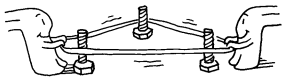
Intermediate Edition

Math+Science Connection

Building Understanding and Excitement for Children

September 2016

Bayview Elementary School
Mrs. Tonya Frost Principal



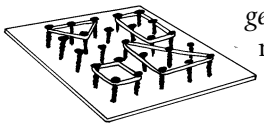
INFO BITS

Piece of the pie

Fractions and pizza go together like mozzarella and pepperoni. When you eat pizza, ask your child what fraction 2 slices would be (if there are 8 slices, 2 slices = $\frac{2}{8}$, or $\frac{1}{4}$). But what about the toppings? If there are 48 pepperoni pieces on the pizza and she eats 6 pieces of pepperoni, what fraction did she have? ($\frac{6}{48}$, or $\frac{1}{8}$ of the pepperoni)

Engineer a geoboard

See what your youngster comes up with when you suggest he build a *geoboard*. He'll need a platform (cardboard, wood) and something for the pegs (pushpins, screws). He can decide how big to make his grid, perhaps 5 x 5. When he's done, he'll enjoy using rubber bands to make shapes and designs on his own geoboard.



Book picks

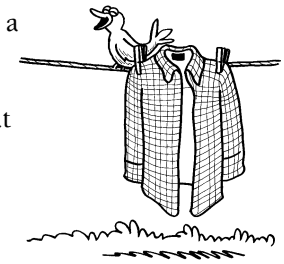
Amazing Minecraft Math: Cool Math Activity Book for Minecrafters (Osie Publishing) is a color-by-number book. Solve a math problem to know what color to make your favorite Minecraft characters.

Walk with your child through galleries of fish, mammals, birds, and more in *Animalium: Welcome to the Museum* (Katie Scott and Jenny Broom).

Just for fun

Q: What has a neck but no head and two arms but no hands?

A: A shirt.



Multiplication games

What better way to practice multiplication than with games your child will want to play again and again? Here are two you can try today—and tomorrow!

Face off

Materials: deck of cards (face cards removed, ace = 1)

Deal all the cards evenly. Then, each player turns over two cards and multiplies the numbers together. Whoever has the highest *product* (answer) collects all the cards. If there's a tie, players turn over their next two cards, and the winner takes all. Keep playing until one person collects the entire deck—he's the winner. *Note:* If a player has only one card left, he can multiply it by itself (9 x 9 or 1 x 1).

Multiply to 1,000

Materials: dominoes, 10 scraps of paper numbered 0–9, paper, pencil

Spread the dominoes out facedown. Shuffle and stack the papers. On each turn, a player picks a domino and uses it to form the largest two-digit number possible (a domino with 3 dots and 6 dots would make 63). Then, the player draws a slip of paper and multiplies by that number to get his score. For example, if he draws 4, he would multiply 63 x 4 for a score of 252. On each round, add your score to your previous one. Whoever reaches 1,000 first wins the game.

Going underground

There's a whole world of activity just under the grass that your youngster can explore. Let her turn a shovelful of dirt over to see what it uncovers, such as:

- **Earthworms.** Worms help to break down leaves and other material, and they move nutrients and minerals around for healthy soil. Can your child find one and identify its head and tail? (*Hint:* Worms usually move head first.)
- **Roots.** Ask her to point to roots in the dirt and follow them to their source. A long single root might be a dandelion, branching roots may be clover, and a thick, strong root could belong to a tree.

The best graph for the job

Graphs help your youngster visualize and understand data. Use this activity to show her how we use different types for different purposes.

Together, find a bunch of graphs from newspapers and magazines. Cut them out, and snip off the headlines and labels. Mix them all up. Now, ask your child to put them back together. As she matches the headings and labels to the graph, she'll learn about which types of graphs are used for different kinds of data.

- ✔ ***A line graph*** is best for showing data over time, like daytime temperatures for a week.
- ✔ ***A bar graph*** is good for comparisons, such as the popularity of various types of music.
- ✔ ***A pie chart*** (or circle graph) shows parts of a whole, as with the age ranges of people who use the Internet.

When she finishes, take turns pointing out something you learned from the graphs. Your youngster might notice that the temperature suddenly dropped on Thursday, more people listen to pop music than rock music, or that young adults use the Internet more than any other age group does.

She'll be amazed at the information you can learn from a graph, especially if you use the right one for the job! ⬢

SCIENCE LAB See the (surface) tension

Your youngster can combine a little water and soap to have a lot of fun with *surface tension.*

You'll need: eyedropper, cup of water, nickel, liquid soap, towel

Here's how: Let your child use the eyedropper (or drip water from his fingertip) to slowly put water on the nickel, counting how many drops it holds before the water washes over the edge. Have him dry off the nickel, add a few drops of soap to the water, and repeat the experiment.

What happens? The nickel will hold a surprising amount of regular water, but not nearly as much soapy water.

Why? Water molecules are tightly stuck together, creating what's called surface tension. That's what keeps the water from flowing over. Soap breaks apart the water molecule bonds, decreasing the surface tension.

Real-world fact: This is why soap helps clean dishes. It breaks apart the water molecules so they mix with grease and wash it off dishes. ⬢

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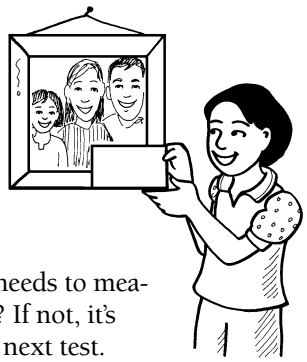
MATH CORNER Squared away



How can you tell when a rectangle is a square? Challenge your child to find objects she thinks are squares—perhaps picture frames, cheese slices, or sticky notes—and then do these tests to see if they actually are.

Test 1: Since squares have four equal-length sides, she needs to measure all the sides with a ruler. Are they the same length? If not, it's not a square. If they *are* the same, she'll move on to the next test.

Test 2: A square's four angles are all right angles. Suggest she use the corner of an index card for comparison. Do all the angles of the object match the corners of the card? If they do…she's found a square!

Idea: Ask your child if she knows what the shape is if all four sides are equal but the angles are not all right angles. *Answer:* a rhombus. ⬢

Q & A Yes, I can!

Q: *My son thinks he can't do math because he makes mistakes. How can I show him that he can succeed in math?*

A: Here's a simple idea that's pretty effective: Whenever your son says things like, "I can't…" or "I don't understand…," add the word "YET." You can explain that that is what learning is all about—adding knowledge we don't have "yet" as well as learning from mistakes we make.

Then, try this. Have your youngster work one of his math homework problems out loud for you. Going step by step, he's likely to find where he got stuck. You might be able to ask him questions that will steer him toward the answer, or he could ask his teacher for help the next day.

Also, point out what he *did* understand, even if it was only saying the problem in his own words or doing the first step. ⬢

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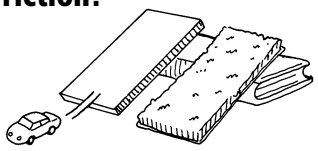
INFO BITS

Artistic angles

Suggest that your child draw a picture using only straight lines. He might sketch a city landscape, an apartment building, or an abstract design. When he's done, can he identify the right (90°), acute (less than 90°), and obtuse (over 90°) angles? *Tip:* He could use a protractor to measure the angles.

What is friction?



Have your youngster set up two ramps for a toy car, one smooth (a book, a piece of wood) and one rough (corrugated cardboard, a carpet scrap). She'll see that the car goes more slowly on the rough ramp—and learn about *friction*, or the resistance of motion when objects rub against each other.

Web picks

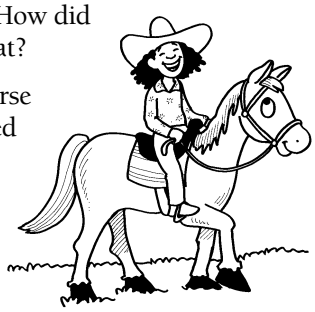
🖳 Help the monster get home by solving multiplication and division story problems at *members.learningplanet.com/act/mc/freemenu.asp*.

🖳 Visit *teacherstryscience.org/kids* for experiments with sound waves, chemical reactions, and more.

Just for fun

Q: A girl came to town on Monday. After staying three days, she left on Monday. How did she do that?

A: Her horse was named Monday!



Fabulous fractions

Your child needs to know about fractions for math class, as well as for everything from cooking to construction to finances when she grows up. Use these ideas to build everyday fraction skills.

Name them

Ask your youngster to make fractions from the world around her. You might say, "What fraction of the month has passed?" If the month has 31 days, that's the whole, and if it's the 12th, 12 is the part—so $\frac{12}{31}$ of the month has gone by. Go back and forth with each other, creating fun fractions like "What fraction of your book have you read?" or "What fraction of your socks are striped?"

> ***A fraction*** is simply a part of a whole. The ***numerator*** (top number) is the part, and the ***denominator*** (bottom number) is the whole.

Add them

Race to the finish line—by adding fractions. Have your child draw a number line from 0 to 12, labeling three evenly spaced tick marks ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$) between each pair of whole numbers. Then, she can write 8 fractions on separate note cards ($\frac{1}{4}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{4}{4}$) and turn them facedown. To play, each person places a token at 0. Take turns picking two cards. Add the fractions shown (say, $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$), and move your marker by that sum (from 0 to $\frac{3}{4}$). As she moves up the number line, she'll work with mixed numbers, too ($4\frac{3}{4} + \frac{1}{2} = 5\frac{1}{4}$). Be the first to reach 12—exactly! ⬢

Build me a home

How do engineers design houses to protect against weather conditions?

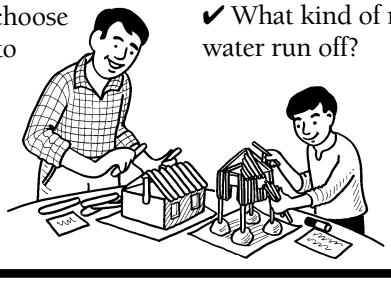
Dream up weather scenarios, and write each one on an index card. ("Snowy, very cold." "Rains daily, extremely hot.") Then, choose cards, and build homes to suit, using household materials like craft sticks, clay, boxes, straws, and tape.

Pose questions to get your child thinking:

✔ If it's very cold, should the house have thin walls or thick walls?

✔ What would protect against high winds?

✔ What kind of roof would help rainwater run off?



Now, show off your houses to each other—and talk about where they might exist! ⬢

The great pumpkin

A fall pumpkin is a good excuse for having math and science fun.

Measure

- How much does a pumpkin weigh? Let your youngster weigh himself, then weigh himself again while holding a pumpkin. The difference is the pumpkin's weight.
- How big around is the pumpkin? Have your child wrap a string around its middle like a belt, cut the string to fit, and measure its length. That's the *circumference* (distance around).

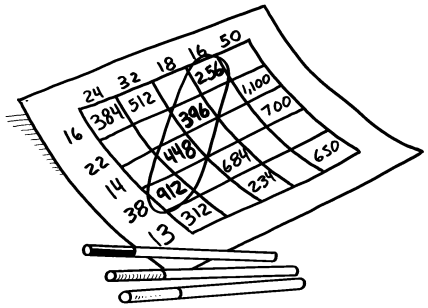
Observe

- At a pumpkin patch, encourage your youngster to notice where pumpkins grow (on a vine, on the ground). How many pumpkins are on each vine? Suggest that he talk to the farmer or read library books to learn more about how pumpkins grow.
- At home, cut off the top of a pumpkin, and let your child scoop out the insides. Have an adult carefully light a candle inside the pumpkin. What happens if you put the top back on? (The light goes out.) Try again after carving a face. Why does the candle stay lit this time? (Because the holes let in oxygen.)

MATH CORNER Double-digit dash

Multiplying two-digit numbers is a skill that's developed with practice. This game will give your child that practice.

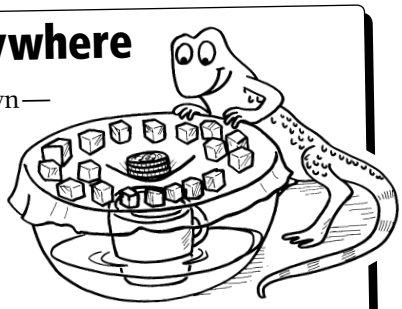
Have your youngster make a 5 x 5 grid (like a bingo card). Above each column and to the left of each row, he can write any two-digit number.



The object is to get four in a row—across, down, or diagonal. The first player picks an empty square and multiplies the column and row numbers together (*example:* 24 x 35 = 840). If he gets it right, he writes the answer in the square. (*Tip:* Use a calculator to check answers.) The other player, using a different color pen, takes his turn.

Play until someone gets four in a row or the board is full and it's a draw.

SCIENCE LAB Water, water everywhere



What goes up must come down—and go back up! Show your youngster how the water cycle works.

You'll need: mug, large bowl, measuring cup, hot water, plastic wrap, 4 quarters, ice cubes

Here's how: Help your child set the mug in the bowl and carefully pour 1 cup hot water around it. Have her cover the bowl tightly with plastic wrap, place the quarters on top (in the center), and add ice cubes all around them.

What happens? The hot water quickly starts to change into water vapor and rise. When it hits cold air (from the ice cubes), it changes to water droplets on the underside of the plastic wrap. The weight of the quarters funnels the water so it drips into the mug. If your youngster pulls off the plastic wrap, she'll find water in her mug.

Why? When water is heated by the sun, it evaporates, rising into the air as water vapor and collecting into clouds. As the water vapor cools, it condenses back into water and eventually falls to the earth as rain or snow.

PARENT TO PARENT Think your way to 100

I noticed that my daughter Tia didn't like to do math in her head. Since my mother is a fourth-grade teacher, I asked her for ideas. She suggested this "mental math" game.

To win a point, you have to reach 100 in two steps—no paper or calculators allowed. On each turn, give the other player a number and two operations to use, such as division and addition or multiplication and subtraction. For example, I gave Tia the number 77 and said to use division and addition. It took her a few minutes, but she figured out she could divide 77 ÷ 11 = 7 and then add 7 + 93 = 100.

Tia is surprised that she's enjoying doing math problems in her head. And you know what? It's good for my brain, too!

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