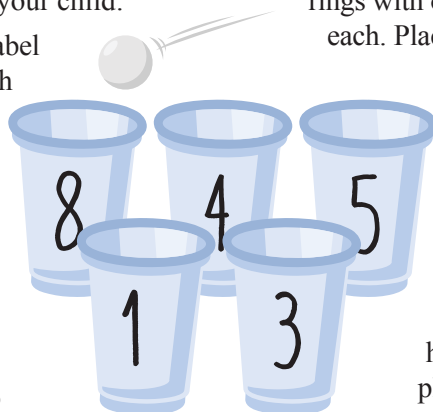
Early Childhood/
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Hold a backyard math carnival

Everyone's a winner when you combine fun carnival games with math. Try these with your child:

- **Dunk and add.** Label 10 plastic cups with a number (1-10 for younger children and 11-20 for older ones). Fill each cup halfway with water, and line them up. Players take turns trying to throw two small balls into the cups. If a ball lands in a cup, the player writes down the cup's number. If not, the player writes down 0. After each round, have your child add (or multiply) the two numbers to get the player's score. The player with the highest score after 10 rounds wins.
- **Fish for equations.** Write math equations, such as $5 + 7 = 12$ or $18 \div 9 = 2$, lengthwise on foam



pool noodles (available at dollar stores). Then, cut the noodles into rings with one number or symbol each. Place the rings in a large tub of water. Players take turns using a stick to fish up rings that form a correct equation. The solution is their score for that round. When every ring has been caught, the player with the highest total wins.

- **Bowl with fractions.** Set up 12 empty plastic bottle "bowling pins." Take turns rolling a ball to knock down the pins. Record each player's score as a fraction, with 12 as the *denominator* (bottom number) and the number of pins down as the *numerator* (top number). After 10 rounds, players add their fractions and reduce them to get their score.

Summer break offers wonderful opportunities to nurture a love of learning and keep young minds engaged. This guide provides a collection of interactive ideas to make math a regular part of your family's summer adventures.

Enjoy summertime math challenges

Interesting activities make math enjoyable. Have your child:

- **Figure out** how many different ice cream sundaes can be made from a certain number of ingredients. What combinations are possible if there are three ice cream flavors, three syrups and three candy toppings?



- **Write numbers 1-30** on slips of paper. Take turns drawing a slip and sharing what the number reminds you of. "There are 30 days in June." "We take Route 11 to Grandma and Grandpa's house."
- **Find math in pictures.** Draw a picture and "hide" math inside it. Your drawing might include rectangular beach towel, a clock showing 11:45 and a window divided into fourths. Can your child spot the math?

Let children count on their fingers

Studies show that finger-counting can improve children's math learning. To provide practice:

- **Trace your child's hands** with sidewalk chalk. Next, have your child number the fingers from 1-10. Then, your child can use the numbered fingers as a visual aid to write every addition sentence equaling 10 ($1 + 9 = 10$, $2 + 8 = 10$, etc.).

- **Play finger-based math games.** Flash a number of fingers quickly. Can your child say how many you held up? Or, show a math problem with your fingers (say, 4 fingers on each hand) and encourage your child to say and solve the problem (" $4 + 4 = 8!$ "). Then, let your child quiz you!

Source: "You Can Count on Your Fingers: Finger-Based Intervention Improves First-Graders' Arithmetic Learning," *Journal of Experimental Child Psychology*, Elsevier.

Source: *Five Activities from Parent Leaders to Support Family Math*; Center for Family Math, National Association for Family, School, and Community Engagement.

Combine math with summer science

The more science your child learns, the more its connection to math becomes important. Reinforce the connection with these summer activities:

- **Explore physics** on the playground. A swing is a simple machine called a *pendulum*. When your child swings, start a stopwatch when the swing reaches its highest point in the back and stop it when it reaches that point again. Do this 10 times, and have your child find the average. This is the pendulum's *period*. At home, have your child experiment with shorter pendulums by tying small objects to strings of various lengths. How does the length of a pendulum affect its period?
- **Make ice cream** to practice measurement and explore chemistry. In a small plastic zipper bag, combine 1 tablespoon sugar, $\frac{1}{2}$ cup milk or cream and $\frac{1}{4}$ teaspoon vanilla extract. In a large zipper bag, combine 4 cups ice cubes and $\frac{1}{2}$ cup salt. Put the



small bag into the large bag, and take turns shaking it while wearing oven mitts. After 5-10 minutes, you will have ice cream! (Salt lowers the freezing point of water, allowing the melting ice to get colder and freeze the ice cream.)

- **Look for symmetry in nature.** During family walks this summer, have your child sketch natural items such as leaves, flowers, seashells and even the moon. Can your child draw a line of symmetry that divides each picture into two matching halves? Do some objects have more than one line of symmetry?

Enhance travel time with math!

No matter where your family goes this summer, maximize learning during travel time with these ideas:

- **Make math bingo cards** for a family trip. Help your child divide sheets of paper into 25 squares and write one math-related item in every square, such as numbers representing speed limits and gas prices (55, 3.10), shapes of street signs (octagon, rectangle), and symbols such as a temperature degree symbol or a percent sign that might be found on signs or displays. Compete to find and cross out squares—five in a row wins!
- **Sing counting songs.** Make up your own versions of traditional songs and nursery rhymes using different numbers or animals. Try “One Hundred Little Monkeys” instead of “Ten Little Monkeys.” Sing “This Old Dog” instead of “This Old Man,” and make up a new rhyme for each number.
- **Pack a baking sheet** and play dough. Sculpt number sentences for one another to solve. Depending on your child's age, include addition, subtraction, multiplication or division problems with whole numbers, fractions or decimals.

Create a math story together

Turn math vocabulary into fun summer stories. Here's how:

1. **Brainstorm a list** of math vocabulary words with your child. Include words related to numbers (*seven, one-half*), shapes (*circle, cube*), measurement (*inch, liter*), problem-solving (*sum, subtract*), etc.
2. **Start a voice recorder**, and begin telling a story using one or more of the words on your list. “We set up an *octagon*-shaped tent.” Have your child tell the next part. “We roasted *four* marshmallows to make s'mores. We needed *two* graham crackers per marshmallow. *Four times two equals eight*.” Take turns continuing the story.
3. **Listen to the story together.** Have your child write it down and draw pictures of the math concepts to illustrate it.

Plant a summer math garden

A lot of math learning can take place in a summer garden. To help your child practice math skills while growing plants in your yard or on a windowsill:

1. **Plant 10 of each type of seed** together. Help your child calculate the percentage of seeds that sprout.
2. **Help your child use** a measuring cup to measure the ideal amount of water to give the plants each day. The soil should be damp but not soggy.
3. **Have your child use a ruler** to measure the plants regularly, and create a graph to show their growth.

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