Intermediate Edition

Math+Science Connection

Building Understanding and Excitement for Children

November 2011

District School Board of Pasco County
Title I

INFO BITS

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.

Science happenings

Let your youngster see how science relates to his world with this everyday idea. Designate a kitchen bulletin board or refrigerator spot for "Science News." Then, have family members post newspaper or online articles about science (hybrid vehicles, medical advances, nanotechnology). Encourage everyone to read them, and discuss the news at dinner.

Book picks

Let a cat lead your youngster on a journey through math. Along the way, he'll learn new concepts and practice solving problems in *The Adventures of Penrose the Mathematical Cat* (Theoni Pappas).

Inspire interest in astronomy with *The Kids Book of the Night Sky* (Ann Love, Jane Drake). Your child can read about stars and look at pictures—and then go outside to see them for real.

Worth quoting

"Science is the torch that illuminates the world." *Louis Pasteur*

Just for fun

Q: What flies without wings, propellers, or jets?

A: Time.

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 her 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." Or she could note that you drove $\frac{6}{10}$ mile on the highway or used $\frac{3}{4}$ cup flour in a recipe. How many examples can she find?

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 the whole strip (for "wild," choose any piece). The goal is to fill the strip without overlapping any pieces (*example:* $\frac{1}{2} + \frac{1}{4} + \frac{1}{4}$).

Practice with words. This is a fun way for your child to work on fractions—and learn her spelling words. Each week, have her list her words on a sheet of paper. Then, ask her to highlight the vowels in one color and the consonants in another. Let her figure out the fraction of vowels and consonants in each word—and in the total list. *Idea:* Have her compare the fractions.

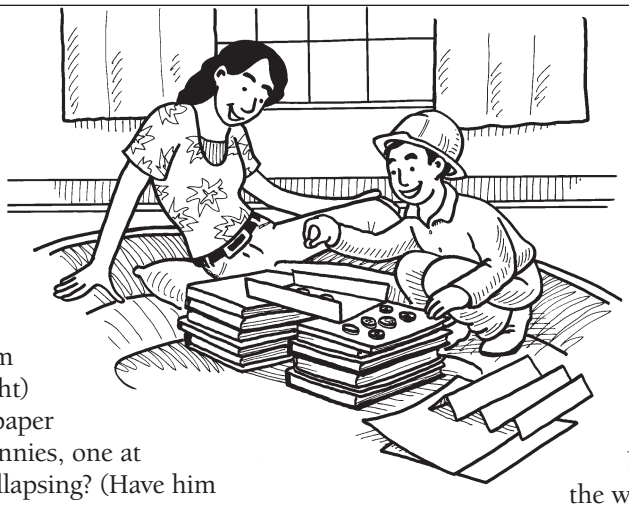
Fish detective

Did you know that buying fish for dinner can help your youngster learn more about animal life? When you're in the grocery store or fish market, have him look carefully at the whole fish displayed, and consider these questions:

- Which are the fastest swimmers? (*Hint:* Look at the shape of the body, fins, and tail.)
- Which ones eat plants? Which ones eat other fish? (*Hint:* Look at the size and shape of the mouth and teeth.)
- How can they hide from predators? (*Hint:* Fish with flat or long, skinny bodies could hide under rocks or in caves. Ones with lighter bottoms and darker tops can blend into the top or bottom of the water.)

Idea: Your youngster can confirm his findings with the fishmonger or by making sketches, taking notes, and consulting books or websites later.

Building bridges



When you're driving across a bridge, ask your child why he thinks it can support your car. Then, help him find out by designing and testing his own bridges at home.

The challenge? To build the strongest bridge possible—out of paper! Have him place two stacks of books (of equal height) about 6 inches apart and lay a sheet of paper across. To test his bridge, he can add pennies, one at a time. How many will it hold before collapsing? (Have him record the number.)

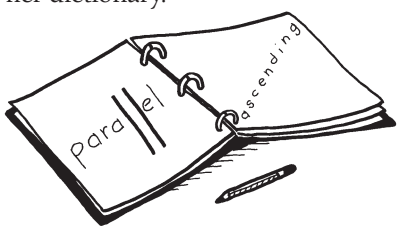
Next, he can experiment with ways to make his bridge stronger. He might bend the paper, roll it, fold it accordion-style, or turn up the sides to make walls. Or he could try different thicknesses by using two, three, or four sheets of paper. With each new design, have him test how many pennies it will hold.

You might explain that when engineers design a bridge, they test its *load*—or the weight of the structure plus the weight it must support—until it fails. Then, they analyze why it failed so they can improve the design and build the strongest structure possible.

Q&A The language of math

Q: *My daughter seems to get math words mixed up. Are there ways we can help her at home?*

A: Definitely! You might start by working together on a clever dictionary where the letters illustrate the math word. For example, she could make the double *l* in *para**ll**el* stand out as parallel lines. Or you could write *ascending* with the letters going up and *descending* with the letters going down. As your child learns new math concepts, she can add pages to her dictionary.



Or set out an envelope labeled "Math Word of the Day." Each day a different family member can put an interesting word (*polygon, quotient)* inside the envelope and then use the word during dinner. After dinner, everyone else writes down what they think the word is and what it means. Did everyone get it?

OUR PURPOSE

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

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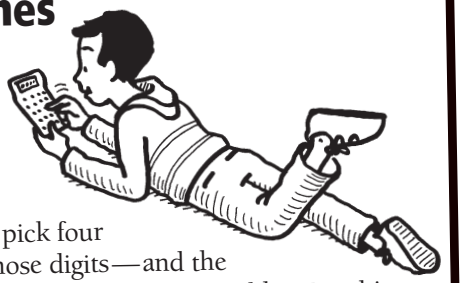
MATH CORNER Calculator games



Your child may already use a calculator to divide numbers or check his homework answers. But he can also use it to play games that will build math skills. Suggest these ideas.

Combine numbers. Ask your youngster to pick four numbers (1, 3, 6, 7). The object is to use those digits—and the operations on the calculator—to make as many numbers as possible. Have him list 1–100 on a sheet of paper and write the equation he comes up with next to each number ($1 = 7 - 6$, $2 = 6 \div 3$, and so on). When he can't make any more numbers, he can try another set of four digits. Which set produces the most?

Cross over. In this two-player (and two-calculator) game, one person starts at zero and adds numbers. The second player starts at 100 and subtracts numbers. To play, take turns punching in any single-digit number you choose and saying the equation ($100 - 7 = 93$). The first one to pass the other person's number by exactly 1 wins that round. Next time, switch the starting numbers.

SCIENCE LAB Spinning around

Whirlpools and tornadoes are forces of nature that might seem mysterious to your youngster. This experiment will teach her about a *vortex*—the whirling mass that is a whirlpool in water or a tornado in the air.

You'll need: water, large mug, food coloring, spoon, ice cube

Here's how: Run tap water until it is very hot. Supervise as your youngster carefully fills the mug with hot water. Have her add a few drops of food coloring (this lets her see the water's movement better). Using the spoon, she should stir the water slowly in one direction until the water is rotating. Then, let her place an ice cube in the center.

What happens? The ice cube should start to spin faster until eventually it is spinning even faster than the water around it.

Why? This experiment creates a vortex. As the ice melts, the water under it sinks, and warmer water from the top is sucked in. This causes the ice cube to spin faster.