

JEFFERSON COUNTY PUBLIC SCHOOLS

101 Simple Ways to Help Your Child With **Math**



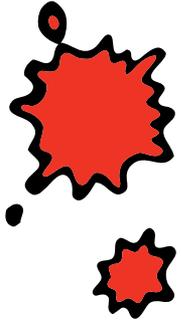
Jefferson County
Public Schools
Shaping the Future

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“ We know math and science skills are the common currency everyone needs to have to succeed in the increasingly competitive global economy. ”

—U.S. Secretary of Education
Margaret Spellings



“ The mathematical sciences particularly exhibit order, symmetry, and limitation; and these are the greatest forms of the beautiful. ”

—Aristotle



“ If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is. ”

—John Louis von Neumann

The Jefferson County Public Schools Communications and Publications Department acknowledges the help of district teachers and math specialists in preparing this booklet.

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Jefferson County Public Schools

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Preschool

Most children develop a sense of numbers when they are very young. Even at two years old, some children can identify one, two, or three objects. Here are some tips you can use to nurture your child's natural number sense and to help him or her get ready for kindergarten math.

-  Encourage your child to separate toys or other objects into groups. For example, you could ask your child to separate blue toy cars from red cars.
-  Use toys or other objects to teach your child the concepts big and little as well as more and less. For instance, let your child play with plastic cups in the bathtub and talk about how some cups have more water in them and some have less.
-  Arrange two rows of toys or other objects. Ask your child if there are more objects or fewer objects in the second row. Instead of counting, help your child find the answer by matching each object in the second row to an object in the first row.
-  Weigh and measure your child, and tell him or her the results.
-  Talk about how some things are taller or shorter and some things are lighter or heavier than your child is. Ask your child to find things in your home that are both tall and heavy or short and light.
-  Teach your child to look for patterns in things. For example, you could arrange different colored stuffed animals so they repeat the pattern red, blue, green.



"If you think dogs can't count, try putting three dog biscuits in your pocket and then giving Fido only two of them."

—Phil Pastoret



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-  Talk to your child about numbers. Teachers would like children to be able to recognize the numbers 1 to 10 and to be able to count to 20 when they start school.

 -  To help your child learn to count accurately and efficiently, use these tips from *Helping Your Child Learn Mathematics*, a publication of the U.S. Department of Education (Office of Communications and Outreach; Washington, D.C.; 2005):
 - Point out that counting lets your child know how many things there are in a group.
 - Point to the object as you recite each number name.
 - Use fingers to count. Put up a finger one at a time. Tell your child that fingers are tools we always have with us.
 - Help your child count without skipping numbers or counting something twice.

 -  Help your child learn the names of such shapes as squares, circles, and triangles. Point out toys and other items in your home that have these shapes.

 -  Sing songs, recite rhymes, and read stories that have numbers in them—“Ten Little Monkeys: Jumping on the Bed,” for example.

 -  You also can read stories that highlight groups of three, such as “The Three Little Pigs” and “Goldilocks and the Three Bears.” Reading these stories gives children a sense of number groupings.

 Encourage your child to work simple connect-the-dot puzzles.

 Help your child develop a sense of time. For example, you might say, “We’ll go to the grocery this evening—after we eat dinner.”

 Teach your child how to say his or her telephone number and address. Your child may learn them more quickly if you set them to the melody of a familiar song, such as “Mary Had a Little Lamb.”

 The year before your child is ready to start kindergarten, explore the Math/Science/Technology (MST) magnet programs that are available to Jefferson County Public Schools (JCPS) elementary students. MST programs are offered at three schools:

- **Brandeis Elementary**, 2817 West Kentucky Street, **485-8214**
- **Wheatley Elementary**, 1107 South 17th Street, **485-8348** (offers a Math/Science/Technology and Humanities Program)
- **Young Elementary**, 3526 West Muhammad Ali Boulevard, **485-8354** (offers the Global Institute for Science, Math, and Technology)

The application period for elementary school magnet programs is the month of February. JCPS provides transportation for most district students accepted into a magnet program. For more information, contact one of the schools or call the JCPS Optional, Magnet, and Advance Programs Office at **485-3323**.

Fun Math Fact

If it takes you a second to count each number, it would take about 11 and a half days to count to a million. It would take about 32 years to count to a billion.



Elementary School

Children work on simple counting skills when they start elementary school. In just a few years, they're ready for such lessons as adding and subtracting fractions, constructing and interpreting line graphs, converting units within the metric system, and graphing ordered pairs on a positive coordinate system. Here are some tips for helping your child develop solid math skills throughout the elementary years.

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- Ask your child to explain what he or she learned in math class today. Letting children take the teacher role gives them the chance to practice new skills and to clarify their thinking on a lesson.

 - Teach your child math by teaching him or her about money. According to the Family Education Network, children between the ages of about six and ten should be able to make change, to understand that things cost money, to be responsible for their own money, and to handle an allowance. (For more information, see <http://life.familyeducation.com/money-and-kids/personal-finance/34481.html>.)

 - Talk to your child about how adults use math in their everyday lives—grocery shopping, budgeting, balancing a checkbook, and checking clothing sizes, for example.

 - Talk about people who use math in their jobs, including builders, architects, engineers, computer professionals, and scientists.

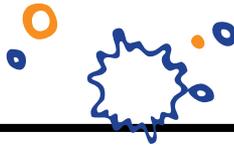
 - Point out that even if your child does not plan to pursue a career in which he or she will use math, learning it is still important because math teaches how to solve problems and how to think logically.

I never did very well in math. I could never seem to persuade the teacher that I hadn't meant my answers literally.

—Calvin Trillin

- Buy a few inexpensive, age-appropriate math workbooks for your child to use at home. You may not think children would sit around and do math problems for fun, but some do.
- Schedule a time and provide a quiet environment for your child to work only on math homework.
- Make a point to praise your child's efforts in math. Don't focus on mistakes. Offer praise every time your child finishes an assignment and every time he or she figures out a difficult problem.
- Ask your child's teacher if you can volunteer to help with math activities in your child's classroom. Volunteering specifically for these activities will show your child that you believe learning math skills is important.
- Talk to a teacher anytime you have questions or concerns about your child's math skills. Questions you might want to ask include "What grade level is my child on?" and "What are some specific things I can do to help at home?"
- Teach your child math tricks, such as the 9-method. Example: To figure out 9×7 , hold out all 10 fingers. Start counting at the pinky finger on your left hand, and then lower the seventh finger (the index finger on your right hand). There are now six fingers to the left and three fingers to the right of the seventh finger. The answer is 63. The trick works with 9×2 through 9×10 .
- Use a storybook to increase your child's interest in math, suggests nationally known math guru Marilyn Burns. For example, you might want to use Leo





Serious Math Fact

On tests of math literacy and problem solving, U.S. 15-year-olds rank 24th when compared to the test results of students in 29 developed nations.

Lionni's *Inch by Inch*, the story of an inchworm who uses math to save his life. After you read the story, you may want to help your child measure things around the house.

- ❑ “Make math a game,” suggests Jefferson County Public Schools (JCPS) teacher Sue Fountain, a winner of the National Presidential Award for Excellence in Mathematics and Science Teaching. “For example, work on number recognition and counting skills by looking for numbers on houses or car tags when you take a walk together through your neighborhood.”
- ❑ Fountain also points out that “many young children enjoy playing school. Join them, and use flashcards with basic addition or subtraction problems. Help your child figure out the answers with beans, poker chips, or just your fingers. Take turns being the teacher.” (A Web site that offers free, printable flash cards is A+ Math at www.aplusmath.com.)
- ❑ Show your child the math resources that are available through the JCPS Web site. On the homepage (www.jcpsky.net), click the *Students* link, select *Elementary*, and then click *Homework Help* or *Practice Your Skills*.





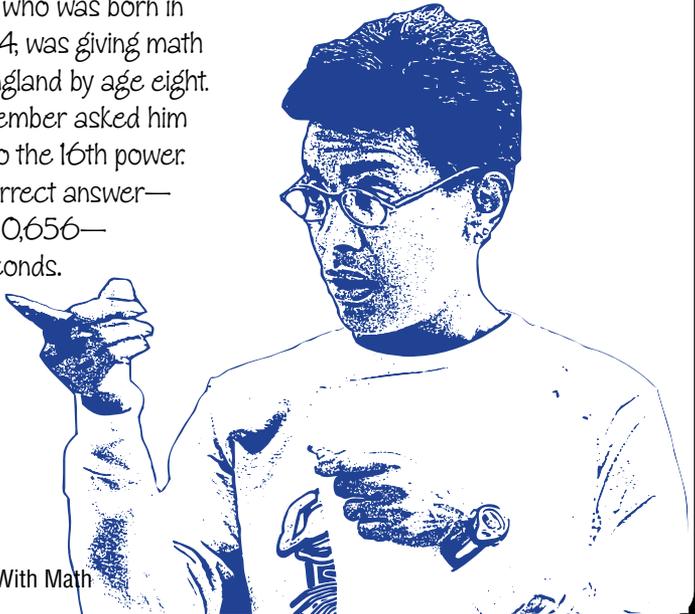
☐ The year before your child is ready to start sixth grade, explore the Math/Science/Technology (MST) magnet programs that are available to JCPS middle school students. MST programs are offered at three schools:

- Farnsley, 3400 Lees Lane, **485-8242**
- Meyzeek, 828 South Jackson Street, **485-8299**
- Newburg, 4901 Exeter Avenue, **485-8306**

Students who are accepted into the program are assigned to one of the schools based on their home address. The application period for middle school magnet programs is the months of November and December. JCPS provides transportation for most district students accepted into a magnet program. For more information, contact one of the schools or call the JCPS Optional, Magnet, and Advance Programs Office at **485-3323**.

Fun Math Fact

Zerah Colburn, who was born in Vermont in 1804, was giving math exhibitions in England by age eight. An audience member asked him to figure out 8 to the 16th power. He gave the correct answer—281,474,976,710,656—in about 30 seconds.



Middle School

The middle school years are the ones in which many students start to lose interest in math because they find it difficult or boring. Use the following tips to keep your child interested.



- Cook up some calculations. “Get your child to help you measure ingredients while you cook,” suggests Lisa Gimbel, a teacher at Noe Middle. “Ask the child how he or she would convert a recipe for 4 into a dish for 2 or a banquet for 20.”

- For students who suffer from math anxiety and test panic, the **Math.com** Web site offers this advice: “Work around the panic by finding something on the test that you can do. Gain confidence and then go back and finish the rest of the problems. Keep going on the ones you can do, then go back and try the others. You might be surprised to find that you can now tackle them with ease.” Your child can find many more tips at **www.math.com/students/advice/anxiety.html**.

- “Be positive about math,” suggests Jefferson County Public Schools (JCPS) teacher Sue Fountain, a winner of the National Presidential Award for Excellence in Mathematics and Science Teaching. “If math was a challenge for you, be careful how you express that to your child. Parents often say, ‘I was never any good at math.’ Unfortunately, the children may begin to believe that they inherited the same inability. Perseverance is more important than heredity.”

- Discuss unfamiliar words in your child’s math homework. Don’t be afraid to admit you don’t know or don’t remember some of the definitions. Look them up together. A Web site where you can look

them up is the Interactive Mathematics Dictionary (<http://intermath.coe.uga.edu/dictionary/homepg.asp>).

-  “Let’s read the problem together and make sure we understand what it is asking.” This is one of the things you might want to say if your child gets frustrated with homework. According to the **Coolmath.com** Web site, you also may want to ask, “Why don’t we take a 10-minute break and come back to this when we aren’t so frustrated?” For more tips, visit www.coolmath.com/parents/.

-  Ask your child to explain what he or she learned in math class today. Letting students take the teacher role gives them the chance to practice new skills and to clarify their thinking on a lesson.

-  Talk to teachers often about your child’s math skills. Let the teachers know you are willing to work with your child at home.

-  Teach your child math by teaching him or her about money. According to the Family Education Network, children between the ages of 11 and 13 should be able to set up a savings plan and a savings account. They also should understand the importance of giving to worthy causes, and they should know how to shop wisely. (For more information, see <http://life.familyeducation.com/money-and-kids/personal-finance/34481.html>.)

-  One way to help your child become a good shopper is to encourage him or her to compare products before making a purchase. Tell your child to look for the same merchandise at different stores. “Compare not only the prices but also the stores’

Serious Math Fact

Each year, U.S. companies spend \$4.3 billion on remedial math education for employees.





return and refund policies,” says Julie Hundley, a practical living teacher at Crosby Middle. “If you compare similar products that have different prices, look for quality and durability.”

- Here’s a quick question you could use to test your child’s shopping (and math) skills. Which of the following is the best deal on backpacks:
 - a. \$24 each
 - b. Buy one backpack at \$32 and get another at 50 percent off.
 - c. Get one backpack free when you buy two for \$36 each.

Answer: This is sort of a trick question because you end up paying \$24 for each backpack in all three deals.

- Encourage your child to find a math study buddy—another student your child can call to work with on assignments and to find out about make-up work if your child is absent.
- Encourage your child to take as many math classes as possible and to always take the highest level for which he or she qualifies.
- If your child uses a calculator in math class, make sure he or she knows how to use it effectively (especially if it’s a graphing calculator). Ask your child to explain to you how it works.

Fun Math Fact

In 1900, all of the world’s math knowledge would have fit into about 80 books. Today it would take more than 100,000 books.



-  If you have a daughter, you may need to work extra hard to keep her interested in math. Studies show that young girls enjoy math, science, and technology as much as boys do, but by the time they become eighth graders, twice as many boys as girls say they're interested in math, science, and engineering careers.

-  Encourage your daughter to visit the Girls Go Tech Web site (**www.girlsgotech.org**). Sponsored by the Girl Scouts of America, the site offers math, science, and technology information and games.

-  Girls Go Tech also offers a brochure for parents, which includes suggestions for activities and experiments that you can do with your child at home.

-  If you decide to hire a math tutor for your child, ask his or her teacher for recommendations. You also might want to contact high schools and colleges to see if their advanced math students offer tutoring.

-  Show your child the homework help and other math resources available through the JCPS Web site. On the homepage (**www.jcpsky.net**), click the *Students link*, select *Middle*, and then click *Homework Help* or *Practice Your Skills*.

-  Another good site to visit on the Web is Figure This! (**www.figurethis.org**). Sponsored by the National Council of Teachers of Mathematics, Figure This! offers interesting math challenges for middle school students.



□ Ask your child to search online for instructions for jobs you want to do around the house that involve math (installing flooring, for instance). Print the instructions, and ask your child to help with the project.

□ The year before your child is ready to start ninth grade, explore the Math/Science/Technology (MST) magnet programs that are available to JCPS high school students. MST programs are offered at three schools:

- **DuPont Manual High**, 120 West Lee Street, **485-8241**

- **Seneca High School Magnet Career Academy**, 3510 Goldsmith Lane, **485-8724**
(offers a Mathematics/Science/Technology component within its Liberal Arts Magnet Program)

- **Western MST Magnet High**, 2501 Rockford Lane, **485-8344**



The application period for high school magnet programs is the months of November and December. JCPS provides transportation for most district students accepted into a magnet program. For more information, contact one of the schools or call the JCPS Optional, Magnet, and Advance Programs Office at **485-3323**.

Serious Math Fact

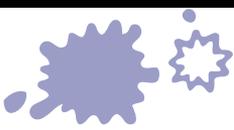
Louisville ranks 12th among 15 peer cities in terms of the percentage of citizens employed in technical or professional occupations.



High School

Whether your teen struggles with math or actually has better skills than you do, you still can play an important role in his or her math education. Here's how.

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-  Build your teen's math skills by building his or her money skills. According to the Family Education Network, high school students should understand budgeting, investing, taxes, and saving for college. (For more information, see <http://life.familyeducation.com/money-and-kids/personal-finance/34481.html>.)
 -  Talk to your teen about debt. A *Consumer Reports* study found that 40 percent of teens don't understand that banks charge interest on loans. Many young people don't even realize that credit cards are a form of borrowing.
 -  If your teen has a job, help him or her fill out his or her own state and federal tax returns. If your teen doesn't have a job yet, get him or her to help with the family tax returns.
 -  Encourage your teen to read the business section of the newspaper. Articles in this section often have a lot of numbers in them.
 -  Encourage your teen to take as many math classes as possible and to always take the highest level for which he or she qualifies.
 -  Continually show an interest in your teen's math education. Every few weeks, you might want to ask, "What are you learning now?" Ask your teen to explain the lesson to you if it's not a math concept you already know.



☐ Help your teen learn about the various career fields in which advanced math skills are important, including architecture, construction, landscaping, engineering, and information technology.

☐ Point out that even if your teen does not plan to pursue a career in which math is important, learning math is still important because it teaches how to think in a disciplined way.

☐ “Be positive about math,” says Sue Fountain, a Louisville Male High teacher and a winner of the National Presidential Award for Excellence in Mathematics and Science Teaching. “If math was a challenge for you, be careful how you express that to your child. Parents often say, ‘I was never any good at math.’ Unfortunately, the children may begin to believe that they inherited the same inability. Perseverance is more important than heredity.”

☐ “No matter how old your children are, don’t be embarrassed if you don’t remember how to work the problems they bring home,” Fountain says. Online resources can help you brush up on your skills. For example, if you visit www.math.com/parents.html you can review lessons on almost any topic your child will study.

☐ For teens who suffer from math anxiety and test panic, the **Math.com** Web site offers this advice: “Work around the panic by finding something on the test that you can do. Gain confidence and then go back and finish the rest of the problems. Keep going on the ones you can do, then go back and try the others. You might be surprised to find that you can now tackle them with ease.” Your teen can find more tips at www.math.com/students/advice/anxiety.html.

“Do not worry about your difficulties in mathematics.

I assure you that mine are greater.”

—Albert Einstein

□ “Because most math courses are cumulative, in other words, new concepts are added to and built upon previous concepts, it is very important that the early material be mastered thoroughly,” says an article in the Math Learning Strategies Database hosted by Muskingum College in New Concord, Ohio. For study tips, visit <http://muskingum.edu/~cal/database/content/math.html>.

□ Encourage your teen to visit any branch of the Louisville Free Public Library to explore math-related books and to use his or her Student Power+Plus Library Card. Every Jefferson County Public Schools (JCPS) student receives a Power+Plus card that offers access to a range of library services.

Besides borrowing books, the card lets students use library computers; access full-text articles from newspapers, magazines, and reference books through the library’s online research tools; and take practice tests for the SAT, ACT, and some Advanced Placement exams.

□ Encourage your teen to use the homework help and other math-related resources that are available through the JCPS Web site. On the homepage (www.jcpsky.net), click the *Students* link, select *High*, and then click *Homework Help* or *Practice Your Skills*.

□ Talk to your teen’s teachers about his or her math skills. Ask how you can help your child at home for college and career preparation.

□ If you decide to hire a math tutor for your teen, ask his or her teacher for recommendations. You also might want to contact colleges to see if their advanced math students offer tutoring.



Family Math Fun

- Play math-related games with your child, suggests Lisa Gimbel, a teacher at Noe Middle. “Dominoes, Yahtzee, Uno, Monopoly, and many other games require math skills,” Gimbel says. “Point this out to your child as you play, and talk about the ways that people use math every day.”
- “Family projects, such as remodeling a room or hanging wall paper, can teach kids an incredible amount of math,” points out Jeffrey Wright, a Louisville Male High teacher and a winner of the Teacher of the Year Award from the Kentucky Department of Education.
- Get your older children to check their younger siblings’ math homework and to offer to be math tutors when the young students need help.
- If your children like sports statistics, you might want to show them how to set up a graph on paper or a spreadsheet on a computer that they can use to track the numbers.
- Let your children help you map a family trip. Ask them to help calculate the number of miles between stops.
- Play math games in the car when your family travels. For example, the U.S. Department of Education recommends this game: Ask everyone to look at the license plate on the car in front of you and to try to make the largest three-digit number possible. If the license plate is 254-116, for example, the largest three-digit number is 654.
- Another travel game for young children: Ask everyone to look at signs and billboards in order to find a series of numbers in order. For example, a sign with A-1 on it gives you the number 1. Then look for a different sign with a 2 on it. See how high you can go.



Online Math Resources

The World Wide Web offers thousands of math sites. Here's a guide to a few of them.

- The AAA Math site (www.aaamath.com), designed for students in kindergarten through the eighth grade, offers interactive lessons and games.
- BrainPOP (www.brainpop.com) offers entertaining online movies on such topics as adding and subtracting fractions, basic probability, and the Fibonacci sequence. BrainPOP Jr. (www.brainpopjr.com) offers movies for students in kindergarten through the third grade.
- Connected Mathematics (<http://connectedmath.msu.edu/parents/>) offers homework tips and a math help section.
- **Coolmath.com** offers games, online calculators, lessons, practice problems, a math dictionary, and a Math for Parents area. Separate sections of the site are available for kids and for "ages 13-100."
- **Funbrain.com**, designed for students in kindergarten through the eighth grade, offers Math Baseball, the Plural Girls, Math Car Racing, and other games.
- The Jefferson County Public Schools (JCPS) Web site offers links to homework help, practice tests, digital tools, and other math resources for every grade level. On the homepage (www.jcpsky.net), click the *Students* link and then select Elementary, Middle, or High.
- **Math.com** offers a large collection of resources for all levels, including homework help, quizzes, games, study and test-preparation tips, calculators and other tools, and expert answers to math questions.
- The Math Forum (www.mathforum.org) offers puzzles, games, a "Parents & Citizens" section, and an Ask Dr. Math



feature with an archive of more than 10,000 answers to elementary, middle, high school, and college questions.

- Math Goodies (www.mathgoodies.com) is a portal that provides interactive lessons, worksheets, and homework help.
- The Math Learning Strategies Database (<http://muskingum.edu/~cal/database/content/math.html>) is a good source for study tips; advice on using substitution (replacing the unknown part of an equation or problem with something known); and strategies for memorizing terms, definitions, symbols, equations, and solutions.
- The National Library of Virtual Manipulatives (<http://nlvm.usu.edu/en/nav/vlibrary.html>) offers interactive tools in the categories Numbers & Operations, Geometry, Algebra, Measurement, and Data Analysis & Probability.
- Success in Mathematics (<http://euler.slu.edu/Dept/SuccessinMath.html>) offers tips on how to study math, how to approach problem solving, how to study for and take tests, and when and how to ask for help.
- The Homework Help area on Education Place (www.eduplace.com/parents/resources/homework/math/) offers such tools as a temperature conversion chart; a list of Roman numerals; metric system information; decimal/fraction equivalencies; and addition, subtraction, multiplication, and division tables.
- The **About.com** math site (<http://math.about.com/>) offers a large collection of articles, tools, worksheets, tutorials, and other resources for all grade levels.
- Cornell University's Math and Science Gateway (www.tc.cornell.edu/Services/Education/Gateways/Math_and_Science) provides links to resources for students in grades nine through twelve.
- Webmath (www.webmath.com) offers online forms in which you can type math problems. The site will instantly analyze a problem and, when possible, will provide a step-by-step solution.
- Visual Fractions (www.visualfractions.com) is a tutorial that models fractions with number lines or circles.



The JCPS Math and Science Initiative

Jefferson County Public Schools (JCPS) is using a portion of a \$25 million grant from the GE Foundation's Developing Futures in Education™ program to fund a new districtwide elementary math curriculum as part of the Add it up—Math + Science for All initiative.

One goal of the initiative has already been accomplished: the development of world-class math standards (the guidelines for what students should know at each grade level). The district's standards are world class because they combine the elements of standards used in the world's highest-performing countries in math: Japan, Singapore, and the Netherlands.

The JCPS standards:

- Divide content into units that provide greater depth of instruction at each grade level.
- Create an expectation that students will not just be exposed to content but will master it within each unit.
- Arrange content so that all students are ready for algebra at least by the eighth grade.

JCPS and the Jefferson County Teachers Association continue to work on revamping the math and science curricula and to focus on increasing the percentage of students scoring Proficient or Distinguished on state tests.

The initiative is also focused on increasing the percentage of high school graduates who enroll in college and on producing graduates who will compete successfully in the global marketplace. For more information, visit www.addituplouisville.com and www.jcpsky.net/Projects/GEMSI/index.html.



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