

# Math+Science Connection

Building Understanding and Excitement for Children

February 2012

Title I Program



## INFO BITS

### Let's measure!

Encourage your child to practice measuring objects in both inches and centimeters. Have her cut string to measure the width of a dishwasher door or the height of a coffee table, for example. She can estimate the string's length and then use a ruler or tape measure to check.

### In hot water

With 2 bouillon cubes and 2 cups of water, your youngster can learn about energy and heat. Let him drop one bouillon cube in a cup of boiling water and the other in a cup of cold water and watch carefully. Which cube dissolves first? Why? (The one in boiling water, because hot water conducts energy faster.)

### Web picks

The U.S. Mint kids' site is chock-full of news, facts, and games about coins. Also includes helpful information for young coin collectors. [usmint.gov/kids](http://usmint.gov/kids)

Explore, tinker, invent, and pretend at [inventionatplay.org/playhouse\\_main.html](http://inventionatplay.org/playhouse_main.html). Your child can solve puzzles, design a cloud, write a story using random words, and more.

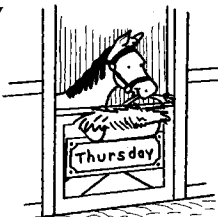
### Worth quoting

"It is useful to constantly observe, note, and consider." *Leonardo da Vinci*

### Just for fun

**Q:** A man rode to Texas on Thursday, stayed for three days, and came back on Thursday. How can this be?

**A:** His horse's name is Thursday!



## Add and subtract big numbers

It's one thing to add  $5 + 3$  or subtract  $6 - 2$ . But it's another thing to add  $797 + 472$  or subtract  $585 - 303$ . Help your child get comfortable adding and subtracting big numbers with these ideas.

**Develop strategies.** There are lots of ways to make big numbers "friendlier." He can break them apart by place value. ( $797 + 472$  becomes  $700 + 400 + 90 + 70 + 7 + 2 = 1,100 + 160 + 9 = 1,269$ .) Or he could round the numbers to make them easier to work with. For  $585 - 303$ , he might subtract  $585 - 300 = 285$  and then subtract the 3 ( $285 - 3 = 282$ ).

**Sum total.** For this game, have each player make a  $3 \times 3$  grid (9 boxes), and place a deck of cards facedown (face cards removed, ace = 1). Take turns drawing cards, and write the number you pick anywhere on your grid. When the grid is filled in, add up the three

3-digit numbers created. The person with the highest sum wins. Make more grids, and play again.

**Subtraction race.** Each player writes "1,000" at the top of a paper. Again, put a deck of cards (ace to 10) facedown. Take turns drawing two cards and setting them down in order into a 2-digit number (4 and 2 makes 42). Subtract the number from 1,000 ( $1,000 - 42 = 958$ ). Keep drawing cards, making a 2-digit number, and subtracting that number from the last number on your paper. The first one to go below 100 wins. *Tip:* See if your child can do the subtraction in his head.



## Design questions

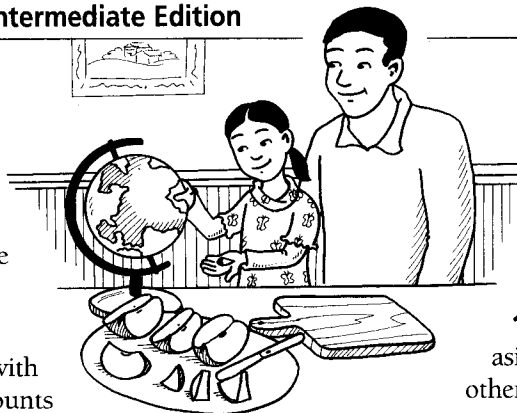
Looking at how objects are designed will give your youngster a window into the world of engineering. Try these activities:

- Give her a mystery object (mug) in a bag. When she takes out the object, ask three questions. What was this designed for? (To hold hot liquid.) What design features make it work? (The handle keeps you from burning your hand on hot coffee.) What else could you use this for? (A pencil holder.)
- Let your child take apart a ballpoint pen or a mechanical pencil. Encourage her to think about the purpose of each piece (spring, cartridge, case). Then, have her put it back together. Seeing how the pieces fit together will help her understand how the design works. *Idea:* Have her leave out one piece and see what happens!



## "Green" projects

Your child probably has learned about "going green" by recycling. With these activities, you can bring science and math into family discussions about protecting the environment.




### Soil conservation

Your child can learn a powerful lesson about the limited space available for growing food and the need to conserve soil. Give her one apple to represent the Earth, and have her follow these steps:

**1.** Cut the apple into 4 quarters, and set aside 3 to represent oceans, lakes, and other water.

**2.** Cut the last quarter into 2 wedges, and set aside 1 ( $\frac{1}{8}$  of the whole apple) for places too hot or cold to grow plants.

**3.** Cut the remaining  $\frac{1}{8}$  into 4 wedges (each is  $\frac{1}{32}$  of the apple). Put aside 3 ( $\frac{3}{32}$ ) for places that are too rocky, steep, or wet or already have buildings.

The remaining  $\frac{1}{32}$  of the apple represents all the land available for crops to feed all the people and animals on Earth! 

### Water pollution

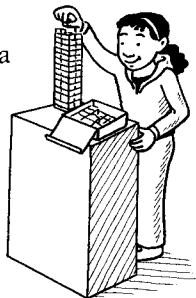
Fill an empty plastic container halfway with water, and have each person add small amounts of used liquids for a few days. *Examples:* water from rinsing a tuna can, dirty bathwater. Then, ask your child how she could clean the water (pour it through a coffee filter, remove objects with tweezers). Also, talk about how communities could keep water from being polluted in the first place (put trash in trash cans, use car washes that treat dirty water).


## MATH CORNER

### Find, build, compute

What do a shoebox, book, and refrigerator have in common? They are all rectangular prisms, or solid shapes with rectangles for their faces (sides). Encourage your child to explore geometry with this common shape.

**Volume.** Let her build a rectangular prism out of dice, sugar cubes, or same-sized Legos. Her model should be solid, with no hidden spaces. When she finishes, have her figure out the volume (count the cubes along the height, width, and length, and multiply the three numbers together). To check her math, she can take apart her structure and count all the cubes.



**Dimensions.** Give your youngster 36 blocks, and see how many different sizes of rectangular prisms she can build. Have her record the different sets of dimensions. *Examples:* 2 x 2 x 9 and 2 x 3 x 6. What do the sets have in common? (Each one equals 36.) 

### OUR PURPOSE

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


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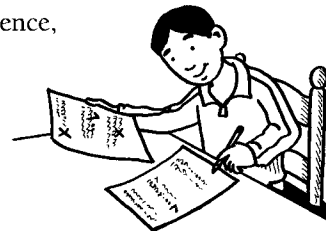
## PARENT TO PARENT

### Rethinking wrong answers

At my last parent-teacher conference, I learned the craziest thing—the teacher said it can actually be helpful when my son Steven gets the wrong answer to a math problem. Mrs. Benson explained that if he tries to figure out where he went wrong, he might understand the math concept better.

She suggested ways we could help Steven when he says his homework answers don't look right. She said he should rework the problem and show his work every step of the way. Seeing his calculations can help him notice careless errors and review the strategy he's using.

Steven could also try a different strategy—he'll learn that it's okay to try various approaches to the same problem. Then, if he still can't figure out the right answer, he can ask his teacher for help the next day. 



## SCIENCE LAB

### Freshwater vs. saltwater

Does your youngster know that it's easier to float in saltwater than in regular water? This experiment will let him see for himself.

*You'll need:* aluminum foil, pennies, 2 bowls, water, salt

*Here's how:* Ask your child to make a boat out of tinfoil. Then, have him fill the bowls with water to create two "lakes"—one freshwater (plain water) and the other saltwater (add 1 tbsp. salt). He should put his boat in the freshwater lake and add pennies, one at a time, until the

boat sinks. Have him record the number of pennies he could float, and then repeat the experiment in the saltwater.

*What happens?* It will take more pennies to sink the boat in the saltwater.

*Why?* Saltwater is denser than freshwater. The greater density provides more upward force (buoyancy) to float objects.

*Fun fact:* Ask your youngster what he thinks happens when ships carrying cargo go from the saltwater ocean to a freshwater river. (Since the ocean provides more buoyancy, boats sink a little lower when they enter the freshwater.) 