

Math+Science Connection

Intermediate Edition

Building Understanding and Excitement for Children

March 2015



INFO BITS

Thinking logically

Mathematical thinking comes into play anytime we organize things. Help your child stretch her logical thinking by asking her to sort something, such as the spice jars in your cupboard. She might arrange them alphabetically, by color, or another way. Point out that sorting makes it easier to find items later.



Keep a lid on it?

Will water boil faster with the lid on or off? Let your youngster predict the answer. With adult supervision, he can test it by putting the same amount of cold water in two pots on the stove, one covered and one uncovered. *Idea:* For other experiments, have him add salt to one pot or make one pot cold water and the other pot hot.

Book picks

▣ Your child can discover shapes and patterns of the natural world in *Mysterious Patterns: Finding Fractals in Nature* (Sarah C. Campbell).

▣ With Tabletop Scientist's *The Science of Air: Projects and Experiments with Air and Flight* (Steve Parker), your youngster could build a wind chimney, a barometer, or a model glider.

Just for fun

Teacher: If you had \$33 in one pocket and \$59 in the other pocket, what would you have?

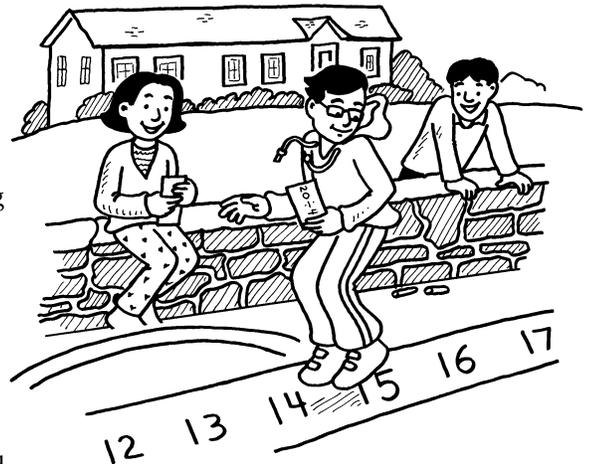
Bryan: Somebody else's pants.



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Life-size number line

A giant number line will help your youngster understand all kinds of math concepts—while having active fun with friends. Encourage him to make a number line from 0 to 30 with sidewalk chalk outside or on masking tape inside. Then, suggest games like these.



Move along

On separate slips of paper, have the children write math directions for moving up and down the number line. *Example:* “Move forward by $48 \div 8$ ” (6). Then, everyone picks a different starting spot. Read the cards, and have all the players follow the instructions at once. If a child “falls off” of the number line (the directions take him below 0 or above 30), he’s out. The last person left is the winner.

Hop to it

Ask players to write 10 multiplication or division problems on index cards. (*Note:* The answers must be on the number line.) Stack the cards facedown, and take turns picking one. To find the answer, hop along the number line. For 6×3 , a

youngster would start at 0 and hop 6 times by 3s, ending on 18. To compute $20 \div 4$, he’d start on 20 and jump backward by 4s for 5 hops.

Solve the mystery

At 0, place a deck of playing cards (face cards removed, ace = 1). Draw 2 cards, and use them to pose a math mystery to the next person. For instance, draw 7 and 4, and say, “Add us together, and you get this prime number whose two digits are both the same.” The other person names the answer by moving to that spot on the number line (11). ▣

Keeping Humpty Dumpty together

Can your budding engineer keep a dropped egg from going splat?

First, let her drop a raw egg into a sink. (It will crack.) Now, challenge her to build a container to protect the egg. She could use household materials like cardboard, tape, foam, plastic bags, craft sticks, or anything she thinks of. Encourage her to test different designs until one succeeds (the egg doesn’t crack when dropped).

Tip: Tell her it’s like building a bicycle or football helmet for an egg! Helmets are designed to protect the head by absorbing energy in a collision or fall. In the same way, the egg’s case will absorb the energy the egg gathers as it falls. ▣



Be a data collector

Perhaps your child notices which songs are at the top of the charts or she follows temperature trends in the newspaper. These are examples of data collection—and your youngster can gather and graph her own data to see how this works.

Menu options

Have her list 10 meals and survey family members or friends for their favorite. When she tallies the votes, she could display the results in a bar graph. She should number the left side for the number of people surveyed (say, 0–10) and the bottom with the 10 dishes (pizza, tacos). Once she colors in the bars, anyone will be able to see at a glance which dish is the top choice.



points into a line graph showing her TV-watching pattern. What does she notice? (For example, maybe she watches the most on Saturdays.)

Screen time

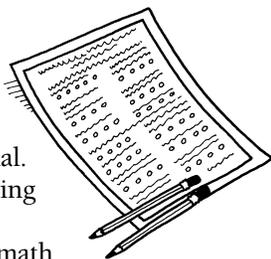
Would you like your child to watch less television? Ask her to graph her TV habits to discover how much she watches each day. For two weeks, she should record the hours watched. Then, she can label the left side of a graph with hours and the bottom with dates. Have her plot dots for her data and connect the



Q & A Prepare for standardized tests

Q: My son has standardized tests coming up. How can I help him get ready for the math portion?

A: Your child will feel more comfortable and confident if he knows the material. In the weeks leading up to the test, he could review his math papers and do problems in his math textbook. You might also play math games together.



If his teacher plans review sessions, be sure he's in school those days. Then, as for any test day, he should get enough sleep and eat a healthy breakfast. Remind him to read the directions carefully before he starts and to ask his teacher if he has questions.

Finally, encourage your son to do his best. But let him know that he's more than his test scores—and that he's valued no matter how he does on the tests.

OUR PURPOSE

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

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SCIENCE LAB

Cabbage juice art

Turn painting into a chemistry experiment with this activity for identifying acids and bases.

You'll need: 2 cups shredded red cabbage, water, saucepan, slotted spoon, coffee filters, cotton swabs, household liquids (lemon juice, vinegar, soap, coffee, milk)

Here's how: In a saucepan, cover cabbage with water, and boil until the water turns color. Help your child use the slotted spoon to remove the cabbage. Then, he should soak coffee filters in the water for 10 minutes. After they dry, he can paint designs on them with swabs dipped in each liquid.

What happens? The cabbage water turns the filters pale blue. The liquid substances will turn the designs either pink or blue-green.

Why? Red cabbage contains a pigment that changes to pink when mixed with acids and to blue-green when combined with bases.



MATH CORNER

Mixed numbers

If you offer your child $2\frac{1}{2}$ cookies or $\frac{7}{2}$ cookies, which would she choose? By converting mixed numbers to improper fractions and back, she'll recognize the better deal. *Note:* Improper fractions have a larger top digit (numerator) than bottom digit (denominator).

Try this: Say a fraction like $\frac{9}{2}$, and ask your child to lay out tokens equal to the numerator (9). Then, have her move the tokens into groups equal to the denominator

(groups of 2). How many groups are there? (4) How many tokens are left over? (1) So the mixed number equal to $\frac{9}{2}$ is $4\frac{1}{2}$.

To convert a mixed number to an improper fraction, she should reverse the process. What is the denominator? (For $2\frac{2}{3}$, for instance, it's 3.) The whole number (2) should be represented by that number of tokens (2 piles of 3 tokens, or 6 tokens total). Add in tokens for the numerator (2 tokens for $\frac{2}{3}$). Now she has 8 tokens, and the improper fraction is $\frac{8}{3}$.

