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Math education has changed considerably over the last several years and continues to change. Most parents were schooled to believe that math is about memorizing facts, procedures, and formulas, and then using that knowledge to produce right answers on tests. As a result, they struggle with two important ideas that are fundamental to how we wish to teach mathematics. First, we want to teach students that there is more than one way to solve a problem. Second, we want students to wonder about, make sense of, and understand what they are doing and to be able to explain their thinking.

Given these striking di□erences, it is no surprise that parents and guardians feel uncertain about how to help their children at home.

Parents have three pressing concerns:

1. How can I make sure my child gets good grades?
2. How do I increase my child's confidence?
3. What do I do when I don't know the math and can't help my child?

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Dr. Raj Shah has always had an a□nity for math. Powered by his love of math, he earned a Ph.D. in physics in 1999, which led to a career in R&D at Intel. In 2008, he quit his job and founded Math Plus Academy, an after-school STEM enrichment program for kids from ages 5–14. His mission is to introduce kids and adults to the wonders of mathematics. Dr. Shah also contributes his time to Math Teacher Circles, the Julia Robinson Math Festival, and is a founding member of The Global Math Project. He believes that everyone can enjoy math, develop strong number sense, and become a perseverant problem solver.

It’s our responsibility as teachers and administrators to empathize with the uncertainty that parents feel and educate them to see that there is more to math than right answers.

In addition, we need to provide parents with the tools and techniques to support their child at home in a way that benefits the child in school and beyond. We can do this without having to teach parents all the math.

This paper provides tips and strategies you can share with parents to help them feel confident about helping their child, even if that child struggles with math. Many of the suggestions presented here can be effective for students throughout their school experience from TK to Grade 12.

A Parent Can Help, Even If They Don't Know Math

As a parent, it can be frustrating to discover that the way you learned math is not the way your child is learning it.

Let's reassure parents that there is no shame in not knowing the "new math."

We can't expect parents to learn all the new math strategies, and that is OK! Many teachers themselves have not learned math the way it is currently being taught. Parents may be hesitant to help students with their math strategies out of concern for teaching them the "incorrect" way, but it is important for students to see di erent representations and models of mathematics, especially when it comes to application. Let's remind parents that their job is not to explain HOW to do math. If parents view themselves as partners in the learning process, then they can focus on:

- Making math about trial and error and not right vs. wrong.
- Encouraging thinking by asking meaningful questions that help connect the learning to their child's experiences.
- Keeping the mood relaxed and not increasing the pressure a child feels.
- Being less helpful—if you end up doing the work FOR the child, they won't learn.
- Playing games and tackling puzzles together.

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3. **Identify an endeavor in which your child demonstrates a growth mindset** and engage in a conversation about how that feels. Maybe the thing they enjoy and practice is music or sports or video games. Everyone has di□erent mindsets for di□erent aspects of their life. This conversation will help your child see that they CAN have a growth mindset in mathematics.

4. **Look for signs that reveal a fixed mindset.** Students with a fixed mindset will try to hide their mistakes and make excuses to avoid trying because they are afraid to make mistakes. In their minds, mistakes are confirmation that they can't do math. They don't recognize mistakes as part of the learning process.

5. **End every sentence that starts with "I can't do..." with the word "yet."** Again, this will reinforce the notion that learning is a process.

Games provide many benefits:

- They are fun for the whole family.
- They are interactive and collaborative.
- They take the pressure out of math and put it into meaningful contexts.
- They involve problem solving, critical thinking, estimation, and arithmetic skills.

Which games are the best?

Almost any game you can think of requires planning, logic, and mental math—all skills that are vital to excellence in mathematics. Even a “word game” like Scrabble involves mathematical thinking when placing words to optimize your score. Family traditions are the glue that holds families together. Parents can start a family game night by choosing one night a week to play games. Turn o the TV, silence your phones, tune out other distractions, and just have fun!

You’re never too old to play games. The games listed below are good for ALL ages from TK to Grade 12 and on to adulthood! Yes, even high schoolers can enjoy good games.

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1. SET (Ages 7+)
    - This game takes a few minutes to learn and enhances visual/spatial reasoning skills. Each player surveys the field of 12 cards, looking for groups of three cards that are all the same or all di erent with respect to shape, color, number, and pattern. Try the single-player online version to learn how the game works.
2. Qwirkle (Ages 6+)
    - Qwirkle is like Scrabble but with shapes and colors instead of letters. Players can build on each other’s lines with new tiles. The creative player can find clever ways to maximize their score. Qwirkle can be played with school-age students. As you play more, you and your child will discover new winning strategies.
3. Carcassonne (Ages 8+)
    - Carcassonne is a tile-based game for two to five players. Players build a landscape by adding tiles to the board as the game goes on. After strategically placing a tile, players have several options for placing their “followers” on the board. This allows the game to be played with a diverse set of competing strategies, which makes it a lot of fun.

4. Settlers of Catan (Ages 8+)
    - Settlers of Catan is the winner of several gaming awards and was called “the board game of our time” by The Washington Post. It challenges players to build colonies as they acquire and trade resources. This is another game that allows for multiple competing strategies. A typical game lasts 60 to 90 minutes.
5. Forbidden Desert (Ages 8+)
    - Forbidden Desert is a cooperative game where each player takes the role of an adventurer with a unique skill that will aid the team. Players work together using each other’s unique skills to survive on an ever-shifting game board. The teamwork needed to play this game makes it a

Other recommended games and puzzles

- Chocolate Fix and Rush Hour (Ages 7+) by ThinkFun—Logic and Reasoning
- Hive (Ages 7+) by Gen42 Games—Strategy
- Zeus on the Loose (Ages 5–9) by Gamewright—Addition and Subtraction Sense
- 24 (Ages 10+)—Mental Math
- Prime Climb (Ages 9–12)—Mental Math
- Sumoku (8+)—Strategy

These games provide kids with great opportunities to develop their thinking and communication skills. Games present a wonderful and natural learning opportunity for all ages.

California Curriculum: 2023 Mathematics Framework

Parents

In California, the importance of teachers supporting parents and guardians in relation to their students' learning is illustrated in Chapter 10 of the new 2023 mathematics framework:

"Because the CA CCSSM and this framework present mathematics instruction that is significantly different from what many parents experienced as students, it is critical to educate parents and guardians about what to expect and about the reasons and research behind the changes. Educating

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