



Math+Science Connection

Building Excitement and Success for Young Children

March 2013

Sweetbriar Elementary School



TOOLS & TIDBITS

Make the number

Write a number at the top of a page. Underneath, have your child represent the number in as many ways as possible. For a younger child, you might use 4. He could draw 4 basketballs, make 4 dots, or write $2 + 2$. For an older child, write a double-digit number like 18. Then, he might list $9 + 9$, $20 - 2$, or $3 \times 4 + 6$.

Science tool kit

Having her own science kit can encourage your youngster to explore her world. She could label a shoe box or plastic container ("Mia's Science Kit") and include paper, pencils, crayons, a magnifying glass, binoculars, a ruler, a compass, and a magnet. Together, add a list of activities to try (observe a caterpillar and draw its picture, find five magnetic objects).

Book picks

▣ What makes teams equal? Read *Equal Shmequal* (Virginia L. Kroll) to help your child find out.

▣ *Will We Miss Them? Endangered Species* (Alexandra Wright) will fascinate your youngster—and so will the fact that it was written by an 11-year-old girl. (Also available in Spanish.)

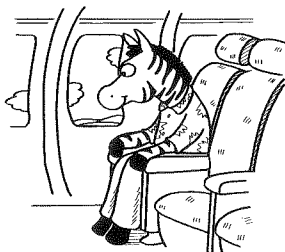
Worth quoting

"It is little by little that a bird builds its nest." *Nigerian proverb*

Just for fun

Q: How do you get a zebra to fly?

A: Buy it an airline ticket.




Let's do algebra!

Algebra for little ones? Why not! With these ideas, your child will enjoy playing with math—and get an early start on the road to algebra.

Pattern tube. Algebra involves number patterns and predictions. Try this: Link together Lego blocks in a pattern (*example*: red, red, yellow, green, red, red, yellow, green). Slide the stack through an empty toilet paper roll, revealing one block at a time to your youngster. When she thinks she knows the pattern, ask her to predict the next four colors. Was she right? Then, let her make a pattern tube for you.

Bag of 10. Have your child put 10 small items (dice, game pieces) in a bag. Take a handful, and say, "I have 6 pieces. How many are still in the bag?" She can count the objects to see if her answer is correct. Then, help her write the equation formed ($10 - 6 = 4$). You can play other ways, too. Tell her how many pieces are left in the bag (7)—this time she has to say the number in your hand (3). Or take a

handful and say, "I'm not sure how many I have." She can count the pieces in the bag (2) and tell you how many are in your hand (8).


Sticky equations. Cut a piece of construction paper into strips. On each one, write an equation, such as $12 + 5 = 17$. Cover one number (5) with a sticky note, and ask, "What number is underneath?" Your youngster might think, "How many more is 17 than 12?" She could count ("13, 14, 15, 16, 17") to find the answer (5). Take turns putting sticky notes on equations and figuring out the hidden number. 

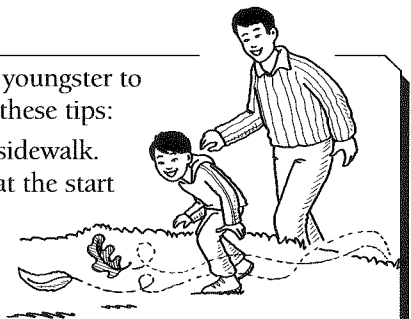
Wind power

On a windy March day, go outside with your youngster to discover—and enjoy—this force of nature. Try these tips:

- Mark a start and finish line on the grass or a sidewalk. Then, each of you can pick up a leaf and put it at the start line. Have your child watch to see how wind gusts carry the leaves through the air. Whose leaf will win the race?

- Let your youngster gather objects outside, such as an acorn, a pebble, a blade of grass, and a pinecone. When the wind kicks up, he can toss them into the wind. Which one goes farthest? What does he think makes the difference (size, shape, weight)?

Idea: Discuss how wind can be used for energy. For instance, wind carries sailboats across water. 

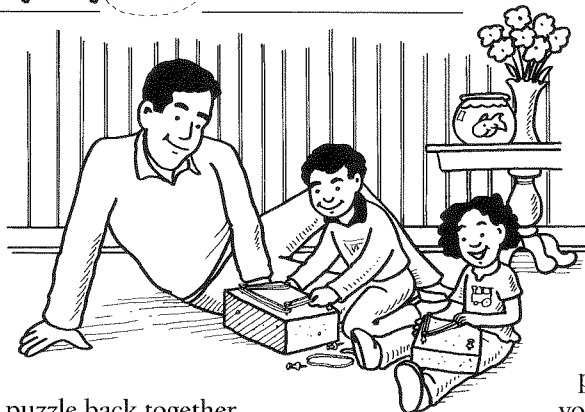


Super shapes

From mealtime to playtime, you can make geometry a fun part of your youngster's day. Here's how.

Mealtime

Jigsaw puzzles teach spatial reasoning and problem solving. Cut your child's sandwich or quesadilla into puzzle pieces, and mix them up on a plate. His challenge is to put the puzzle back together before eating! Or let him make shapes out of his food. He



might cut a slice of cheese into a circle or roll a piece of deli meat into a cylinder. Ask him to name and describe the shapes he forms. *Example:* "This is a circle. It doesn't have any sides or corners."

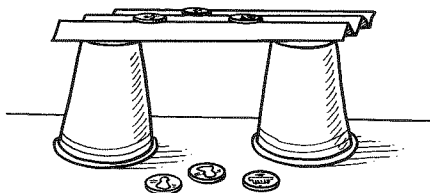
Playtime

For this activity, you'll need a Styrofoam block (from a craft store), push pins, and rubber bands. Help your youngster create a triangle by putting three push pins into the cube and looping three rubber bands around them—one for each side of the triangle. Can he make a rectangle (four pins and four rubber bands)? The pins will be the vertices (corners), and the rubber bands will be the sides. See how many different shapes he can make.

SCIENCE LAB Building bridges

Let your child practice the basic steps of engineering—design, build, test, and redesign—as she tries to make a stronger bridge.

You'll need: 2 plastic cups, paper (cut in half lengthwise), ruler, pennies



Here's how: Have your youngster turn the cups upside down (5" apart) and lay the paper across them. Ask how many pennies she thinks she could put on the "bridge" before it falls down. Then, she can place them, one at a time, and count the number. Suggest that she fold paper different ways and test its strength. For instance, she might fold paper accordion-style, fold it in half, or fold up the sides. She could also use more pieces of paper or change the distance between the cups.

What happens? Different designs will hold different numbers of pennies.

Why? The design of a structure affects its strength. *Idea:* Ask your child why she thinks one design is stronger or weaker than another.

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Resources for Educators,
a division of CCH Incorporated
128 N. Royal Avenue • Front Royal, VA 22630
540-636-4280 • rfeustomer@wolterskluwer.com
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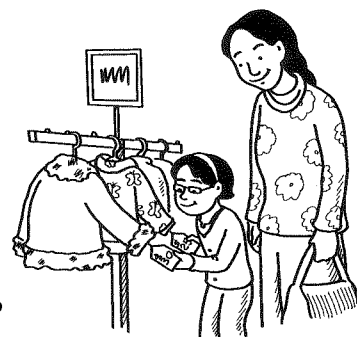
Q & A Good at math

Q: My daughter says she's just not good at math. Is it true that some kids are good at math and some kids aren't?

A: That is a common belief, but no, it really isn't true. And interestingly, studies show that we're usually "good" at the things that we think we're good at. So confidence can have a lot to do with how children perform in school subjects.

Give your child lots of opportunities to use math successfully. At the store, have her compare prices—show her two price tags, and ask which item costs more. Let her be the scorekeeper for games. Have her measure ingredients when you cook. You can boost her confidence by saying, "See, you can do math!"

Also, show an interest in her math schoolwork. Look over papers she brings home. Ask her to explain how she got her answers for math homework. By supporting her, you'll show her that you think she's good in math, and then she's likely to think so, too.

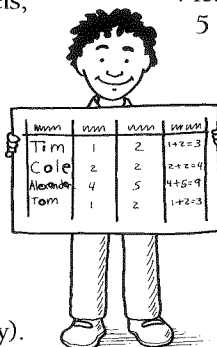


MATH CORNER Names and numbers

When are vowels and consonants a way to build math skills? When your child uses them to count and add. Follow these steps.

1. Help your youngster make a chart with four columns: Name, Vowels, Consonants, Number Sentence.

2. He can write his name and the names of friends or family members down the first column. In each name, have him highlight the vowels in one color and the consonants in another color. *Hint:* Make sure he knows which letters are vowels (a, e, i, o, u, and sometimes y).



3. Ask him to count the number of vowels and consonants in each name and record them. Then, he should write the number sentence adding up the total letters in each name. For example, Cole has 2 vowels and 2 consonants, so $2 + 2 = 4$ letters. Alexander has 4 vowels and 5 consonants, or $4 + 5 = 9$ letters.

4. Let him look at his sheet and make comparisons. Which name has the fewest vowels? The most consonants? Which name has the most letters?

Tip: For practice with bigger numbers, he could use last names, too.

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INFO BITS

Storytime = math time

Read books together, and turn the plots into math problems. For *The Three Little Pigs*, you could talk about how many bricks the pig would need and how much they would cost. Or figure out how he could raise the money. *Example:* If the pig earns \$5 an hour, how many hours would he have to work to pay \$100 for bricks?

Making mountains

Have your youngster overlap two sheets of construction paper and spread sand (or dirt) over the seam. Holding down the top sheet with one hand, he should slowly push the other sheet underneath. What happens to the sand? (It will start to mound.) He has just demonstrated how underground movements help form mountain ranges over time.

Book picks

With clever stories and comic-style drawings, *Fractals, Googols, and Other Mathematical Tales* (Theoni Pappas) teaches various math concepts.

Awesome Ocean Science (Cindy A. Littlefield) includes at-home activities and fascinating facts about the underwater world.

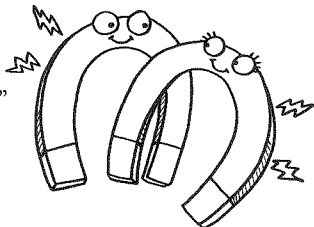
Worth quoting

“Get outside every day. Miracles are waiting everywhere.” *Regina Brett*

Just for fun

Q: What did one magnet say to the other?

A: “I find you very attractive!”



Estimate first

Making estimates can keep your youngster from giving the wrong answer on math homework or tests. That’s because if he estimates first and then his answer is wildly different, he will know something is wrong.

But becoming a good estimator takes practice! Try these ideas.


Change. Let your child pay for purchases and estimate how much change he should get back. Say he’s buying one item for \$5.95 and another for \$3.25 and gives the cashier \$20. He could think, “\$6 + \$3 = \$9,” and estimate that he’ll get \$11 back. If the cashier hands him \$1, he’ll realize there’s a mistake.

Strategies. Encourage him to try different methods for different problems. He might round numbers (rather than $293 + 421$, he could add $300 + 400$). Or he could group pairs of rounded numbers. If he’s adding $\$9.30 + \$3.25 + \$12.97 + \8.99 , he can group the first two ($\$9 + \$3 = \$12$) and the last two ($\$13 + \$9 = \22). Then, he would



add $\$12 + \$22 = \$34$, which gives him a good idea of the actual total (\$34.51).


Calculator. Estimating can alert your youngster to typing errors. For 80×56 , he might estimate that he’ll get a 4-digit number ending in zero. If he sees 448 instead, he’ll know he typed 8 instead of 80. Suggest that he take his estimation a step further and estimate the first digit (4, since $8 \times 5 = 40$). Then, if he gets 2,800, he would know it was wrong.

Tip: Point out that the goal of estimating is not to find the exact answer—but to get one that is reasonable. 

Investigate advertising claims

Does your child believe everything she sees on commercials or reads in ads? Let her put on her scientist “hat” to figure out if a product “really does that!”

First, have her choose an advertising claim to test. Maybe a detergent promises to remove lipstick stains or a chewing gum’s flavor is supposed to “last longer.” She can set up an experiment, record the data, and decide if the statement is true.

To test the detergent, for instance, she might rub lipstick on an old T-shirt and then wash it. Did the stain come out? For the chewing gum, she could chew several brands and time how long the flavor lasts. As she conducts these experiments, she’ll practice science skills—and learn to be a smart consumer. 



Math Jeopardy

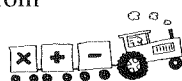
Usually, your child has to give the answers to math problems. With this Jeopardy game, she sees the answers and has to come up with the questions!

Start by making a game board together. Divide a poster board into 24 boxes (four columns and six rows). In each top box, write a math category: Addition, Subtraction, Multiplication, and Division. Then, put a random number in each square, choosing an assortment of 1-digit, 2-digit, 3-digit, or larger numbers. Finally, cover each number with a sticky note and assign dollar values from \$100 to \$500 down each column.



To play, take turns selecting a category and a box (“I’ll take Division for \$200”). The contestant has to make up a math problem using the number that’s uncovered (for 27, she might say, “ $27 \div 3 = 9$ ”). If her math is correct, she keeps the sticky note; if not, it goes back on the board. Continue taking turns until all the notes are removed. Add up your dollar amounts—the high score wins.

Note: Each box could have several correct problems. For another way to play, have contestants name two or three ways to use the number in the box. 📦



Q & A Prove it!

Q: In school, my daughter has to “prove” that her math answers are right. How can I help her work on that at home?

A: Proving answers is an important way for your child to understand her “math thinking.” At this age, children may say they “just knew it.” But to move on to higher math skills, they need to know the steps they’re taking to find the answers.



When your daughter does math homework, ask her to prove a few answers to you. She could explain out loud what she did in her head. Or she might draw pictures or use objects to act out the problems.

Another idea is to use “math buddies.” She and a friend could do the same problem and then explain to each other how they solved it. Your child will see that people can use different strategies to get the same answer, which will help build her math thinking as well. 📦

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Resources for Educators,
a division of CCH Incorporated
128 N. Royal Avenue • Front Royal, VA 22630
540-636-4280 • rfeustomer@wolterskluwer.com
www.rfeonline.com

SCIENCE LAB

Hot and cold

Your youngster might make hot chocolate with cocoa powder or a cold drink with orange-flavored granules. Let him conduct this experiment so he can learn what happens as he stirs.

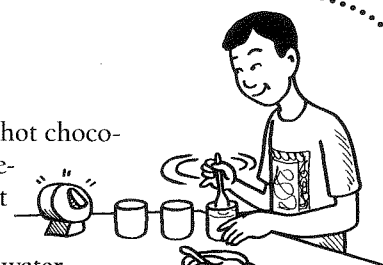
You’ll need: 3 glasses (all the same size), sugar, water, spoon, timer (a watch with a second hand or a cell phone app)

Here’s how: Have your child fill the first glass $\frac{2}{3}$ full with very cold water and add 2 heaping tsp. sugar. He should stir until the sugar dissolves, timing how long it takes. Next, he can fill another glass $\frac{2}{3}$ full with room-temperature water and follow the same procedure. Finally, help him carefully fill the last glass $\frac{2}{3}$ full with very hot water and repeat the experiment.

What happens? The hotter the water, the faster the sugar dissolves.

Why? Water and sugar, along with everything else in the universe, are made of particles that are constantly moving. Certain solids will dissolve in liquids and form a *solution*. Warmer water has more energy, so the particles move around faster and mix together more quickly.

Idea: Try the experiment with other materials, such as salt or baking soda. Do the results change? 📦



MATH CORNER

It’s a match

Guess what’s hiding in your child’s sock drawer? A fun math activity.

Put two black socks and two white socks in a bag, and ask him how many socks he would need to pull out to be guaranteed a pair. (The answer is 3.) Next, add two red socks. How many would he have to take out now to be assured a match? (4) And if you added two green socks? (5)

He will have to problem-solve to make his predictions. Suggest that he lay out two pairs of socks and pull one from each—and then pull one more sock. He will see that the third sock would make a match. What happens if he lays out three pairs and tries again?

After he does this with various numbers of pairs, ask if he can figure out the math rule that will solve the problem every time (divide the total number of socks by 2 and add 1). 📦

