Intermediate Edition Math-Scien e Connection

Building Understanding and Excitement for Children

September 2020



Jigsaw geometry

Do a jigsaw puzzle together, then let your child find its perimeter and area. First, have her measure

each side and add the

lour measurements to get the perimeter (24 + 24 + 18

+ 18 = 84 inches). For the area, she should multiply length x width (24 x 18 = 432 square inches). Without checking the box or counting each piece, can she use math to say how many pieces are in the perimeter? The whole puzzle?

Family stargazing

Head outdoors on a clear night to observe the sky with your youngster. You could take along a library book or download a free app to identify stars, constellations, or planets. Idea: Encourage him to sketch the night sky and connect stars to create and name his own constellation.

Book picks

The little girl in *Math Curse* (Jon Scieszka and Lane Smith) finds math everywhere. She adds words, subtracts shoes, and even puts math symbols in her art project.

Vour child can make glowing clothes, dancing bubbles, silly putty, and more with the help of Real Chemistry Experiments: 40 Exciting STEAM Activities for Kids (Edward P. Zovinka).

Just for fun

Q: Why was the equal sign so humble?

A: Because it knew it wasn't less

than or greater than anything else.

Math in nature

Right outside your door is a math "classroom" for your youngster. Try these ideas for practicing math while enjoying nature.

Estimate the leaves

How many leaves are on that tree? Your child could count the leaves on a small branch (say, 24) and the branches on a limb (3), and multiply $(24 \times 3 = 72)$. To estimate the total number of leaves on the tree, he can estimate the number of limbs (maybe 22) and multiply by the number of leaves per limb (22 x 72 = 1,584). He'll see how estimating and multiplying are helpful when he can't count things one by one.

Tell a story

Ask your youngster to make up and solve story problems based on what he sees outside, perhaps bees buzzing from flower to flower. Example: "One day, Miss Bee buzzed around collecting pollen. She visited 240 flowers in 2 hours and spent the same amount of time on

Cover your sneeze!

Does your child know how far a sneeze can travel? Easily 6 feet or more! This activity will show her why covering up a sneeze helps stop the spread of germs.

Have your youngster fill a spray bottle with water and line up six pieces of 9-inch by 12-inch construction paper on the floor, end to end. Now she can

stand at one end of the 6-foot line of paper, spray the water, and see where droplets land. Are there wet spots on all the papers?

Let your child try again with fresh sheets of paper, this time covering the nozzle with her hand. The droplets don't go far at all. Now she'll see that she should cover her own sneezes with a tissue (or sneeze into her elbow if she doesn't have a tissue). 🍞



each flower. How many flowers did she visit per minute?" (240 flowers ÷ 120 minutes = 2 flowers per minute)

Add it up

Help your child use natural materials as place value tools. He might find small pebbles ("ones"), medium-size rocks ("tens"), and large rocks ("hundreds"). Then, let him arrange them to form an addition problem like 132 + 259. He can add them, trading tens for ones and hundreds for tens when necessary. He'll end up with 3 large rocks, 9 medium rocks, and 1 pebble—or 391.



Part of a whole, part of a group

A fraction can describe part of a whole ("I ate $\frac{1}{6}$ of the pizza") or part of a group (" $\frac{3}{10}$ of the beads are green"). These activities will help your youngster work with both types of fractions.

Play dough. Let your child make a play-dough pizza and cut it into equal

slices. Then, she can use a toothpick to label each piece with a fraction that tells what part of the whole it is.

SCIENCE Musical LAB science

To tune a violin or cello, a musician must loosen or tighten the strings. How does that affect the instruments' sounds? Let your child make his very own string instrument to find out!

You'll need: empty rectangular tissue box, four identical rubber bands



Here's how: Let your child stretch the rubber bands around the box crosswise. Have him play the instrument by

plucking the "strings" over the box opening, listening to the sound they make. Now he can remove the strings, stretch them lengthwise around the box, and pluck them again.

What happens? Plucking the looser strings (those stretched crosswise) creates a lower pitch than plucking the tighter ones (those that are stretched lengthwise).

Why? Plucking the strings causes vibrations that produce sound. Looser strings vibrate less frequently, while tighter ones vibrate more frequently. The more frequent the vibration, the higher the pitch. $\widehat{\mathbf{y}}$

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If her pizza has 8 slices, she would carve $\frac{1}{8}$ into each one. Now she can roll out the dough, divide it into a different number of slices, and write new fractions.

Beads. Have your youngster sort 20 beads by color. What fraction of the group is each color? She can find out by writing the number of each color (the numerator, or top number) over the number in the group (the denominator). Say she has 5 blue beads $(\frac{5}{20})$, 9 yellow beads $(\frac{9}{20})$, and 6 red beads $(\frac{5}{20})$. If she adds the three fractions, her answer will equal $\frac{20}{20}$, or 1—because all the parts together equal the group.



Multiplication is in the cards

Watch the fun multiply in this game that lets your youngster practice multiplication facts.

1. Remove the face cards from a deck of playing cards and shuffle the rest (ace = 1). Arrange them faceup to create an S-shaped game-board path.

2. Start at one end of the path. Take turns roll-

ing two dice (say, 3 and 4) and moving a game token that number of cards (7).

3. Multiply the sum of the dice by the value of the card you land on for your score. If you land on a 5, you would say "7 x 5 = 35" and score 35 points.

4. Keep rolling, multiplying, and adding to your score until everyone reaches the end of the path (exact count not required). High score wins.

Variation: For a bigger challenge, include jacks (11) and queens (12).

What can I graph?

Q: My son always enjoys making graphs in school. Any suggestions for creating graphs at home?

A: Your child can turn almost anything your family does into a graph! For one month, suggest that he track the foods everyone eats for breakfast or the kinds of exercises they do. He could make a tally

mark for each bowl of cereal or serving of eggs eaten, or for each time someone runs or rides a bike.

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As he collects data, he can put it into a bar graph. He should divide a sheet of paper into rows and columns and write breakfast foods or exercises across the bottom. Next, he'll need to decide what the scale will be (say, 1 square = 5 servings of a food) and write numbers (0, 5, 10, 15, 20, 25, 30) up the left side.

From time to time, ask your son questions like "Which kind of break-

Serv-

fast food have we eaten the most of so far?" or "How many more times did we run than ride bikes this week?" He'll see what's most common—and help you know what to buy at the grocery store.

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Let's skip count

Can your child skip count by numbers other than 2s, 5s, or 10s? Give him a random number (say, 7) and a starting point (perhaps 65). He would count 65, 72, 79, 86. Then, have him skip count backward. Maybe you'll have him begin at 103 and count back by 11s (103, 92, 81, 70).

Making mountains

Have your youngster lay two sheets of paper on a baking sheet so they overlap slightly and spread sand (or soil) over the seam. Holding down the top sheet with one hand, she should



slowly push the other sheet under-

neath. The sand starts to mound. This shows how underground movements help form mountains over time.

Book picks

Marty views every situation like a math equation in The Math Wiz (Betsy Duffey). But can he solve the problem of being picked last in gym class?

Captivate your child with fascinating facts about tarantulas, diving bell spiders, jumping spiders, and more in Spiders (Kay de Silva).

Just for fun

Q: Which weighs more, 1 pound of rocks or 1 pound of feathers?



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Mental math games

The more often your youngster does math in her head, the more efficient she'll become. Play these games that will inspire her to come up with strategies for solving problemswithout pencil and paper.

Math Jeopardy

In this game, players first choose answers and then call out problems. Let your child draw a Jeopardy board (6 columns, 5 rows) and write a one- or two-digit number in each box.

Take turns picking an answer (say, 8) and stating four problems (addition, subtraction, multiplication, division) that equal it. Example: 5 + 3, 60 - 52, $4 \ge 2, 16 \div 2$. Your youngster will practice doing all four operations in her head!

Check problems on a calculator. If they're all correct, score 8 points and cross out the 8. When all answers are chosen, the person with the highest score wins.

Mixtures and solutions

Stir up your child's enthusiasm for chemistry with some hot chocolate! Here's how he can explore mixtures and solutions.

First, let him scoop cocoa powder and marshmallows into a mug. It's a mixture because the substances don't dissolve, melt, or otherwise change. What happens when he adds hot milk? It becomes a solution because the cocoa dissolves and the marshmallows melt.

Together, think of more examples of mixtures and solutions. Your youngster might say that trail mix is a mixture and lemonade is a solution.



Fact fluency race

Who can score closest to 100 points without going over? Each player rolls a die to get her starting score. On each additional roll, she may add the number rolled to her score or multiply the number by her score.

Say your youngster has 32 points and rolls 5. By using the mental math strategy of rounding, she'll realize that 32 x5 would put her over 100, since 30 x 5 = 150. So adding (32 + 5 = 37) is the better choice.

Keep track of scores on paper. A player may choose to stop rolling at any time-the winner is the person who gets closest to 100. 🗊



forward.) An obtuse angle (more than 90°)? (Lean backward.)

Now suggest that he hold his

arms so they're parallel lines

(lines that never touch). Can

he make perpendicular lines

Create abstract art. Encour-

age your youngster to draw a

dozen straight, crisscrossing lines all over a piece of paper and color the shapes he forms.

(lines that intersect at right

angles) with his arms?

He could use a different color for each type of shape (trapezoid, rhombus, pentagon) and count how many of each there are. Now let him display his colorful work of art on

Geometry: Move it, draw it

Your youngster can stretch his body *and* his mind with these ideas for learning geometry through movement and art.

Strike a pose. Have your child sit upright with his legs straight out in front of him and his arms stretched above his head. He's a right angle (90°). How could he make an acute angle (less than 90°)? (Lean

PARENT TO PARENT Solving for x

I noticed my daughter Lucy's math assignments had problems with *x* in them. Since I didn't do equations like that until middle school, I asked her teacher why they were already doing algebra.

He explained that teaching kids to solve for *x* is an early algebra skill that builds number sense and gives them a head start on the more advanced math they'll do later. That made sense to me, so I asked how I could help Lucy work on algebra.



The teacher said we might make up problems with numbers missing in different places, such as x + 7 = 12, 5 + x = 12, or 5 + 7 = x. He pointed out that Lucy doesn't have to use *x*—she could draw a heart, a star, or anything she likes.

Lucy decided to write problems on the sidewalk using pictures in place of x. Sometimes, we leave equations on sticky notes for each other to find—under dinner plates or on the bathroom mirror, for instance. Her current favorite math activity? Typing equations on my phone or tablet—with emojis in place of x.

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Place-value scarecrow

This twist on "Hangman" will

the refrigerator. 🔰

1. Secretly think of a four- or five-digit number. (You may use the same digit more than once.) Draw a blank line for each place. *Example:* For 5,078, write _, _ _ _.

2. Your youngster should guess a digit (0–9). If he guesses 7, you would say, "There's a 7 in the tens place," and he would write a 7 in the correct blank (_ , _ <u>7</u> _).



3. If he guesses a digit that's not in your number, he draws a scarecrow body part and writes the digit next to it.

4. When all the blanks are filled in, ask your child to read the number to you ("Five thousand seventy-eight").

5. Switch roles, and play until your scarecrow is complete. $\widehat{oldsymbol{y}}$

SCIENCE

Why does my brain do that?

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Your family may get tongue-tied with this brain-testing experiment.

You'll need: 2 sheets of white paper, 8 different-color crayons or markers, stopwatch

Here's how: On one piece of paper, have your child write 8 color words with matching crayons (blue with a blue crayon). On the second sheet, she should write the same words, but this time in a different order and in the "wrong" colors (blue might be written in orange). Time family members as they quickly say the colors of the words on the first page. Repeat with the second page—make sure to say the colors and not read the actual words (say, "orange" rather than "blue").

What happens? You say the colors when they match the words faster than you do when they don't match.

Why? One part of the brain reads words and another part identifies colors. When you
try to simply name the colors, your brain instead tries to read the words.