

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

Centimeters rule

What does your child

think: Should he use centimeters to measure the height of a building, or the length of a worm? Let him try measuring various objects (sofa, magazine, birthday candle, a room) with meters and centimeters. He'll see that when it comes to measuring smaller items, centimeters rule!

Flex your muscles

Your youngster may be surprised to know her body has more than 600 muscles. Play Simon Says to flex her thinking muscles—and her real ones. Take turns being Simon, and give directions like “Simon Says use your neck muscles to turn your head” or “Simon Says jump up and down to make your heart muscle pump faster.”



Book picks

▣ *Arithmetic-Tickle: An Even Number of Odd Riddle-Rhymes* (J. Patrick Lewis) will tickle your child's fancy with rhyming riddles that require math to solve.

▣ Your young detective can learn to investigate voiceprints, identify ink samples, and more in *Detective Science: 40 Crime-Solving, Case-Breaking, Crook-Catching Activities for Kids* (Jim Wiese).

Just for fun

Q: How can you make a line longer without touching it?



A: Draw a shorter line next to it. Now the first one is longer!

Tell me your strategy

Encourage your youngster to think like a mathematician—she'll feel proud of herself as she tries different strategies and realizes there's more than one way to solve math problems.

Explain the steps

Give your family simple math equations—no pencils allowed. For instance, ask, “What is $4 + 3 + 6$?” Have each person share her answer and how she reached it. You might say, “First, I thought $4 + 3 = 7$. Then, I added $7 + 6$ to get the answer, 13.” Your child could respond, “I grouped $4 + 6$ to make 10, then added $10 + 3$, and I also got 13.” It will be interesting for everyone to see the different methods used.

Justify your answer

In school, your youngster will be asked to explain and justify her answers—or *what* she did and *why* she did it. Let her practice when she does homework. Perhaps she has to graph



pets in your neighborhood, and she makes a bar graph. She might *explain* that there are 7 dogs because the bar goes up to 7 and *justify* that there are more dogs than cats because that bar is longer.

Consider options

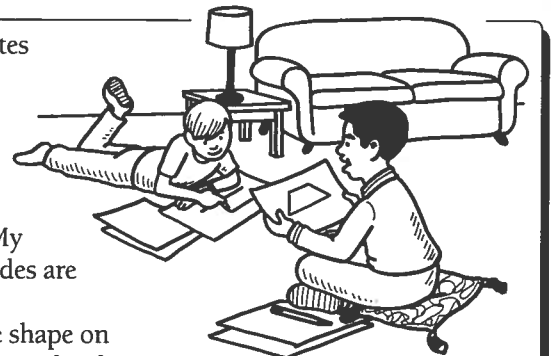
Have your child try different approaches to everyday math problems. If you invite another family for dinner, ask her to adjust recipes from 4 servings to 10. What are two ways to figure out the quantities for each ingredient? (Multiply by 2.5. Or double and add half of the original number.) Which method was quicker? ▣

Shape up

Explore shapes and their attributes with this clever drawing game.

Each player needs paper and a pencil. Have your child secretly draw a shape (say, a trapezoid) and describe it to the other players, one attribute at a time. He might say, “My shape has four sides.” “Two of its sides are parallel to each other.”

Players use the clues to draw the shape on their papers. Whoever correctly names the shape with the fewest number of clues gets to start the next round. ▣



SCIENCE LAB Take out the trash

Let your child make his own mini landfill— he'll learn about matter as he discovers what happens to garbage *and* why it's a good idea to recycle.

You'll need: container with a lid, soil, "trash" of different materials (yogurt cup, banana peel, paper clip, cardboard, paper, tinfoil), water, digital scale, small shovel. Do not use meat, egg, or dairy products.

Here's how: Have your youngster make a three-column chart ("Item," "Prediction," "Result") and predict whether each piece of trash is *biodegradable* (will decompose). Next, he can fill the container with soil, bury the items, and water lightly. Finally, he should weigh his landfill and put the covered container in a dark place. After a month, let him weigh it again and dig for the buried items.



What happens? The weight will be about the same. The items will have disappeared, decomposed partly, or be unchanged.

Why? The matter changed form, but it's still there. Organic matter breaks down and becomes part of the soil. Some materials take longer to decompose, so pieces remain, and others never break down.

Idea: Your child can use his chart to sort items (biodegradable vs. not biodegradable) and use evidence to draw conclusions about what types of materials decompose. 📦

MATH CORNER Fraction line

Here's a fun (and tasty) way to play with fractions.

1. Have your youngster lay a long piece of string along the kitchen table.

2. Give her small snacks (raisins, blueberries), and tell her to place one at the beginning, one at the end, and one at the halfway point. Then, she could place a snack halfway between the first two snacks and another one halfway between the second two.



3. Now it's time to turn the snacks into a fraction number line. Let her replace—and eat!—the snacks at the beginning and end with sticky notes labeled 0 and 1. Challenge her to replace the other snacks with the correct fraction labels ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$). Next, she could add snacks and labels for eighths, thirds, and sixths.

4. Use the number line to ask each other questions like "Which is greater, $\frac{1}{3}$ or $\frac{1}{2}$?" "Which is less, $\frac{1}{6}$ or $\frac{1}{8}$?" 📦



Cloud-tastic

Cloudy days are a great opportunity for a science lesson. Try these activities.

● **Track.** Have your child observe how clouds move. Using a dry-erase marker, let her draw an outline on a window of the clouds she sees. She can check back in 30 minutes and describe the changes. Does she know why clouds shift? (Wind blows the clouds, changing their shape and position.)

● **Model.** Your youngster could use cotton balls, glue, paper, and markers to create and label her own clouds. She'll probably remember that *cumulus* is puffy, *cirrus* is thin, and *stratus* is flat. *Nimbus* clouds are rain-filled—they might be *cumulonimbus* or *stratonimbus*. (Tip: She can stretch the cotton balls thin for cirrus and use a black marker to darken the nimbus.)

● **Predict.** Encourage her to take clues from the clouds to forecast the weather. Suggest that she keep a daily journal where she sketches the clouds and notes the weather. Can she find patterns to use in making her own forecasts? 📦



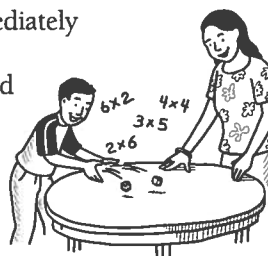
Q & A Build math fluency

Q: I heard another parent in my son's class talk about "math fact fluency," but I'm not quite sure what that means. Can you explain?

A: Math fact fluency is the ability to quickly and accurately recall basic math facts. This lets your child immediately get to work solving math problems, rather than getting bogged down in what 6×7 or $32 \div 4$ equals. It's like knowing a foreign language: You're considered fluent when you can speak without hesitation.

Fluency doesn't happen all at once, it comes over time. Your youngster will get lots of practice in school and while doing homework.

Playing math games will help, too. For example, take turns rolling two dice and multiplying the numbers together. Or while driving in the car, give each other rapid-fire math questions. Stick with it, and before long your son may surprise you with his math fluency! 📦



OUR PURPOSE

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

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