Math+Science Connection

Building Understanding and Excitement for Children

Open-door angles

Doors in your house are the perfect place for hands-on practice with angles. Take turns opening or closing a door and asking, "Acute, right, or obtuse?" Partially open a door, and it's an acute angle. Open it straight out, and it's a right angle. Open it wider, and it's obtuse.

Habitat for rent

Help your child think about what animals need to survive (shelter, food, water). Then, have her choose an animal (monkey) and write a classified ad for a home that will meet its needs. *Example:* "Tall tree in a tropical rain forest. Large river nearby for drinking. Plenty of leaves, fruit, and insects to eat."

Book picks

❏ *The Man Who Counted: A Collection of Mathematical Adventures* (Malba Tahan) combines an adventure story with interesting math puzzles.

❏ Learning about the solar system is fun when planets tell the story themselves. Dan Green's *Astronomy: Out of This World!* contains fascinating facts and details along with cartoon illustrations your youngster is sure to love.

Just for fun

Q: What has three feet but no legs or arms?

A: A yard. ·
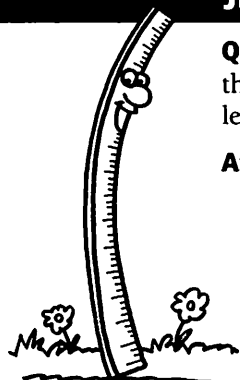
Fractions of fun

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

Keep a diary

Show your youngster that fractions are a part of everyday life. For a week, have her record and illustrate each one she notices. For instance, she 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 she find and draw?

Play a game

Have each player cut a sheet of construction paper into six horizontal strips. She should leave the first one whole and then cut the second one in half (fold it, and cut along the fold), and the others into thirds, fourths, sixths, and eighths. With bits of masking tape, label a die: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, $\frac{1}{8}$, and "wild." To play, roll the die, and lay the matching piece of paper on your whole strip (for "wild," choose any piece). The goal is to be the first one to fill your strip without overlapping any pieces (*example:* $\frac{1}{2}+\frac{1}{4}+\frac{1}{4}=1$ whole strip).

Put in order

Together, make a set of fraction cards, with 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 child can put them in order. Then, while she closes her eyes, lay the cards in order but leave out a few. Give her the missing cards, and have her put them where they go. 🐟

Look at me!

Help your youngster learn about the science of *optics* with this mealtime activity.

Have him look at himself in a clean spoon. What happens if he looks in the bowl of the spoon? (He's upside down.) What happens on the other side? (He's right side up.)

Next, have him bring his finger toward the spoon and watch what happens on each side. The bowl (the *concave* side) will magnify his finger, or make it look larger. The back (the *convex* side) will make his finger look smaller. Ask your child how scientists might use this information to make eyeglasses, cameras, or telescopes.

Tip: He can remember which side is which by thinking of concave as "caves in." 🐟
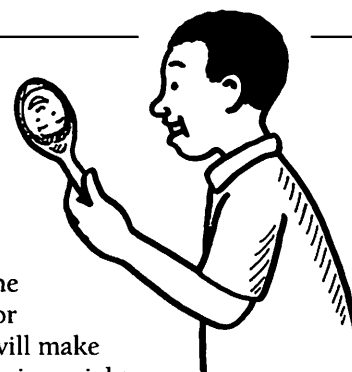
Multiply and divide

Learning to multiply and divide can be more about *thinking* than memorizing. Strategies like these will help your youngster practice.

Make it fun. If your child collects toy animals, you might ask, "How many legs do 4 horses have?" He can *skip count* the legs by 4s (4, 8, 12, 16) to see that 4 x 4 = 16. Or if he has friends over and wants to divide 17 pretzels equally among 3 people, he can "deal them out." He'll see that each person gets 5, and there are 2 left over. (17 ÷ 3 = 5, remainder 2)
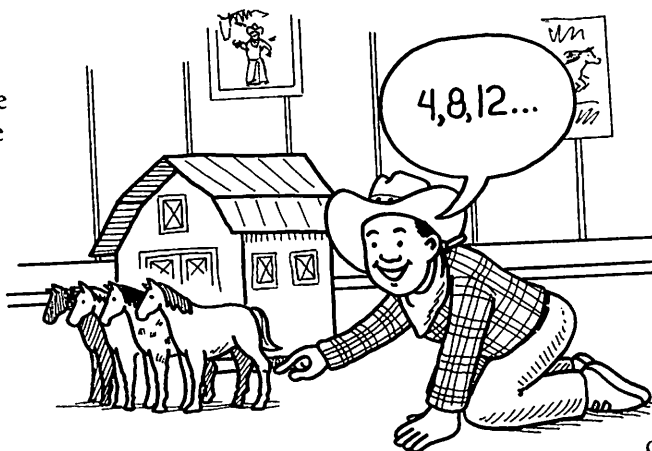
Use what you know. Encourage your youngster to look for clues to help him solve problems. For 8 x 7, he could consider other math facts he knows. "I know 4 groups of 7 = 28. I need 8 groups, so I can double that answer. If 28 + 28 = 56, then 8 x 7 = 56." For 30 ÷ 5, he might say, "I know 10 ÷ 5 = 2. There are three 10s in 30, and 3 x 2 = 6. So 30 ÷ 5 must be 6." 🎲

Q&A Talk up math

Q: *I've never felt comfortable with math. How should I talk to my child about what he's learning in math class?*

A: Try to show enthusiasm for what your youngster is doing in math. You might ask him each day at dinner or homework time what he studied in math that day. Let him explain the concepts he's working on, and follow up with questions. For instance, if he's learning about decimals, you could ask how decimal points are used in money (they separate the parts of a dollar from the whole dollar).

Then, when your child finishes his homework, have him show you how he solved a few problems. As he explains his methods to you, he'll be reinforcing his own skills. And he'll be proud to be teaching you something! 🎲

MATH CORNER Measuring volume

Which popcorn container does your youngster want at the movies? Have her do this activity to find out!

Ask her to roll two index cards into cylinders—one vertically and one horizontally—so the edges just touch, and tape them closed. One cylinder will be tall and skinny, and the other one short and wide.

Then, have her predict how many (same-size) marbles each tube could hold. Will the totals be the same? To test her prediction, let her fill each tube with marbles and count. How can she explain the result?

Your child may be surprised to find the shorter, wider cylinder holds more. That's because the radius of a cylinder has a greater effect on its *volume*—the amount of space inside a 3-D object—than its height does. So when she's ordering popcorn, she might prefer the shorter, wider cylinder to the taller, skinnier one! 🎲
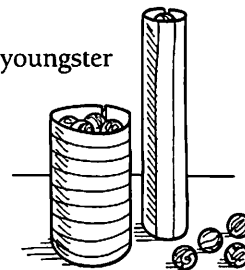
SCIENCE LAB Where did the green go?

This experiment uncovers a surprising fact: When leaves change color in the fall, it's really the green going away and the colors that were there all along coming out.
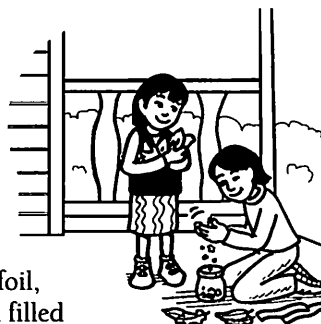
You'll need: green leaves, small jar, rubbing alcohol, wooden spoon, foil, small bowl, water, coffee filter, scissors

Here's how: Have your child tear the leaves into the jar, cover with alcohol, and mash with the spoon. Seal with foil, and place the jar in a bowl filled with hot water. After 30 minutes, she should cut a strip from the coffee filter, remove the foil, and dangle the filter into the alcohol. Let it sit for an hour.

What happens? Lines of different colors will travel up the filter.

Why? Green leaf color comes from the chemical *chlorophyll*, which helps make food for trees in spring and summer. In fall, chlorophyll is no longer produced, so the hidden colors (yellow, orange, red) can be seen. 🎲