Intermediate Edition

Math+Science Connection

Building Understanding and Excitement for Children

Marshall Elementary School

INFO BITS

Think logically

Mathematical thinking comes into play anytime we organize things. Help your child stretch her logical thinking by asking her to sort something, such as the spice jars in your cupboard. She might arrange them alphabetically, by color, or another way. Point out that sorting makes it easier to find items later.

Shorter days

How does a scientist say it's the first day of fall? He says it's the *autumnal equinox*. After the equinox, the days (or daylight hours) get shorter than the nights. This year the equinox is September 22. Have your youngster record what time the sun rises and sets each day for a week. How do the minutes of daylight change?

Book picks

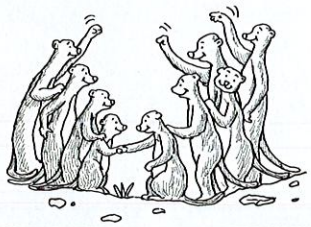
Go Figure: A Totally Cool Book About Numbers (Johnny Ball) contains math patterns, puzzles, and ancient ways of writing numbers.

Use *The Body Book: Easy-To-Make Hands-On Models That Teach* (Donald M. Silver and Patricia J. Wynne) to create a paper skeleton or build models of eyes and ears.

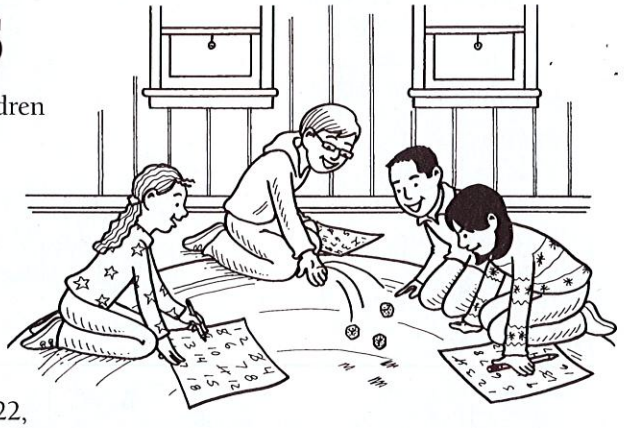
Just for fun

Q: Since two's company and three's a crowd, what are four and five?

A: Nine.



Same answer, different strategies



Since math is orderly, children can solve the same problem using different strategies—and still come up with the right answer. Here are ways for your youngster to see this in action.

Add and think

Ask your child to pick three two-digit numbers (say, 22, 54, 18) and add them together. How did he get the sum? He might have added the ones (2 + 4 + 8 = 14) and then the tens (2 + 5 + 1 = 8 tens, or 80), and then added the results together (80 + 14 = 94).

Can he think of a different method? For instance, he could make the numbers "friendlier" to add: Change 22 and 18 each to 20 (since they're both 2 away from 20). Then, add 20 + 20 = 40, and compute 40 + 54 = 94.

Which strategy does he like better?

Roll the dice

Play a game using three dice. First, each person writes the numbers 1–18 on a sheet of paper. On his turn, a player rolls all three dice and uses either two or three of the numbers rolled to make one of the numbers on his paper. He may add, subtract, multiply, or divide.

Say your youngster rolls 3, 2, and 5. He could make 10 (3 + 2 + 5 = 10 or 2 x 5 = 10). Or he might make 1 by subtracting 3 – 2 = 1, or computing (3 + 2) ÷ 5 = 1. How many different ways can he reach the same answer? Cross out each number made—the first player to use all 18 numbers wins.

Idea: Play again using four dice, trying for the numbers 1–24.

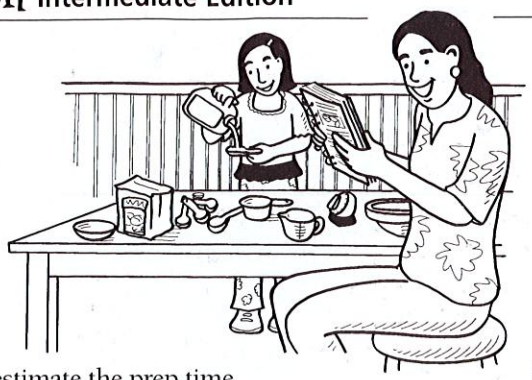
Traffic, traffic everywhere

Encourage your child to notice how traffic intersections are designed and how the traffic flows. Then, have her try her hand at being a traffic engineer.

On poster board, she could draw streets with intersections where two or more roads cross. She should add traffic lights and signs (stop, right turn only, yield, speed limit) as needed.

Using toy cars and people, let your youngster demonstrate how her traffic system would work. Is it safe for pedestrians and cars? Pose questions, such as "What happens when several cars need to turn left here?" Using what she learns, she can redesign her roads for safety and better traffic flow.

Measure while you cook



Pick something to cook or bake with your child, and see what kind of measuring magic unfolds with questions like these.

● **When should we start?** Have your youngster read through the recipe and estimate the prep time. She can add that to the cooking time to tell you when you need to begin. For example, if you want to eat at 6 p.m., she might figure out: "30 minutes of prep + 45 minutes of cooking = 1 hour 15 minutes, so we should start at 4:45 p.m." Then, when you put the dish in the oven, she could note the time, set the timer, and say when it will be done. She'll be learning about *elapsed time*—as well as helping you make dinner!

● **Which measurements are the same?** As you cook, let your child explore different ways to measure ingredients. If you need a cup of milk, ask how many ounces that is (8). *Tip:* Liquid measuring cups have hash marks for ounces. When you need $\frac{1}{4}$ cup of flour, suggest that she measure it in tablespoons (she'll find that 4 tablespoons = $\frac{1}{4}$ cup). Encourage her to work out other measurements, such as 3 teaspoons for each tablespoon. She'll get more familiar with measurement equivalents and also be more comfortable in the kitchen.

PARENT TO PARENT

Math at work

One day my daughter looked up from her math homework and said, "Dad, I know this stuff pretty well, but I'm going to grow up to be an author, so I'm never going to use it."

I thought about her comment and said, "Emily, why don't we conduct a survey? Let's find five grown-ups who all have different jobs. You can ask them each how they use math in their work."

Emily thought that sounded interesting. She asked our friends and family members: a doctor, a builder, a singer, a graphic designer, and a receptionist. She was surprised they all used math—for example, calculating proper doses, cutting wood, understanding contracts, figuring out how to size images, or deciding how much paper to order. Now it's become a game for us when we're out to guess how someone is doing math on the job!

OUR PURPOSE

To provide busy parents with practical ways to promote their children's math and science skills.

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MATH CORNER

Fractions of fun

Understanding fractions is much easier when your youngster can visualize them. Here are ideas to help him see—and use—fractions.

Keep a diary

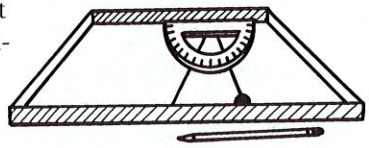
Show your child that fractions are a part of everyday life. For a week, have him record and illustrate each fraction he notices. For instance, he might write, "We had a half day of school today," or "Mom asked for $1\frac{1}{3}$ pounds of turkey at the store." How many examples can he find and draw?

Put in order

Together, make a set of fraction cards, writing one fraction per index card ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2). Shuffle the cards, and see how quickly your youngster can put them in order. Or while he closes his eyes, lay the cards in order but leave out a few. Give him the missing cards, and have him put them where they go.

SCIENCE LAB

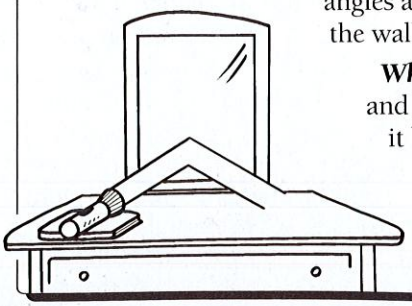
Follow the bouncing light



Can your child predict what light will do when it's reflected off a mirror? Comparing it to a bouncing ball will help.

You'll need: ball, box, pencil, protractor, flashlight, wall mirror

Here's how: Let your youngster roll the ball inside the box so it bounces off a side. With a pencil, he can mark the path he observed. Have him use the protractor to measure the angles the ball made going toward and away from the side. Then, in a darkened room, ask your child to shine the flashlight on the mirror at different angles and, each time, watch where the light reflects on the wall.



What happens? The ball hits the side of the box and bounces off at the same angle. For instance, if it hits at a 20-degree angle, it will bounce off at a 20-degree angle. When light reflects, it behaves the same way—reflecting off the mirror *(angle of reflection)* at the same angle at which it arrived *(angle of incidence)*.