

Math+Science Connection

Beginning Edition

Building Excitement and Success for Young Children

April 2013

Sweetbriar Elementary School



TOOLS & TIDBITS

Time yourself

Use a timer to help your youngster understand the passage of time. Set a kitchen or cell phone timer for 1 minute, and ask her to predict when it will buzz. Or say, "We're eating dinner in 3 minutes." Then, set a timer, and see if she can call "time!" when it's about to go off. With practice, she'll get better at estimating *elapsed time*.

Hear a heartbeat

Before your child's next checkup, help him make his own stethoscope to try at home. He can use duct tape to attach a funnel to a paper towel tube (wide end of the funnel facing out). Then, have him listen to your heart. Run in place for a minute, and let him listen again. He'll see that exercise makes your heart beat faster.

Web picks

Find a variety of math games and apps, organized by age and grade level, at knowledgeadventure.com/subject/math-games.aspx.

Help your youngster use science to make tops, instruments, and more with the ideas at sciencetoymaker.org.

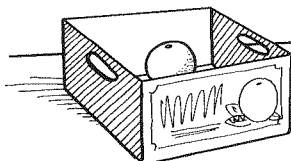
Worth quoting

"Arithmetic is being able to count up to 20 without taking off your shoes."
Mickey Mouse

Just for fun

Q: How many oranges can you put in an empty box?

A: One.
After that, it's not empty anymore!



Math on the road

"Are we there yet?"

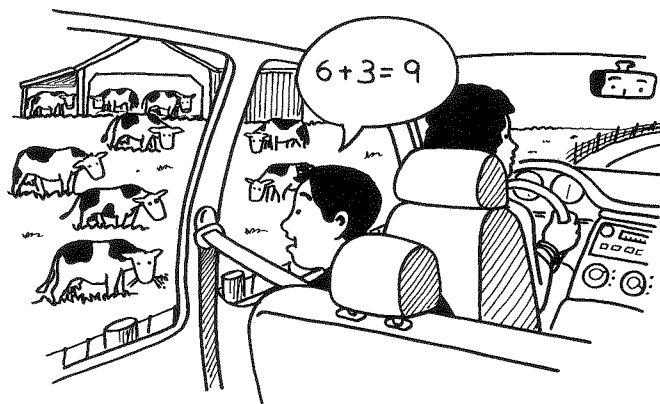
Take the edge off your child's time in the car by playing math games along the way. He'll practice math skills—and he won't get bored! Try these ideas.

Count the cars

Let your youngster pick a car color to look for (red). Then, each time he sees a red car, he counts it aloud. After 2 minutes, he can switch to another color (blue). After 2 more minutes, ask, "How many red and blue cars did you see altogether?" Or give each person a car color to count. The first one to 10 wins. Pick new colors, and play to 20.


Look for numbers

Work on number recognition by reading signs. Passengers might spot numbers on exit signs or billboards. An older child could use the numbers to make equations. For instance, if he sees a speed limit of 35, he can add the numbers ($3 + 5 = 8$). Or




he might subtract one speed limit from another ($55 - 40 = 15$).

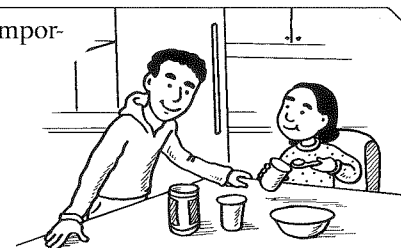
Use what you see

Make up math problems based on the sights you pass. If you see a farm, you could say, "There are 6 cows in the field. If 3 more were in the barn, how many cows would live on this farm?" (9) When you're stopped at a light, have your youngster count the windows on the front of a house (4). Then ask, "If the same number of windows are on the front and back, and half as many are on each side, how many total windows would there be?" ($4 + 4 + 2 + 2 = 12$) Let him think of math problems for you, too. 

Liquid or solid?

This tasty activity will show your youngster important differences between solids and liquids.

1. Empty a can of frozen juice concentrate into a bowl, and have your child touch it (with clean hands). Ask her how it feels (cold, hard) and what shape it is (a cylinder). This is a *solid*.
2. Let it sit until it melts. How would she describe it now? (Runny, no shape.) This is a *liquid*.
3. Pour the concentrate into two paper cups, and put one in the freezer. After several hours, she'll see that the one in the freezer is solid again. What does she think makes the substance go from solid to liquid to solid? (Answer: temperature.)
4. Let her eat the frozen one with a spoon! 



Math rocks

Math fun is as close as the nearest rocks! Head to your backyard or to a park, and follow these suggestions.

Find. Ask your child to gather 20 rocks of all different sizes, shapes, and colors and put them in a bucket or bag. As she deposits each one, she'll practice counting.

Sort. Have her sort the rocks by color or shape. She will need to notice *attributes*—or characteristics—to decide how to sort them. She might put brown



rocks in one pile and gray rocks in another. Or she could divide them by rounded or flat.

Order. Let your youngster line the rocks up by size, from smallest to biggest, or biggest to smallest. Help her use vocabulary words like *pebble* and *stone* to describe smaller ones. Can she think of other words that indicate a rock's size?

For example, a grain of sand is a very tiny rock, and a *boulder* is a huge one.

Number. With permanent markers, ask her to draw different numbers of dots on 10 rocks (one dot, two dots, three dots) and numerals (1, 2, 3) on the other 10. Then, mix them up, and have your child pair each "dot rock" with its matching "numeral rock."

SCIENCE LAB

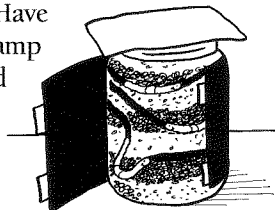


Worms welcome here!

After a spring rain, your youngster might notice worms crawling around. He can learn about these critters by making a "worm hotel."

You'll need: large glass jar, damp soil, worms, leaves, grass, kitchen scraps, construction paper, tape

Here's how: Have your child put damp soil in the jar and carefully place five worms inside. He can add "worm food" like leaves, grass, lettuce, apple pieces, or carrot peels. Then, he should tape dark construction paper around the jar and cover the top loosely with paper. Let the jar sit in a cool, dark place for 24 hours, and remove the paper.



What happens? The worms will have made tunnels in the dirt and begun eating the food. *Tip:* Encourage your child to observe the "hotel" over several days for changes. Then, make sure he returns his "guests" to the outdoors.

Why? In nature, worms dig through soil, eating what's there and adding nutrients to the soil.

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

Singing along with number songs

When I heard my son, Jason, singing along with his favorite songs the other day, it occurred to me that we could use songs to practice math.

I asked him to help me think of songs with numbers in them. He came up with "This Old Man," "The Ants Go Marching," and "Five Little Monkeys Jumping on the Bed." As we sang them, I heard him counting forward and backward.

Then, I suggested that he make up his own number songs. Jason had fun coming up with songs like "On Top of Addition" to the tune of "On Top of Spaghetti," and "The Numbers on the Bus" to the tune of "The Wheels on the Bus." He even decided to create his own songbook. After he wrote down each song and illustrated it, we stapled the pages into "Jason's Numbers Songbook." He's enjoying his musical math practice, and I'm happy to hear him singing his numbers!



MATH CORNER

Looking at arrays

Working with *arrays*—or arrangements of objects in rows and columns—can help your youngster get ready for multiplication. Here's how:

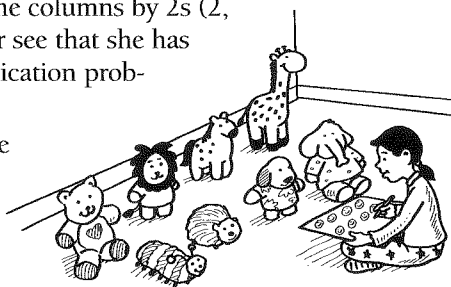
- Let her use toys to make arrays. For example, she could line up 2 rows with 4 stuffed animals each. To find the total, have her count the columns by 2s (2, 4, 6, 8). Help her see that she has created a multiplication problem: $4 \times 2 = 8$.

- Have her make a picture of her array. She might draw a smiley face to

represent each stuffed animal. This will help her visualize $4 \times 2 = 8$ on paper.

- Ask her to arrange the toys in another way. This time, she could have 2 columns of 4 animals. What problem did she make? ($2 \times 4 = 8$) She'll see that you can multiply digits in either order—this is the *commutative property*.

- Let her make arrays with even numbers of other objects. For instance, she might organize 12 erasers into 4 rows of 3, 3 rows of 4, 6 rows of 2, 2 rows of 6, 1 row of 12, and 12 rows of 1.



Math+Science Connection

Intermediate Edition

Building Understanding and Excitement for Children

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Sweetbriar Elementary School



INFO BITS

In your head

When you play games, ask your child to keep score in his head. This will help him with the “mental math” skills that are important in school—and in daily life. If you’re playing one-on-one basketball, he can keep a running total for each person. Or he could tally scores for card games like hearts or gin rummy.

Sorting it out

How are a tiger, a lizard, and your youngster alike and different? A three-way Venn diagram is a fun way to think about this. Have your child draw three overlapping circles. Then she can write in shared and unique characteristics. For instance, all three have eyes, brains, lungs, and teeth. But a tiger and a lizard have four legs, while she has two.

Web picks

Find a variety of multiplication games at multiplication.com/games. By solving facts quickly, your child could win the Grand Prix, keep ice cream shop customers happy, and more.

Encourage your youngster to explore weather at scholastic.com/kids/weather. He can change the temperature and humidity to create different conditions.

Worth quoting

“Go down deep enough into anything and you will find mathematics.”

Dean Schlicter

Just for fun

Q: The more you take, the more you leave behind. What are they?

A: Footsteps.



Divide and conquer

These are the years when your child tackles division. Use the following ideas to help her become as comfortable with dividing as she is with adding and subtracting.

Division games

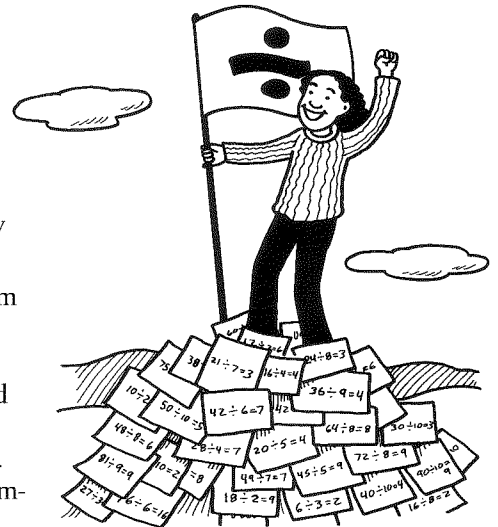
Games are a fun way to practice any math skill. Try these.

Cut in half. Remove the face cards from a deck of cards. Turn over two cards at a time to make a 2-digit number, and divide it in half. *Example:* Draw a 7 and a 2, make 72, and your score is 36 ($72 \div 2 = 36$). Play until no cards are left. The high score wins. *Note:* For odd numbers, use halves ($71 \div 2 = 35\frac{1}{2}$).

Add and divide. On your turn, roll six dice at once, and add the numbers together. Then, roll one die, and divide your total by that number. *Example:* Roll 3, 1, 5, 3, 2, and 4 for a total of 18. Roll a 3, and score 6 ($18 \div 3 = 6$). After five rounds, the low score wins. *Note:* If the total doesn’t divide evenly, use fractions ($19 \div 3 = 6\frac{1}{3}$).

Real life

Show your youngster how she’ll use division in the real world.



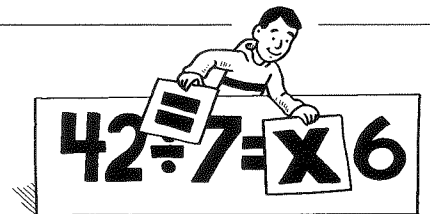
Calculate tips. Ask her to figure out restaurant tips. For 15 percent, she can divide the check (say, \$25) by 10 (\$2.50), divide that number by 2 (\$1.25), and add those numbers together ($\$2.50 + \$1.25 = \$3.75$ tip). For 20 percent, have her divide the tab by 10 and double that number ($\$25 \div 10 = \2.50 ; $\$2.50 \times 2 = \5 tip).

Figure out quantities. Let her divvy up snacks when she has friends over. If there are 20 pretzels and 4 kids, for instance, each person would get 5 pretzels ($20 \div 4 = 5$).

Division strategies

Your youngster may feel that he has a lot of division facts to memorize! Remembering these tips will help:

- Multiplication and division are *inverse* operations, so if he knows $6 \times 7 = 42$, he also knows $42 \div 7 = 6$.
- To divide by 1: the answer is the number you started with ($43 \div 1 = 43$).
- To divide by 2: cut the number in half (half of 14 is 7, or $14 \div 2 = 7$).
- To divide by 4: divide by half and then half again. For $24 \div 4$, divide 24 in half (12), and then divide 12 in half (6). So, $24 \div 4 = 6$.
- If a number ends in 0, it can be evenly divided by 10. Just drop the 0 to get the answer ($810 \div 10 = 81$).



SCIENCE LAB Hovering around

How does a hovercraft hover? With this amazing experiment, your youngster will find out.

You'll need: old CD, pop-top lid from a plastic drinking bottle, strong glue, 3 different-size balloons, timer

Here's how: Have your child glue the base of the lid (with the pop-top closed) onto the center of the CD, covering the hole. When the glue dries, help him blow up a balloon and stretch the neck over the top part of the lid—being careful not to let any air escape. Then, he should put the hovercraft on a table, pop the lid open, start the timer, and give it a push. Ask him to repeat the experiment twice



more and average the times (add the three times together, and divide by 3). Let him do the experiment again with the other balloons and compare the average times.

What happens? The device hovers above the table. The bigger the balloon, the more air is inside, and the longer the hovering time.

Why? Hovercrafts glide on a cushion of air, which is why they are also called ACVs (or air-cushion vehicles).

The hovercraft creates vents of slowly moving air that are trapped beneath it, allowing the craft to glide upon them.

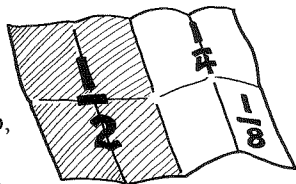
Fun facts: Hovercrafts are *amphibious* vehicles—they can travel above land or water. They are used for rescue operations on ice and water, mail delivery to remote river villages, and military operations. 📦

MATH CORNER

Fold a paper, see a fraction

Did you know your youngster can use paper folding to learn about *equivalent* fractions—or fractions that have the same value? Try these steps.

1. Have her fold a sheet of paper in half, open it up, and color one side. What fraction of the paper is colored? ($\frac{1}{2}$)



2. Ask her to fold the same sheet back in half and then in half again. How many equal parts are there now? (4) How many are shaded? (2) She'll be able to see that 2 quarters is the same as $\frac{1}{2}$, or $\frac{2}{4} = \frac{1}{2}$.

3. Let her fold the sheet back into quarters and then, with one more fold, into eighths. How many eighths equal $\frac{1}{2}$ now? (4) So, she'll know that $\frac{4}{8} = \frac{2}{4} = \frac{1}{2}$.

Idea: Take turns asking questions like "What's bigger, $\frac{2}{4}$ or $\frac{3}{8}$?" She can use the sheet to count the parts. 📦

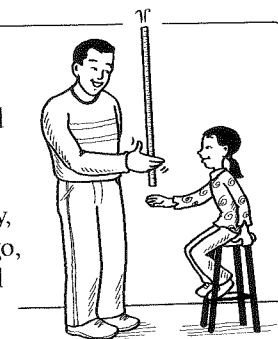
Think fast!

Reacting quickly can come in handy whether your child is playing sports or trying to catch a pencil rolling off her desk. She can check her reaction time with this activity.

Stand opposite each other, and hold a yardstick vertically, with the "0" end just above her hand. Tell her you will let go, and she should catch the yardstick between her thumb and fingers as quickly as possible. What number is her thumb on? Have her record the measurement. Let her repeat the experiment several times in a row. Does her reaction time get faster?

Reaction time is the interval between *stimulation* and *reaction*—or the time it takes for her eyes to tell her brain the yardstick is falling and for her brain to tell her fingers to catch it.

Ideas: Switch roles, and test your reaction time. Practice daily for a week to see if your times improve. 📦



PARENT TO PARENT

Math field trips

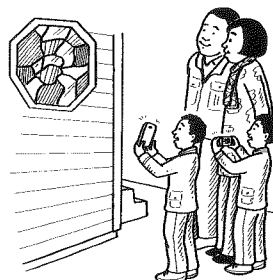
Our twin boys love school field trips, so I recently said to my husband, "Why don't we do family field trips, too?" And since math is their favorite subject, he thought it would be fun to take math excursions.

Our first trip was to our own downtown. We looked for the tallest buildings, and our kids counted the stories. Then, they tried estimating the heights of the buildings. We also had the boys take pictures of shapes they found, like a triangular pyramid on the bank's

roof and octagons in a church's stained glass windows.

Once we started thinking in terms of math field trips, we found ideas all around us. Next on our agenda is a tour of a nearby factory—our kids are curious to find out how math is used in producing motorcycles.

And they've asked if we can go to a baseball game and call it a math field trip. When they said they could calculate batting averages and compare pitching speeds, I realized they had a point! 📦



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