FAMILY'S ROLE IN SUPPORTING MATH DEVELOPMENT AT HOME

Math can sometimes feel intimidating. This resource and similar tools will help you guide your child in developing a positive identity around using math, instead of saying "I'm not a math person." Math is a journey. It has the power to help solve problems, support critical thinking, develop executive functioning skills and open doors to a successful future.

Studies indicate that early math skills are the strongest predictors of later academic achievement regardless of race, gender, or socio-economic status. We showcase our math skills every day from creating schedules and budgeting to following a recipe. Your everyday tasks probably look different from what others in your community do to help their children learn math. That's okay - there are a variety of ways to help children learn math at home! While the actions look different, they likely align to adults playing one of these six key roles: **supporters, encouragers, modelers, monitors, advocates and co-creators.**

These diverse roles that families play to support learning at home come from a research-based framework for Family School Partnerships called the **Dual Capacity Framework**. On the following pages, you'll find concrete ways to play each of the six roles at home to help children—from Kindergarten to High School—develop strong math skills and confidence.

Before you dive into the roles, take a few minutes to familiarize yourself with Colorado's Academic Standards for Mathematics. These guides outline what students should be able to do in math by the end of each grade: **Kindergarten**, **1st**, **2nd**, **3rd**, **4th**, **5th**, **6th**, **7th**, **8th**, **High School**.

Understanding these standards will help you build stronger partnerships with your child's math teachers. But remember, all children progress at their own pace! As you explore the standards and this guide, consider reviewing the standards for grades above and below your child's grade to get a sense of how math skills develop over time.

There is no one way to play any of these roles, and we know there are countless ways you already support your child that may not be included in this guide. As you explore the tips and recommendations on the following pages, we hope you feel inspired to try something new to help your child become a confident and skilled mathematician.

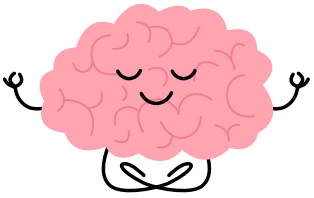
FAMILIES AS SUPPORTERS: *PARTNERING FOR MATH DEVELOPMENT*

As a child grows, your role as a supporter adapts to fit their needs. The supporter ensures that a child has the time, space, and help to build their math understandings, problem-solving skills, and ability to communicate about math. Your support - no matter your level of math knowledge - makes a huge difference in your child's development of confidence, resilience, and a love for math!

ALL GRADES:

- **Create a study area:** Establish daily routines for your family so that everyone knows when it is time to focus. A comfortable, well-lit, quiet work area with a pencil, eraser and scratch paper can make a huge difference!

- **Model a mindful math mindset:** Your mindset toward math sets the tone. Modeling how to stay calm and encouraging (even when a problem feels frustrating), helps your child build similar skills for facing challenging academic tasks.



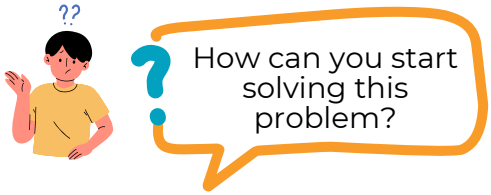
- **Provide brain breaks:** Make math homework more approachable by chunking tasks (e.g., child completes 5 problems at a time) and providing movement breaks.

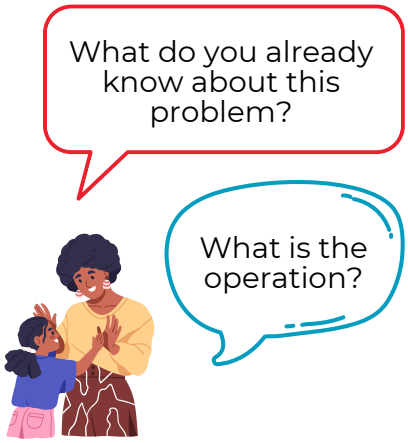
- **Make real-world connections:** Model math in your own life, whether balancing a budget, planning a trip schedule, or solving puzzles. This helps your child understand that math is a practical, necessary skill.

GRADES K-5:

- **Serve as a guide**: Use guiding questions to help your child approach a problem.

- **Use visuals as an aid:** Act out or draw pictures to represent the actions in a story problem. This allows your child to visualize and comprehend the information, helping them to determine the operation(s) to use to solve the problem.





GRADES 6-8:

- **Support time management:** Create a schedule which allows enough time for math homework and time to wind down with a book before bed! Even the most reluctant middle schoolers really appreciate the downtime and might even find they like it. They also need plenty of rest for their brains to keep growing.

- **Build independence:** Encourage your child to solve problems on their own first, and then ask them to defend their work and mathematical thinking. This is a great place to push your child's use of math-specific vocabulary. It also will help them discover miscalculations on their own.

- **Make math part of everyday life**: Help your child make connections between math and real life by asking them to apply various math concepts in everyday situations, like calculating sales prices, interpreting graphs in the news, and adjusting recipes.

GRADES 9-12:

- **Be a coach:** Be a resource by offering to review instructions, clarify questions, or double-check answers, but avoid completing the work with them.
- **Highlight the future:** Discuss how math relates to career aspirations or real-world problems, such as budgeting, engineering, or data analysis.

- **Prepare for assessments:** Help your child access practice tests and study guides for math-based standardized tests (e.g., SAT, ACT) to improve test–taking strategies. This will help them feel more comfortable and confident with the assessment, which can ultimately enhance their performance.

- **Provide emotional support:** Encourage them! High school math, especially advanced topics, may be stressful. Remind them that persistence and effort are key to mastering difficult material.

FAMILIES AS ENCOURAGERS: *PARTNERING FOR MATH DEVELOPMENT*

Encouragement from our friends and family help us celebrate successes and face challenges. These words of affirmation can serve as the gentle nudge to keep going when things get tough. Math development can feel challenging at times, but it's also an exciting journey!

Building math skills takes time, practice, and determination. In the role of Encourager, you have the unique opportunity to be your child's biggest cheerleader. Your patience, positivity, and belief in their abilities can inspire them to embrace challenges, build confidence, and stay motivated, no matter their age or stage of learning.

ALL GRADES:

- **Cheer them on:** Be your child's #1 fan and celebrate math achievements, no matter how small! Positive reinforcement boosts confidence and motivation.
- **Show enthusiasm:** Share your excitement and wonder for math and STEM by saying things like, "Wow, math is everywhere!"

GRADES K-5:

- **Make math fun:** Turn math practice into games or challenges, like using dice to practice addition or multiplication or timing how quickly your child can complete a problem set.

- **Celebrate the entry point:** Highlight even the smallest success (e.g., setting up a problem) with specific praise so your child knows what they did correctly. This builds confidence and makes difficult problems more accessible.
- **Use positive language:** Develop a growth mindset for your child by replacing finite statements such as "This is hard," or "I can't do this," with growth statements, such as:

GRADES 6-8:

- **Share your own experiences:** If you've struggled with math, let them know that they are not alone and provide examples of how you overcame the struggle: "I remember finding this tricky. I studied with my friend to get help and better understand the concept."

- **Serve as a student:** Let them explain or teach a tricky concept they're learning. Putting concepts in their own words will reinforce your child's learning and they will feel pride in teaching you something new.

- **Suggest resources and tools:** When they're stuck, encourage them to ask their teacher for extra help or use online tutorials, such as Khan Academy, to strengthen their understanding of a tricky concept. Highlight their independence when they seek help.

GRADES 9-12:

- **Emotional support before assessments:** Ease test anxiety by acknowledging their hard work in studying and preparing for a quiz or test.

- **Encourage persistence:** Remind them that complex concepts take time to master. Praise their effort and improvement rather than the outcome.

- **Acknowledge their independence:** Validate their initiative in tackling math challenges and seeking out help from their teachers or online tools, such as Khan Academy.

FAMILIES AS MODELERS: *PARTNERING FOR MATH DEVELOPMENT*

As a caregiver, you have the unique opportunity to set a positive example about learning! You are a powerful model - your actions, words and attitude shape how they perceive and approach their education. By modeling positive attitudes and engaging in everyday problem-solving, you can inspire your child to build confidence and strong skills in math. Highlighting math in daily life helps create a cohesive and supportive environment at home, reinforcing what your child is learning at school!

ALL GRADES:

- **Family fun:** Use math-based games or puzzles, like Sudoku, board games or card games to show that math can be enjoyable and part of family fun.
- **Highlight math's daily use**: Showcase the math you use daily, such as measuring ingredients while cooking, calculating time, or comparing prices while shopping. Explain how math is influencing the choices you make daily for yourself and the family. This shows the child that adults take math seriously.

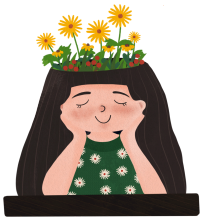
GRADES K-5:

- **Develop math vocabulary:** Pair math terms with objects to make concepts tangible. For example, say "This table is a rectangle because it has four sides and the opposite sides are equal," or, "This stack of 10 books is greater than the other stack of 3 books."

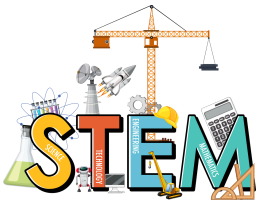
- **Find math at home:** Use activities and chores around the home to engage in organic, authentic math conversations with your child. Most these activities root in the foundational math skills of sorting, comparison, and number sense. For example, you can say: "I wonder which pot can hold the most water?" or "You have 30 seconds left in the bath. Let's count backwards together.".

- **Make learning interactive:** Discuss how games help build both math and logic. For example, UNO builds number recognition and Mancala builds counting and strategic thinking. Other games to consider are Chutes & Ladders (counting within 100), Tangrams (shapes and spatial reasoning), jigsaw puzzles, LEGOS. See here for additional games and online programs.

GRADES 6-8:



- **Showcase a growth mindset:** Share your thinking out loud when you make a miscalculation. Acknowledge that making mistakes is a part of learning: “I underestimated how much time it would take me to make dinner, and now we are all very hungry. Tomorrow, I will start 15 minutes earlier so we can start on time.”



- **Engage in math-related conversations:** Ask your child questions that require math or STEM reasoning, such as “How would you calculate how long it will take us to travel 200 miles at 55 mph?” Involve them in decision making for house or cooking projects, asking them to measure items, adjust recipes, or create budgets.

- **Be open about using math tools:** Show how tools like calculators, spreadsheets, or apps can be helpful and demonstrate how to use them purposefully, emphasizing that its important to understand the math concept so that you appropriately use the tool.

GRADES 9-12:

- **Foster financial literacy:** Teach your teen basic financial concepts like budgeting, saving, compound interest, and credit scores. Use real-life examples, such as creating a savings plan for a personal goal or comparing student loan options. Encourage them to use financial literacy apps (e.g., Greenlight, Mint or YNAB) to track their expenses and build practical money management skills.

- **Teach time management:** Help your child develop organizational skills to manage larger projects. Share tips for studying effectively and managing deadlines, which will prepare them to live independently.

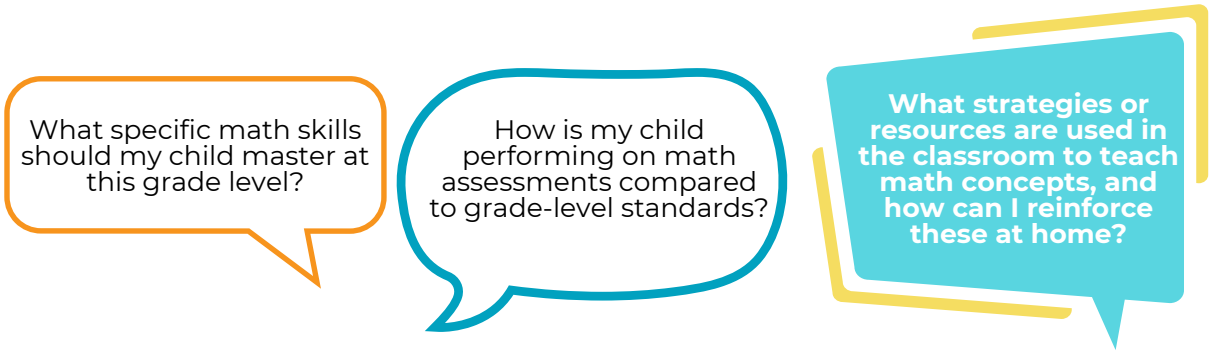
- **Model life-long learning:** Take up new learning challenges (like coding or spreadsheet formulas) and share that journey with your child. Show them that developing math and STEM skills enhances job marketability and makes life more interesting.

FAMILIES AS MONITORS:
PARTNERING FOR MATH DEVELOPMENT

With the influx of communication and news, it is easy to lose track of important information from your child's school! You play the role of Monitor in your child's math development by staying informed about expectations for your child at each stage of their education. The goal is for you to understand their progress through school assessments, online gradebooks and teacher conferences. This active monitoring better ensures that your child is on track to meet grade-level expectations, identify when they need extra support, and connect them with learning opportunities to help them succeed.

ALL GRADES:

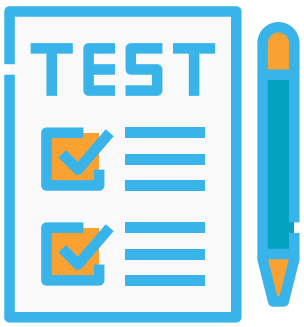
- **Ask questions:** To track your child's math development, it is important to have all the information you need to support their growth at home. Consider asking



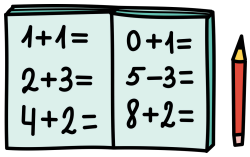
If your child is not yet on grade level, some additional questions are:

- What interventions or support services are available to help my child catch up to grade level?
- What short-term goals can we set to track my child's progress in closing math gaps?
- How will the school communicate my child's progress and let me know if additional help is needed?

- **Understand statewide assessments:** Read the Colorado Department of Education's testing resource for educators and parents and ask your child's teacher what tests will be administered and ask how you will receive results. Reach out to your school if you do not receive or understand your child's results.



GRADES K-5:



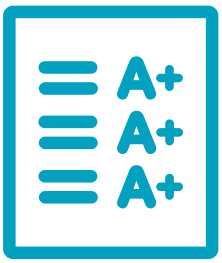
- **Track and discuss classwork:** Regularly review your child's math work alongside them to see completion rate, identify patterns or difficulties they may be facing. Discuss their work openly to show that you are paying attention to their progress. This not only helps you understand their learning but also demonstrates your investment in their success, increasing their own accountability and engagement.

- **Maintain a log:** Keep a simple record of your observations from homework or activities, math achievements and challenges over time. This log can help you monitor growth and prepare for future discussions with educators.

- **Prepare for conferences:** Request your child's math assessment data or any assignments that will be discussed at the meeting. Familiarize yourself with the information, looking for trends in strengths and growth areas. Understanding the data allows you to ask the right questions during your limited in-person time with the teacher!

GRADES 6-8:

- **Engage in reflection:** Ask your child to share their thoughts about their own progress in math. Questions like, "What math topics feel easy for you?" and "What do you find hardest about your math homework?" can help them take ownership of their learning. Use this reflection to guide discussions with teachers and reinforce your role as a supportive partner in their math development.



- **Monitor online gradebooks:** Stay up-to-date on your child's math progress by checking online gradebooks or teacher communication platforms. Follow up with your child about missing work or low grades. Use this information to discuss strategies with the teacher during conferences or via email.

GRADES 9-12:

- **Ensure completion of graduation requirements and college readiness:** Familiarize yourself with the state's graduation criteria, including mandatory math courses (e.g., Algebra I, Geometry, Algebra II). Additionally, align their course selections with their post-high school plans (college, trade school, or careers).

- **Strengthen executive functioning skills:** After teaching your child how to prioritize their workload and commitments, check-in periodically to ensure deadlines are met but allow them to take ownership of their schedule. If they struggle, consider introducing tools like planners or digital apps to track tasks and due dates.

FAMILIES AS ADVOCATES: *PARTNERING FOR MATH DEVELOPMENT*

Adults who show up as advocates for a child when it comes to math development ensure that their child has the necessary support, resources, and opportunities to build math skills and ability to explain or communicate their mathematical thinking. As a family, you can instill in your children the idea that math is not just about rote equations. Math is used to understand the world, solve engineering problems, innovate, advocate for oneself, and participate in society. Let your child see you advocate in your school and community for better math and STEM resources and programs.

ALL GRADES:

- **Inquire about interventions:** Ask your child's school what additional resources or interventions, such as tutoring, specialized math or STEM programs, or assessments for learning differences like dysnumeria or dyscalculia are available through the school. See specific questions to ask teachers so you know what to advocate for on the Family as Monitor page.
- **Get involved:** Collaborate with other caregivers to raise money for classroom tools, STEM-focused programming and field trips, technology (e.g., robotics, 3-D printer), or lab equipment.
- **Promote math and STEM confidence:** Work with educators for lessons that celebrate problem-solving and that incorporate strategies to reduce math anxiety, such as group work.

GRADES K-5:

- **Share observations:** You know your child's areas of strength and growth best! If your child is excelling or struggling with certain aspects of math or STEM, communicate this with the teacher so they can tailor support and inspire growth.
- **Request tailored materials:** If your child will benefit from extra challenges or support, ask the teacher for specific resources, such as math games, hands-on manipulatives or additional worksheets.

- **Encourage frequent communication:** Inquire about consistent updates on learnings in the classroom or upcoming

GRADES 6-8:

- **Push for STEM extracurriculars:** Advocate for after-school programming, such as math leagues, science fairs, robotics clubs, or coding clubs. Activities such as these will ensure that children have continued support and inspiration outside regular school hours.

- **Monitor opportunities:** Ensure your student has access to advanced classes, extracurriculars, and other programs, regardless of perceived ability or background.

- **Champion inclusive representation:** Talk to your child's teachers and school about ensuring learning materials and role models reflect diverse contributions in STEM, the materials should showcase all genders, ethnicities and backgrounds.

GRADES 9-12:

- **Promote digital literacy:** Encourage the school to offer workshops on using industry-standard tools like Python, MATLAB, CAD, or GIS software.

- **Campaign for STEM curriculum:** Work with parent and community councils or district curriculum committees to enhance STEM elective options such as Advanced Placement (AP) math and science courses, dual-enrollment programs with colleges, or courses like computer science, engineering, robotics, or data science.

- **Highlight scholarships and programs:** Ask counselors, teachers and schools for resources that inform students about STEM scholarships, summer programs, internships, and future career paths. Considering pooling community knowledge about these opportunities in STEM.

FAMILIES AS CO-CREATORS: *PARTNERING FOR MATH DEVELOPMENT*

Adults play the role of Co-Creator by collaborating with educators and the community to enhance programming, support, and learning opportunities outside of school. The co-creator goes beyond attending school events and volunteering, serving as true partners in identifying challenges, offering solutions, and sharing insights to make math education more effective and engaging.

Every family engages in math-related activities at home. Imagine the possibilities if educators fully understood the math skills and experiences your child develops outside of school and connected those to classroom lessons. When these connections are made, math becomes more inclusive, meaningful, practical, and enjoyable for students, paving the way for lifelong success.

Unlike the other five roles that parents play to support math development, the suggestions below are intended to create connections between families' strengths and cultural knowledge and what students learn in school, and are appropriate for any grade.

SHARE YOUR FAMILY'S INTERESTS AND CULTURE:

- Collaborate with educators to highlight non-traditional or culturally specific ways that math and science are applied in your family's everyday life. For example, if your family cooks together, perform a cooking demonstration during a fractions unit and discuss the importance of measurements. If your family works in construction, present during the geometry unit, explaining how shapes, measurement and spatial reasoning are important knowledge for the career. Activities such as this allow for true partnership- you bring a wealth of knowledge and the educator brings the skill of being a teacher.

PROMOTE INCLUSIVE COMMUNICATION

- Ensure that all the caregivers involved in your child's education receive communication about your child's education. Teachers and administrators should share updates, grades, and opportunities with moms, dads, grandparents, or other caregivers who actively support the child.

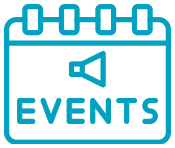
CO-CREATE FAMILY-EDUCATOR MEETINGS TO SUPPORT MATH DEVELOPMENT

- Before parent teacher conferences, send your child's teacher an email sharing any concerns or questions you have about your child's math progress. Conferences are short but this is a strategy to promote a solutions-oriented conversation.

- Create a plan with your child's teacher to set specific, achievable math goals for your child. Agree on the timeline for achieving each goal, progress monitoring, and the frequency and form of how progress will be communicated.

CO-HOST STEM EVENTS

- Partner with educators to develop events that bring families and the community together to discuss and celebrate math, science and technology. Events could be family math nights, science fairs, career fairs, or community-based STEM challenges (e.g., coding contests, engineering design projects, or budgeting exercises).



ADVOCATE FOR MULTILINGUAL COMMUNICATION

- If school communication about math or STEM programs, assignments, or events only come in the dominant language, make the school aware of the need for translations. Work with administrators to ensure all families receive clear, accessible information in their preferred language to effectively support their child's math development.