Intermediate Edition

Math+Science Connection

Building Understanding and Excitement for Children

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Frog Pond Math and Science Connection
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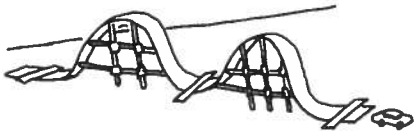
INFO BITS

What's my problem?

"The answer is 7 elephants. What's the question?" Give your youngster an answer, and she has to come up with an addition, subtraction, multiplication, or division problem for it. *Example:* "If 350 elephants are divided evenly in 50 herds, how many are in each herd?" Now, let her pose an answer for you.

Roller coasters and bumper cars

Suggest that your young engineer design his own amusement park. He



could start by dreaming up rides and drawing a layout of where they would go. Let him use his math and science skills, along with household items like building toys, cardboard, and straws to create models of the rides.

Web picks

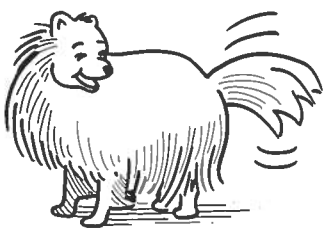
Your child can test her math knowledge with quizzes sorted by grade level and topic at *aplusclick.com.*

Help the monkey find the bananas! At *playcodemonkey.com*, your youngster will get step-by-step guidance through beginning computer programming.

Just for fun

Q: Why did the dog wag its tail?

A: Because no one would wag it for him.



Hooray for arrays

Arrays—or objects organized into rows and columns—are the perfect tool for visualizing multiplication. Try these ideas.

There's one!

Around the house or running errands, be on the lookout for arrays. Your youngster might point out drawers in a cabinet, snacks in a vending machine, or soup cans stacked at the store. Which array has the most items? He can figure this out by counting the rows and columns and multiplying those numbers together. A vending machine, for example, may have 6 rows and 7 columns and hold 42 snacks (6 x 7 = 42).

Either way

Have your child draw a skyscraper with an array of windows. If his building has 20 rows and 5 columns, there would be 100 windows (20 x 5 = 100). Next, let him draw a low-rise building, swapping the number of rows and columns. With 5 rows and 20 columns, he'll still have 100 windows (5 x 20 = 100). This illustrates the *commutative property*, which states that the order of the multipliers doesn't matter.

Robot in action

With graph paper and scissors, your youngster can create an "array robot." He should cut out an array of squares for each body part and label it with its multiplication problem. For instance, if the body is 10 rows by 4 columns, he would write "10 x 4 = 40." Let him join the parts with brass fasteners and hang up his moving robot. *Idea:* Have him add all the *products* (answers) together. He'll learn how many squares are in his robot.

Ramp it up

How can something simple help you do more work with less effort? Let your youngster make an inclined plane, one type of *simple machine*, to find out.

Have her lift a bulky toy (say, a doll house) to the height of a chair's seat. Then, help her prop an ironing board against the seat and push the doll house up.

Suggest that your child measure the seat's height and the ramp's length. She'll realize that while she had to move the toy a longer distance up the ramp, it was easier than lifting it—because less force was needed. And that is why moving trucks have ramps!

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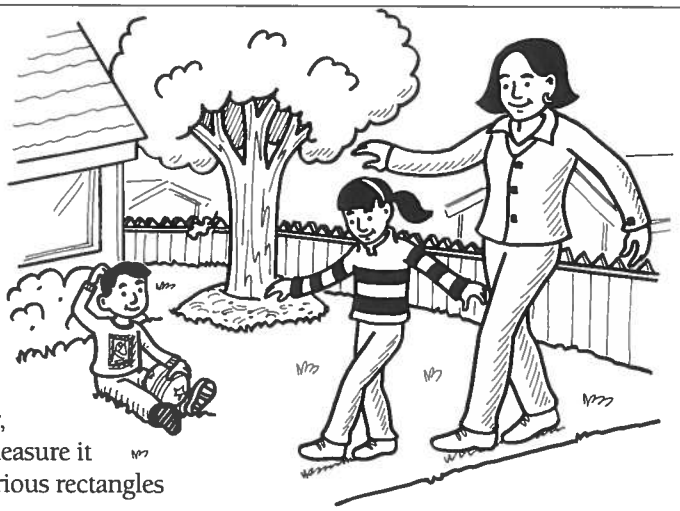
Perimeters in the real world



Encourage your child to explore *perimeter* (the distance around an object) with these strategies.

● **Books.** Have your youngster wrap a piece of string around the four sides of a book and cut to fit. To find the perimeter, she should lay the string flat and measure it with a ruler. Then, let her make various rectangles from the string. For example, the perimeter for an 8″ x 10″ book is 36″. She could make a 7″ x 11″ rectangle or a 9″ x 9″ one—and the perimeter will still be 36″! Are there any other rectangles with a perimeter of 36″?

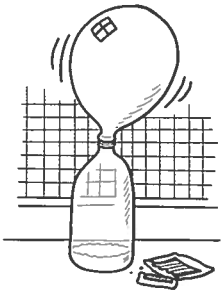
● **Yard or playground.** Starting at one corner, ask your child to walk heel-to-toe around the edges, counting each footstep until she ends up where she started. Her final count is the perimeter (in footsteps).

● **Rooms.** Using a measuring tape, your youngster can determine the length of each wall in her bedroom. Adding the numbers together will give her the perimeter.

SCIENCE LAB Full of hot air

There's more than one way to blow up a balloon! With this experiment, your child will create a chemical reaction that inflates a balloon on its own.

You'll need: water, empty plastic bottle, packet of yeast, 1 tsp. sugar, balloon



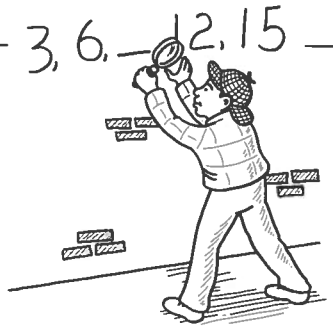
Here's how: Have your youngster pour 1 inch of very warm water in the bottle. Then, he should add the yeast and sugar and swirl it all together. Help him stretch the balloon and place its lip over the neck of the bottle. Let it sit for 20 minutes.

What happens? The balloon inflates.

Why? The yeast becomes an active organism that feeds on the sugar. *Carbon dioxide* is released, and the gas fills up the balloon.

Idea: Your child could repeat the experiment with cold water and with room-temperature water. How do the results change? Why would the water temperature affect the outcome?

MATH CORNER Pattern detective



Recognizing patterns will give your youngster practice in mathematical thinking. Ask him to put on his detective hat with this fun activity.

1. Think of a pattern (add 3). Write out numbers in the pattern, leaving one blank (3, 6, _, 12, 15).

2. Now your young detective has to collect clues about the missing number. He might think, "Each pair of numbers is 3 apart." Using his clues, he'll recognize the pattern as "add 3" and the missing number as 9.

3. Now, have him use his detective skills to determine the 10th number in the pattern (30) or the 20th (60). Ask him to explain how he figured it out.

4. Take turns posing more patterns. *Ideas:* Try ones with several steps, such as 4, 16, 52 (multiply by 3, then add 4). Or start with a number other than 0.

PARENT TO PARENT I'll draw the line at that!

My daughter Ruby enjoys geometry, but some terms confused her. Mr. Gregg, her math teacher, suggested this simple game.

The object is to create a drawing with at least one line, line segment, ray, and point. To make our game, we wrote "point (•)" on 10 index cards, and on 5 cards each, we wrote "line (↔)," "line segment (•—•)," and "ray (•→)." Then, we shuffled the cards and stacked them facedown.

The first player chooses a card and draws that item on her paper—if she can. That's because to draw a line segment or a ray, the player needs to already have one or two points on her paper! We keep taking cards and adding to our pictures until someone has drawn them all.

Ruby loves the game, and the more we play, the more comfortable she seems with the terms.

OUR PURPOSE

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

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