

Math+Science Connection

Intermediate Edition

Building Understanding and Excitement for Children

February 2011

Giles County Title I



INFO BITS

World records

World records offer a fun way for your youngster to compare numbers. Encourage him to look up records that interest him (the speed of the fastest animals, the length of Olympic-winning long jumps). Then, help him set his own records by timing his speed for running a block or measuring his jumps.

Observing trees

Encourage your youngster to observe bare trees this winter. She can notice the shape and angle of the branches in different kinds of trees. Have her sketch her favorite tree and keep the drawing. In the spring, summer, and fall, she can sketch the same tree—she'll have a record of one tree's annual cycle.

Web picks

Your youngster can play math games involving counting, geometry, fractions, graphing, and more at <http://math.rice.edu/~lanius/Lessons>. Some games are available in Spanish, too.

Inspire your child to learn more about astronomy, genetics, and other science fields. At www.iwaswondering.org, she can explore the work of 25 women scientists and even submit questions for scientists to answer.

Worth quoting

"Every experiment proves something. If it doesn't prove what you wanted it to prove, it proves something else."
Anonymous

Just for fun

Q: Why isn't your nose 12 inches long?

A: Because then it would be a foot.

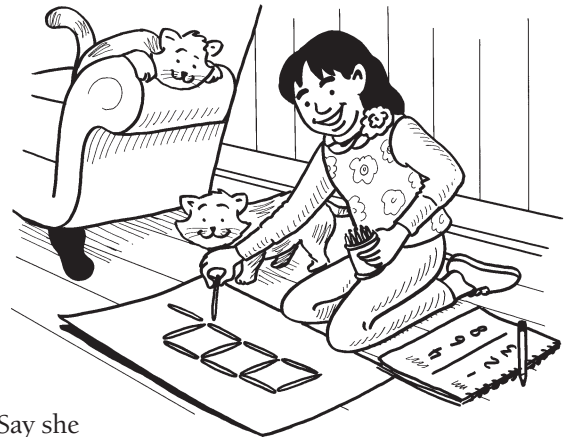


The road to algebra


Algebra opens the door to many exciting math concepts as your child gets older. Encourage her to start building early algebra skills now with these ideas.

Predict patterns. Learning to recognize and predict patterns will help your youngster think algebraically. Ask her to make an "even/odd" pattern, such as alternating two colors of Lego blocks (red, yellow, red, yellow). Say she lines up 12 blocks, starting with red. Ask her what color the 19th block will be. The 20th? The 100th? What pattern does she notice?

Find relationships. Encourage your youngster to think of connections between two groups. For example, show her a box of 8 crayons. What's the relationship of the crayons to the box? (8 crayons = 1 box) How many crayons would there be if she had 7 boxes? (8 crayons x 7 boxes = 56 crayons) Encourage her to describe the "rule" for this algebra problem ("If there are




8 crayons in a box, $8 \times$ the number of boxes = the total number of crayons").

Build reasoning. Have your child use toothpicks to make a "train of squares." She should form four toothpicks into a square and add three toothpicks for each new square. As she goes, she can keep a two-column chart with the number of squares (1, 2, 3) and the number of toothpicks on the perimeter, or around the outside edge (4, 6, 8). What would the perimeter be for a 10-square train or a 25-square train? *Hint:* She can use her chart to find the pattern ($2 \times$ number of squares + 2) and figure out the answers (22, 52). 

Circle power

Does your child know what holds people inside the cars of upside-down roller coasters? With this activity he'll find out.

Have him put a cloth in a bucket and rapidly swing the bucket upside down in a vertical circle. He will be amazed when the cloth stays inside! But what happens if he swings the bucket more slowly?

The spinning bucket demonstrates *centripetal force*, which causes objects to move toward the center rather than in a straight line—and move in a circular path. If your youngster swings the bucket slowly, there won't be enough momentum to keep the cloth moving. Gravity will take over, letting the cloth drop to the ground. 

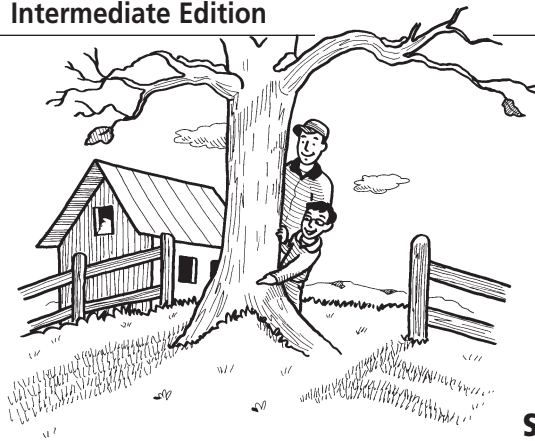


Seeing shadows

Groundhogs aren't the only ones who can see their shadows. Let your youngster learn about sunlight and practice measuring with these activities.

What's a shadow?


Ask your child what he thinks causes a shadow. Let him experiment by turning on a desk lamp and having him put objects (a mug, a stapler) at different points under the light. He'll see that shadows are caused by objects blocking the light.



Shadow walk

Go outside on a sunny day, and have him look for shadows cast by objects of different sizes and shapes. He might notice a shadow of a fire hydrant, a flagpole, or a house. Also point out shadows made by living things like people, animals, and plants. Ask your child what light these objects are blocking (sunlight).

Shadow measurements

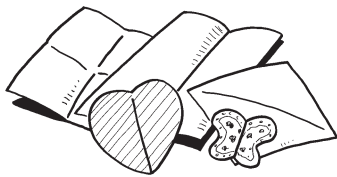
On a bright day, go outside in early morning, at noon, and in late afternoon with a piece of paper, a pencil, and a tape measure or ruler. Measure each other's shadows to the nearest inch or centimeter. Have your youngster record the length, time, location, and position of the sun (directly overhead, behind a building). Discuss the findings. When were the shadows the shortest? The longest? 

MATH CORNER


Line of symmetry

Fold a square. Fold a rectangle. What does your child see? These activities can help her learn about symmetry.

Using a blank sheet of paper, have her draw and cut out a square and a rectangle. Ask her to fold each one exactly in half. What does she notice? She should find that the two halves are mirror images of each other—or symmetrical.



Let your youngster see how many ways she can fold each shape so that it is symmetrical. For example, a square can be folded four ways (into two different diagonals, in half horizontally, and in half vertically). A rectangle can be folded two ways (in half horizontally or vertically). Those folds are the lines of symmetry, or the lines that divide the two symmetrical halves.

Have your child search through magazines for pictures that are symmetrical. To check, she can cut them out and fold them in half—if the two halves match exactly, the item is symmetrical. *Hint:* Symmetrical objects might include a butterfly, heart, or snowflake. 

SCIENCE LAB


Bounce a ball

Talk about fun! Here's a chemistry experiment that creates a ball your child can bounce.

You'll need: measuring spoons, borax (found with laundry detergent in grocery stores), warm water, 2 cups, spoon, white glue, cornstarch

Here's how: Have your child stir $\frac{1}{2}$ tsp. borax and 2 tbsp. warm water in a cup until the borax dissolves. In another cup, she should put 1 tbsp. glue, $\frac{1}{2}$ tsp. of the borax mixture, and 1 tbsp. cornstarch. After it sits 10–15 seconds, she can stir until it's too thick to stir any more. Then, have her use her hands to make it into a ball.

What happens? The mixture will become solid.

Why? The mixture is made of *polymers*, which are long chains of molecules. The glue contains a polymer that makes the ball strong, while cornstarch contains a polymer that makes the ball elastic. The borax binds the two kinds of molecules together. 




PARENT TO PARENT

Math + writing

My son Andrew likes to write stories and poems, and he also loves math. I was wondering if there was a way he could enjoy both at the same time, so I asked his teacher for advice.

First, she suggested that Andrew and I brainstorm "story starters" involving numbers, shapes, time, or money. We came up with some good ones like, "Tommy woke up to find there were no more clocks in the world," and "Once upon a time there was a boy named Dave Ision who lived at 123 Numerator

Lane." Andrew wrote a great story about the division problems of the "Ision" family!

Also, his teacher told me about a type of Japanese poetry called haiku where the first line has to be five syllables, the second line seven, and the third line five. I suggested that Andrew try a math haiku, and here's what he came up with: "Multiplication/ Opposite of division/ Back and forth they go." My son is having fun writing about math, and I'm enjoying reading his work! 



OUR PURPOSE

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

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