

# ST MATH® PARENT GUIDE | Let us answer your questions

## Can a game change how you feel about math?

At MIND Research Institute, we believe every student has the potential to deeply understand, and truly love math. This belief drives all of us—researchers, educators, mathematicians, game designers—to make ST Math the best program it can be.

## What is the ST Math® program?

ST Math is a PreK-8 visual instructional program that leverages the brain's innate **spatial-temporal** reasoning ability to solve mathematical problems. With ST Math, students build deep conceptual understanding, and schools and parents see proven, repeatable results.

## Why aren't there any instructions?

The ST in ST Math stands for **spatial temporal**, and it refers to learning math concepts by manipulating objects in space and time.

ST Math's patented approach starts by teaching the **foundational concepts** visually, then connects the ideas to the symbols, language, and robust discourse. This approach works well because with visual learning, students are better equipped to tackle unfamiliar math problems, recognize patterns, and build conceptual understanding. Without language barriers, the problems are accessible to all students, regardless of skill level or language background.

## Why are there so many puzzles?

ST Math is mastery based, which means students must pass each level with all puzzles correctly solved. Each student has their own personalized journey and takes as long as they need to **achieve mastery**. By using similar visual models and game situations across grade levels, ST Math helps students build and strengthen their conceptual understanding, and connect their existing knowledge to new situations. This means that ST Math works from the start with early learners, and it can also reinforce and repair weak conceptual foundations for students who are already **struggling**.

## Why was my answer wrong?

In ST Math, action is critical and mistakes are the perfect opportunity for learning. Animated informative feedback offers an **intrinsically motivating** learning experience that shows students the mathematical consequences of each answer. Students don't just guess at multiple choices, or worse, get a question wrong and wonder why. With ST Math, students see the math animating on screen, and are able to better understand exactly why they got the answer right or wrong.

### Why does it look so simple?

ST Math's visual approach limits distractions so your child's full attention can be focused on solving the math problem at hand. The design is intentionally simple. It's called an "impoverished environment" because simple designs offer no distractions and keep the focus on the learning.

### My child is frustrated, how can I help?

In ST Math, the game puzzles start off simple and then get more challenging as the student progresses. It's normal for your child to feel some frustration when the puzzles get harder—we call that productive struggle, or learning from mistakes. When they reach a challenging problem, they may ask for your help. It's hard, but try not to give them the answer. Instead, **ask questions** to help your child think through the math in the game. Encourage your child to take risks and ask them to explain what they learn from the wrong answer.

### Who is MIND Research Institute?

ST Math is created by MIND Research Institute, a nonprofit social impact organization specializing in neuroscience and education research. For over 20 years, MIND has worked towards redefining math education. Through ongoing research, we continue to investigate key questions about learning, mathematics, and how the brain works. We work to create unique and effective learning environments for students and teachers, both inside and outside of the classroom.



### Who is Jiji?

*Jiji is a 3-foot-tall penguin on a journey through the world of ST Math. Students help Jiji overcome obstacles by solving math puzzles – and they associate Jiji with the thrill of challenge and success. Jiji crosses the screen every time a student successfully completes a puzzle, leading them to the next challenge. Jiji is curious, persistent, patient, and friendly. Jiji's name means "little chicken" in Mandarin.*

**For more information on MIND Research Institute and ST Math, visit [stmath.com](http://stmath.com).**



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# GUÍA PARA PADRES DE ST MATH® | Permítanos responder sus preguntas

## ¿Puede un juego cambiar tu sentir sobre las matemáticas?

En MIND Research Institute, creemos que cada estudiante tiene el potencial de comprender profundamente y amar verdaderamente las matemáticas. Esto nos impulsa a todos—investigadores, maestros, matemáticos, y diseñadores de juegos—a hacer de ST Math el mejor programa posible.

## ¿Qué es ST Math®?

ST Math es un programa de instrucción visual para los grados PreK-8. El programa utiliza la capacidad innata de razonamiento **espacio-temporal** del cerebro para resolver problemas matemáticos. Con ST Math, los estudiantes desarrollan una comprensión conceptual profunda, y las escuelas y los padres ven resultados comprobados y repetibles.

## ¿Por qué no hay instrucciones?

El 'ST' en ST Math significa **espacio-temporal**, y se refiere al aprendizaje de conceptos matemáticos mediante la manipulación de objetos en el espacio y el tiempo.

El enfoque patentado de ST Math comienza visualmente enseñando los **conceptos fundamentales**, luego conecta las ideas con los símbolos, y el lenguaje y el discurso sólido. Este enfoque funciona porque con el aprendizaje visual, los estudiantes están mejor equipados para resolver problemas matemáticos desconocidos, reconocer patrones y desarrollar una comprensión conceptual. Sin barreras de idioma, las problemas son accesible para todos los estudiantes, sin importar su nivel de habilidad o lenguaje.

## ¿Por qué hay tantos problemas de resolver?

ST Math se basa en la maestría, que significa que los estudiantes deben pasar cada nivel con todos los problemas matemáticos resueltos correctamente. Cada estudiante tiene su propio viaje personalizado y toma el tiempo que sea necesario para **lograr la maestría**. Mediante el uso de modelos visuales y situaciones de juego similares en todos los niveles, ST Math ayuda a los estudiantes a construir y fortalecer su comprensión conceptual, y conectar su conocimiento existente a nuevas situaciones. Esto significa que ST Math funciona desde el principio con los estudiantes que aprenden temprano, y también puede reforzar y reparar los fundamentos conceptuales débiles para los estudiantes que ya tienen **dificultades**.

## ¿Por qué mi respuesta fue incorrecta?

En ST Math, la acción es crítica y los errores son la oportunidad perfecta para aprender. La reacción animada inmediata ofrece una experiencia de aprendizaje **intrínsecamente motivadora** que muestra a los estudiantes las consecuencias matemáticas de cada respuesta. Los estudiantes no solo adivinan opciones múltiples, o peor, se equivocan sin saber por qué. Con ST Math, los estudiantes ven la animación matemática en la pantalla y pueden comprender mejor por qué obtuvieron la respuesta correcta o incorrecta.



### ¿Por qué se ve tan simple?

El enfoque visual de ST Math limita las distracciones para que toda la atención de su hijo/a pueda centrarse en resolver el problema matemático en cuestión. El diseño es intencionalmente simple. Se llama un "ambiente empobrecido" porque los diseños simples no ofrecen distracciones y mantienen el enfoque en el aprendizaje.



### Mi hijo/a está frustrado, ¿Cómo puedo ayudar?

En ST Math, los problemas matemáticos del juego comienzan de manera simple y luego se vuelven más desafiantes a medida que el estudiante progresa. Es normal que su hijo/a sienta cierta frustración cuando los problemas se vuelven más difíciles: a eso lo llamamos lucha productiva o aprender de los errores. Cuando llegan a un problema desafiante, pueden pedir su ayuda. Es difícil, pero trata de no darles la respuesta. En cambio, **haga preguntas** para ayudar a su hijo/a a pensar en las matemáticas del juego. Anime a su hijo/a a correr riesgos y pídale que le explique lo que aprende de la respuesta incorrecta.

### ¿Quién es MIND Research Institute?

ST Math es creado por MIND Research Institute, una organización sin fines de lucro de impacto social especializada en investigación en la neurociencia y educación. Por más de 20 años, MIND ha trabajado para redefinir la educación matemática. A través de la investigación en curso, continuamos investigando preguntas clave sobre el aprendizaje, las matemáticas y cómo funciona el cerebro. Trabajamos para crear ambientes de aprendizaje únicos y efectivos para estudiantes y maestros, tanto dentro como fuera del salón de clases.

### ¿Quien es Jiji?

*Jiji es un pingüino de 3 pies de altura en un viaje por el mundo de ST Math. Los estudiantes ayudan a Jiji a superar obstáculos resolviendo problemas matemáticos, y asocian a Jiji con la emoción del desafío y el éxito. Jiji cruza la pantalla cada vez que un estudiante completa con éxito un problema, lo que lo lleva al próximo desafío. Jiji es curioso, persistente, paciente y amigable. El nombre de Jiji significa "gallinita" en Mandarín.*

**Para obtener más información sobre MIND Research Institute y ST Math, visite [www.stmath.com](http://www.stmath.com).**



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# Using ST Math® at Home

## Instructions for Accessing ST Math Outside of School

Dear Parents or Guardians:

With ST Math, students play computer games designed to teach math. They can play the games at home on devices with internet access. We encourage you to have your child play the games to review and practice the math skills learned in ST Math.

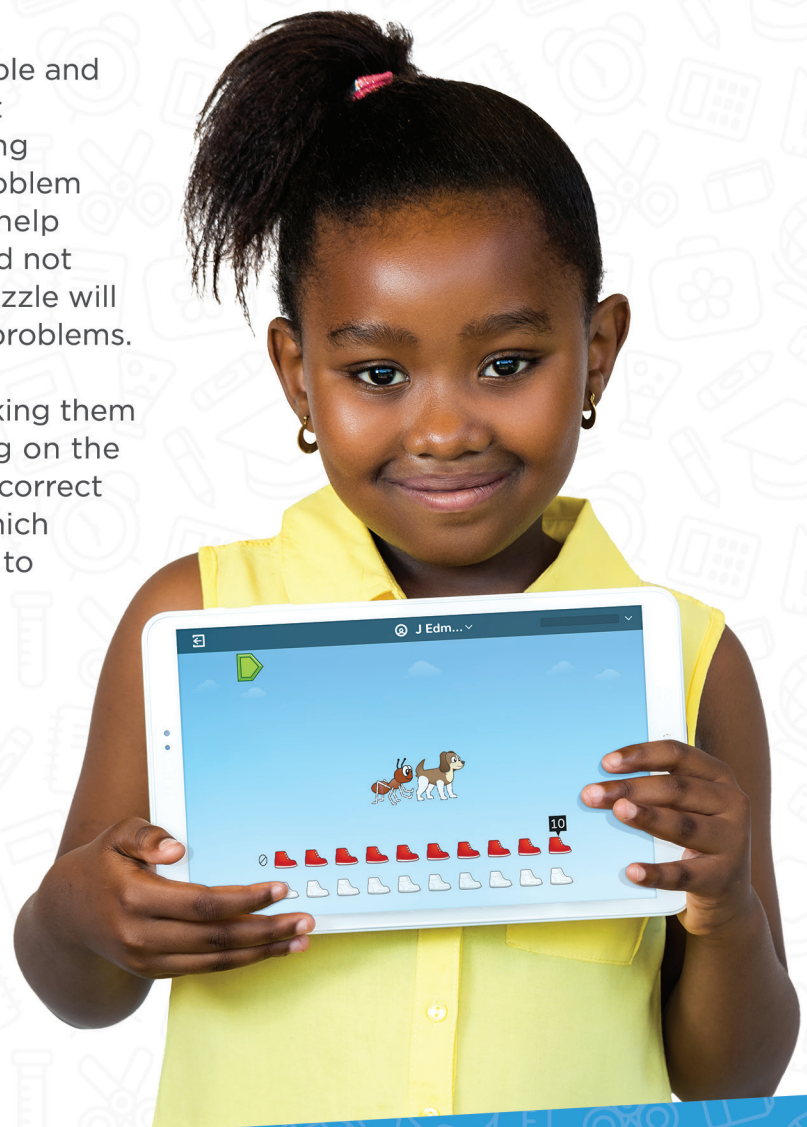
Your child's teacher may assign ST Math games for homework. Please make sure only the child with the ST Math account plays the games. Your child will access the program just as he or she does at school.

In ST Math, the game puzzles start off simple and then get more challenging as the student progresses. When they reach a challenging problem, your child should attempt the problem and use the visual feedback provided to help them figure out why their answer did or did not work. The feedback provided with each puzzle will help students figure out how to solve the problems.

If your child is struggling, help them by asking them questions about what they see happening on the screen. You should not give your child the correct answer to get them past the game with which they are struggling. The goal of ST Math is to promote problem solving.

### Questions?

Please ask your child's classroom teacher.



**STMath**  
stmath.com

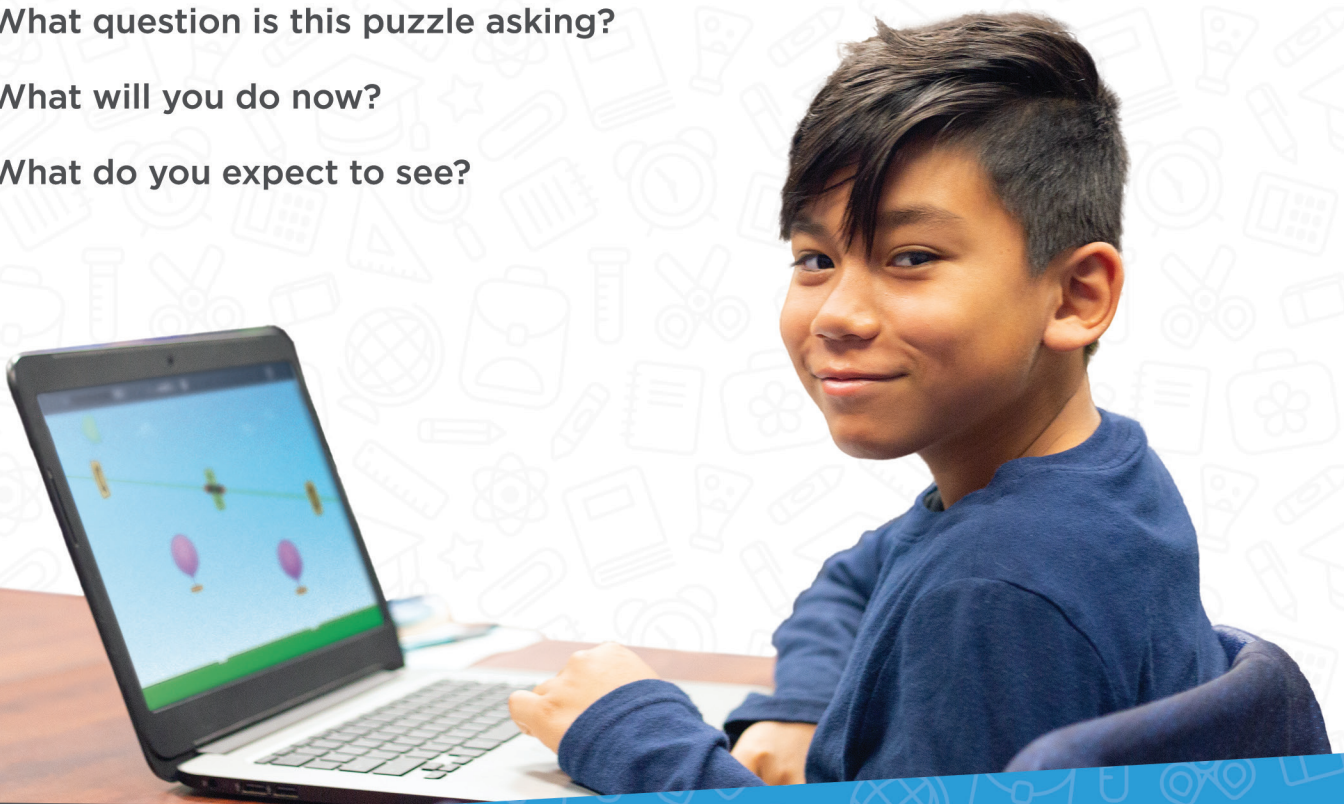


# Facilitating Questions

In ST Math®, the puzzles start off simple and then get more challenging as the student progresses. When they reach a challenging problem, they may ask for your help.

To help them, ask questions like:

- What do you notice about the puzzle?
- What did you learn from the previous level that can help you here?
- What can you click?
- Describe what you see after you click. What did you learn?
- Describe the strategy that you are going to use.
- What can you do to get JiJi across the screen?
- What question is this puzzle asking?
- What will you do now?
- What do you expect to see?





# Bring Math into Your Family Routine

Reading with your child is considered an integral part of a daily or nightly routine. **Shouldn't math be equally important?**

We don't mean doing worksheets of problems with your child. Instead, think about how you can incorporate mathematical conversation into daily activities like cooking, shopping, driving, or combine them with other activities like games, art and puzzles.

You can use ST Math to promote mathematical conversation with one of these ideas below:

- **Ask your child to select a level they have completed (it will be marked in green), and teach it to a family member.**
- **Build a summer math word wall with vocabulary words they use while explaining the games.**
- **Create word problems that go along with each puzzle.**
- **Write a math story based on the visual picture in a level.**

For more ideas on how to bring math into your family's routine, check out these resources:

- **K-12 Game-a-thon** - [mindresearch.org/gameathon](http://mindresearch.org/gameathon)  
Design a math game with your child and enter it in this national challenge!
- **Bedtime Math App** - [bedtimemath.org/apps](http://bedtimemath.org/apps)  
Daily activities and problems to solve together.
- **Calculation Nation** - [calculationnation.nctm.org](http://calculationnation.nctm.org)  
Interactive games for upper elementary and middle grades math curriculum with fractions, factors, multiples, and more.
- **The California Math Council** - [cmc-math.org/about](http://cmc-math.org/about)  
Free math education articles and activities for students from pre-K through high school.
- **Figure This!** - [figurethis.nctm.org](http://figurethis.nctm.org)  
Math challenges for middle school students and families.
- **The Math Forum** - [mathforum.org](http://mathforum.org)  
"Ask Dr. Math", take on an internet math hunt, or compete in one of the many weekly and monthly math challenges based on grade level.
- **Illustrative Mathematics** - [illustrativemathematics.org](http://illustrativemathematics.org)  
Mathematical tasks that closely illustrate all of the Common Core Standards for each grade.



# Homework Without Tears

## 12 Homework Tips for Parents

You don't have to dread helping your kids with math homework.

Homework helps students develop study skills, fosters independence and responsibility, increases students' understanding of content, teaches time management skills and builds positive academic self-image. Unfortunately homework can also cause unnecessary frustration, prevent students from participating in extracurricular activities and lead to poor self-esteem.

Luckily those negative aspects are preventable by making homework an important priority for your family and trying out these 12 helpful homework tips:

### 1 Limit Distractions

Create a homework zone for your child that is away from the television and other places where there could be distractions such as pets, people coming and going, and loud noises.

### 2 Provide Tools

Make sure the materials that your child may need are readily available. It's helpful to have a stash of pencils, pens, a dictionary, etc. available. Check in regularly and make sure that any special materials needed for class projects are provided so their work won't be disturbed.

### 3 Help Manage Time

Establish a set time for doing homework. Don't wait until just before bedtime to do homework when they are tired and easily distracted. Think about using a morning or afternoon on the weekend for working on big projects, especially if the project involves getting together with other classmates.

### 4 Be Positive

The attitude you express toward homework will be the same attitude your child acquires. Make it a habit to tell your child that the work they're doing is important.

### 5 Do YOUR Homework

Show that the skills they're learning are related to things you also do as an adult. If your child is reading, you could be reading too. If your child is practicing math, you could balance your checkbook.

### 6 Teach, Don't Tell

It's important that when asked for help you give guidance but not answers, that way your child learns the material and concepts. Remember that a lot can be learned from struggle and that too much help can teach your child that when the going gets rough, someone will do the work for them.

### 7 Cooperate

Teachers will often ask that you play a role in your child's homework. Make sure you're being an advocate for the teacher and follow their direction so you can show that school and home are a team.

### 8 Foster Independence

Some homework is really intended for students to do alone. Homework is a great way for children to develop independence and accountability for lifelong learning skills.

### 9 Communicate

Make sure you talk to your child's teacher and understand the purpose of homework and what the class rules are.

*Continued >*



# Homework Without Tears

## 12 Homework Tips for Parents

### 10 Build Metacognitive Skills

Help your child decide what homework is hard and what is easy, then encourage them to work on the hard stuff first so they're most alert for challenging work.

### 11 Schedule Short Breaks

Watch your child for signs of failure and frustration. Let your child take a short break if they're having trouble keeping their mind on the assignment. Build perseverance but set time limits to avoid burnout.

### 12 Reward Progress and Effort

When your child has been successful and is working hard, celebrate success with a special event to reinforce positive effort.

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**How much time is really enough?** These numbers are estimates, the actual time spent doing homework at night can vary with each child's motivation and interest level.

**K-2**  
10-20 Minutes

**3-6**  
30-60 Minutes

**Middle/High School**  
60 Minutes  
*(Varies greatly based on class load)*

**Not all homework is equal!** It's important to know what homework type your child's teacher has assigned and what their homework policy is. Here are four examples of homework you might see this year:

### 1 Practice Homework

Just like it sounds, this type of homework is designed to help your student learn and remember key concepts taught in the classroom.

### 2 Preparation Homework

This homework consists of material that hasn't been taught in the classroom just yet. These assignments are designed to introduce your child to the content that will help them acquire concepts taught later on in class.

### 3 Extension Homework

Students are asked to apply their skills to other content or a special project in this homework style that is usually assigned over a period of time.

### 4 Integration Homework

This homework is similar to extension, but often results in a class presentation or event like a science fair.