# Family Math

## Core Competencies

NAFSCE
NATIONAL ASSOCIATION FOR FAMILY, SCHOOL, AND COMMUNITY ENGAGEMENT

Center for Family Math

# Acknowledgements

The Center for Family Math envisions a world where family math advances learning and equity for each and every child and does this by advancing research, policies, practices, partnerships, and systems that inspire, harness, and amplify the power and love of math. The Center for Family Math is an initiative of the National Association for Family, School, and Community Engagement (NAFSCE) which is the first membership association focused solely on advancing family, school, and community engagement. Its mission is advancing high-impact policies and practices for family, school, and community engagement to promote child development and improve student achievement.

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# Introduction

Families play a foundational role in children's mathematical development. Contrary to the common misconception that math learning begins only when children enter formal schooling, in reality, math is woven into everyday family life from birth. Parents and caregivers naturally introduce math concepts during daily routines, whether counting toys, measuring ingredients for a recipe, or comparing prices at the store. These simple activities help children build number sense, mathematical vocabulary, and problem-solving skills long before formal schooling starts. As children get older, families also shape children's attitudes, confidence, and persistence in math when they talk about math in positive ways and hold high expectations for their children's math learning. With this in mind, there is an urgent need for family-facing practitioners to effectively support and build on the math learning that's already happening at home. These "family math practitioners" equipped with core competencies in family math engagement can bridge the gap between home and school, validating the learning that takes place outside of school, and extending families' mathematical strengths into the classroom in meaningful ways.

The purpose of the Family Math Core Competencies is to provide a clear, shared framework that helps family math practitioners - math teachers, math teacher educators, administrators, and community and parent leaders - align their efforts toward a common vision for engaging families in mathematics. This document is the result of over a year of research seeking to identify and understand the knowledge, skills, and dispositions that family math practitioners bring to forming strong relationships with families and communities around mathematics.

The Family Math Core Competencies are based on, and serve as a companion document to, the Family Engagement Core Competencies.[1] The Family Engagement Core Competencies are a unifying body of knowledge for family-facing professionals more broadly and identify competencies that fall into four broad domains: reflect, connect, collaborate, and lead alongside families. Reflection refers to the ability of family-facing professionals to look inward to interrogate their own biases and understanding of the role of families in children's learning, and to look outward to come to understand family and community expertise. Connection refers to the ideas that family-facing professionals must communicate with families, create welcoming spaces for them, and partner with the broader community, in spaces such as libraries, museums, and afterschool programs, to establish partnerships that create ecologies of learning. Collaboration is about harnessing those connections and applying them to learning contexts and academic progress. And finally, leading alongside families refers to how families and family-facing professionals work together to champion policies that benefit all families and children.

Our hope is that this document expands upon these ideas and links them specifically to family and community engagement in mathematics.

**A note on our terms:**

**Mathematics:** A logical way of thinking that allows for increasing precision. It is a tool for making sense of the world and solving problems.

**Family math:** Family math refers to the everyday, relational, and culturally grounded ways that children and their caregivers explore mathematical ideas together—at home, in communities, and across learning settings. It includes informal conversations, games, problem-solving moments, routines, stories, and real-life tasks through which families make sense of numbers, patterns, shapes, reasoning, and data. Family math follows a targeted universalism approach: our universal goal is for all families to feel confident, joyful, and capable of supporting their children's math learning. To achieve this, we implement targeted strategies that address structural inequities and provide additional supports for families who have been historically excluded from math learning opportunities.

**Core Competencies:** Core competencies are the essential knowledge, skills, dispositions, and behaviors that individuals must demonstrate to be effective in a particular role, profession, or domain. They serve as a shared framework that clarifies what practitioners should know and be able to do, guiding preparation, professional learning, evaluation, and continuous improvement.

**Family math practitioners:** Family math practitioners are educators, practitioners, and leaders who design, facilitate, and support meaningful math learning experiences with and for families. They may work in schools, early childhood programs, community-based organizations, libraries, museums, afterschool programs, or higher education.

**Family and community engagement:** Family and community engagement is the collaborative, ongoing partnership among families, educators, and community members to support children's learning, development, and well-being. It centers mutual trust, shared responsibility, and two-way communication, recognizing families and communities as experts in their children's experiences and essential contributors to educational success.

# Who Might Use the Family Math Core Competencies

We envision that this document can be used by a range of family math practitioners across a variety of contexts:

- Math teachers, family liaisons, and other staff in schools to instill confidence around mathematics, assess and deepen their practice, and engage in dialogue with others around family math topics
- Principals, professional development providers, and coaches to align with mathematics curriculum, structure the scope and sequence of professional and continuing learning opportunities, and support organizations in how to start conversations around family math
- Math teacher educators in educator preparation programs to develop syllabi and other course materials and clinical experiences
- State Education Agencies to guide the development of policies, mandates, and mathematics and professional standards and math pathways
- Afterschool, library, and museum staff, and others in community organizations who provide families with opportunities to explore mathematics within their communities
- Parent leaders to incorporate mathematics in day-to-day practice and advocate for high-quality mathematics experiences in their communities and nationally

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# Why Family Math Core Competencies Are Important

The purpose of the Family Math Core Competencies is to create a nationally agreed upon and unifying set of professional competencies for the family math field. These competencies are important for several reasons:

- **Family math is a powerful lever for strengthening children's mathematical achievement and reducing math disparities.** Establishing clear Family Math Core Competencies helps ensure that practitioners are equipped to create inclusive, relationship-centered learning experiences that honor families' strengths, cultural knowledge, and diverse ways of doing math. Grounded in equity-focused frameworks like NCTM's Catalyzing Change and equitable teaching practices,[2] these competencies aim to dismantle barriers and ensure that families of color, multilingual families, families of children with disabilities, and families experiencing poverty all have the opportunity, resources, and agency to support their children's mathematical growth. The Family Math Core Competencies work to ensure that every family can participate in high-quality, culturally affirming math experiences. Yet opportunities for rich, culturally grounded family math experiences are not distributed equally. Many families encounter systemic barriers such as limited access to resources, biased assumptions about their mathematical capabilities, and learning environments that do not reflect their cultural, mathematical, and linguistic strengths. Family Math Core Competencies help interrupt these inequities by guiding practitioners to design experiences that deliberately counteract these disparities and expand meaningful math opportunities for every family.
- **Clearly defined competencies support professional growth by identifying the key knowledge, skills, and dispositions family math practitioners need to develop.** Engaging families in mathematics is not intuitive work; it requires practitioners to understand how families experience math in the routines of their daily lives, how cultural beliefs and practices shape learning, and how to design interactions that are respectful, strengths-based, and accessible. Competencies articulate these expectations in actionable terms, giving practitioners a shared language and developmental pathway for growth. In doing so, they recognize family math as a specialized area of practice that demands continuous reflection, training, and intentional skill-building.
- **The Family Math Core Competencies strengthen accountability across the field by setting shared expectations that guide professional learning and allow family math practitioners and organizations to measure progress.** Without common standards, family math programs and services often operate in silos, making it difficult to assess whether practitioners are truly equipped to partner with families. These

competencies offer clear benchmarks for training, credentialing, and evaluation, helping the field identify gaps and monitor improvement over time. This is especially important given that many math teachers receive little preparation in family engagement. In fact, math-specific family engagement is rarely addressed in educator preparation. For example, one national study found that math and science teacher programs devoted less than 10% of coursework to family and community engagement topics.[3] This training gap has real consequences: without guidance on how to collaborate with families, even committed educators may miss opportunities to make math inclusive, relevant, and accessible to all students.

- **Family Math Core Competencies offer a roadmap for consistency across family math programming.** Organizations across states and sectors often approach family math differently, resulting in uneven experiences for families and missed opportunities for learning. A shared competency framework helps align practices across contexts including schools, early childhood settings, libraries, museums, and community organizations so that families encounter a consistent, affirming, and strengths-based approach. This alignment promotes equity by ensuring that high-quality family math engagement is not dependent on where a family lives or which program they happen to access.

# The Importance of Families for Mathematics Learning

Mathematical knowledge and skills begin to develop early in the lifespan, and it is families that provide the first learning environment for children to develop them. There is a prevailing assumption that mathematics is an abstract discipline of formulas and algorithms that is not taught and learned until children enter formal schooling, but in reality, mathematics is an embedded, cultural practice that is grounded in everyday life and routines beginning from the earliest ages in life.[4] Focusing on strong family, school, and community partnerships ensures that children receive a strong mathematical foundation even before they enter formal schooling.

As children enter into formal schooling, research shows that families promote children's mathematics performance through a variety of behavioral and psychological mechanisms including the ways they talk about and practice mathematics with their children and the expectations they hold for their children's mathematical identities.[5] Specifically, family mathematics talk helps children cultivate their own mathematics vocabulary and expand mathematical ideas and concepts in domains such as number, quantity, measurement, operations, and space. Beyond mathematics talk, family mathematics activities, both those that are formal (e.g., helping with homework) and informal (e.g., playing with cards, puzzles, etc), provide children opportunities to manipulate objects, reason and think conceptually, and hone problem-solving skills.[6] Further, high family expectations for their children's mathematics achievement and learning are related to higher mathematics scores and the increased likelihood that children will continue into high-level mathematics in the high school years and enter mathematically focused post-secondary programs and careers.[7]

Finally, a strong focus on family, school, and community partnerships is important for children's mathematical learning because when families have access to, connect to, and communicate with educators in schools and community settings, they amplify, enhance, and become more confident in their support and advocacy for their children's learning.[8] Simultaneously, educators use what they learn from families about their everyday routines and practices to create more culturally relevant, responsive, and sustaining curriculum and teaching.[9] This contextualizes mathematics learning in everyday communities, which is particularly important to centering equity and ensuring that mathematics is relevant and meaningful, a key consideration of various national mathematics standards and curriculum. It also helps families overcome anxiety about math, which can negatively impact children's own thinking, confidence, and success.[10]

# The Family Math Core Competencies

The Family Math Core Competencies outline the knowledge, skills, and dispositions that family math practitioners embody when they meaningfully infuse the joyful and loving math routines that naturally exists in homes and communities into their practice and simultaneously reach out and connect to families to reinforce and expand these everyday daily math actions. The family math core competencies fall into four broad areas:

- **Reflect** is about looking inward to center the love and joy of math, examine one's own math story, and build the ability to appreciate how math shows up in the culturally-grounded everyday lives of families.
- **Connect** is about building relationships and creating the conditions for math engagement by reaching out to families, anchoring math in familiar experiences, and expanding family math partnerships.
- **Collaborate** is about working together in relationships with families to co-create meaningful math teaching and learning experiences, approaching math learning holistically, and engaging in two-way, ongoing communication about children's math progress.
- **Lead** is about acting in solidarity with families to create the systems and conditions that build and strengthen family math within schools and other community-based organizations and institutions

## Table 1. A summary of the family math core competencies

| **Reflect** is about looking inward to center the love and joy of math, examine one's own math story, and build the ability to appreciate how math shows up in the culturally grounded everyday lives of families. | **Connect** is about building relationships and creating the conditions for math engagement by reaching out to families, anchoring math in familiar experiences, and expanding family math partnerships. | **Collaborate** is about working together in relationships with families to co-create meaningful math teaching and learning experiences, approaching math learning holistically, and engaging in two-way, ongoing communication about children's math progress. | **Lead** is about acting in solidarity with families to create the systems and conditions that build and strengthen family math within schools and other community-based organizations and institutions |
|---|---|---|---|
| **Honor the Love and Joy of Math**<br><br>**Family Math Practitioners** reclaim math's fun, curiosity, and playfulness so that they along with families and children feel confident, capable, and engaged. | **Reach Out to Families About Math**<br><br>**Family Math Practitioners** communicate and connect with families in engaging ways to foster trust and build relationships around math. | **Co-Create Actionable and Accessible Family Math Resources**<br><br>**Family Math Practitioners** co-design family math materials that reflect families' knowledge, experiences, cultures, and needs. | **Make Institutional Commitments to Family Math**<br><br>**Family Math Practitioners** partner with families to develop an organizational vision, put budget and staffing in place, develop policies and programs that support family math goals and objectives, and collect data to continuously improve. |
| **Value How Math Exists in the Everyday Lives of Families**<br><br>**Family Math Practitioners** come to understand how all families and communities use math in their everyday lives. | **Anchor Math in Familiar Ideas**<br><br>**Family Math Practitioners** pair math experiences with familiar family and community practices. | **Approach Math Learning Holistically**<br><br>**Family Math Practitioners** adopt real-world, experiential learning approaches to math and reinforce for families how to extend math concepts in the home and community. | **Build Family Math Capacity**<br><br>**Family Math Practitioners** have opportunities to engage in ongoing professional learning that supports their efforts to engage families in math and support parents in building their own confidence. |
| **Uphold Math Foundations**<br><br>**Family Math Practitioners** conceptualize math not just as memorizing steps and procedures, but as real-world problem-solving and sense-making across the developmental spectrum | **Build Partnerships & Access to Math**<br><br>**Family Math Practitioners** collaborate with learning settings like schools, libraries, small businesses, museums, and child care centers to expand math engagement opportunities. | **Exchange Insights on Math Progress**<br><br>**Family Math Practitioners** together with families use data to track children's mathematical progress and engage in conversation with families about that progress in accessible, understandable, and concrete ways. | **Navigate Math Education Systems with Families**<br><br>**Family Math Practitioners** are familiar with PreK–12 math pathways and together with families navigate these transitions to promote long-term success. |

# Reflect:
# Seeing Math in Ourselves and Our Families

| Reflect is about looking inward to center the love and joy of math, examine one's own math story, and build the ability to appreciate how math shows up in the culturally grounded everyday lives of families. |
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| **Honor the Love and Joy of Math**<br>**Family Math Practitioners** reclaim math's fun, curiosity, and playfulness so that they along with families and children feel confident, capable, and engaged. |
| **Value Ways Math Exists in the Everyday Lives of Families**<br>**Family Math Practitioners** come to understand how all families and communities use math in their everyday lives. |
| **Uphold Math Foundations**<br>**Family Math Practitioners** conceptualize math not just as memorizing steps and procedures but as real-world problem-solving and sense-making across the developmental spectrum. |

Family math practitioners reflect on their own experiences with mathematics and deeply consider how adults in children's lives also have their own math journeys and strengths. Reflection encompasses three main ideas: the importance of family math practitioners honoring the love and joy of math, valuing ways that math exists in the everyday lives of families, and upholding math foundations.

When family math practitioners honor the love and joy of math, they reclaim mathematics as a fun, discovery-oriented, sense-making, dynamic, and playful activity. Mathematics has often been mistakenly treated as a proxy for intelligence in our society and a sorting mechanism in schools, a reality that has contributed to widespread fear and anxiety around the subject. Family math practitioners seek to break this cycle and shift mindsets around mathematics. This involves addressing their own fears and discomfort and sharing their own mathematical journeys so that they can support families in doing the same. Akin to this, family math practitioners emphasize that mathematical ability can grow with effort and practice and that productive struggle, the idea that taking time to grapple with difficult problems that are not easily solved, is fundamental to what mathematics is.

Family math practitioners also value ways math exists in the everyday lives of families. A large body of research highlights how mathematics is naturally situated in different cultures and daily experiences, and family math practitioners take time to value

mathematics in these lived experiences so that families and children see their own ways of knowing as central to mathematical learning. For example, everyday activities such as cooking together offer rich opportunities for children and families to explore measurement, estimation, and proportional reasoning. Families also engage in meaningful mathematical thinking when they budget, shop for groceries, or plan weekly schedules. In addition, many cultural traditions like games, crafts, and storytelling are filled with mathematical patterns and structures that reflect the diverse ways families make sense of the world. Consequently, family math practitioners must examine how their own privileges and biases shape who they perceive as "math capable," and recognize the linguistic, cultural, and disability-based diversity of families whose mathematical knowledge and lived experiences enrich children's learning.

Finally, reflection requires that family math practitioners uphold knowledge of mathematics that stays true to math, not just by memorizing steps, but as real-world problem-solving and sense-making across the developmental spectrum. This means family math practitioners honor the diverse ways families approach problem-solving, highlight multiple strategies, and help learners see that mathematics is expressed in many forms, not just in traditional, procedural mastery. They also emphasize that math is development, not perfection, such that math learning is a continuous process of growth, exploration, and reflection rather than about getting every answer right.

# Connect:
# Building Relationships for Family Math

| **Connect** is about building relationships and creating the conditions for math engagement by reaching out to families, anchoring math in familiar experiences, and expanding family math partnerships. |
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| **Reach Out to Families About Math**<br>**Family Math Practitioners** communicate and connect with families in engaging ways to foster trust and build relationships around math. |
| **Anchor Math in Familiar Ideas**<br>**Family Math Practitioners** pair math experiences with familiar family and community practices. |
| **Build Partnerships & Access to Math**<br>**Family Math Practitioners** collaborate with learning settings like schools, libraries, small businesses, museums, and child care centers to expand math engagement opportunities. |

Family math practitioners build relationships with families around mathematics. Connecting around family math encompasses the interrelated ideas of reaching out to families, anchoring math in familiar ideas, and building partnerships and access to math in the community.

Above all else, family math practitioners reach out to families to foster trust and build mutually respectful relationships around math. As families engage with mathematics in their everyday lives, family math practitioners name, draw attention to, affirm, and highlight for families the importance and value of these everyday math experiences for children's learning. Family math practitioners also seek to reinforce how these everyday mathematical experiences that children experience align to the teaching and learning of mathematics in classrooms and other learning settings. Finally, family math practitioners work to ensure a truly bidirectional flow of mathematics knowledge from the home to the school by intentionally bringing insights from families' lives into teaching and learning practices and mathematics learning environments.

At the same time, family math practitioners seek to grow and amplify families' understanding of mathematics by anchoring math ideas in what families find familiar and comfortable. For example, they might highlight patterns and number concepts that show up in children's storybooks, draw attention to strategic thinking and counting embedded in well-loved family games, or explore shapes, sequences, and comparisons that naturally emerge in families' oral storytelling traditions.

Finally, family math practitioners connect families to community spaces like libraries, small businesses, museums, after school programs, and sports programs, to name just a few, where children can get the math enrichment they need to succeed and thrive, and explore their math curiosities nested with their families. People who are good at math wrestle with it, and think about it, and tinker with it, all the time and everywhere, so these community spaces provide important jumping off points to foster math explorations.

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# Collaborate:
# Working Side by Side with Families to Teach and Learn Math

| **Collaborate** is about working together in relationships with families to co-create meaningful math teaching and learning experiences, approaching math learning holistically, and engaging in two-way, ongoing communication about children's math progress. |
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| **Co-Create Actionable and Accessible Family Math Resources**<br>Family Math Practitioners co-design family math materials that reflect families' knowledge, experiences, cultures, and needs. |
| **Approach Math Learning Holistically**<br>Family Math Practitioners adopt real-world, experiential learning approaches to math and reinforce for families how to extend math concepts in the home and community. |
| **Exchange Insights on Math Progress**<br>Family Math Practitioners together with families use data to track children's mathematical progress and engage in conversation with families about that progress in accessible, understandable, and concrete ways. |

Family math practitioners draw upon their relationships with families to co-create meaningful math teaching and learning experiences for children, approach math learning holistically, and engage in ongoing, two-way communication about children's math progress.

Co-creating actionable and accessible math resources means that family math practitioners and families as equal partners design family math materials that reflect families' knowledge, experiences, cultures, and needs. Clear, actionable, low-lift ideas, ones that are crafted collaboratively with families, rather than for them, ensure that family math is culturally sustaining and relevant. These resources are actionable in that they offer clear, practical ways for families to support math learning through concrete steps, examples, and activities they can try immediately in everyday settings. For example, these resources use plain language, inclusive formats, and multiple modes such as text, visuals, audio, or multilingual versions so that families of all backgrounds, abilities, and contexts can easily understand and use them.

# Lead Alongside Families: Creating Family Math Systems

| **Lead** is about acting in solidarity with families to create the systems and conditions that build and strengthen family math within schools and other community-based organizations and institutions. |
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| **Make Institutional Commitments to Family Math**<br>**Family Math Practitioners** partner with families to develop an organizational vision, put budget and staffing in place, develop policies and programs that support family math goals and objectives, and collect data to continuously improve. |
| **Build Family Math Capacity**<br>**Family Math Practitioners** have opportunities to engage in ongoing professional learning that supports their efforts to engage families in math and support parents in building their own confidence. |
| **Navigate Math Education Systems with Families**<br>**Family Math Practitioners** are familiar with PreK–12 math pathways and navigate together with families these transitions to promote long-term success. |

Family math practitioners in solidarity with families and parent leaders play an important role in leading family math efforts across schools and other organizations and institutions. This means partnering with families to make institutional commitments to family math, building family math capacity, and helping families navigate math educational systems.

Institutional commitment to family math means that organizations prioritize partnering with families around mathematics as a core instructional strategy. Just as family literacy is now a norm in many schools and community spaces, family math practitioners do the same for family math. This begins by families and family math practitioners together creating a shared vision for family math and ensuring that family math is not treated as an add-on to activities, but an essential component of it. In accordance with this driving belief, family math practitioners show their support for the work by funding family math resources, staff, and programs, and putting in place policies that support it. Family math practitioners also collect data on their programs to understand the influence they are having so that their programs, policies and services can continuously learn and grow.

Family math practitioners must also build their own knowledge, skills, and confidence in mathematics so that they have opportunities to experience the joy, creativity, and curiosity of math themselves. In this way, they are prepared to learn alongside families. Likewise, families benefit when family math practitioners create flexible, responsive learning spaces that honor families' insights and adapt activities based on their cultural and community contexts. This shared shift strengthens the capacity of both educators and families to approach math as an accessible, engaging, and empowering subject.

Finally, family math practitioners help families navigate mathematics course options. This empowers them to make informed decisions that keep students on a strong path toward college and career readiness. When families understand the role math plays in admissions and career opportunities, they can better support their children in choosing the right courses. Bridging this information gap is especially critical for historically marginalized communities, where access to guidance is often limited and tracking is common.

# A Note on Our Methods

We used an iterative and highly collaborative process to develop the Family Math Core Competencies, ensuring they reflected real practice, real communities, and real family math experiences. We began by conducting 12 semi-structured interviews with professionals across the country who already work at the intersection of family engagement and mathematics. To center equity from the start, we intentionally included leaders from organizations serving multilingual, Indigenous, low-income, and historically marginalized communities. Our sample included representatives from math-focused organizations, parent-led groups, early childhood programs, school districts, children's media, research and evaluation firms, and universities. This range of voices allowed us to gather diverse perspectives on what educators need to know and do to partner effectively with families around children's math learning. Each interview lasted about an hour and invited participants to reflect on their work, the knowledge and skills they consider essential, the barriers they encounter, and the strategies they use to build strong, culturally affirming relationships with families.

Using a grounded theory approach, we coded transcripts for themes related to mindsets, relationship-building, cultural knowledge, everyday math, assessment, and core math learning domains. With support from NotebookLM (a closed, privacy-protected AI research tool), we created an extensive list of codes and then organized them into a coding manual aligned with NAFSCE's Family Engagement Core Competency domains: Reflect, Connect, Collaborate, and Lead. After finalizing the manual, we analyzed transcripts and resolved questions and ensured consistency. Throughout, we attended closely to how issues of equity, access, and representation emerged in participants' experiences and recommendations.

Importantly, the development of the competencies did not end with the interviews. We validated and refined our work through a participatory process with The Center for Family Math Steering Committee of family engagement and math experts, NAFSCE's Board, our Parent Leader Advisory Council (PAC), and the informants themselves. In addition, we shared and tested emerging ideas during an NSF-funded convening, which brought together math teachers, math teacher educators, and parent leaders to discuss what high-quality family math educator preparation should look like. Their feedback helped us clarify language, strengthen alignment with real classroom and community experiences, and ensure that the competencies resonate across educator preparation, community organizations, and family-serving programs.

This participatory process ensured not only methodological rigor but also practitioner validity: the competencies were co-developed with the very people who represent and serve diverse families and communities. As a result, the Family Math Core Competencies reflect both the lived expertise of practitioners and the diverse strengths, hopes, and cultural knowledge of the families they partner with.

## End Notes

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