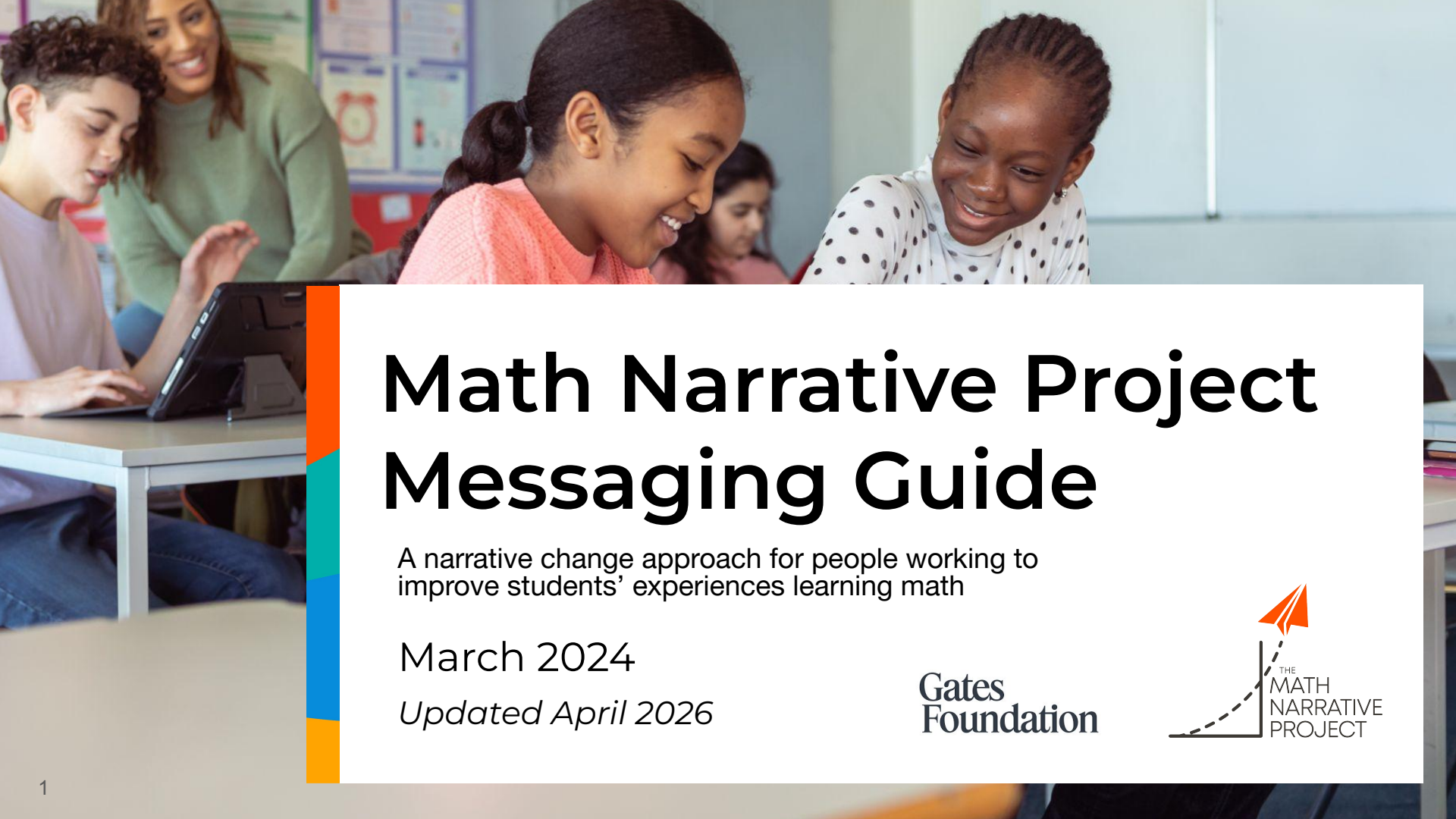

Math Narrative Project Messaging Guide

A narrative change approach for people working to improve students' experiences learning math

March 2024

Updated April 2026

Gates Foundation

THE MATH NARRATIVE PROJECT

ABOUT THE MATH NARRATIVE PROJECT

Math is a deeply emotional subject for students, teachers, and parents* alike.

"When am I ever going to use this?"

"Math is so frustrating." ***"I'm just completely lost."***

In America's K-12 public schools, well-documented and persistent disparities in resources and learning outcomes have negatively affected students who are Black and Hispanic, and students from lower-income households.

The subject of math stands out as one uniquely rife with inequities and emotion. With the support of **The Bill & Melinda Gates Foundation**, researchers from **Goodwin Simon Strategic Research** (GSSR) and **Wonder: Strategies for Good** (Wonder) investigated how cultural narratives impact how students see themselves, their abilities, and their potential as it relates to learning math.

The Math Narrative Project aims to advance an evidence-based messaging and narrative change strategy to improve math instruction and outcomes for 6th to 10th grade Black and Hispanic^ students of all incomes and Asian American and Pacific Islander (AAPI) and white students from lower-income backgrounds. The project focuses on these students, as they are most likely to encounter systemic barriers to accessing high-quality math education and math resources.

From 2022 to 2024, Wonder and GSSR conducted research with 6th to 10th grade public school students, and the math teachers and parents who influence their learning experiences. The first phase of research focused on developing an understanding of how these groups think and feel about learning and teaching math. Researchers used insights from this first phase to develop hypotheses and then test narrative interventions and messages, with the goal of changing emotions and beliefs standing in the way of students' math learning.

The recommendations that come from this research are aimed at shifting narratives, **so that more students have more positive experiences learning math**.

**Throughout this guide, the research team uses 'parent' to refer to both parents and guardians.*

^Throughout this guide, the research team uses the term 'Hispanic'. Consistent with what the research team heard in focus group discussions and in surveys, a 2022 Pew Research survey of 3,030 U.S. Hispanic adults found that 53 percent of Hispanics prefer to describe themselves as "Hispanic," 26 percent prefer "Latino," two percent prefer "Latinx," and 18 percent have no preference.

ACKNOWLEDGMENTS

The Math Narrative Project received expert guidance from adult and youth advisors.

Advisory Group

The project Advisory Group was made up of professionals working in the areas of math pedagogy, adolescent development, math identity formation, media, learning sciences, and educational psychology. Advisors provided feedback on research tools, messaging materials, and research findings, and informed the direction and understanding of the research in every phase.

Dr. Kyndall Brown, Executive Director, California Mathematics Project

Grace Doramus, Chief Innovation Officer, Beyond100K

Sergio Estrada, Science Design Fellow and Co-Lead facilitator, FUSE

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Dr. Maria del Rosario Zavala, Associate Professor of Elementary Education, San Francisco State University

Youth Advisory Panel (YAP)

The project also benefited from the guidance and participation of young people participating in BUILD's youth fellowship program. The program aims to help empower young people as changemakers and CEOs of their own lives. For this project, YAP members received training in the research methodologies used for the project, and support from BUILD staff members Tiffani Hutton, Lydia Phillips, and Cindy Pineda. YAP members contributed to shaping research tools, developed test messages with the research team, and shared their personal stories about learning math. Their participation in this project was invaluable.

Alejandra Ochoa
Aury Fernandez
Eddie Chable
Franciliana Barbosa
Judith Vasquez
Lourdes Hernandez
Marianny Solis
Mehrin Maisha
Monique McLean
Norma Martinez

ABOUT THIS GUIDE

What is a messaging guide? A messaging guide is a tool to improve communication around emotionally-complex issues – like advanced math learning. This messaging guide is not a script or a replacement for real and genuine conversations, but rather a collection of evidence-based best practices and tips for improving the effectiveness of these conversations. This guide was written by researchers and narrative strategists from GSSR and Wonder to provide guidance on how to effectively communicate with 6th to 10th grade students, parents, and math teachers. The recommendations are informed by messaging interventions developed and tested by Wonder and GSSR during this research project.

Who should use this guide? The following messaging recommendations are meant for anyone working to improve math education for 6th to 10th grade students — teachers, advocates, curriculum or professional development experts, researchers, district leaders, and funders.

How can this help me? By using these messaging recommendations in your work, you can help students to interpret their math experiences more positively and see that higher–level math (like algebra or above) is relevant to their lives. You can also support adults — math teachers and parents — to understand how their actions impact students' learning experiences.

Visit mathnarrative.org for more details on methodology, the research team, narrative change, and more.

Guide At-A-Glance

This section previews the main concepts shared in this Messaging Guide, the Research Insights and Messaging Recommendations.

GUIDE AT A GLANCE (1 OF 2) : RESEARCH INSIGHTS

Among all three audiences — students, teachers, and parents — the research has yielded important insights about the nature of learning and teaching math.

- Learning and teaching math is a **deeply emotional experience** for students, parents, and teachers.
- Students' experiences of learning math are **informed by the context in which they live** and learn — including, for instance, learning interruptions from COVID-19, home life outside of the classroom, or the lack of availability of outside help for math learning.
- **Teachers and parents often struggle** — and sometimes do not think there is a need — to make math feel relevant to students' lives and futures.
- For many students and parents, **struggling** while learning math is **perceived as negative** and is often interpreted by others as an indication of one's capability to do math.
- Teachers sometimes **misinterpret students' struggles** learning math as "checked-out" behavior and may not always communicate to students that needing help is an inherent part of learning math.

GUIDE AT A GLANCE (2 OF 2) : MESSAGING RECOMMENDATIONS

Based on the research insights and subsequent message testing, the research team developed messaging recommendations that provide guidance for practitioners working with students, teachers, and parents on how to effectively disrupt harmful narratives and replace them with more positive ones. For more detail, see page 28 -37.

ELEVATE STUDENT AGENCY

ACKNOWLEDGE REAL-WORLD CONTEXT

ACKNOWLEDGE EMOTIONS IN MATH LEARNING

MAKE MATH RELEVANT

AFFIRM THE VALUE OF MISTAKES

ENCOURAGE HELP-SEEKING

REFRAME STRUGGLE AND CAPABILITY

REASSESS ASSUMPTIONS

PRIORITIZE BUILDING RELATIONSHIPS

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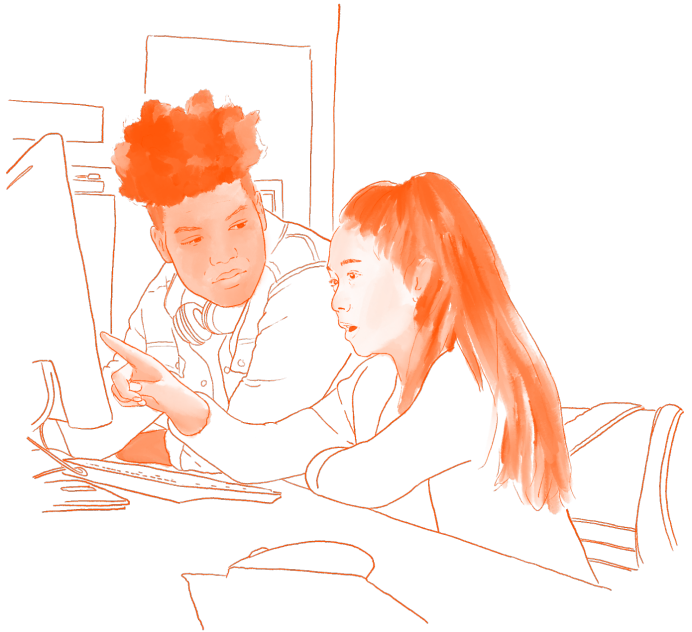
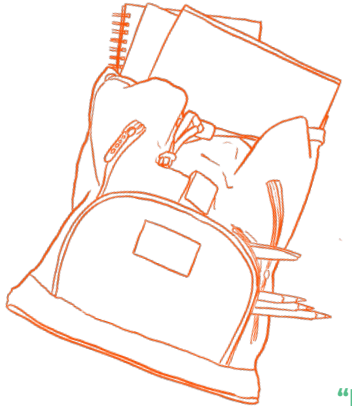


IN STUDENTS' OWN WORDS

"[Math is] fun because I like the games. Then sometimes it can be stressful because you just don't know what's going on. And then sometimes it's draining if you get too much work. Then sometimes peaceful when you get to class and you know what's going on."

Black Female, Student, FL
Source: MNP Student Qualitative Research



"I get anxious when asking questions in class because I don't want to look stupid...and math is one of my tougher classes to learn."

Hispanic Male, Student, TX
Source: MNP Student Survey Data, n1091 respondents

"The good stuff about math is, after reading it, you feel a completion and it feels you're actually doing something with math."

Black Male, Student, NY
Source: MNP Student Qualitative Research

"It's really draining in trying to keep up with the others after they're getting it and you're not...we have to teach ourselves in a certain period, like in a certain time before it gets off to the next thing."

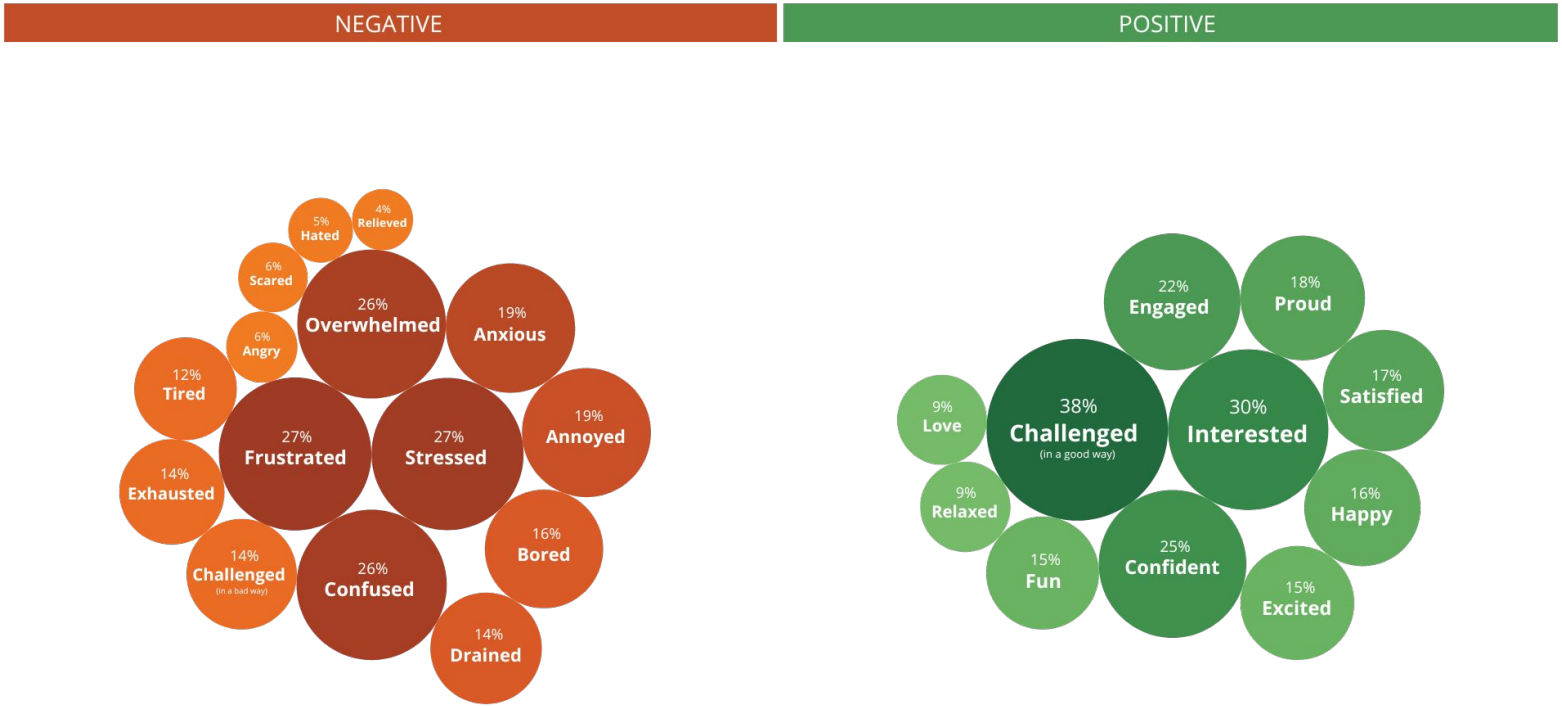
HIspanic Female, Student, CA
Source: MNP Student Qualitative Research

"I think one of the things that can make math really stressful for students is that they have a fear of making mistakes. I find that relatable."

AAPI Female, Student, TX
Source: MNP Student Qualitative Research

STUDENT EMOTIONS ABOUT LEARNING MATH

In a survey of 6th to 10th grade students, the research team asked how students feel when learning math.



The size of each bubble corresponds with how often the emotion was mentioned by research participants.
Source: MNP Student Survey Data, n1091 respondents

TEACHER EMOTIONS ABOUT TEACHING MATH

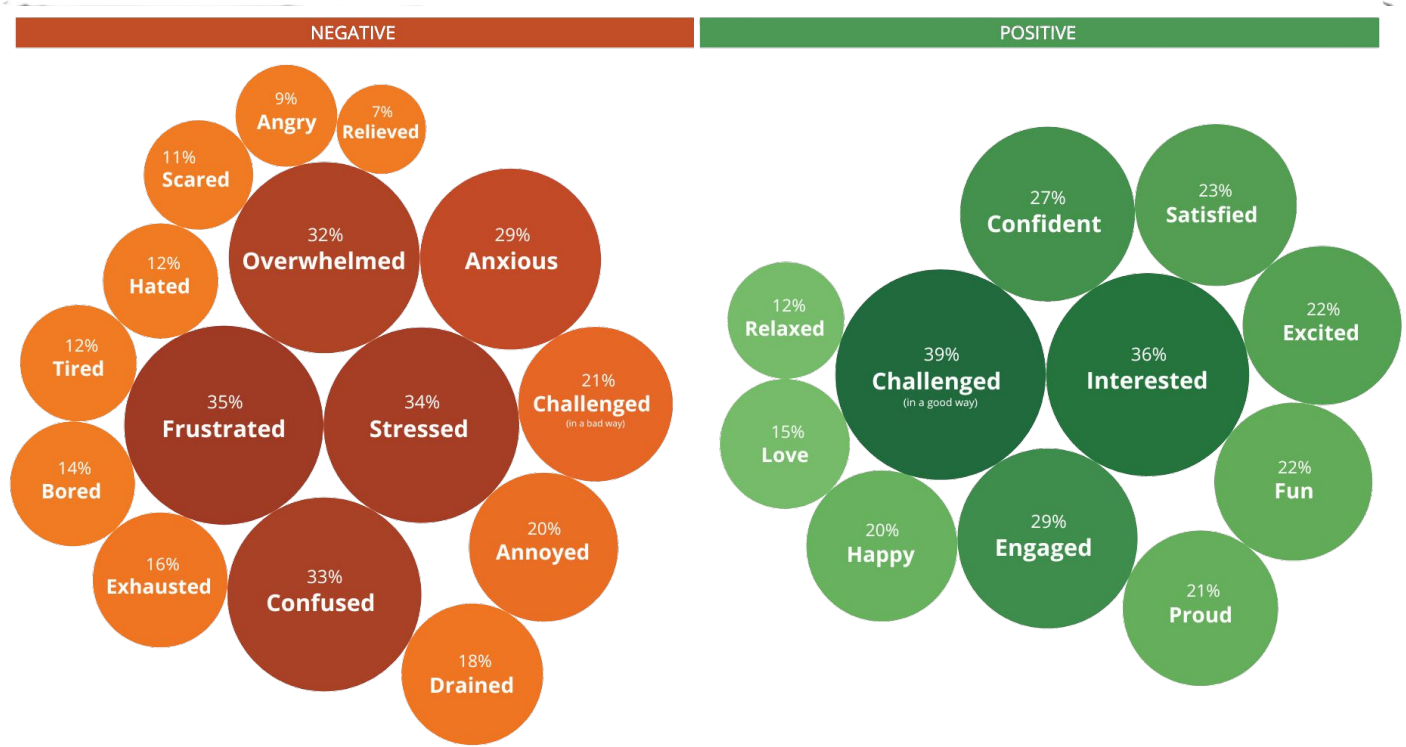
In a survey of 6th to 10th grade math teachers, the research team asked what emotions teachers have when they are teaching math.

NEGATIVE | POSITIVE

The size of each bubble corresponds with how often the emotion was mentioned by research participants.
Source: MNP Teacher Survey Data, n820 respondents

PARENT EMOTIONS ABOUT LEARNING MATH

In a survey, parents of 6th to 10th grade students were presented a list of words and asked to describe the feelings they had when *they* were learning math.



The size of each bubble corresponds with how often the emotion was mentioned by research participants.
Source: MNP Parent Survey Data, n2312 respondents

What is Narrative Change?

This section defines narrative change as a tool to improve existing math learning experiences and describes the way students, teachers, and parents all interact within a narrative ecosystem.

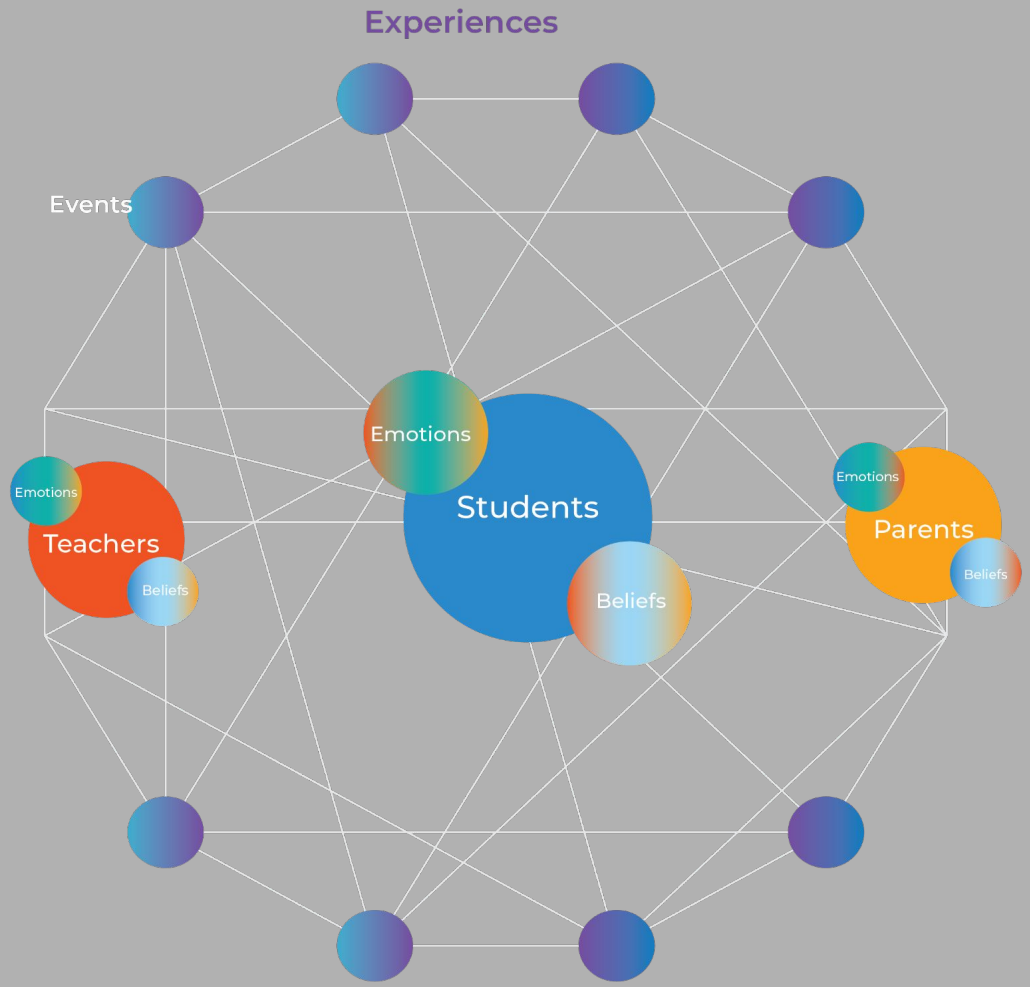
NARRATIVES, NARRATIVE CHANGE, AND NARRATIVE INTERVENTIONS

Narratives are systems of stories that shape our attitudes and behaviors and help us make meaning of the world around us. Narratives powerfully impact how students see themselves, their abilities, and their potential — and how teachers and parents think feel about learning and teaching math. Some narratives help students to persist in math, while others can be barriers to their learning.

Narrative change is an effort to counter, modify, or replace existing narratives by creating and deploying new or different narratives. While many factors influence how students experience math instruction, the work of the Math Narrative Project is focused on the possibilities of *narrative change*. Narrative change can improve existing math learning interventions and facilitate the adoption of new interventions.

Narrative interventions are stories, messages, language, frames, and other narrative tools that are designed to connect to people's experiences and values — and act to change dominant narratives. Narrative interventions seed or model the beliefs necessary to help our audiences change how they think and feel about learning and teaching math. Examples include instructional materials, classroom teaching, teacher training and professional development, or online resources for students, teachers, and parents.

Any intervention must be credible across all three audiences. Otherwise, a narrative shift effort may receive pushback from one of the audiences, undermining the ability to drive narrative change among the other audiences.



NARRATIVE ECOSYSTEM

Narrative ecosystems are systems of stories that shape the environments of how people feel about math. Adults create learning environments for students (teachers at school and parents at home).

The messaging recommendations in this guide aim to create an enabling environment for positive behavior change so that more students can learn more math.

For students, this can change how they see the relevance of higher-level math in their lives.

For adults, this can help them:

- Understand how their actions impact students' beliefs and learning experiences.
- Feel more motivated to help students persist when learning math feels hard.
- Feel equipped with positive narratives for themselves and to share with students.

NARRATIVE CHANGE OPPORTUNITIES

Throughout this research, the research team worked to identify which narratives support or interfere with student motivation and learning, as well as the beliefs among adults that support or undermine student's ability to persist. Some narratives can be helpful (support math learning) or problematic (present a barrier to learning math).

For instance, to the right are some of the narratives about math learning that are problematic, and are interfering with the goal of ensuring more kids learn more math. The opportunity for narrative change is to disrupt or reframe these narratives.

There are also **real-world factors** influencing students, teachers, and parents everyday that narrative alone may not be able to impact (a few examples in the table below).

Students	Teachers	Parents
• Help sometimes unavailable • COVID learning interruptions • Adolescence - social dynamics	• Students with different levels of math knowledge and language proficiency • Admin. and district requirements • Intervention fatigue	• Not all parents feel equipped to help • Shift to Common Core • Kids in adolescent development

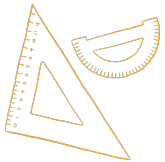
EXAMPLES OF PROBLEMATIC MATH NARRATIVES FROM THE RESEARCH:

- Some people are **good at math**, and some people are not.
- If a student **struggles** while learning math, no amount of **support** will help them get better.
- A **teacher's job** is to teach; a **student's job** is to learn.
- Higher-level math like algebra is **only valuable** as a **gatekeeper** subject.
- Higher-level math is **only relevant** to a few **STEM careers.**
- **Math learning** is rational, **not emotional.**

Research Insights

This section details the research findings among all three audiences – students, teachers, and parents – about the nature of learning math, as well as the beliefs and cultural narratives held by these audiences.

RESEARCH INSIGHTS: AN OVERVIEW



Insights from this research provide a rich evidence base for anyone working to strengthen math instruction and help students have better experiences learning math (e.g., math curriculum and technology designers, professional development and teacher prep, district leaders, or funders).

Across all three audiences — students, teachers, and parents — the research has yielded important insights about the nature of learning math. Most prominently, the research team discovered that **learning and teaching math is a deeply emotional experience** for all. Students reported a wide range of emotions about learning math, with a majority reporting having only negative or mixed emotions, rather than having only positive ones, and parents have distinct (often negative) memories of learning higher-level math. For teachers, their negative emotions can interfere with them being able to better support students who may be struggling to learn higher level math.

Students' experiences of learning math are **informed by the context in which they live and learn** — including, learning interruptions from COVID-19, home life outside of the classroom, class sizes, testing, or the lack of availability of outside help for math learning. There is also a heightened sensitivity towards social dynamics and fear of embarrassment during adolescence.

Teachers and parents often struggle to make math feel relevant to students' lives and futures. Sometimes, they do not think there is a need to connect learning math to things students understand, believe are real, and care about.

For many students and parents, **struggling while learning math is perceived as negative** and is often interpreted by others as an indication of having a limited capability to learn math. Many students report that understanding math concepts quickly and with ease is an indicator of being "good at math."

When students struggle to learn math, teachers sometimes **misinterpret those struggles** as "checked-out" behavior and may not always communicate to students that needing help is an inherent part of learning math.

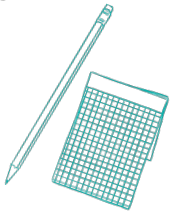
RESEARCH INSIGHTS: STUDENTS

"You wouldn't need the Pythagorean theorem to change a tire or something. It's kind of useless sometimes."

Hispanic Male, Student, Texas
Source: MNP Student Qualitative Research

Many students believe that...

- ...most adults don't need higher-level math (like algebra or above) in their lives. Sometimes they even hear that from adults themselves.
- ...higher-level math is only relevant to STEM careers or other highly specialized and technical fields/careers.
- ...making mistakes or not immediately "getting" new math concepts means they are not good at math.
- ...asking questions is embarrassing and means they are not smart enough to learn math.
- ...struggling to learn math is a sign that they are not good at math.
- ...If they are not good at math, they will never get better.



Many students report...

- ...not knowing about negative stereotypes based on race or gender in math.
- ...assessments of their own math capability are fluid, not static, and are based on shifting external factors, including the teacher they have for math that year and the topic they're currently learning about in math.
- ...that when they struggle in math, it means they probably won't ever "get" the concept they're struggling with.

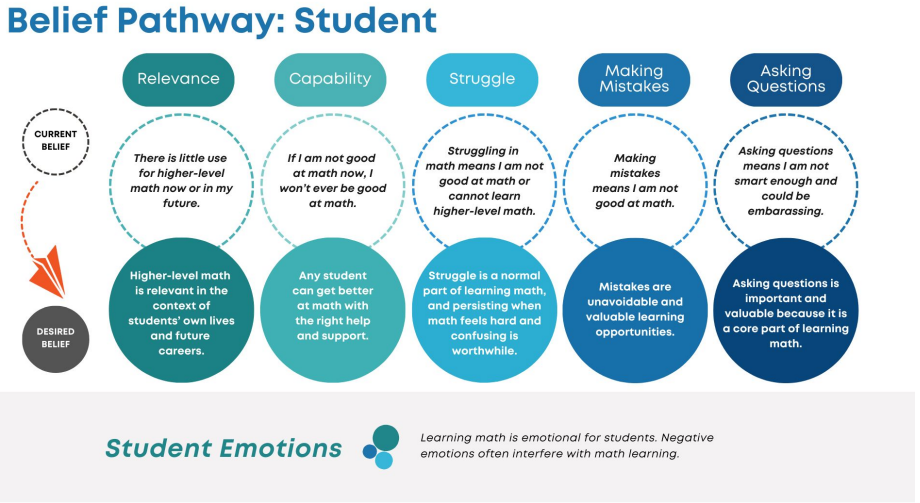
THE JOURNEY: CURRENT BELIEF TO DESIRED BELIEF

In order for create better math experiences for students, it is important to know the current **beliefs about math** each audience holds, as well as determining the desired beliefs they will hold when our narrative interventions are successful.

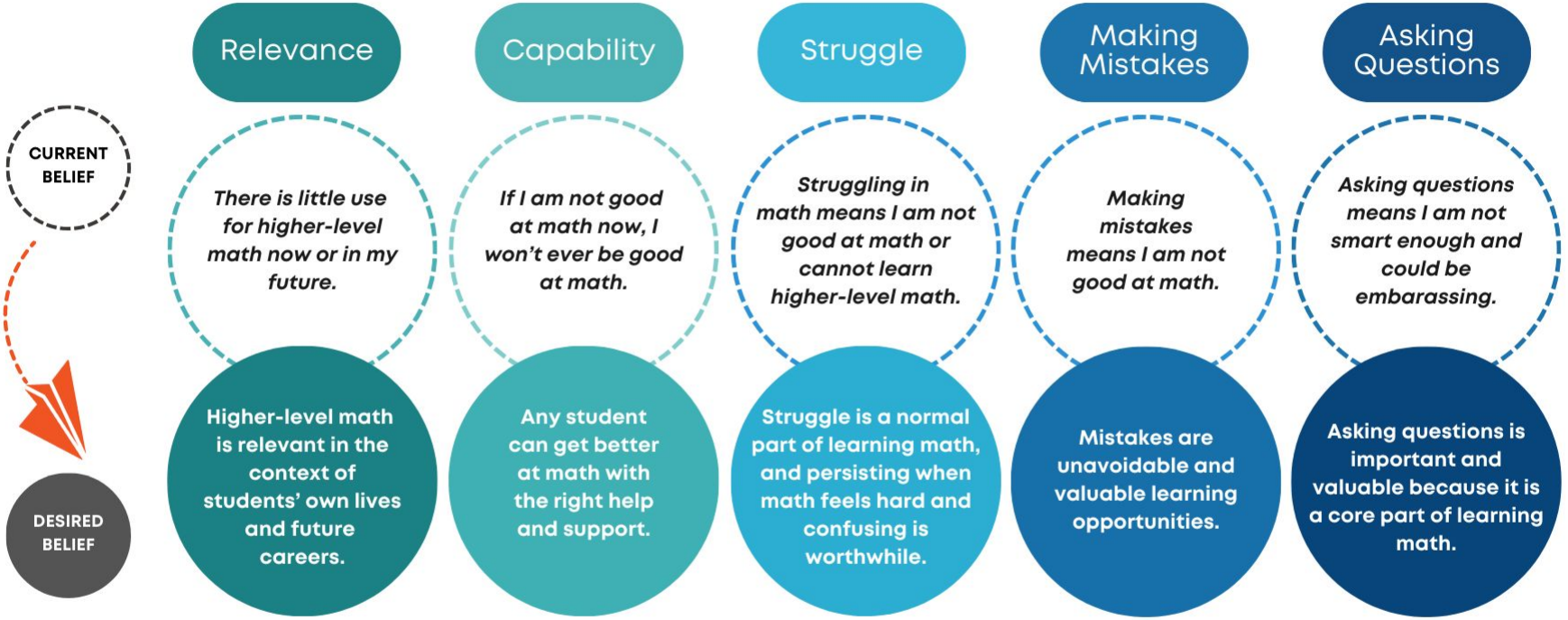
Each insights slide is followed by the beliefs pathway for their respective audience.

How the audience currently relates to the topic (e.g., the relevance of math)

Beliefs that support positive math experiences for students.



Belief Pathway: Student



Student Emotions

Learning math is emotional for students. Negative emotions often interfere with math learning.

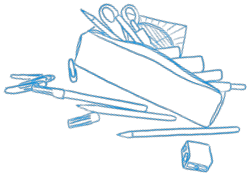
RESEARCH INSIGHTS: TEACHERS

Many teachers believe that...

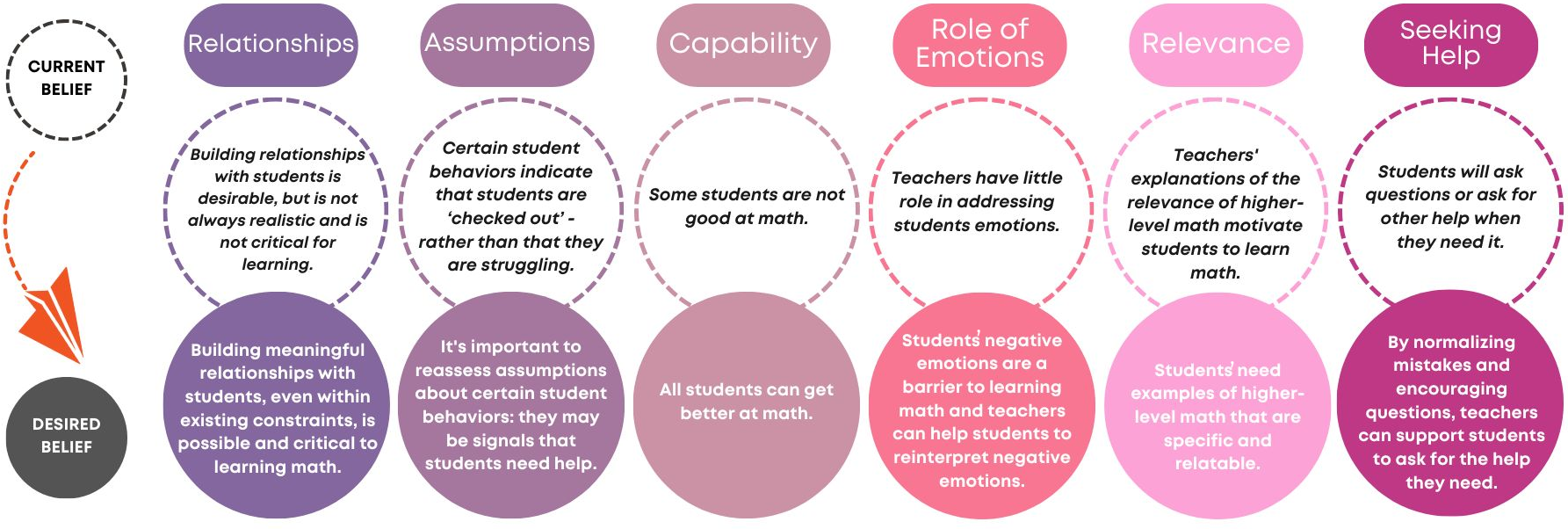
- ...students' emotional experiences are not relevant to learning math — or at least that teachers don't have a role in helping students understand and manage their emotions about math.
- ...it is a student's responsibility to seek or ask for help when they need it.
- ...some students just can't get higher-level math.
- ...they are students' first support for learning — and also that students are in class only a small percentage of the time. Many express a desire for more parental involvement in math learning at home.
- ...relationships and feeling they belong in the classroom are important for their students, but there are many things outside their control that can get in the way of making those things a priority (e.g., administrative demands, standardized testing, and pacing).
- ...in order to balance the demands placed on them with the needs of their students (who often have vastly different levels of math knowledge and capability) teachers often feel they need to prioritize students whom they perceive as putting in effort.

"We all have that math brain. It comes easier to us. You've heard that some people are math-brained — left brain, right brain, and all that."

White Male, Teacher, New York
Source: MNP Teacher Qualitative Research



Belief Pathway: Teacher



Teacher Emotions

Teaching math is emotional for teachers. Many of these emotions are positive, but negative emotions can interfere with teachers' capacity to help students learn math.

RESEARCH INSIGHTS: PARENTS

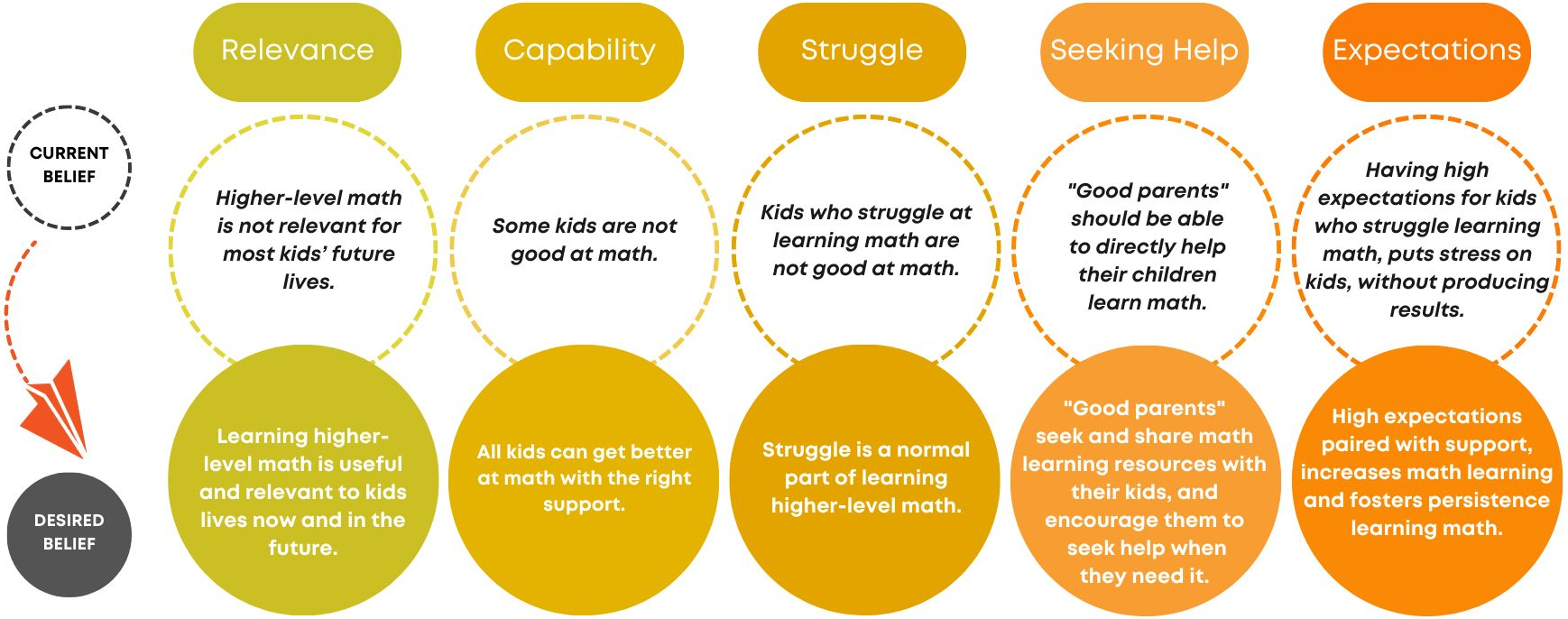
Many parents believe...

- ...basic math skills such as addition, multiplication, and percentages are valuable and useful, especially for dealing with money and finances, but most people won't ever need higher-level math like algebra.
- ...they haven't personally needed higher-level math to get by as an adult, especially those who struggled with math growing up, and have still done "just fine" in life. As a result, they believe their children will not need higher-level math either.
- ...in the idea of a "math person" and feel it is someone who is both good at math and who likes math and that these traits are innate, rather than malleable, and shaped by students' environments and experiences.
- ..."good parents" should be able to help their children with learning math, but many feel they personally are not able to, or believe their child's teacher is more equipped to help.
- ...a parent's role is to protect their children, and some parents see high expectations for their child's math learning as placing unnecessary stress on children who are struggling.
- ...when they see their children struggle at learning math, they think their children are not good at it.

"Some things just come to people naturally...I think it's a mix between understanding that maybe this person is just inherently not strong in a certain subject, but also identifying the ways that they do learn to maybe expand how the subject is taught."

Black Female, Parent/Guardian, California
Source: MNP Parent Qualitative Research

Belief Pathway: Parent



Parent Emotions

Math is emotional for parents. Many parents have had negative experiences learning math.

Messaging Recommendations

This section shares messaging recommendations (guidance on how to disrupt problematic math narratives). The messages were derived from the research insights shared on previous slides and from testing messages.

MESSAGING RECOMMENDATIONS OVERVIEW

The following messaging recommendations are informed by insights and findings from The Math Narrative Project. They provide guidance on how to effectively communicate with 6th to 10th grade students, parents*, and math teachers.

ELEVATE STUDENT AGENCY: Messaging should elevate student agency and center students' emotions and experiences, which are critical to their math learning.

ACKNOWLEDGE REAL-WORLD CONTEXT: Empathize with students, teachers, and parents by acknowledging and naming the real-world challenges they face.

ACKNOWLEDGE EMOTIONS IN MATH LEARNING: Normalize the emotional nature of learning math, and provide examples of how negative emotions can be reinterpreted.

MAKE MATH RELEVANT: Deliver credible and motivational messaging on the utility, relevance, and value of higher-level math for students' lives, desired careers, and futures.

AFFIRM THE VALUE OF MISTAKES: Normalize making mistakes as an important and valuable part of learning, including learning math.

ENCOURAGE HELP-SEEKING: Build student confidence to seek the help they need to learn math and equip parents and teachers with messaging that supports and encourages students to seek out help.

REFRAME STRUGGLE AND CAPABILITY: Reframe struggle from a sign of lacking capability to a sign of needing support.

REASSESS ASSUMPTIONS: Encourage teachers to reexamine their assumptions about what certain student behaviors mean and the impact of students' negative emotions on their math learning experience.

PRIORITIZE BUILDING RELATIONSHIPS: Show teachers the impact of their relationships with students on math learning, and support teachers to prioritize building relationships in their classrooms.

MESSAGING RECOMMENDATIONS: STUDENTS

The following recommendations are intended for people communicating directly with students. They are meant to support professionals, including teachers, instructional designers, district leaders, curriculum developers, content developers, and others who work to engage, motivate, and enable students to learn math.

There are seven messaging recommendations for students. The first three recommendations should be applied across all messaging, so that all messaging interventions elevate student agency and acknowledge the real-world context and emotional nature of math learning. This approach helps prime audiences to be more receptive to the other messaging based on the other recommendations.

#1: ELEVATE STUDENT AGENCY

Messaging should elevate student agency and center students' emotions and experiences, which are critical to their math learning.

Why is this important? Students are more motivated to persist in learning math when they are encouraged to exercise agency and take ownership in their own math learning.

Position students as active participants in their math learning with messages that:

- Feature peers who describe their own experiences learning math and how their choices have enabled them to persist when math gets difficult.
- Elevate near-peer student messengers (an older student close in age) who have a range of experiences and feelings about math to help students relate more positively and quickly to the message.
- Highlight student agency by underscoring that students can make decisions about how they approach, persist through, and solve problems.

Note: Students often respond well to messengers regardless of whether they match their own racial and gender identity; they are more likely to connect emotionally to those who share similarities in their lived experiences and context.

Messages about math learning should balance honesty with agency.

- Avoid claiming that students can assert agency in all situations. For example, messages should be honest about the aspects of students' math education over which they have little or no control (i.e., the stakes of making a mistake on a test, state-wide testing, a district requirement that they take certain classes to graduate).
- Emphasize the parts of their lives over which they do have control (i.e., asking for help from a teacher, finding resources online, getting help from a friend).

#2: ACKNOWLEDGE REAL-WORLD CONTEXT

Empathize with students, teachers, and parents by acknowledging and naming the real-world challenges they face.

Why is this important? Students' experiences learning math are impacted by what happens both inside and outside of the classroom. Naming valid concerns and circumstances shows students that the messenger understands that their challenges are real. This acknowledgement helps to prime them to be more receptive to subsequent messaging about persisting in math learning.

Acknowledge the realities students face. Examples reported by research participants include:

- Help is sometimes unavailable when students seek it
- Having a bad math teacher for one or more classes can interfere with math learning
- COVID learning interruptions and knowledge gaps
- Teachers' increasing reliance on online learning and the difficulties for some students to get timely help when they need it
- Issues students are experiencing outside of the classroom
- Heightened sensitivity towards social dynamics and fear of embarrassment during adolescence
- Large class sizes/high student-to-teacher ratios
- Pacing of teaching and emphasis on testing and standardized testing outcomes

#3: ACKNOWLEDGE EMOTIONS IN MATH LEARNING

Normalize the emotional nature of learning math, and provide examples of how negative emotions can be reinterpreted.

Why is this important? Students' negative emotions around learning math can reduce their willingness to persist when learning math gets difficult. When frustration, stress, or feeling overwhelmed are particularly strong, students may be more likely to disengage completely.

Acknowledge that mixed or negative emotions, like feeling frustration, being overwhelmed or being confused around learning math, are normal and shared by others.

- Share near-peer stories in which students describe the emotions they experience learning math.
- Affirm many students' perception that learning math can feel hard and sometimes feels harder than other subjects.

Reframe negative emotions as an indication of a need to seek help and not as an indication of an inability to learn higher-level math (like algebra or above).

- Show how peers and near-peers who have had negative emotions learning math have moved from feeling overwhelmed to understanding that their negative feels are a sign they can and should get help.

Do not inadvertently dismiss students' emotions by suggesting that negative feelings are something to be pushed through, ignored, or skipped over (e.g., "just keep trying" and "there's no reason to be upset").

#4: MAKE MATH RELEVANT

Deliver credible and motivational messaging on the utility, relevance, and value of higher-level math for students' lives, desired careers, and futures.

Why is this important? Students often don't believe higher-level math like algebra is relevant to their lives and therefore may not feel motivated to persist when learning higher-level math feels hard.

Deliver credible messaging on higher-level math's utility, relevance, and value for students' current lives and futures.

- Include examples of relevance that students understand, believe are real, and care about, such as: keeping your career options open; financial literacy; and having greater financial power so you don't get scammed or cheated.

Alleviate heightened stress about learning math, by pairing messaging about relevance with messages that show students where and how they can get help, support, and resources.

- Employ varied messengers, including near-peers, teachers, and parents/other trusted adults.

Rather than just telling students that math is relevant, show varied examples that resonate with different young people:

- Examples should show how math is used in that specific instance.
- Examples should include a mix of concepts and applications so that students at different points in their math education can relate.

Avoid messaging that:

- focuses exclusively on how higher-level math is a prerequisite to future education goals
- refers to the value of math in abstract phrases like "math is a universal language"
- lists specific jobs that require higher-level math

DOWNLOAD: Help Students Connect the Dots on How Learning Higher-Level Math is Useful and Relevant to Their Lives

#5: AFFIRM THE VALUE OF MISTAKES

Normalize making mistakes as an important and valuable part of learning, including learning math.

Why is this important? Students often experience negative emotions like frustration, embarrassment, and shame when making mistakes in the context of learning math, which can cause them to disengage or doubt their capability.

Normalize making mistakes as an important and valuable part of learning.

- Remind students that most people make mistakes when learning something new.
- Draw parallels to learning other subjects or skills, including sports, gaming, music, and other activities that students enjoy and feel positively about.
- Use messages from teachers and near-peers to help ease students' negative feelings about making mistakes.
- Be honest that mistakes carry different consequences in certain contexts, like homework or in the classroom; failing to acknowledge that mistakes on tests are higher stakes can undermine the credibility of the messaging.

Affirm that making mistakes is not a reflection of a student's overall capability or potential but rather an indication that you need more help or support.

- Include messaging that encourages asking questions and seeking support.

Do not provide generic advice or cliched enthusiasm about making mistakes (e.g., "It's great to make mistakes.").

- Instead, acknowledge the negative emotions students may feel and show empathy around how it feels to make mistakes (e.g., "You're learning, and that's what matters. Everyone makes mistakes sometimes. Keep going and don't be afraid to ask for help.").

STUDENT RECOMMENDATIONS

#6: ENCOURAGE HELP-SEEKING

Build student confidence to seek the help they need to learn math and equip parents and teachers with messaging that supports and encourages students to seek out help.

Why is this important? Students often feel that asking questions or asking for help can feel embarrassing and means they are worse than their peers at learning math or that they are not good at math.

Encourage students to recognize that asking questions is a valuable part of the learning process and that everyone has questions at some point in their learning.

- Share stories of students who demonstrate and model confidence and have the agency to ask questions in and out of the classroom.

Take the stigma out of asking questions during math learning:

- Convey that everyone needs to ask questions when they are learning new things, with messages such as "questions are part of understanding new ideas."
- Utilize teacher messengers who model supportive responses to students' questions.
- Employ near-peer messengers who can share stories about how they came to value of asking questions.
- Acknowledge that fear of embarrassment and social anxieties are a normal part of adolescence and may be present for many students.

Share stories of students who asked a question despite concerns of being embarrassed and had a good experience. Or share instances in which students found ways to ask a teacher for help privately or to ask their peers.

Expand students' perceptions of the places and people who can assist them with learning math such as:

- students asking peers for help in class or after class and asking teachers for help during or after class or privately rather than in front of the whole class.
- a variety of tangible, realistic, free, and low-cost resources, including online resources, help from adults who are not teachers, or school-provided tutors.

Suggest a range of options for getting help that are accessible to a wide range of students.

- Be careful not to only suggest ways of getting help that many students may not be able to access (e.g., hiring a private tutor, or expecting a teacher will always be available after class).

#7: REFRAME STRUGGLE AND CAPABILITY

Reframe struggle from a sign of lacking capability to a sign of needing support.

Why is this important? Students who struggle when learning math interpret it as a sign of their capability, and it discourages them from persisting in learning higher-level math.

Acknowledge that struggling while learning is a common experience and not inherently a sign that you're bad at something.

Reframe struggle from a sign of lacking capability to a sign of needing support.

- Affirm that persisting through struggle with support is important for building stronger math skills.
- Encourage students to reflect on other parts of their lives that they enjoy (ex: sports, gaming, music, dance, etc.) where they have already demonstrated that they can engage with struggle in positive ways.

Use messengers, including adults and near-peers, who share their own experiences of struggle and describe how they overcame this and what resources helped them. These messengers can validate students' experiences of struggle, model how to reinterpret struggle, and point students toward resources that can help them.

When possible, deliver messaging during the actual moment of struggle, as it is particularly impactful.

Do not provide generic affirmations or simplistic advice about struggling with math (e.g., "just keep trying") without also offering concrete ways to get help.

MESSAGING RECOMMENDATIONS: TEACHERS

The following recommendations are intended for people communicating directly with teachers. They are meant to support professionals, including teachers, instructional designers, district leaders, curriculum developers, content developers, and others who work to engage, motivate, and enable students to learn math.

There are nine messaging recommendations for teachers. The first three recommendations should be applied across all messaging, so that all messaging interventions elevate student agency and acknowledge the real-world context and emotional nature of math learning. This approach helps prime audiences to be more receptive to messaging based on the other recommendations.

If you are introducing these recommendations to teachers, start by acknowledging the real challenges they face and consider using a variety of trusted messengers who understand different teaching contexts. These approaches should be presented as small, practical, evidence-based tools that are easy to use (rather than a wholesale new teaching approach) and have been tested across a wide range of classrooms.

#1: ELEVATE STUDENT AGENCY

Messaging should elevate student agency and center students' emotions and experiences, which are critical to their math learning.

Why is this important? Teachers are often trained to see their role in the classroom as delivering information to students and students' role as absorbing information. This one-way relationship can make it difficult for students to take ownership over their math learning. By inviting students to practice exercising agency in their own learning—rather than teachers just delivering information—students can better engage with their math learning.

Offer messaging that encourages teachers to invite students to think about how they approach, persist through, and solve problems.

Elevate students as messengers to teachers to encourage teachers to reflect, be curious, and empathize with students' emotions and experiences learning math. You can:

- Share a range of first-person student stories that give teachers insight into students' emotional experiences learning math.
- Show teachers the barriers that discourage some students from seeking help and the impact teacher behavior has on students' learning environment.
- Create opportunities for teachers to hear from young people (who are not their own students) about their math classroom experiences to foster empathy and understanding.

Include messaging that encourages teachers to invite students to exercise their own agency, rather than tell students how to act or feel.

#2: ACKNOWLEDGE REAL-WORLD CONTEXT

Empathize with students, teachers, and parents by acknowledging and naming the real-world challenges they face.

Why is this important? Teachers are often asked to adopt new teaching practices and interventions, which can feel overwhelming and lead to skepticism. Building trust by acknowledging the pressure teachers face can help teachers be more receptive to messaging about changing their teaching practice.

Acknowledge the constraints that teachers experience, and validate their concerns to help reduce their skepticism and make them more open to suggested changes.

Some constraints reported by teachers include:

- Large class sizes
- Students with different levels of math knowledge and language proficiency in the same classroom
- Gaps in learning from COVID
- Student absences
- Administrative and district pressure and requirements
- Pacing and curriculum requirements
- Emphasis on testing and standardized testing outcomes
- Lack of time both inside and outside the classroom
- Varied level of parental involvement and support at home
- Feeling overwhelmed by the frequent introduction of new pedagogical changes

#3: ACKNOWLEDGE EMOTIONS IN MATH LEARNING

Normalize the emotional nature of learning math, and provide examples of how negative emotions can be reinterpreted.

Why is this important? Teachers are sometimes unaware that students' negative emotions about learning math can interfere with their motivation and willingness to persist. Some teachers may not feel equipped to (or responsible for) helping students manage their negative emotions. Others may feel that the demands of the classroom leave too little time to help students manage their own emotions.

Encourage teachers to empathize with students' negative or mixed emotional experiences learning math by utilizing prompts that enable teachers to reflect on their own math learning journeys or creating opportunities for teachers to reflect individually or with peers on how emotions show up in their math teaching.

Use stories of peer teachers to show teachers they have a role in helping students reinterpret their emotions:

- Start by affirming teachers' emotional need to see themselves as good teachers who care for their students
- Describe how the teacher previously did not recognize how students' negative emotions were interfering with their math learning, what specific words or phrases they used to reinterpret emotions in the classroom, and the change the teacher sees in their students, as a result.

Provide teachers with examples of concrete things they can say to students to help them reinterpret their emotions in real-time, such as:

- When you're feeling frustrated, confused, or overwhelmed, that's a signal to ask questions and get extra help.
- When you feel lost in class or don't understand, it can be embarrassing to ask for help. Those moments are the best time to get extra support. Even though it's hard, it's important for you to ask for the help you need.

Affirm that teachers can take small steps to acknowledge students' emotions, which builds trust with their students, and does not require training as a therapist or counselor.

#4: MAKE MATH RELEVANT

Deliver credible and motivational messaging on the utility, relevance, and value of higher-level math for students' lives, desired careers, and futures.

Why is this important? Teachers believe it is important that students understand the relevance of learning higher-level math to their lives. However, many believe higher-level math's importance is obvious, while others do not feel well-equipped to offer credible examples to different students.

Affirm that teachers get asked frequently about the relevance of math and find it challenging to provide answers that students find credible.

- Provide a range of different examples about the relevance of math so that different students have more opportunities to connect (e.g., the immediate relevance of learning higher-level math may resonate more with middle school students compared to career-oriented examples, though it is helpful to use both).

Frame messages about the relevance of math for students as a "toolbox" for teachers.

- A toolbox reinforces the idea that no single example of relevance will work for all students or for all teachers.

Provide examples about the relevance of math connected to contexts students understand, believe are real, and care about (e.g., keeping your career options open, financial literacy, and having greater financial power so you don't get scammed or cheated).

- Show how specific math concepts are applied in the real world (e.g., describe how linear equations can help students understand loans).

Avoid messaging that:

- focuses exclusively on how higher-level math is a prerequisite to future education goals
- refers to the value of math in abstract phrases like "math is a universal language"
- lists specific jobs that use higher-level math

DOWNLOAD: Help Students Connect the Dots on How Learning Higher-Level Math is Useful and Relevant to Their Lives

#5: AFFIRM THE VALUE OF MISTAKES

Normalize making mistakes as an important and valuable part of learning, including learning math.

Why is this important? Many teachers know that making mistakes can feel demoralizing for students, and may try to help by 'rescuing' them with the answer. Encouraging teachers to reframe making mistakes as useful—rather than just giving students the answers—can help students persist through the mistakes.

Show teachers how to respond positively when students make mistakes and address negative emotions such as embarrassment or fear that students often experience when they make mistakes.

- Acknowledge the negative emotions that students may experience when they make mistakes.
- Frame mistakes that students — or adults — make as opportunities for learning.
- Model how to unpack a mistake to learn from it.
- Affirm that making mistakes does not reflect a student's overall capability but rather indicates needing more help or support.
- Be real that some mistakes come with higher stakes than others: mistakes in homework or in the classroom can be learning opportunities, whereas mistakes on tests are more consequential. Not acknowledging these differences can undermine the credibility of the messaging.

Help teachers realize that students need to hear explicit messages that reframe making mistakes as a valuable part of the math learning process. You can:

- Share student stories describing how they feel when they make mistakes and how teachers respond.
- Include negative experiences, such as a student who feels embarrassed or ashamed about mistakes, to help teachers build empathy for students.
- Include positive experiences, such as a student who feels good when a teacher responds non-judgmentally to a mistake by breaking down the specific steps to solving a problem to model for teachers what students need from teachers.
- Share stories from peer teachers — diverse teachers with varied levels of teaching experience — describing what they do to create a positive learning environment in their classrooms that values mistakes as learning opportunities.

#6: ENCOURAGE HELP-SEEKING

Build student confidence to seek the help they need to learn math and equip parents and teachers with messaging that supports and encourages students to seek out help.

Why is this important? Teachers often expect students will ask questions or seek help when they need it, but many students won't ask for help unprompted, in part because they feel uncomfortable doing so, or they feel so lost they are unsure of what to even ask.

Encourage teachers to understand better the barriers to seeking help that many students experience. You can:

- Use student stories to show teachers which teacher behaviors motivate students to ask questions and which may inadvertently discourage questions.
- Remind teachers about the realities of students' developmental age (i.e., students don't want to be perceived as needing help, or they are afraid of being teased by other students)
- Show teachers how their behaviors sometimes inadvertently shame or embarrass students (e.g., describe the impact of teachers who respond to questions by saying, "I just explained that" or "You weren't paying attention").

Encourage teachers to reflect on moments when students may be struggling but too embarrassed to ask for help, and what actions they can take as a teacher to encourage students to seek help.

Guide teachers to feel better equipped to encourage students to seek help by:

- Sharing stories of peer teachers who have successfully created classroom environments where students regularly ask for help.
- Pointing out the sources students can easily access to seek help (e.g., in school, after school, online, one-on-one at the teacher's desk, etc.)

Motivate teachers to create an environment in which students feel more comfortable asking questions by:

- Highlighting stories of other teachers who started more actively soliciting questions and offering different avenues to ask questions (in group settings and one-on-one), which took shame and embarrassment out of learning.
- Share examples of what teachers can say to praise asking questions (e.g., "That is a great question.") or destigmatize asking questions: (e.g., "It's helpful when you ask a question. A lot of other students have the same question.")

#7: REFRAME STRUGGLE AND CAPABILITY

Reframe struggle from a sign of lacking capability to a sign of needing support.

Why is this important? Narratives that only some students can be good at math or can learn higher-level math can shape teachers' beliefs about their own students' capabilities.

Create opportunities for teachers to reflect on when and why they determine that some students are unable or less likely to be able to learn higher-level math, like algebra. You can:

- Share stories of peer teachers who describe their own motivations to reconsider how they determine students' capability in the classroom.
- For example, spotlight stories where a teacher shares: when they realized they were assuming specific students could not or would not understand the materials; ignored students who struggle often or don't appear to get math. Then counter this with what led the teacher to question their own behavior, and how small changes helped them to engage with this student differently in order to get them the help they needed.
- Share messages that describe the challenges of teaching a class with students at different levels of math proficiency and how peer teachers have successfully managed this range in their own classrooms.

Avoid messages that suggest teachers deliver false optimism or positivity (i.e., "Struggling is great!"), which can feel inauthentic and frustrating for students if not offered with concrete ways to get help or solve problems.

When possible, deliver messaging during the actual moment of struggle, as it is particularly impactful.

#8: REASSESS ASSUMPTIONS

Encourage teachers to reexamine their assumptions about what certain student behaviors mean and the impact of students' negative emotions on their math learning experience.

Why is this important? Teachers often feel they do not have the time to provide every student with one-on-one support. When teachers see certain student behaviors — like failing to complete their coursework — they may interpret that as a lack of interest in learning and focus their attention on other students.

Encourage teachers to get curious about how students feel about learning math and the connection between student behaviors and student emotions. You can:

- Help teachers to explore potential alternative reasons for student behaviors in class by reflecting on questions such as:
  - What do I believe confusion and frustration look like in my students?
  - Could this student feel lost or stuck on a problem or a concept or frustrated and overwhelmed, so they have given up?
  - How can I find out if something else is going on for this student?

Provide opportunities for teachers to reflect on how they interpret certain student behaviors and the emotions that may be driving those behaviors. You can:

- Share stories from students' perspectives that describe the behaviors they do when they feel stressed or overwhelmed—such as doodling, submitting a blank worksheet or test, or talking to another student in class—and then invite teachers to reflect on their own assumptions about what these behaviors (above) represent.

Avoid implying that teachers don't understand their students at all. Rather, remind teachers about their positive motivations to be teachers and then show them how to reinterpret some students' behaviors and small steps they can take to help their students and get their students re-engaged.

#9: PRIORITIZE BUILDING RELATIONSHIPS

Show teachers the impact of their relationships with students on math learning, and support teachers to prioritize building relationships in their classrooms.

Why is this important? While many teachers believe building relationships with students is important, they often do not feel relationships are integral to math teaching or that they have time to prioritize relationship-building given their focus on helping students learn math.

Position building relationships as critical to learning math, an element of math learning that significantly helps students learn higher-level math effectively and successfully.

Leverage teachers' desire to help their students to motivate and encourage teachers to take on and try out interventions. You can:

- Show the power of small changes teachers can make to build and strengthen relationships with students.
- Provide a range of small-scale interventions aimed at teachers and share how these interventions have been successfully adapted by other teachers with minimal preparation and time investment.

Create opportunities for teachers to reflect on how intentional efforts to build positive relationships with students, especially early in the year, build trust and improve their ability to teach math.

Show teachers how developing good relationships positively impacts students' math learning and support teachers to prioritize building relationships with students:

- Tap into the beliefs most teachers have about the importance of belonging and relationships for students' learning.
- Utilize stories from both students and peer teachers to emphasize the importance of building empathy and trust in the classroom, and how once built, trust yields positive learning outcomes.
- Provide examples that match the needs of different types of teachers (e.g., new and seasoned), working with different student demographics, in different geographic and political contexts.

Avoid messaging that implies relationships should be prioritized at the expense of other important teaching practices; show it is a "both/and."

DOWNLOAD: Teacher Math Story

MESSAGING RECOMMENDATIONS: PARENTS

The following recommendations are intended for people communicating directly with parents. They are meant to support professionals, including teachers, instructional designers, district leaders, curriculum developers, content developers, and others who work to engage, motivate, and enable students to learn math.

There are six messaging recommendations for parents. The first three recommendations should be applied across all messaging, so that all messaging interventions elevate student agency and acknowledge the real-world context and emotional nature of math learning. This approach helps prime audiences to be more receptive to messaging based on the other recommendations.

#1: ELEVATE STUDENT AGENCY

Messaging should elevate student agency and center students' emotions and experiences, which are critical to their math learning.

Why is this important? When parents see their child struggle with learning math, they may try to minimize their child's stress may not realize they can encourage their child to advocate for themselves and take ownership of their math learning.

Encourage parents to get curious about their child's math learning experience.

- Equip parents with questions they can ask to get their child to share more about their experiences learning math.
- For example, parents can describe steps they took to get their children to open up about their experiences learning math, and the changes they then took to better support their child's math learning.

Show parents how children can exercise agency in their math learning.

- Share short stories that center a diversity of choices a student can make to positively impact their learning, including decisions a student makes every day in math class, such as asking for and accepting help, and seeking or accepting resources.

#2: ACKNOWLEDGE REAL-WORLD CONTEXT

Empathize with students, teachers, and parents by acknowledging and naming the real-world challenges they face.

Why is this important? Parents sometimes feel defensive when presented with messaging that does not acknowledge the obstacles they may face while trying to support their children's math learning. Naming valid concerns and circumstances parents face builds trust and helps to prime parents to be more receptive to subsequent messaging.

Affirm parents' desire to be a "good parent" implicitly or explicitly. You can:

- Affirm that parents face many challenges, have good intentions, and want to do right by their children.
- Acknowledge that most parents strive to be "good parents," and want to be able to help their children succeed, including finding resources to support their child when learning math gets hard.

Acknowledge the factors that may influence how parents feel about supporting their child's math learning:

- Parents' own experience with learning math and perception of their own math capability.
- The shift to Common Core, and how this makes it more difficult for some parents to help their children learn "new math".
- Adolescent development, and the changes that young people go through physiologically, emotionally, and biologically between 6th and 10th grades.
- Emphasizing the ways parents can support their child's math learning with other resources, rather than needing to be able to directly help them or understand higher-level math themselves.

#3: ACKNOWLEDGE EMOTIONS IN MATH LEARNING

Normalize the emotional nature of learning math, and provide examples of how negative emotions can be reinterpreted.

Why is this important? Parents often have very distinct memories—especially those who had negative experiences —of learning math. Many parents unwittingly pass down negative attitudes about learning math to their children.

Help parents reduce their stress and manage their own negative emotions about learning math by showing how they can provide support to their child(ren) without passing down their own negative emotions.

- Share stories about parents with varied emotional experiences learning math, showing what a parent can say or do to help their children manage negative emotions related to struggling with math.
- Effective messages show parents how they can unintentionally transmit their stress about learning math to their children by saying things like, “I’m not a math person either” when trying to support their child who is struggling.

Acknowledge negative emotions and affirm struggle as a normal part of children’s math learning process. This can help debunk the notion that some students are naturally good at math and help to reduce parents’ stress about their child’s math learning. You can do this by:

- Offering suggestions for how to speak with their child about their math learning experiences.
- Pairing messages that address or acknowledge students’ negative emotions with messages about higher-level math (like algebra or above) relevance, student capability, and available resources.
- Helping parents reframe student’s negative emotions while also pointing to resources and reassuring parents that children are capable of learning higher-level math. Messages that lack that reassurance or resources can heighten parents’ stress.

PARENT RECOMMENDATIONS

#4: MAKE MATH RELEVANT

Deliver credible and motivational messaging on the utility, relevance, and value of higher-level math for students' lives, desired careers, and futures.

Why is this important? Parents may not use higher-level math or don't see how they use higher-level math in their everyday lives and work, which can make it harder to communicate its relevance to their children and support their motivation to persist. Some parents may also feel they have been able to live a good life without using higher-level math — and therefore tell their children that higher-level math is not important to learn.

Share credible examples with parents of how higher-level math is relevant for students' current lives, future careers, financial literacy, and agency.

Effective examples for parents about the relevance of higher-level math connect to contexts that they and their children understand, and believe are real, including:

- Learning math helps keep your future career options open.
- Learning math can help prevent you or your family from getting scammed or cheated.
- Learning math can increase your financial literacy, such as helping you understand interest rates and choose between loans.

Frame higher-level math as opening more career paths rather than being a requirement for a good career or specific jobs (i.e., "higher-level math helps students have more choices about what they do in their lives").

Avoid exacerbating parents' stress around higher-level math by pairing relevance messages with messages that:

- Reassure parents all children can get better at math
- Connect parents to different types of resources available to help support their child's math learning.

Avoid messaging that focuses exclusively on how higher-level math is a prerequisite to future education goals, refers to the value of math in abstract phrases like "math is a universal language", or lists specific jobs that use higher-level math.

DOWNLOAD: Help Students Connect the Dots on How Learning Higher-Level Math is Useful and Relevant to Their Lives

#5: AFFIRM THE VALUE OF MISTAKES

For Recommendation #5: AFFIRM THE VALUE OF MISTAKES, visit the Messaging Recommendations for Students or Teachers

PARENT RECOMMENDATIONS

#6: ENCOURAGE HELP-SEEKING

Build student confidence to seek the help they need to learn math and equip parents and teachers with messaging that supports and encourages students to seek out help.

Why is this important? Parents want to help their children with math learning, but often don't know how to directly help them or where to turn for resources.

Affirm parents' desire to be "good parents" who can help their child learn math, even if the help is not direct support for homework.

Build confidence among parents to seek resources and support for their children when learning math feels hard. To do this, you can:

- Normalize the challenges of raising adolescents.
- Ensure messengers are diverse and varied — including parents who have had strong and positive experiences learning math and also those who have not and feel less capable of helping, and regardless found ways to support their child's math learning.
- Include effective messengers like other parents and education experts who can share their own experiences helping students persist and provide resources.

DOWNLOAD: Parent Resources for Math Learning

Provide parents with lists of resources that include a diversity of options with varying levels of financial cost and time commitment.

- Parents also appreciate resources that they can share with their students that don't depend on the parents' own math skills.
- Messages for parents that offer resources are more effective when they are packaged and presented with messages that elevate the capability of all students to learn and get better at math.
- Messages about capability give parents hope that encouraging their children to get help and providing resources will actually help rather than cause unnecessary stress.

Suggest a range of options for getting help that are accessible to a wide range of families.

- Be careful not to only suggest ways that parents can get help for their child that may not be accessible for all parents (e.g., hiring a private tutor).

#7: REFRAME STRUGGLE AND CAPABILITY

Reframe struggle from a sign of lacking capability to a sign of needing support.

Why is this important? Narratives that children are innately either good at math or bad at math can reinforce parents' beliefs that when their child struggles it means that they're not good at math. Parents may worry that encouraging their child to persist at math will simply cause them more stress without increasing their math ability.

Motivate parents to encourage their children to persist when learning math gets hard, by elevating three core messages as a package: 1) higher-level math is relevant and valuable, 2) anyone can get better at math with the right support, and 3) effective resources are available.

- Acknowledge and affirm that most parents strive to be "good parents," including getting their child help when learning math feels difficult.
- Package messages about relevance, capability, and resources together.
- Effective messengers include other parents and education experts who can share their own experiences helping students persist and provide resources.

When possible, deliver messaging during the actual moment of struggle, as it is particularly impactful.

Tap into parents' existing beliefs about the value of persistence and apply it to learning higher-level math, using messaging that helps parents:

- View mistakes as learning opportunities. Make comparisons to learning other skills or even something like exercise (e.g., "If your muscles are sore or you are short of breath, it just means you're challenging your body as you strive to get stronger.")
- Acknowledge negative feelings like frustration, and surface positive feelings, like the satisfaction of persisting through something hard and succeeding.
- Encourage children to keep trying by emphasizing that what matters isn't if they "get it" right away, but if they stick with math and ask for help when they need it to learn the math skills that they might need for their futures.
- Remind children to seek out help that works for them from a variety of resources or different people.
- Praise your child's hard work and effort, rather than praising them for "being smart" or getting things quickly, which can inadvertently discourage them from taking on challenging work.

Do not provide generic affirmations or simplistic advice about struggling with math (e.g., "just keep trying") without also offering concrete ways to get help.

Test Messages

This section provides evidence for why the messaging recommendations were effective with students, teachers, and parents. A few example test messages are deconstructed to demonstrate how the test messages informed the messaging recommendations.

WHY THIS MESSAGE WAS EFFECTIVE

Sample video message of Hispanic female near-peer tested with student audience

"When I think about math, I feel anxious, nervous, and honestly, I don't really like it. And I think this is because always in the math classroom from a young age, I just felt dumb or just super slow compared to the rest of my classmates. There's just so many steps and so many things to remember, and I feel like there's even just this pressure where it's like, math is so useful...it just makes it that much more difficult to learn. I would feel like I just wanted to cry.

In middle school, I had a lot of substitutes, and anytime that I needed just help, I wasn't able to get it. And when moving on to high school, it just made it that much more difficult because I didn't have the basic math. When math got difficult, I didn't really go to my parents just because they didn't really know much about math, so I would go to my siblings.

My brother was in college, and it was really nice because he would be able to break down the steps and really help me and be like, oh, no, you need to understand this part in order to continue on. I just needed that clarification and make sure that I was doing things correctly, because sometimes I would just doubt myself. And that doubt made it so that I would get that answer wrong.

My best resource was also Google because there's a lot of applications or websites that you can download, and I would use them just to check my work because sometimes it's just a little tiny thing that you get wrong, and it makes the rest of the problem incorrect. For me, mistakes were helpful because once I made that mistake, it stuck with me. I was like, I'm never going to make this ever again. So I would always recheck the problem and be like, let me make sure that the mistake that I made last time isn't happening again. But when I finally get a math problem that I've been struggling with correct, it's like, I feel like I've conquered the world...

What motivated me to ask for help was because I knew nobody else was going to help me. A lot of people have told me I have this really calm face, or they don't know how to read me, so just knowing that I knew that people weren't going to know if I was confused or not, so I had to seek it out because nobody else was going to do it for me.

Even though I don't really like math, it did come in handy once my senior year knowing how to read my financial package and what the numbers meant. I'm not super rich, so I need to make sure that the amount that I would have to pay wasn't too high."

Acknowledge emotions in math learning: The messenger talks about her own negative emotions learning math, which helps to normalize them. She then goes on to say that her eventual response was to seek help, and when she was able to succeed after getting help and get a problem correct, she had more positive emotions.

Acknowledge real-world context: The messenger shares her experience having to learn without a consistent math teacher, and without much help from her parents, which is an experience many students can relate to.

Encourage help-seeking: The messenger models some of the different ways she was able to get help when her parents couldn't help her.

Affirm the value of mistakes: The messenger reflects on mistakes she's made, and says both that mistakes are not a sign of lacking capability (often just a "little tiny thing"), and also that making a mistake in practice can be valuable because it helps you remember that concept for the future.

Elevate student agency: The messenger talks about how she decided to take action in her math education after realizing that she is the one with the power to seek out what she needs to learn math.

Make math relevant: The messenger gives a concrete and relatable example of how learning higher-level math can be helpful in the real-world.

WHY THIS MESSAGE WAS EFFECTIVE

Excerpt from sample message statement as part of a news article tested with parent audience

For this article, Maria [a local mother] and Mateo [her son who has been struggling with algebra] agreed to meet Dr. Harris [a child psychologist and education researcher who specializes in adolescent development] and talk with her, together, about what was going on with Mateo and math, while this reporter listened in. After introductions, Dr. Harris asked open-ended questions of both, like, "Describe yourself as a parent," and, "Describe how math class has been making you feel." After both Maria and Mateo responded to these questions, Dr. Harris gave Maria time on her own to discuss how she might include some of these tips in her parenting – for all three of her kids.

1) **Parents need to listen to their child.** Although it's natural for parents to feel impatient or lose their tempers, try to avoid sounding confrontational. Find out what's going on through gentle prompts, like, "What is most confusing to you about math?" "Do you feel like you can ask questions?" "Does your teacher offer extra hours for you to stop by and ask for help?" When Maria and Mateo practiced this part, Maria discovered that Mateo had struggled with long division and fractions in elementary school, but had somehow powered through until he got to algebraic concepts and equations. This time around, nothing he did seemed to help and he just ended up feeling more and more lost.

2) **Parents need to be careful about how they pass on their own math experiences to their children.** Some parents excelled at math, others struggled for years, and still others were just okay. No matter what parents' own experiences were, they will likely impact how they talk about math with their kids. "I was a good math student, but I had a really tough time with calculus," admits Maria. "But I realized that it wasn't helpful for Mateo to hear that I sailed through algebra and then hit a brick wall with calculus. What was helpful was for me to convey to Mateo that both success and struggle are normal and sometimes even helpful." Mateo nodded in agreement when Maria said this, saying, "It was such a relief to hear that my mom had struggled with math, too, even though it wasn't the same struggle I was having. It made me realize that maybe struggle is just a part of life, even though it feels really stressful in the moment."

3) **Parents can find different ways to support their kids to learn math.** "We're not a wealthy family, although we do all right," says Maria. "I know that a lot of moms are like, 'just hire a tutor!' because that's what they do for their kids. And I will, but Mateo and I talked about what else he might try first. Like, he said the teacher did offer extra help sessions and he had been a little bit shy about going, but I encouraged him to check it out. When he went for the first time, he brought home a list of online resources the teacher recommended, and one of them, Khan Academy, was free. He checked out the videos and was amazed at how simple and clear the explanations were of different concepts."

Both Maria and Mateo felt that the guided conversation with Dr. Harris was helpful. Maria felt like she had a better idea of what Mateo was feeling, and how to support him navigating a hard time in his education with empathy and care. Since that time, Mateo's grades have improved, although he still finds algebra hard at times. However, now when those moments happen, he both has more resources to check out, and most importantly, he and Maria can talk about what to do.

→ **Elevate student agency**: The psychologist in this article encourages parents to get curious about their child's experience learning math – and with that information, the mom is able to help her son take action to get the help he needs.

→ **Reframe struggle and capability**: The mother in the article models a conversation with her son where she shifts the way she talks about her own experiences with math to show her son that struggling when learning something new is not a bad thing.

→ **Encourage help-seeking**: The article lists several different ways that the student was able to get help, both paid and free, with different mediums.

WHY THIS MESSAGE WAS EFFECTIVE

Sample video message featuring multiple teachers, tested with teacher audience

Black male teacher:
Kids I teach range from low socioeconomic kids to high income middle income kids. The one commonality between all of them is just math in general is just not a strong subject for a lot of learners...So what I stopped doing is I stopped assuming that all the students had a strong foundation. I understand how it feels to be in that environment and knowing you have a pacing calendar, you have district benchmarks, you have unit assessment tests you have to get through. The thing I did is I challenged myself to stop saying that I don't have the time. Part of what motivated me to become a teacher, specifically a math teacher, it's like I remember how it felt to be sitting in a math class and not know what's going on and being too embarrassed to ask the question because I was afraid of not only what my peers are going to say, but how my teacher might respond and what that may do to me in front of my peers. So being honest about, Hey, this is what this feels like. Tell me how you feel right now. Because I remember when I was in ninth grade, I felt like this, and this is what helped me, really helped them see that I was, no, I didn't come out as a grown man algebra teacher. I used to be in their shoes too. And so building the relationship is by far the most important thing you can do. So why do you have to learn this? Because the world is ever changing. I don't know what your life's going to be like outside of this classroom. You don't know that either. So the more tools you can have in your toolbox, the wider you can develop your skill set, the better off you'll be. When life gives you a detour. Maybe you were going in one direction and something changed your mind. Now you want to go in a different direction. I want you to be prepared for whatever comes your way.

AAPI male teacher:
I've taught for a good amount of years. I know when the concept gets really challenging and students make a lot of common mistakes, I just preload them and prefund them and be like, Hey guys, this unit's going to be really tough. This is the hardest unit of this section, but just know that you're going to make a lot of mistakes. I'll make mistakes too, but making mistakes is part of the learning process. These mistakes are how we learn as students and how we grow as people. So continue to make mistakes because it's better to make mistakes now on the practice, on the assignments, on the quizzes, than to make mistakes on the tests. I think when I build that solid connection with students, they're able to engage more with the curriculum because they understand that I deeply care for them and I'm truly invested in their growth and in their success.

White male teacher:
I used to be just like, oh, that kid isn't trying, and I don't know, I can't try for them. I guess they're just not trying. I got to keep doing the thing and then just wait for them to start trying. And you start to realize over the years that there's a reason for everything. Very rarely is a kid truly just lazy. Oftentimes there's something going on at home or they are completely lost and they feel shame about being lost. They know they shouldn't be lost, and then that just makes them kind of close up. So there's always some reason why a kid is behaving the way they're behaving. It takes checking in with that kid.

AAPI female teacher:
I've been teaching for 10 years now. I generally do believe that all students can learn high degrees of math with the right guidance. I really do believe that. I really like seeing my students feel proud of themselves. When I first started teaching, I was pretty quick to rescue the kids. It's really easy as a teacher to just tell them what the formula is. I think kids actually understand more than they think they do. When I hear kids stay, I don't get it. I just ask them, what do you get? Try to figure out what they do understand and start working from there and help guide them into how they can apply what they already know. Over time, you just see kids changing their mindsets and it was just like a really beautiful thing to see.

→ **Acknowledge real-world context**: This messenger names some barriers that many teachers face (pacing, district benchmarks, etc.) and talks about how he was able to make some changes to help students despite these barriers.

→ **Prioritize relationship building**: Despite the challenges and constraints mentioned earlier, this teacher talks about small ways he is able to build relationships with students by sharing his own experiences

→ **Make math relevant**: This messenger gives an example of something he says to make math feel more relevant to students – that learning higher-level math can open more doors in their future.

→ **Affirm the value of mistakes**: This messenger models how to tell students that mistakes are a normal part of the learning process and that everyone makes them. Importantly, he names that making mistakes while *practicing* has different stakes than mistakes on a *test*. This makes the statement more credible.

→ **Reassess assumptions**: This messenger reflects on how he has made assumptions about whether students are trying – but then realized some other reasons a student could be behaving in a way that seems checked out. He encourages teachers to check in with kids when they are making those assumptions.

→ **Reframe struggle and capability**: This messenger begins by providing the motivation for reassessing some of her approaches in the classroom. Then she normalizes typical teacher behavior and shows others how to pivot to a different approach in small steps (e.g., it does not require a complete overhaul to their pedagogy)

Thanks from the research team

The research team is incredibly grateful to our advisors, as well as all of the students, parents, and teachers across the country who shared their stories, opinions, and feelings about learning math.

Their contributions helped us not only center student voice and experience in this project, but also helped us understand why this research matters--so that more students can have positive experiences learning math, in ways that can help open more doors for them in their future lives.

For more information about The Math Narrative Project, visit **mathnarrative.org** or write to **hello@mathnarrative.org**.

THE MATH NARRATIVE PROJECT